THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

EDITED BY

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Rev. G. WHEELER, M.A., F.E.S., F.Z.S. *and*

and

HENRY J. TURNER, F.E.S.,
Editorial Secretary

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EDITORIAL.

In our editorial of last year, we groused at the fact that "not a single British worker" had come forward to help with the revision of the *British Noctuae* of Tutt. At that time we had not begun our notes. Now that a commencement has been made, it was quite expected that British entomologists would support the magazine particularly for the sake of these notes, which render available the much scattered information that the majority of individuals, even those in touch with good libraries, would be unable to obtain without much delay and difficulty.

During the past year, 24 pages of notes have appeared; only a small contibution we agree, and we also agree with the criticism that the completion at that rate is in the far future. It must be noted that Tutt dealt with many species so exhaustively that but little addition will be necessary. The earlier species were less thoroughly dealt with and species like *C. or* had not received any intensive study as of late years.

If, however, our British workers will support the project, we shall only be too pleased to accelerate the issues of parts, one or more each month, but without adequate financial support it is impossible to publish.—Hy.J.T.

Subscriptions are now due.

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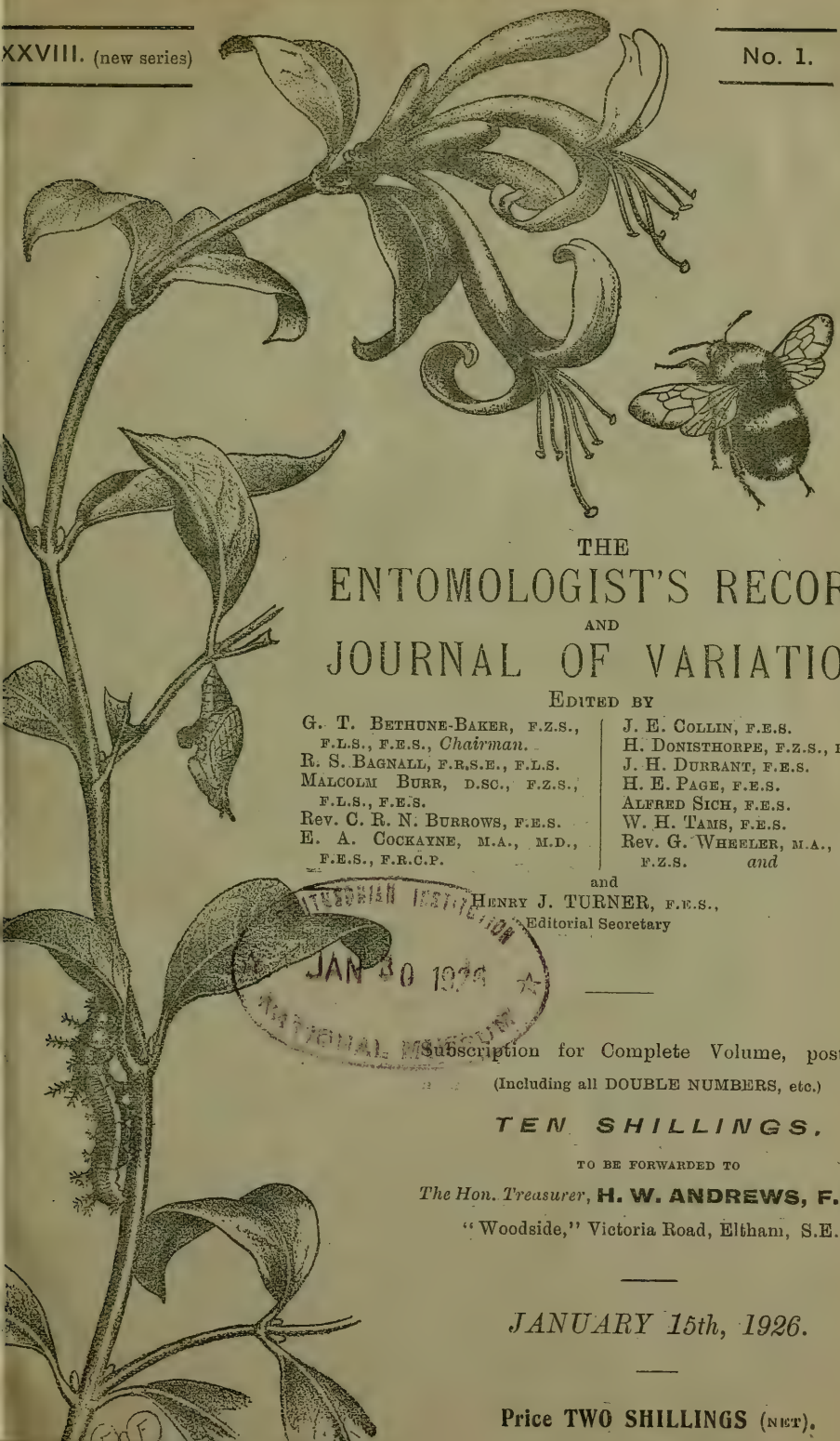

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The Entomologist's Record

AND

JOURNAL OF VARIATION.

Vol. XXXVIII. No. 1. January 15th, 1926.

Editorial.

January 1st, 1926.

It is with much regret that we have to record the decease of our printer, who passed peacefully away on New Year's Day. He wrote us a fortnight ago a cheerful letter expressing his pleasure at having printed the magazines for the past twenty-four years.

The continuance and future of the magazine is now assured. We have successfully paid our way under the new regime. Subscribers and contributors have stood loyally by us. The few natural withdrawals have been made up and old subscribers are beginning to come back. There now remains to obtain such further additions to our list of direct subscribers as will warrant us in a return to our former size of 24 pages. Will our friends help in this?

We get a few "grumbles" in the course of the year; some quite legitimate, other more or less inexcusable. The well known and eminent entomologist who writes, "It is a good move of yours to publish that List of the Varieties of the British Geometers in the *Record*, but it would have been infinitely more useful if you had added a short description of each of the vars. Very few Lepidopterists will have the least idea to what form any particular name refers, except, of course, the very few old varietal names with which everyone was familiar. It would have taken years (of the *Record*) to complete it, but it would have been well worth it," voices a real criticism. We have given only the outer crust of the loaf. But to the correspondents who say that we give them "nothing they want," or that the matter we publish is of "no interest," or who discontinue subscription because there is nothing on the "Physiology of insect life," we would say *give us of your own best* on the lines you consider to be your special side of the study, and we guarantee imitation, the "sincerest form of flattery," will bring forth the desired contents.

The Supplements seem to be appreciated as a good innovation. Their issue enables long continuous articles to be collected and bound at the end as an integral portion of the volume. This method is particularly convenient for Lists, such as that of the "Varieties of British Geometers" or the "Hymenoptera of Hampshire," which latter is completed in the present number.

The British Noctuae and their Varieties.—To numerous

enquiries *re* the promise of last year we would call attention to the following remarks made then. "It is proposed to give original descriptions of the various forms named and indicated in these authors [Staudinger, Spuler, Seitz, Hampson, Culot, Oberthür, etc.] and to add any further forms which may have been announced in the literature of Entomology or omitted in the above works. To do this is *rather a herculean task*, as many of such forms were originally differentiated by workers in more or less remote areas, and announced in magazines of limited and local circulation, and, may be, not exclusively devoted to Entomology. Thus *correspondents would be rendering much aid if they would indicate where such records occur, and notes on the variation of any species would be very useful to incorporate.*"

When I say that *not a single British worker* has come forward to assist, the remark *herculean task* would appear amply justified. As instances of the "task" it might be mentioned that the Bibliography of each species must be first worked out; which for the first two species to be considered, *G. derasa* and *T. batis* gives over 70 references to each; that Tutt did not always give the original descriptions and references, *e.g.*, *derasoides* is Butler, *Ann. and Mag. N.H.*, not Dobrée; he did not discuss the fact that *juncta* of *T. batis* had probably already been described, named and figured by Reuter in the *Ent. Tid.* as *confluens*; and so on.

Under such difficulties delay is inevitable. In the course of the next few months I hope that the first 4 pages will be published, with continuation at regular intervals.

My worthy colleague the Treasurer wishes me to call attention to the Notice:

"SUBSCRIPTIONS and all business matters should in future be sent to Mr. H. W. Andrews, "Woodside," 6, Foot's Cray Road, Eltham, London, S.E.9," and to point out the convenience of an *early* attention to his request.—Hy.J.T.

Nomenclature.

The provisional committee of the III. International Congress of Entomology, held at Zürich, July 19th-26th, 1925, elected for the duration of the Congress, proposed, and the Congress in its General Meeting of July 25th, unanimously passed, the following resolution:

The Congress considers it desirable to express the opinion

(1) that in the future (*i.e.*, from the time when the revised rules of nomenclature have become law) it shall be compulsory for the publication of a new genus to be accompanied by a description of the genus as well as by the citation of an already known species or by the description of a new one; and

(2) that in future a new name published must be accompanied by a description in words (or a reference to a former such description) also in the case of Lepidoptera.

Dr. J. Waterston proposed and the Meeting unanimously agreed that this resolution be sent to all Editors of Entomological Journals.

The Entomologist's Record. *Photo, H. Main.*

Variation of Necrophorus mortuorum, F.

1. *ab. maculatus*, nov. ab. Type specimen × 2.
2. ,, ,, ,, Another specimen × 2.
3. *ab. disjunctus*, nov. ab. Type specimen × 2.
4. ,, ,, ,, Another specimen × 2.

5 & 6. Typical specimens of *N. mortuorum*, F. × 2.

Forms of Necrophorus mortuorum, F. (Col.)

By H. WILLOUGHBY-ELLIS, F.Z.S., F.E.S.

During some recent work in collecting, naming and recording Coleoptera for the Victoria History of Huntingdonshire, I had occasion to go through a large number of my own specimens, collected in that county during the last few years, and in addition a number sent to me by Dr. Jordan of the Tring Museum, collected by Mr. W. Holland in Wood Walton Fen and neighbourhood.

Amongst the latter were some forms of *N. mortuorum*, F., which are also represented in my own collection. As these forms are not described from the Continent and, as is now apparent, are recurrent in this country, they are described below :—

N. mortuorum, F. ab. *maculatus*, nov. ab.—In this form the posterior black elytral band, instead of being continuous, is broken up into a series of black spots and the posterior red band is continued, in some cases, to the posterior edge of the elytra and in others almost thereto. This edge is consequently not (or at most very narrowly) margined with black. Type in my collection from Berkswell, Warwickshire—June, 1912. Another specimen was sent to me by Dr. Jordan from Wood Walton Fen (W. Holland, 2. VII. 23).

N. mortuorum, F. ab. *disjunctus*, nov. ab.—In this form the anterior yellow band is more or less broadly interrupted with black at the suture and the two posterior yellow spots are usually smaller than in the type. These markings are similar to those in *N. interruptus*, Steph., but there are no characters, as is the case in that species, to justify specific rank.

Type in my collection from Otterburn—May, 1910. Another specimen in my collection from Scarborough, coll. Lawson, no date, and also one sent to me by Dr. Jordan from Wood Walton Fen collected by Mr. W. Holland, 15.VIII.22.

Sir Vauncey Harper Crewe Collection.

By S. G. CASTLE-RUSSELL, F.E.S.

The remainder of this collection was sold at Stevens's Auction Rooms on November 4th last, and attracted a considerable number of buyers. Generally, the lots fetched much better prices than when the first portion was sold, and the total realized (about £700) was much more satisfactory.

The two most highly priced butterflies recorded, *viz.*, the entirely black and wholly white specimens of *Melanargia galathea*, realized respectively £28 and £35, the latter price being, as the Auctioneer explained, a record for a single specimen of a British butterfly. The black specimen depreciated to the extent of £4, the price realized at the Farn sale being £32. Both specimens were acquired for the remarkable " Bright " Collection.

Many beautiful aberrations and rare species were comprised in the collection and produced the following prices :—

The *Euvanessa antiopa* 5s., 16s., 35s., 70s., 70s., 65s., each.

Lot.

208. *Chrysophanus dispar*—A fine perfect male, £8 10s.

209. A fine perfect female, £8 10s.

210. A fine large male, £13 10s.
211. Exceptionally large female fine and perfect £13.
21. *Lasiocampa ilicifolia*, R. Weaver, 40s.
24. *Laelia coenosa*, a good pair, 45s.
33. *Plebeius argus* (*aegon*)—female with right forewing male colour—a mixed gynandromorph, 35s.
34. *Bupalus piniaria*, a true gynandromorph, 45s.
36. A fine ab. of *Ochyria designata*, £5 10s.
38. *Apatura iris* without white bands on hindwings, 28s.
50. *Abraxas grossulariata*, a white ab. without markings, £11.
40. Two *Hyloicus pinastri*, 35s. Two ditto, 12s. Three ditto, 26s.
74. Mahogany Cabinet, 40 drawers, £33.
80, 81, 82. Lots of two. *Agriades coridon*—ab. *fowleri*, 24s. to 50s.
84. *Abraxas sylvata*—black form 5s.
86. A striking black aberration of *Dryas paphia* (*valesina*) with borders of faint white markings, £12.
87. *Limenitis sibilla* ab. *nigrina*, very perfect, £4.
88. *Brenthis selene*—light forewings and black hindwings, Burney coll., £10.
89. *Brenthis euphrosyne*—upper and underside ab., Stevens' coll., £12.
90. *Sphinx ligustri*—2 light and dark abs., 45s.
94. *Epinephele tithonus*—white hindwings, 28s.
95. *Zygaena trifolii*—black form, 55s.
96. *Dryas paphia*—Gynandromorph, Cardew coll., 24s.
97. A light ab. of *Arctia villica*, 26s.
100. *Melanargia galathea*—entirely black aberration—fig. Frohawk, £28.
103. *Arctia caja* ab., brown forewings, 35s.
104. *Notodonta bicolor*—Burnt Wood. Chappell, £6 10s.
105. *Catocala nupta*—forewings with markings of hindwing, 40s.
107. *Callimorpha dominula*, black ab., 30s.
108. *Catocala nupta*, melanic ab., Mason Coll., 110s.
109. *Arctia villica*, entirely black, 110s.
110-11. Two *Noctua subrosea*, 90s., 45s.
112. *Cucullia artemisiae* (*abrotani*) Burney Coll., 85s.
114. *Carterocephalus palaemon*, Briggs' Coll., 80s.
119. *Euchloë cardamines*, female streaked with orange—Mason coll., 60s.
120. *Cerura vinula*, black ab. Clark coll., 120s.
122. *Pontia daplidice*, two, 32s. 6d.
127. *Aglais urticae*, ab., fine, Burney coll., 22s.
129. *Pararge megera*, banded ab., Burney coll., 85s.
135. *Notodonta tritophus*, Burney coll., 10s.
136. *Notodonta ziczac*, 2 abs., and *Cerastis erythrocephala*, 2—6s.
137. *Deiopeia pulchella*, Bournemouth, 1891, 24s.
141. *Camptogramma bilineata*, 2 large black forms, 35s.
143. *Brenthis selene*, unique black ab., Ringwood, £5.
150. *M. galathea*, cream white aberration, fig., Frohawk, £35.
151. *Brenthis euphrosyne*, dark ab., 65s.
155. *Dryas paphia*, richly marked with black. Cornwall, 1904, £9 10s.
156. *Brenthis selene*, pale golden form, £2.
158. *Sphinx ligustri*, very black form, 22s.

159. *Mamestra brassicae*, 4 pink forms, A. Horne, 28s.
165. *Erebia aethiops*, almost black ab., Galashields, 1921, 35s.
168-9. Six *Pieris napi*, yellow form Donegal, £5.
170. *Papilio machaon* ab., 60s.
172. *Parasemia plantaginis*, nearly black ab., £8 10s.
174. *Dryas paphia*, male ab. New Forest beautifully marked, 110s. ditto female, richly marked, 80s. ditto female, very black, 80s. ditto female, with large discal spots, 20s. ditto 12s. ditto female, black form, 30s. ditto heavily spotted and streaked, 55s. ditto black, £7 10s. ditto richly marked, 55s. ditto male, richly marked black, £5 10s. ditto (*valesina*), velvety black, New Forest, £15.
200. *Argynnis cydippe* (*adippe*), pale silvery form, Stevens' coll., £5.
201. *Epinephele jurtina*, pale buff albino, Mason Coll., 65s.
202. *Epinephele jurtina*, white ab., £7.
203. *Pyrameis cardui*, fig., Newman Brit. Butterflies, £17.
204. *Dryas paphia*, a beautiful almost completely black female in perfect condition, Dr. H. Charles, 1908, rare type, £15.
205. *Dryas paphia*, pale golden male, Mason coll., £10.
206. *Papilio machaon*, light ab., 110s.
207. *Euchloë cardamines*, male ab., Burney coll., 70s.
216. *Aphantopus hyperantus*, with large ocelli, 45s.
217. *Argynnis aglaia*, pale ab., 45s.
227. *Ematurga atomaria*, a black pair, 7s.
229. *Dryas paphia*, richly marked with black, £7 10s.
231. *A. cydippe* (*adippe*), male, large black spots forming bands, £5.
234. *Jocheaera alni*, black ab., 85s.
235. *Noctua subrosea*, fine male, J. Standish, £7 10s.
236. do. 1856, J. Standish, £7 10s.
237. *Aglais urticae*, ab., Ingall coll., 35s.
238. *Aricia medon*, white underside streaked, 65s.
239. *Erynnis boetica*, male, Bognor, 1880, 80s.
241. *Lycaenopsis argiolus*, true gynandromorph, 60s.
242. *Dryas paphia*, a fine male in good condition heavily banded with black on all four wings, £13, a rare form.
243. *Dryas paphia*, true gynandromorph, £8.
253. *Polyommatus icarus*, true gynandromorph, a large specimen, A. E. Gibbs, and *Issoria lathonia*, 85s.
254. *Apatura iris*, ab. *iole*, W. Marshall, 40s.
255. *Crymodes exulis*, dark form, 55s.
259. *Abraxas grossulariata*, forewings banded, hindwings greyish black, 90s.
266. *Zygaena filipendulae*, black ab., 20s.
275. *Aglais urticae*, black form, Hodgkinson coll., £7.
307. *Noctua subrosea*, a fair pair, 28s.
311. Mahogany Cabinet, 30 drawers, £15.

Ants and Myrmecophiles at Bordighera.

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

Having spent part of last winter at Bordighera, in Italy, I took the opportunity to study the ants of the neighbourhood and investigate their habits. Very few species were found at large, it being too early in the year (January-March), and most of the species mentioned in this

paper were found either under stones, or by digging in the earth. Very few of these ants occur in Britain; and it was a great pleasure to me to study species in life which I had only previously seen in collections, or read about.

The most prolific collecting grounds at Bordighera were the high ground just above the sea, covered with sand, rocks and aloes, etc., the olive woods above the town, and the undercliff on the lower road by the sea to Ospedaletti and near the Osteria, made famous in Ruffini's novel "Dr. Antonio."

Ponerinae.—1. *Ponera eduardi*, Forel.—Several small colonies of this non-British *Ponera*, were found under stones at Ospedaletti in February, and isolated ☿ ☿ at Bordighera in March.

Myrmicinae.—2. *Myrmica sulcinodis*, Nyl., var. *sulcinodo-scabrinodis*, Forel.—This var. was the only *Myrmica* I found. Small colonies occurred under stones on February 8th and March 7th, in the Olive Woods above the town. The following myrmecophiles were taken with this ant—a small beetle *Bathysiola aubei*, Kiew., *Platyarthrus hoffmanseggi*, Brdt., *Cyphodeirus albinos*, Nic.; the aphid *Forda formicaria*, C. Heyd., and a small spider, also found with other ants.

3. *Aphaenogaster* (*Attomyrma*) *subterranea*, Latr.—In January and February, many small colonies were found under stones, and by digging in the earth. Often a few ☿ ☿ only were seen, and these quickly disappeared into the ground; much digging failing to locate their proper nest. A larger colony was found under a stone in the olive woods on March 7th. At Ospedaletti and Dolceacqua larger colonies occurred under stones. In the former locality a white smooth *Clythra* case was secured in a nest of this ant on February 6th. The mouth of the case was closed up, but when I had come back to England and had placed the case in my observation nest of *Stenamma westwoodi*, the larva protruded and crawled about in the nest for some days. Finally it closed the case again, but could not find enough material to make it secure; as when it had probably turned round to pupate, the wretched *Stenamma* ☿ ☿ forced an entrance and devoured it. *Cyphodeirus albinos*, Nic., was the only other myrmecophile seen with this ant.

4. *Aphaenogaster* (*Attomyrma*) *subterranea*, Latr., var. *clara*, Sants.—A number of specimens of this new variety was dug up under a small stone on February 3rd.

5. *Aphaenogaster* (*Attomyrma*) *subterranea-dulcinea*, Sants.—Several colonies of this new subspecies were found under stones, at the sides of rocks, and in the ground with small grains of earth raised over them.

6. *Aphaenogaster* (*Attomyrma*) *gibbosa*, Latr.—A few ☿ ☿ were found under a stone at Ospedaletti on February 6th. This, the typical form, is new to Italy, as my respected colleague, the late Professor Emery, puts it in square brackets in his excellent work on the *Formicidae* of Italy [*Bull. Soc. Ent. Italiana*, **47** 56 (1915)], and says it occurs in France.

7. *Messor barbarus*, L.—This was the first species of ant I saw in Italy; small black ☿ ☿ were walking in files on paths and over rocks, carrying small seeds. Their large red-headed ♀♀ were only seen when a nest was dug up, deep down in large galleries, sometimes over

a foot in depth. The species was nesting under stones, in banks, and mounds, by the sides of rocks, etc. The ☿ ☿ were found later walking about everywhere, often among crowds of *Tapinoma nigerrimum*; the latter not attempting to attack them, but getting out of their way. I once found two *M. barbarus* ☿ ☿ fighting, so locked together that they died in the spirit tube, still holding on to each other. I collected a large quantity of over a dozen different species of seeds taken from the granaries of these ants, which were situated in pockets just below the surface of the ground. A number of Lepismas (some very small among the seeds) were found with this ant; as also *Cyphodeirus albinos*.

8. *Messor structor*, Latr.—A very large colony of this species was found on February 1st, the nest being situated under a heavy stone close to a rock. This I dug up entirely, but no queen could be found, and no granary. Many ♀♀, large and small ☿ ☿, ♂ ♂, and larvae were present. The Myrmecophiles taken were—*Platyarthrus hoffmanseggi* and *Cyphodeirus albinos* in numbers; a small fly *Drapetis nervosa*, Lw. (this species I have taken with *Formica fusca* in England); various Lepismas; and a number of two species of *Anthicus* (*A. 4-guttatus*, Rossi, and *A.* (*Leptaleus*) *rodriguesi*, Latr.), these were right in the nest, and kept crawling out of it and up the rock, as I dug it up. The only other occasion on which I found this ant, was on February 20th, when I took a single ☿ entangled in a spider's web, but still alive.

9. *Messor instabilis*, Sm., var. *bouvieri*, Bond.—A ☿ of this form was dug up near the "Osteria" on February 17th. This is its first record for Italy.

10. *Pheidole pallidula*, Nyl.—Many colonies were found under stones of all sizes at Bordighera, Ospedaletti, Sasso, and on Monte Nero, etc. In several nests I found two species of seeds. The ♀♀ in two nests, on Monte Nero on February 24th, all possessed black heads. It is very entertaining to watch the big headed soldiers, when a nest is disturbed, marching forward with open jaws ready to attack anything. Their real function is however to crush the seeds—those which I found were very hard. The myrmecophiles of this ant were —Lepismas frequent: *Platyarthrus hoffmanseggi*; *Cyphodeirus albinos*; and some small Acari. A large *Cetonia* larva was found in a colony on February 24th, an *Anthicus* larva on February 20th; the beetle **Thorictus grandicollis*, Germ., February 20th, and a delightful little beetle *Dachillus minutus*, Sol., on March 7th. It feigned death when touched; with the legs closely packed against the body, and the antennae close together, rigidly extended in front of the head, when it looked like a small seed. Wasmann records another species *Dachillus algiricus*, Luc., as only being found with ants.

11. *Cremastogaster scutellaris*, Ol.—The first specimen I took of this ant was on February 1st, when a single ☿ was found sunning itself on a stone at the foot of a wall by the side of the ancient aqueduct. Later very many ☿ ☿ were observed walking along a wall at Ospedaletti. A large colony was found in an Olive tree at Sasso on February 10th, in burrows in the hard wood; another colony occurred in a large rolled up mullein leaf, February 22nd, and one was also

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*This species is recorded by Wasmann with *Tetramorium caespitum* and *Aphaenogaster testaceopilosa* at Biskra (Bonnaire) and Tangiers and Gibraltar (J. J. Walker).

found on February 27th nesting under a stone resting on an olive stump, the interstices being filled up with a black carton. I collected samples of this carton, but to my regret, it got left behind when I came home.

12. *Cremastogaster sordidula*, Nyl.—Colonies of this small species were found under stones at Bordighera, Sasso, Ospedaletti, and Monte Nero. In one colony nearly all the ☿ ☿ were callows and 6 deälated ♀ ♀ occurred in this nest. On one occasion, on March 7th, a colony was nesting under the same stone as a colony of *Pheidole pallidula*. When the stone was raised, the two species, which occupied different halves of the area, became mixed, and their behaviour was very interesting to watch. When a *Cremastogaster* found itself among a number of the *Pheidole* it remained quite quiet with the gaster raised in the typical *Cremastogaster* manner, and the *Pheidoles* quickly moved away. A *Pheidole* ♃ with open jaws would advance, but on meeting a *Cremastogaster* ☿, the former would quickly retire. When however a *Pheidole*, ♃ or ☿, found itself among the *Cremastogaster* ☿ ☿, it made all speed to extract itself. Their (the *Pheidoles*) behaviour was very different when under the same stone as a colony of *Camponotus*, as will be seen later. *Cyphodeirus albinos*, the small spider (before mentioned) on various occasions, and a few of a pink Aphid (*Tetraneura* sp.) were the only mymecophiles found with this ant.

13. *Solenopsis fugax*, Latr.—This little robber-ant was found with various species of other ants, as well as on a few occasions apparently alone, but probably with connecting galleries with some other ant's nest. February 3rd it was observed in great abundance in the earth of a nest of *Camponotus aethiops*; all the ☿ ☿ were small and of equal size. A few ☿ ☿ were seen under a stone, apparently by themselves, on February 8th; a ☿ was taken in a nest of *Aphaenogaster subterranea* on February 11th; 1 ☿ on the same day in a nest of *Pheidole pallidula*; a number under the same stone as *Plagiolepis pygmaea* on February 22nd; and on March 7th very many, all small ☿ ☿, under a stone by themselves.

14. *Leptothorax niger*, Forel.—One ☿ of this rare species was dug up from under a stone on February 17th, near the "Osteria."

15. *Leptothorax nylanderi*, Först., var. *lichtensteini*, Bond.—A large colony of this variety was found under a stone on February 23rd.

16. *Tetramorium caespitum*, L., a var. near to *impura*, Först.—A large colony was found under a stone in the Olive woods on February 17th. The last two mentioned vars. are new records for Italy.

(*To be concluded.*)

The Life-cycle of Coleophora ornatipennella, Hb.

By ALFRED SICH, F.E.S.

In this journal (Vol. XXXIII., p. 188), I showed that the egg of this species is laid in the calyx of *Salvia pratensis*, on the receptacle which supports the four seeds, that the larva in its first stage mines in the receptacle, and in its second stage eats one of the seeds and then forms a case of the hard covering of the seed. It then leaves the *Salvia* calyx and spins up the case elsewhere. In the case it now undergoes a second change of skin, then unfastening its case wanders off probably to the ground. Thus far my observations went in 1921. My next

opportunity of meeting with this species was on April 5th, 1922, a cold day with even a few snow-flakes falling. To my surprise I found the larvae had been feeding some time, and most of them were in their final cases. It struck me that they might perhaps commence feeding in autumn, not passing the winter in their seed cases. So on October 30th, 1925, I again visited their haunts, on the bank of the Limmat, near Schlieren, west of Zurich.

For some time I searched grass and leaves of *Salvia* for the seed cases and had just concluded that further search would be useless when I caught sight of a small case of *C. ornatipennella*. It was attached to a grass blade that had been mined, but was not the seed case, but that which I had considered as the spring case, made from grass. Afterwards many cases were found, and the large mines showed that the larvae had been feeding some weeks. The grass had also many quite fresh shoots on which the larvae were feeding. The smallest case was about 4mm. long, but two larvae had already made the first addition to their cases.

Several blades of grass were mined from the tip downwards to an inch or more, and at the extremity of a blade so mined I found one of the seed cases of the summer. The brown outer covering of this case was now grey and much wrinkled, and on examination the case proved to be brittle, and it easily broke up. This was the only one I found, those belonging to the other larvae must have already fallen off.

From the number of the grass cases found it may certainly be concluded that it is not the habit of the larva to hibernate in the seed case, as I had at first supposed, but that it leaves this case in the autumn and passes the winter in a new case made from a portion of a grass blade. After the winter the larva must recommence feeding quite early in the spring, and pupate towards the end of April, because the moths are fully out in the third week in May.

I think we may look on this retirement into a case during the hot time of the year as a form of aestivation. Thus the larva can await in safety the time when its favourite grass puts forth new shoots of tender leaves, into which the small larva can mine with ease.

Remarks on the evolution of the Zygaenae and an attempt to analyse and classify the variations of Z. lonicerae, Scheven, and of Z. trifolii, Esp., and other subspecies. (*With Plate VIII.*)

By ROGER VERITY, M.D.

(*Continued from Vol. XXXVII., p. 158.*)

Subspecies *palustris*, Obth.

Race **hibera**, mihi. This is one of the most differentiated and striking races, so that it seems incredible it should not yet have been recorded. The explanation, no doubt, is that the *Zygaena lonicerae* and *Z. filipendulae* of Spain are extremely difficult to make out and that it is only quite lately the subject has been taken up. Burgeff in 1914 (*Münchner Ent. Ges.*, p. 61) recognised a constantly five-spotted race of *filipendulae* from the Sierra Segura in Southern Spain and named it *gemina*. I possess it from La Garriga (Barcelona) and Querci in 1924 collected a large series at Orihuela (Sierra of Albarracin in Aragon), where it flew mixed with the race of *lonicerae* I have described

as *intermixta*, already very variable in itself, so that it has been quite a task to separate the two species. A still more instructive example is afforded by the mistake I made in 1921 in dealing with *Z. filipendulae* (*Ent. Rec.*, p. 84). I said I had received from Oviedo in the Asturias a large series of *Zygaenae*, which answered perfectly Oberthür's description of *seeboldi* from Bilbao (*Ét. Lép. Comp.*, IV., p. 543) and that on the strength of the specimens before me I could not agree with him that it was a *filipendulae*, but that it must be a *lonicerae*, with individual variations having quite the build and aspect of *trifolii*. Since then I have received an exactly similar series from Cuenca, m. 1400, in Nueva Castilla, and I have often looked at them, wondering how Oberthür and I could have judged them so differently. It was only last year that the truth dawned upon me and that the explanation was we were both right! My mistake lay in the fact that I had not detected that in my series there were a few *filipendulae* mixed with a majority of *lonicerae* and so exceedingly similar to them that it was most difficult to separate them. Evidently Oberthür's specimens from sea-level were probably all *filipendulae*, but his description of the local features applies to both species, except in regards to the six-spotted individuals, which in my series only exist in one female from Oviedo and in one male from Cuenca. The thick, heavy build of body, antennae and wings, the deep saturated tone of the dark scaling as well as of the bright carmine one and the peculiar tinge of the latter, warmer (less crimson or wine-coloured) than in the other races, are characters which both species exhibit equally. As to the characters by which one can separate the two species in these series, the only one which I have found to be constant is the indigo blue sheen on underside of *filipendulae*. In *lonicerae* there is never more than a slight trace of it on the forewing in a few individuals and never any on the marginal band of the hindwing; usually they are both quite dull. The following features can only be relied on when several point to the same conclusion. In *lonicerae*: antennae shorter and thicker between club and root; wings broader in the middle, between costa and tornus (this character is very conspicuous in the large *palustris*-like individuals, but does not exist in the small *trifolii*-like ones); scaling slightly more translucent when viewed against the light; sheen on upperside lesser; carmine spots much larger on upperside in *palustris* individuals, but by no means so in *trifolii* ones; dark band of hindwings broader on an average and more even in breadth, but with many exceptions; on underside carmine spots, on the contrary, as a rule, lesser in extent and with a lesser tendency to flow together than in *filipendulae*, although they are less sharp in outline than in true *lonicerae*. This is one of the reasons for which I place this race in the *palustris* subspecies, although its antennae are often longer and more pointed than in nymotypical *palustris*. In this and other respects variation, however, is great. Some of my specimens are perfect *trifolii*, resembling *syracusia*, except for their heavier build and peculiar *seeboldi*-like colouring. I should designate them as form **hiberuncula,** which some day will probably be found to constitute a race in particular localities. I already notice that from Cuenca I only have one male against eight of *hibera* and one transitional female against eleven, whereas from Oviedo I have five against seven and

three females against three; evidently the much more damp Asturian mountains produce the *trifolii* structure more often than the dry Sierra of Albarracin.

Race *palustris*, Obth., *Ét. Ent.*, XX., p. 44-46, pl. 8, f. 151-3 (1896) = *major*, Tutt, *Ent. Rec.*, IX., p. 88 and 167 (1897). "Types" from Rennes in N.W. France. Extends to the north of France, the north of Germany and to England, whence Tutt described it a year later than Oberthür under the name of *major*. Both these authors agree that some of the English races (Isle of Wight, Freshwater, etc.) are identical with the French one. In my introductory remarks, p. 119, I have already described the characteristic structure of antennae and wings, different both from *trifolii* and *lonicerae*. In the table of races I show its position as regards the extent of dark and red pattern. I need only add that it is one of the few races which produces a sixth spot on the forewing (*sexmaculata*, Obth., *l.c.*). As to its size, Tutt's name would have suited the nymotypical race, but I must point out the fact that there exists in England also the following.

Race **palustrella,** mihi. This is perfectly identical with the giant (33-39mm, of expanse from tip to tip) *palustris* of Rennes, in every respect, including structure, colouring and markings, but it is much smaller in size (28-32mm.) and its wings are slightly shorter and more rounded at apex. My typical series was collected by T. Grosvenor in Surrey, on the 5th and 7th of June, 1922, and very kindly presented to me by him together with the splendid material I will deal with later.

Subspecies *seriziati*, Obth.

Race *seriziati*, Obth., *Ét. Ent.*, I., p. 33 (1876) and III., p. 41, pl. V., fig. 7 (1878) and XIII., p. 21, pl. VIII., fig. 71-3 (1890).—Not having sufficiently large series of this insect at my disposal, I do not profess to discuss its position thoroughly. Tutt's impression was that it is a *palustris* and I agree with him in connection with the largest and most highly characterised specimens, although some seem to range still further and to be, near *trinacria*, parallel even to *lonicerae*, whereas the small individuals seem to come very near to *australis*. This African *palustris* from the littoral region of Algeria (Bona to Collo), would thus vary in very much the same way as the Spanish race *hibera*. In *seriziati*, however, the highest degree of melanism as a normal variation is reached; no other *lonicerae* is as dark on the whole, because here form *nigra*, Dziurz., with the hindwing entirely invaded by the dark scaling of the marginal band, is quite common.

Subspecies *trinacria*, Vrty.

Race *trinacria*, Vrty., *Bull. Soc. Ent. France*, 1917, p. 222.—In Sicily there exist four markedly different forms: One is very small, its antennae and wings are very rounded at apex, so that it belongs distinctly to subspecies *trifolii* and it falls broadly-speaking, within its race *australis*; I will describe it as **paraustralis.** Another is *syracusia*, Zell. A third is a little larger and the antennae and wings are a little more pointed, but it still is a *trifolii: siciliae*, Vrty. Finally there is the very large *trinacria*, which at first sight one would think might

belong to sub-species *lonicerae*, as compared with the former. As a matter of fact I originally described it as such. Now, however, I have gone more thoroughly into the differences of these insects, I am perfectly convinced *trinacria* is a *palustris*, notwithstanding the longer and thinner antennae of some individuals than in the other race I group under this subspecies. Its wings have the broad *palustris* shape, the pale crimson spots of forewing are very large and the third and fifth are often actually connected by a streak (form *krügeri*, Ragusa, *Boll. Lab. Zool. Portici*, Dec. 1924, p. 88) or a minute dot between them represents the latter (form **punctonotata**, mihi.); on underside they spread still more; the marginal dark band of hindwing is always broad and it may even cover half the distance between the end of the cell and the margin. My "types" are from Lupo, south of Palermo, sent for examination by the late Ragusa, and now they are in the Rothschild collection. Turati has kindly sent me some collected by Krüger on the Madonie at 1400 m., on July 1st.

(*To be continued.*)

A New Use for Ants.

By MALCOLM BURR, D.Sc., F.E.S.

In Northern Siberia there are immense areas of forest which are inhabited only by a few wandering Tungus. These are a race of hunters, related to the Manchus, and it is believed that they once inhabited a more genial, southerly region. But at present they are mere nomads, dependant entirely upon the chase for their existence. They have, however, certain characteristics which have given plausibility to the theory that they once had a higher culture, but, driven into the inhospitable north by more powerful nations, have retrograded. One of these relics of a former civilisation is their strange intolerance of vermin, a characteristic that might well be copied by many civilised peoples, in Europe as well as in Asia. They object to the presence of various parasitic insects in their primitive abodes, and have an original way of getting rid of them. About the end of September, they collect an ant's nest and bring it into their huts. The ants quickly exterminate the vermin, and the intense winter frosts then soon cause the ants to disappear, so that these practical myrmecologists can enjoy the warmth of their primitive homes in peace.

SCIENTIFIC NOTES AND OBSERVATIONS.

A Day's Work in the Life of a Wasp.—Whilst writing at my study table on August 22nd, 1925, I noticed a worker wasp which had come in at the window, hovering over and flying down into a small jug which contained honey with which to feed my ants. Only a

small quantity of honey was left at the bottom of the jug and the wasp had to go right down to the bottom to get at it. On and off I found that the wasp kept coming back to the honey, so I determined to put down the times of its arrivals and departures. I found that it continued to come regularly from August 22nd to September 9th, after which date it was seen no more. It started coming as soon as my study window was opened in the morning—7.30 a.m. being the earliest time I have noted, and 7.36 p.m. being the latest departure before the window was shut. The times it spent at the honey varied considerably, but the time between its departure and its return was mostly about seven minutes. It was very nervous at first, and the least jar of the table, or shadow cast over the honey pot, caused it to fly off; but eventually it got quite tame, and did not fly away even when I moved the honey pot about. When it left the honey it flew straight out of the window, across the garden, and over some trees at the bottom; but when returning it was more deliberate, entering the window with a "buzz" and circulating over the honey pot before dropping into it. In the morning it was generally waiting outside for the window to be opened, when it entered at once; and on several occasions it continued to come during heavy rains. The following is the time table for one day, which will show the wonderful industry and the perseverance of this brave little creature. The record for the whole nineteen days was much the same.

Arrival	Departure	Arrival	Departure
7.43 a.m.	7.55 a.m.	2.26 p.m.	2.37 p.m.
8.8	8.20	2.46	2.54
9.25	9.33	3.1	3.10
9.41	9.55	3.19	3.28
10.5	10.16	3.35	3.44
10.21	10.30	3.51	4.0
10.35	10.43	4.4	4.20
10.50	11.0	4.28	4.35
11.7	11.20	5.0	5.9
11.35	11.45	5.15	5.26
11.52	12.3 p.m.	5.36	5.45
12.11 p.m.	12.22	5.53	6.5
12.35	12.44	6·12	6.24
12.49	1.0	6.31	6.42
1.9	1.19	6.49	6.59
1.30	——	7.9	7.16
2.5	2.17	7.25	7.36

Where there is a longer interval in the records, I was either out of the room or at meals.—Horace Donisthorpe.

NOTES ON COLLECTING, etc.

Notes on Aegeria andrenaeformis.—For some years I have found and bred this species freely though I have never seen the perfect insect in its native haunts. In Hampshire it occurs somewhat

sparingly except for one locality, but in Buckinghamshire, in the neighbourhood of Chesham, where I first found it, it may be taken in some numbers. It feeds but rarely on *Viburnum opulus* even where that shrub grows plentifully among *V. lantana*, but where a bush has been attacked, the old exit holes are often numerous. In my experience the usual situation is the edge of a beech wood on the slope of a hill, or a thick hedge on a hillside such as is common in the Chilterns. Where *V. lantana* grows right inside a wood, as it does rarely, it is usually riddled with borings, and in White's Wood, near Chesham, I found in 1924 eight capped mines in a single stem, and I have often found three or four. The full fed larva always lies head downwards, and where a long stem in a wood has bent over and perhaps touches the ground, the larva still bores upwards although it may in such a stem be working towards the roots. I have found mines in almost prostrate stems, when only by splitting could I discover which side of the cap the mine was. In some localities, for instance near Shawford, Hants. a very high percentage of mines are pecked open by birds, just at the spot where the full fed larva lies in the pupal cell, but I have only rarely found pecked-out mines in Bucks. On the other hand, I have found both in Bucks and Hants, mines with the cap removed and the exit hole freshly gaping. Such mines are usually empty but by no means always. Whatever enemy has found the mine and torn away the cap, has not always succeeded in reaching the full fed larva.

It is not generally realised how early these larvae complete their mines and form the pupal chamber, in which they rest head downwards until June. Probably all feeding is completed by the time the leaves fall, and certainly I have never found an uncompleted mine during the Christmas holiday—I mean of course a second year mine. On Boxing Day, 1925, I found a number of mines with perfect caps of bark and others with caps made of silk and gnawed wood. The birds had hardly begun their ravages then, where by Easter they will have pecked out most of the mines. First year mines were also found last Boxing Day. The young larvae betray their presence by a slight swelling which shows were they fed for a short time, just beneath the bark, and by a very small quantity of fine whitish yellow frass blocking the small hole that will later on be the exit hole for the perfect insect. Six of these mines were opened and in every case larvae were found. They were in length from 4-5 mm., and the mines they had bored in the centre of stems of varying thickness were from 15-33 mm. long. I have never had any difficulty in forcing this insect from full fed larvae whether taken early or later in the year, and have so far bred but a single parasite, possibly because I have rejected imperfectly capped mines, or split them open to examine them.—Wm. Fassnidge (M.A., F.E.S.).

CURRENT NOTES AND SHORT NOTICES.

Both the *Canadian Entomologist* for November, and the *Entomological News* for December have articles in them of much interest and value. The former has a description of the "Ventral Prothoracic Gland in some

Notodontid Caterpillars," a gland apparently of small dimensions situated just in front of the prothoracic legs, so that when disturbed and when, as is the habit of many, the caterpillar throws its head back it, in some cases, ejects an acrid fluid even as far as eight inches. In other cases the writer (John D. Detwiler) says, however much he teased the larvae they would not eject, though the gland was present. He deals well with the general histology of the subject and his observations are a contribution of much value. From his remarks we would say that it is possible that the gland is in process of evolution and development, for in some species it is a means of defence but in others it does not yet appear to have arrived at that stage.

In the "*News*" the first article deals shortly with some of the Termites of the Amazon Region. It appears that they avoid the great areas beside the river that are subject to winter flooding, whilst even in the dry country above the flood line they are far from numerous, though such trees as the guava tree are attacked by them. They bore right into the solid wood and make great galleries within, all their activities being carried on in the interior, and the exterior holes being filled up with "excrementable matter that hardened into a grey, earthen-like substance." It appears to be unusual for them to attack living tissues of plants and the few cases recorded of this are all referred to the *Kalotermitidae*.—G. T. B.-B.

A meeting of the Entomological Club was held at Caracas, Ditton Hill, on December 1st, 1925. Mr. W. J. Kaye was host and occupied the chair. In addition to the host the following members of the Club were present—Messrs. Robert Adkin, H. St. J. K. Donisthorpe, H. Willoughby-Ellis, and Dr. Harry Eltringham. The visitors present were Capt. N. D. Riley, Messrs. E. E. Green, G. C. Leman, A. Hall, F. A. Oldaker, and H. J. Turner. The meeting was called for 6.30 p.m. and the guests were received by Mrs. Kaye. Tea and light refreshments were dispensed in the Drawing Room after which a business meeting of the club was held and Mr. Kaye's collection of tropical insects was inspected. Supper was served at 8 o'clock and the guests dispersed about 11 o'clock after having spent a most enjoyable evening.—H.W.-E.

List of Members recommended to be appointed Officers and Council of the South London Entomological and Natural History Society for 1926. *President*, T. H. L. Grosvenor, F.E.S. *Vice-Presidents*, E. A. Cockayne, M.D., M.A., F.E.S., N. D. Riley, F.Z.S., F.E.S. *Treasurer*, A. E. Tonge, F.E.S. *Librarian*, E. E. Syms, F.E.S. *Curator*, S. R. Ashby, F.E.S. *Hon. Editor of Proceedings*, H. J. Turner, F.E.S. *Hon. Secretaries*, Stanley Edwards, F.L.S., &c. (*Corresponding*), H. J. Turner, F.E.S. *Council*, J. H. Adkin, H. W. Andrews, F.E.S., C. Craufurd, W. Crocker, A. W. Dennis, S. B. Hodgson, E. Step, F.L.S., W. H. T. Tams, F.E.S., H. Worsley-Wood.

The Entomological Society of London opened its autumn session with an unofficial presentation to its worthy Treasurer, under whose able guidance, the whole of the Society's Liabilities, due to the purchase and equipment of the permanent freehold residence, 41, Queen's Gate, S.W., have been paid off. In addition some of the

metropolitan Fellows and others entertained the Treasurer to a Dinner at which the presentation was made. During the Autumn Mr. W. J. Kaye read a paper on the Butterflies of Jamaica; Mr. C. Williams discussed the Orthopterous Fauna of the New Hebrides; and Mr. F. Bainbrigge Fletcher communicated a paper on the Plume Moths in the National Collection, Walker's types. Most of the other papers were short, on special structures such as the Egg-burster in *Aphididae* by Mr. G. T. Gimmingham; the Venation of the *Hepialidae* by Mr. A. Philpott, and on local faunas and small groups of species. Among the exhibits were a gynandromorph of *Papilio androgeus*, by Mr. Dicksee, the rare *Morpho uraneis*, slides of the scent scales of *P. rapae*, a rare termitophilous Dipteron from India, another gynandromorph of *P. androgeus* by Lord Rothschild, some of the butterflies collected on the "St. George" Expedition, the British Lepidoptera from the Oberthür collection, etc., etc. Dr. Imms gave an account with lantern illustration, of an entomological visit to the Hawaiian Islands.

The South London Entomological Society, by its two meetings per month throughout the year, keeps in touch with a large number of its members, of whom 40 or 50 are present at each meeting except perhaps at holiday times. The mutual aid in interesting one another is still, as of old, the key of the attractive meetings. In April, Mr. O. R. Goodman gave a capital account of his holidays with the net in the island of Corsica, showing many lantern slides. In May, Dr. Fremlin described the action of the Malaria parasite, and Mr. Turner discussed the newly described race *britannica* of *Thera variata* and of the race *columbana* of *Sarrothripus revayana*. A feature of the year has been the exhibition of living larvae of many species by a considerable number of members. Mr. Blenkarn has exhibited a number of rare and local Coleoptera at different meetings. Mr. Urich gave a short address on collecting on a tropical island, Trinidad. Mr Hugh Main showed and discussed many items taken in Fabre's country and other parts of S. France localities. Mr. R. Adkin discussed the *Hyponomeuta* sp. which is found attacking appletrees. Many exhibits were made at the "Other Orders" evening and on several occasions capital lantern slides were shown illustrative of Insect Economy. In November Mr. W. J. Lucas discussed the Orders of British Insects, illustrating his notes with lantern slides.

The Insect House at the Zoological-Gardens was raised from its old former obscurity and inefficiency, to a really attractive feature of the Society's Gardens under the able management of Miss Evelyn Cheesman. F.E.S., and we are somewhat astonished to find that the opportunity of her long absence from her duties (on special leave to join the "St. George" expedition to the Southern Seas), has been taken to "push" her from her post. It is curious that several modern "propagandist" paragraphs have appeared in the daily papers on this "change." One regrets that, now Miss Cheesman has gained so much scientific experience and knowledge of this group of animals, her services, which we have been assured were quite available, are not now acceptable to the Zoological Society of London.

Subscriptions for Vol. XXXVIII. (new series), 10 shillings, should be sent to Mr. H. W. Andrews, *Hon. Treasurer*, **"Woodside," Victoria Road, Eltham, S.E. 9.**

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MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. January 20th, Annual Meeting. February 3rd., February 17th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. January 28th, Annual Meeting. February 11th, Paper, E. J. Bunnett, "Flora of Manitoba."—*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.*, J. P. Hardiman, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

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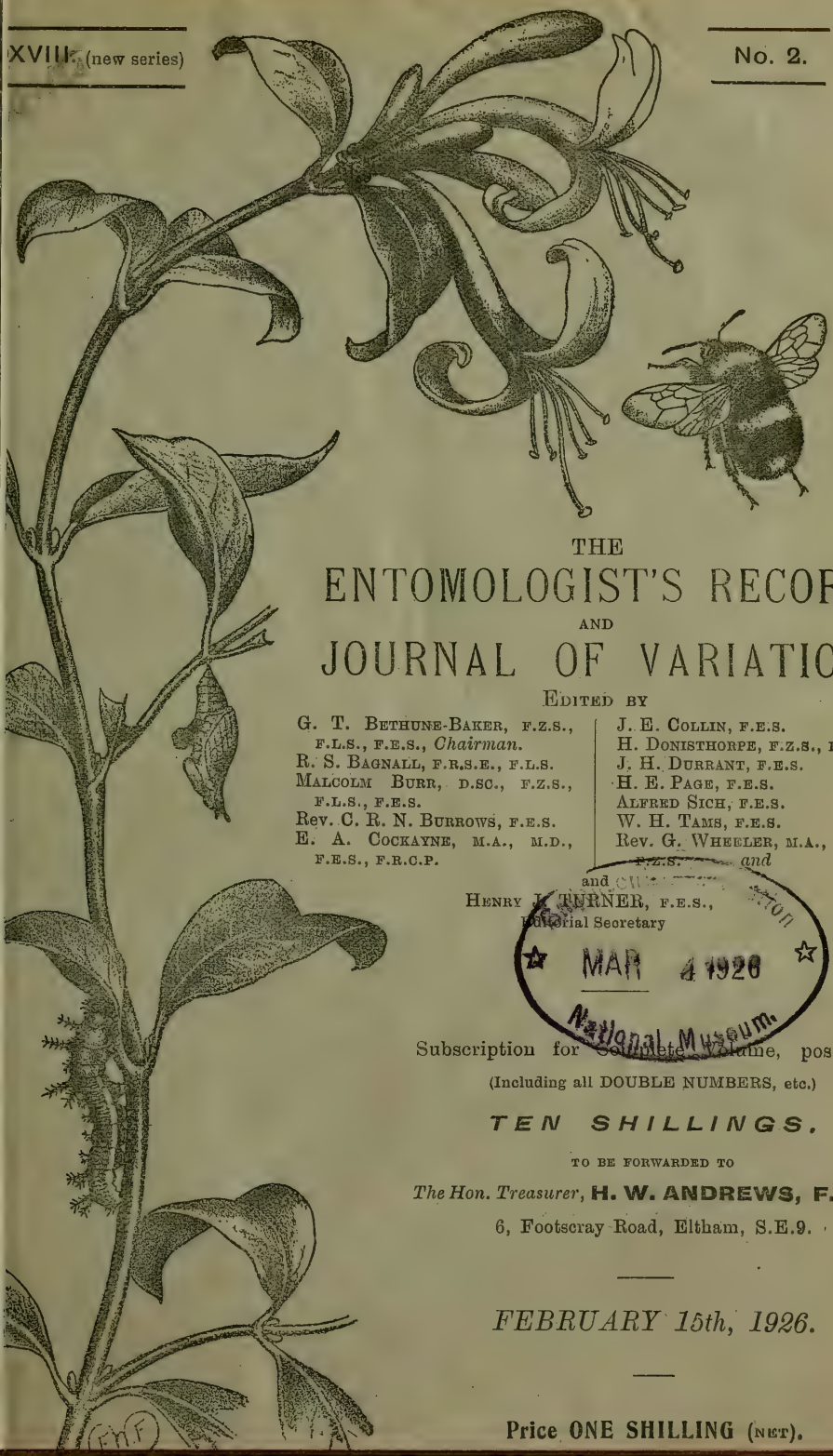

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By HORACE DONISTHORPE, F.Z.S., F.E.S., etc.

(*Concluded from p. 8.*)

Dolichoderinae.—17. *Tapinoma nigerrimum*, Nyl.—This species was very abundant at Bordighera, both on the sandy and rocky places on the small hills above the sea, and in the river beds near; but not in the olive woods nor in the places visited in the neighbourhood. The ☿ ☿ ran about all over the place, and the nests were found in various habitats—under stones; in the ground with small cones above formed of earth grains; in mounds of earth; and formed of leaves, buds, etc. On January 29th I dug up one large nest deep in the ground; it contained thousands of ☿ ☿ and one queen was found. On January 31st I noticed a number of ☿ ☿ holding something at an entrance to their nest, which was situated in a bank. When disturbed the ☿ ☿ ran away, and what they had been holding proved to be a deälated ♀, quite unhurt, and very active. This recalled to my mind Dr. Santschi's description of how the ♀ of *Wheeleriella santschii*, For., is "arrested" by the ☿ ☿ of this same *Tapinoma*, before she gains admittance into their nest! In one large colony in a nest built in a grass tussock of bits of grass, buds, etc., which contained vast numbers of ☿ ☿, and many sex larvae, only one queen was found; but in another colony situated in a bank very many deälated ♀ ♀ were present. On this occasion a number of ☿ ☿ was observed carrying a small snail shell. A vast colony occurred on the banks of the river, the ants had built up two large earth mounds, and the ☿ ☿ —many of which were very large and black—were all over the whole area.

Formicinae.—18. *Plagiolepis pygmaea*, Latr.—This tiny species was common everywhere, nesting under stones, tiles, and in the sand, etc., though much digging never produced a ♀. ☿ ☿ often turned up with other ants, and when the nests of the latter were being dug up.

19. *Camponotus* (*Myrmoturba*) *maculatus*, F., subsp. *aethiops*, Latr.—On February 2nd a large colony of this ant was dug up, the nest being situated under two deeply embedded stones— ☿ ☿ of all sizes occurred, and deep down ♃ ♃ were found. Five Lepismas and numerous *Cyphodeirus albinos* were seen in this nest. This ant was subsequently found on several occasions under stones; and at Dolceacqua on March 6th, ☿ ☿ were seen running on the grass growing on the first floor of the fine old ruined Castle.

20. *Camponotus* (*Tanaemyrmex*) *sylvaticus*, Ol.—This ant was first seen on February 5th, when a single ☿ was found under a stone. On February 16th a single ♃ was observed sunning itself on the rock wall by the side of the road; and on the same day a small new colony consisting of a large queen, a few small ☿ ☿, and some small larvae was found under a stone. In this nest *Cyphodeirus albinos*, *Platyarthrus hoffmanseggi*, and a Lepisma occurred. Subsequently numerous colonies were seen under stones, and Lepismas in most of them. Very many ♃ ♃ with very bright red heads and thoraces were present in one colony; and on the same date, February 17th, a number of a Coccid (*Eriococcus bezzii*, ?) occurred in another. The ☿ ☿ of this ant when disturbed have a curious habit of raising

the gaster and holding it erect, which gives them a very un-*Camponotus*-like appearance.

21. *Camponotus* (*Orthonotomyrmex*) *lateralis*, Ol.—On January 30th a large colony of this really beautiful ant—with its bright red head contrasted with its shining black body—was found under a stone at the foot of an olive tree. It contained many ☿ ☿ and larvae, and numerous ♂ ♂ and winged ♀ ♀. A large Lepisma was taken in this nest, and small Acari were noticed on some of the ☿ ☿. A colony, which also contained ♂ ♂ and winged ♀ ♀, was situated under the same stone as *Pheidole pallidula* at Ospedaletti on February 6th. When disturbed the *Pheidoles* attacked the *Camponoti* with the greatest fury, numbers of them fastening on to their legs, wings, and antennae. Various other colonies were subsequently found. In one situated in an olive tree, a queen and many winged ♀ ♀ were present; in another under a stone, only ♂ ♂, and no winged ♀ ♀, occurred. A colony between two stones contained a queen, many large ☿ ☿, and larvae; but no winged sexes were present.

22. *Acanthomyops* (*Donisthorpea*) *emarginatus*, Ol.—At Sasso, on February 10th, ☿ ☿ of this species were observed walking along on a stone wall; and the nest was found to be situated under stones at the foot of the wall. On March 6th ☿ ☿ were noticed on the walls of the ruined castle at Dolceacqua; and in larger numbers on walls on the outskirts of the town.

23. *Acanthomyops* (*Donisthorpea*) *brunneus*, Latr.?—On February 6th a large colony of this ant was found under a stone at Ospedaletti. In the field I took them to be *A.* (*D.*) *niger*. A ☿ was captured running over the root of an olive tree at Bordighera; and two large colonies occurred under stones on the highest part of Monte Nero on February 24th. Again I took them to be *A.* (*D.*) *niger*; and I am very well acquainted with *A.* (*D.*) *brunneus* in England! They are much darker than our species, the head is quite black, and the rest of the body dark brown; but there are no outstanding hairs on the tibiae. I propose to call them *A.* (*D.*) *brunneus* var. *nigro-brunneus*. They are perhaps the same form (from Genoa) which Emery (*l.c.* 167) doubtfully referred to var. *alieno-brunnea*, Forel.

24. *Formica fusca*, L.—on March 6th a colony was found under a stone at Dolceacqua; but I never observed the species at Bordighera. In this nest the small spider, and a specimen of *Anthicus longicollis* occurred. I may here mention that though I was collecting Coleoptera all the time I was at Bordighera and took every species I saw, the only occasions on which I saw any *Anthici* were when examining ants' nests!

In conclusion I must express my best thanks to my colleague Dr. F. Santschi for naming some of the more difficult forms.

Myrmecophilous Notes for 1925.

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

I have written a separate account of the work done in connection with the ant *Acanthomyops* (*Donisthorpea*) *brunneus*, Latr., but a few other observations, and records with ants, still remain to be published.

Formicidae.

The following species of ants were noticed at Charmouth early in the year—*Myrmecina graminicola*, Latr., *Myrmica ruginodis*, Nyl., *M. scabrinodis*, Nyl., *Tetramorium caespitum*, L., *A.* (*D.*) *niger*, L., *A.* (*C.*) *flavus*, F., *A.* (*C.*) *umbratus*, Nyl., *Formica fusca*, L., and *F. fusca* var. *rubescens*, Forel.

Myrmecina graminicola, Latr.—In 1925 no females were reared in my colony of this species, which I have had under observation for over 15 years. I account for this by the fact that in the winter of 1924-5 the ants were not fed at all, and were kept in a cold room, the nest only being watered occasionally. The colony is nevertheless in a flourishing condition.

Formica pratensis, Retz.—When at Bournemouth in September last, I determined to try and find the nest of *F. pratensis*, mentioned and figured in *British Ants* (p. 270, and Plt. XVI.) Much building has taken place since I was there last, in 1914, and the original spot by the side of a road had been turned into an ornamental border, and planted with rows of trees, but quite close at hand at the entrance to what is left of the Talbot Woods, I found a large *pratensis* nest at the foot of a fir tree. Subsequently other nests were found near houses at the edge of the woods; one colony occupying a deserted *F. exsecta* nest. It is fortunate that *F. pratensis* will live nearer to human habitations than *F. rufa* (and is much more tolerant of such situations than *F exsecta*), and this no doubt has saved it from extinction in its old locality. On sieving a small quantity of the first nest, the following myrmecophiles were observed:—*Oxypoda formiceticola*, Märk., *O. haemorrhoa*, Sahl., *Leptacinus formicetorum*, Märk., *Trichopteryx montandoni*, All., *Ptenidium myrmecophilum*, Mots., *Monotoma conicicollis*, Aub., *Cyphodeirus albinos*, Nic.; and *Thyreosthenius biovata*, Camb.

Introduced Species.

Cremastogaster lineolata, Say.—Saunt sent me a number of ☿ ☿ of this ant taken on American Ash in a timber yard at Coventry, on April 28th, 1925. It is found in the United States and Canada.

Pheidole megacephala, F., var. *punctulata*, Mayr.—Saunt sent me ♃ ♃, and ☿ ☿ taken in a timber yard at Coventry, on August 12th, 1925.

Camponotus (*Myrmentoma*) *caryae*, A. Fitch, subsp. *rasilis*, Wheeler, var. *pavidus*, Wheeler.—Saunt sent me some soldiers and workers of this var., which he had found in American Ash in a timber yard at Coventry on May 9th, 1925. Being too busy at the time to try and name them, I sent specimens to several myrmecologists without much success—Santschi told me he had not got it in his collection, and Crawley suggested that I should describe it as a new species in the subgenus *Myrmophyma*, etc.—I therefore sent specimens to Wheeler who tells me it is the above variety. It is curious that I should not have thought of looking in my introduced drawer, as I possess ♂, ♀, and ☿ ☿ from Hereford taken in 1911 (see *Brit. Ants*. p. 348), moreover I had correctly named the specimens in question myself with Wheeler's monograph on the American *Camponotini*.

Camponotus (*Myrmothrix*) *abdominalis*, F.—Massee sent me a number of ♃ ♃ and ☿ ☿ found in a bunch of bananas at Malling, in October, 1925.

COLEOPTERA.

Myrmedonia humeralis, Gr.—A specimen was taken on July 29th, in the nest of *A.* (*D.*) *fuliginosus* in the birch tree at Pyrford Common which I have visited for so many years. This makes the 38th species of myrmecophile taken in this nest.

Myrmedonia limbata, Pk.—Found on May 13th, running in company with ☿ ☿ of *A.* (*D.*) *niger*, in a sand pit at Freckenham.

Drusilla canaliculata, F.—Specimens were observed running about in the sand in company with ☿ ☿ of *A.* (*D.*) *niger* and *M. scabrinodis* at Charmouth on May 23rd.

Atheta sodalis, Er.—Taken in a nest of *A.* (*D.*) *niger* in Windsor Forest on August 26th. I have found this beetle previously with *F. rufa*, *A.* (*D.*) *brunneus*, etc.

Amphotis marginata, F.—Several specimens found in the *fuliginosus* nest at Pyrford on July 29th, were taken home, and introduced into my *brunneus* observation nest. At first they were received with considerable hostility by the *brunneus* ☿ ☿, who persistently attacked them, but they were protected by their shape, and the way in which they can contract their antennae, and legs. Some of them are still alive today (February 1st) in the nest. They rest beneath the wood and frass in the nest, though they occasionally come out for a stroll. They feed on the honey, flies, etc., given to the ants. The *brunneus* ☿ ☿ sometimes still try to attack them in a half-hearted manner, but soon give it up. Once or twice I have seen *brunneus* ☿ ☿ gently scrape the back of an *Amphotis*, as do their true hosts (*fuliginosus*); but I have never observed them attempting to feed the beetle. This of course may frequently be seen if one keeps *Amphotis* in a *fuliginosus* observation nest.

Stenosis angustata, v. *intermedia*, Sol.—Mr. H. Main kindly gave me a number of live examples of this Continental beetle which he had taken in company with ants at Le Lavandou on September 25th, 1925. They reminded me at once of the little *Dichillus minutus*, Sol., which I took with *Pheidole pallidula* at Bordighera in March, 1925, and indeed they are extremely like it, though of course very much larger in size. Both genera belong to the tribe *Stenosini* in the family *Tenebrionidae*. Wasmann [*Krit. Ver. Myr. Ter. Arth.* 156 (1894)] mentions a *Dichillus algiricus*, Luc., found in nests of *Catyglyphis viaticus*, F., in Algeria, and "only with ants" in Spain; but he suggests that *Stenosis* sps. are only "chance guests." From my experiments with these beetles however I am of the opinion that they are undoubtedly myrmecophilous. I may mention that they are extremely hard and tenacious of life. I had, as I thought, killed two specimens with boiling water from the "Geyser," and after mounting them on card, I put them away in a box. A fortnight later, when I chanced to look at them again, the unfortunate beetles were seen to be moving their bodies from side to side, although their legs and antennae remained stuck to the card. I quickly unstuck them and washed them with water, when they walked about as if nothing had happened. They were then put into my *brunneus* observation nest, where they have lived ever since. I had previously, on October 6th, introduced two *Stenosis* into this nest. The ants never attempted to attack them, but from the very first seemed to accept them as a natural and proper object to be in the

nest! These three beetles have now lived quietly in this nest for over three months.

On October 8th, I placed a *Stenosis* in my *Myrmecina* nest. These ants always kill and eat any insect given to them, but they seemed helpless against this beetle. On November 1st, I removed it, as it was devouring the ants larvae, and moreover had nipped off the tips of several of the ants' antennae, thereby rendering them unable to find their way about, etc. On the same day I had introduced one of these beetles into my *Stenamma westwoodi* nest. The ants attacked the beetle, but their mandibles appeared to have no effect on its hard body and it always got away. On October 21st, I found it had seized a *Stenamma* larva which it was dragging along, while two *Stenamma* ☿ ☿ were in vain lustily tugging at the larva to endeavour to get it away from the *Stenosis*. In this case also it was considered advisable to remove the beetle. It is much to be regretted that Main did not find out the name of the ants with which he found these beetles.

Diptera.

Pseudacteon brevicauda, Schmtz.—The specimens of *Pseudacteon* captured by me with *Myrmica ruginodis* in Windsor Park, 7.VII.24 and recorded as *P. formicarum*, Ver. [*Ent. Rec.*, **37** 5-6 (1925)], are really *P. brevicauda* a species new to Britain, recently described by H. Schmitz from Saxony [*Soc. Ent.* **40** 23 (1925)].

Araneina.

Synageles oenutor, Luc.—A number of examples of this ant-like spider was observed at Charmouth, in June, running on the sand and under the sedge on the under cliff in company with numerous ☿ ☿ of *Myrmica scabrinodis* and *A.* (*D.*) *niger*.

Myrmarachne formicaria, De G.—On June 9th, I discovered a fine colony of *Formica fusca* v. *rubescens*, Forel., inhabiting a bank facing east on the undercliff at Charmouth. The situation of the nest was traced by tracking workers (mostly large and very red in colour), which kept bringing up prey, chiefly *Hypera* larva, green with a white stripe (probably that of *H. plantaginis*). Having dug up the nest, and captured a typical *rubescens* queen, I was sitting watching the ants all hurrying about, when I noticed, what looked like, one of the redder ☿ ☿ running in company with them. Its appearance and movements were just like those of the ants, yet something caused me to quickly bottle it; when I found it was a spider coloured red and black like the ants. On sending it to Randell Jackson it proved to be a fine ♂ of the above spider. I have twice before taken this rare species—a ♂ and 2 ♀ ♀ with *Myrmica scabrinodis* at Sandown, I. of W., on August 26th, 1908, and a ♂ with the same species of ant at Luccombe Chine, on August 27th, 1909, but on each occasion the spiders were smaller (not adults), being the size and colour of the *Myrmica*.

Crustacea.

Platyarthrus hoffmanseggi, Brdt.—On May 23rd, this little myrmecophilous "wood-louse" was observed in numbers, very large specimens being present, in a nest of *F. fusca*, situated under a large stone on the under-cliff at Charmouth.

Remarks on the evolution of the Zygaenae and an attempt to analyse and classify the variations of Z. lonicerae, Scheven, and of Z. trifolii, Esp., and other subspecies.

By ROGER VERITY, M.D.

(*Continued from page 12*).

Subspecies *trifolii*, Esp. Group I. (*siciliae*.)

Race ? **siciliae,** mihi.—Amongst the specimens sent to me from Sicily by the late Ragusa some years ago, there are some, probably collected in the district of Palermo, which just fall by their small size and rather thick antennae within the limits of subspecies *trifolii*, but which point distinctly to the *lonicerae* structure by the sharper apex of antennae and wings than is usual in the former. The red spots of the forewing are distinctly larger and more irregular in shape than in the other *trifolii* of Sicily, recalling *trinacria* on a reduced scale (one specimen is even a *punctonotata* form); also the tone of red, inclining to carmine, is transitional to the latter's; the marginal band of the hindwing is narrower than the average in *trifolii* of that region and it does not prolong itself to the abdominal and to the costal margins.

As *centralitaliae*, which would fall in this Group by its structure, is probably only the *trifolii*-like individual form of race *pauper* of the *lonicerae* subspecies, I will deal with it in the paragraph on the latter. Also the II. gen. *gracilis*, Fuchs, of race *trifolii* comes in here, but it will be dealt with in connection with this race.

Group II. (*syracusia*).

Race *syracusia*, Zeller, *Isis*, 1847, p. 301.—Oberthür has very rightly pointed out in his *Ét. Lép. Comp.*, IV., p. 491-4 (1910), that the southern *trifolii*, which had been, till then, lumped together under the name of *syracusia*, varied very broadly. He split them into two very different groups: *syracusia* and *australis*. The distinction is, in fact, perfectly obvious in nature and it is clear from Oberthür's remarks in general and from the localities he gives for these races, that he meant to restrict Zeller's name to the larger, heavier race, more saturated in colour and of a colder tinge, usually with an indigo blue sheen and occasionally with a deep bronzy green, as described by Zeller ("*niger-viridibus*") and with red inclining to crimson, and red spots of forewing usually small in size; the fifth spot, however, is in some individuals rather large as compared with the others and oval lengthways, towards the apex, as Zeller, very rightly, observed it (compare with the description of *australis* I give below). Some of the characters Oberthür mentions however, I do not find are distinctive, because they vary too much in both races; thus, the longer and more pointed antennae and the narrower dark band of hindwing must, I think, be left aside, although it is quite true that *australis* produces occasionally hindwings melanic to a degree never observed in *syracusia*. Zeller lays particular stress on the broad marginal band prolonging itself to the base of the wing along the abdominal margin and along the costa, as existing commonly in *syracusia*. Where Oberthür, to my mind, begins misleading one is in quoting Rambur's figures in the *Cat. Lép. Andalousie*, pl. I., fig. 5-8, as representing *australis*. They do not agree with Oberthür's minute description of the latter. Fig. 8

is a most characteristic *syracusia*, as Rambur himself remarks: fig. 6 differs very little from it; the female of fig. 7 does suggest an *australis*, but it is not good enough to convey the look of it; fig. 5, by the shape of its wing and its more pronounced blue certainly is the *Z. filipendulae* subspecies *stoechadis* that Rambur gives it for; it even represents well its Spanish race *kindermanni*, Obth., and it is surprising Oberthür should have referred it to *trifolii*; Staudinger had made the same mistake. It is high time full credit should be given to Rambur for his keen insight here, as in the case of the *Grypocera* species he discovered!

In Sicily, as in Algeria, and in Central Europe, *trifolii* has a II. gen. in September. It is smaller than I. gen.; wings slightly more elongated, sheen deep bronzy green rather than indigo, spots of forewing very small: **secundogenita**, mihi. Oberthür observed that the specimens of it collected by Zickert at Catania are remarkably similar to the race of Plouharnel on the Quiberon peninsula in southern Brittany. This I can confirm, as far as I can judge from one Zickert specimen, kindly sent to me by Turati to examine. Tutt, too, notes that examples from the Channel Islands and Broxbourne appear almost inseparable from *syracusia*. Thus it is quite certain that *syracusia* is met with locally as a race in Algeria, in Spain, as far north as Catalonia, and that it occurs as an extreme individual variation of race *orobi* (see below) along the western coast of France, as far as the south of England, evidently produced by the moist and mild Gulf-stream climate.

Sagarra will deal at length in the *Butll. Institut. Catalana d'Hist. Nat.* with the interesting October emergence of *syracusia* at the Llobregat, near Barcelona, collected in 1925 by Querci. It can be described, on an average, as intermediate between its I. gen. *syracusia*, and the II. gen. *duponcheliella* of *duponcheli*, of which, however, it never has the thick antennae. It varies extremely, and it exhibits all grades of transition between the two in size, tone of colour and extent of pattern. Besides this, several specimens collected with it seem to belong to a corresponding emergence of *Z. filipendulae*, race *kindermanni*, so that the name of **intricata** applies well to it.

Race **magnaustralis**, mihi.—Oberthür, *l.c.*, p. 493, records a race from Khenchela in Algeria, which he describes as "larger than *australis*, with larger red spots and the shape of the wings more elongated" and which he can refer neither to *australis* nor to *syracusia*. Turati has sent me for examination a series collected in Algeria by Faroult, which perplexed me in exactly the same way, so that it is obvious it is a race distinct from both. To the features mentioned by Oberthür I must add that the colours of most individuals are unusually vivid for this species: the sheen on the dark parts recalls that of *filipendulae* and it is indigo blue in both sexes; the red is of a carmine tinge, as in *australis*, but more saturated and brighter; the fourth spot (lower central one) is remarkably large as compared with the others, whereas in *syracusia* it is the fifth which tends to be large and oval in some individuals, as mentioned by Zeller; the marginal band of the hindwing is broad, reaching a little more than half the distance between cell and hindmargin in males and a little less in females.

Race *australis* (Lederer: *nom. nudum*), Obth., *Ét. Lép. Comp.*, IV., p. 491 (1910).—The southern race which contrasts most with *syracusia*,

as defined above, can be described as being considerably smaller and frailer and less deep in colour; there evidently is in austrates a touch of yellow, so that the forewing has a green sheen, instead of a blue one, and the red is of a warmer carmine, especially on the forewing; Oberthür rightly points out that the dark band of the hindwings has a blue sheen and that the red of these wings tends slightly more to carison, as in *syracusia*. Another important difference between *australis* and *syracusia* is that in the former the dark band of the hindwing is, on an average, considerably broader, whilst, on the contrary, on the forewing it is the red which tends to be more expanded than in the latter, notwithstanding considerable individual variations in both these races. Oberthür records a form of *australis* with the hindwings entirely darkened over, which he says is frequent in the Sierra-de-Alfakar, but which he has seen from nowhere else (ab. *caerulescens*, Obth.). As *trifolii*, in fact, produces this form in no other race, even as a rare aberration, one is inclined to wonder if those specimens were not *stoechadis*, especially as Oberthür insists twice on the point that Rambur's figure 5 represents it. The females of *australis* I have seen differ markedly from the males by having as narrow a marginal band to the hindwing as nymotypical *trifolii*, narrower in some than in Rambur's fig. 7. Oberthür says he regrets he has not been able to procure and read Lederer's original description. I have looked it up and I find in his *Versuch. d. europ. Lepid. in möglichst natürl. Reihenfolge zu stellen* published in the *Verh. zool.-bot. Ges. Wien*, 1852, p. 71, there is no description or no remark about the name *australis*. It is simply mentioned as follows: "*syracusia*, Z., 1847; *australis*, Rb., *in lit.*; ? *charon*, B. *Icones*, pl. 54 (non Hb.)." These three names, according to Lederer, thus referred to a species distinct from *trifolii*. Evidently Rambur must have originally created the name of *australis* and sent out specimens labelled with it, because one understands from the text in his *Catalogue Andal.* that he did not consider all his Malaga specimens as being *syracusia*. The name, however, remained a "nomen nudum" in Lederer, and Oberthür was at liberty to validate it as best he liked. The distribution of *australis* still remains to be made out exactly: Oberthür gives Andalusia and western Algeria (*magnaustralis* and *syracusia* in eastern Algeria) and he mentions Barcelona. Ragusa has collected in Sicily very small and green specimens I have named *paraustralis* (p. 11; Figs. 18-19); I have one of these and Prof. Rocci has lent me another, but their exact place of origin and the way they stand to *syracusia* in that island are not sufficiently known. Turati has sent me a specimen identical with Batna ones in in his collection, which is labelled "Asia Minor" by Staudinger.

I possess a form from Aragon, striking from its very small size, long and narrow, thinly scaled, translucent wings, pale bluish and pink tints, which I should name **rosella**, mihi.

Group III. (*trifolii*).

Race *trifolii*, Esp., *Die Schmett.*, II., p. 223, pl. XXXIV., fig. 4-5 (1783).—Esper, both in his Latin diagnosis and in his description in German, clearly speaks of three spots, the largest being the middle one. His figure 5 of the female corresponds to it; fig. 4 of the male has all the spots confluent (form *minoides*, Sélys), but the Rules of Nomen-

clature give precedence to the text over figures and in this case it turns out well, because thus the nymotypical form is also the most frequent in the majority of localities of the race which, broadly speaking, is the nymotypical one. It is characterised by its rather thinner scaling than in any of the others, by the resulting tendency of the dark markings to be slightly more translucent, less deep in tone and with a weaker sheen ; the red is bright but rather clearer; the dark marginal band of hindwing varies considerably, but on the average it is narrow. The tendency of the spots of forewing to be very broad and to flow together is the most striking feature. In some localities this tendency becomes unusually pronounced and a high percentage of individuals belong to forms *glycirrhizae*, Hb., with confluence of the two basal spots into one and of the three others in another, and *minoides*, Sélys, thus creating a secondary aberrative race, which should bear the former of these names. In others, on the contrary, the average aspect of the race approaches *orobi*, Hb. Apart from these local differences the race described by Esper from Frankfurt-on-the-Main spreads to most of Central Europe, from England as far south as the Gironde, whence I possess a large series collected in July at St. Come Bazas by the Abbé Sorin, perfectly similar to specimens from Germany, Belgium, etc. Oberthür describes under the name of *pusilla*, *Ét. Lép. Comp.*, p. 498, a dwarf secondary aberrative race from Auch (Gers) and emphasises that at Lectoure, which is quite near to it, one finds the usual *trifolii*. A second generation of *trifolii* has been recorded by several authors. Fuchs names *gracilis* [*Stett. Ent. Zeit.*, XLI., p. 118 (1880)], what he took to be a local race at Bornich in the Rhine Valley, but Burgreff has looked it up again lately (*Mitt. Münchener Ent. Ges.*, 1914, p. 62), and found it is the summer emergence, which is on the wing from July to September on the Loreley, whereas the I. gen. of May and the beginning of June is nymotypical *trifolii*. II. gen. *gracilis* is described as small and frail; shape of wings as in *trifolii* ; spots of forewing smaller; marginal band of hindwing narrower ; antennae identical with those of *lonicerae*.

Race *orobi*, Hüb., *Eur. Schmett.*, II., fig. 133 (no text).—As I have mentioned above, there are localities all over the habitat of the nymotypical race, where the majority of individuals, especially of the male sex, have the five spots of forewing reduced in size and standing well apart from each other, so that series of specimens have quite a different look from those in which the nymotypical medium form prevails, and they stand opposite race *glycirrhizae*, Hb. In such cases I think Hübner's name *orobi* should be applied to the entire race, as his figure represents perfectly the form with five distinct spots. The minute spot between spots 3 and 5, which exists in some copies of that book, can be disregarded, being the rare aberration one meets with now and then in Central Europe, but not normally, as in the *palustris* of Sicily I have named *punctonotata*.

Race **subsyracusia**, mihi.—A grade of variation higher than *orobi* along the same line constitutes a bright and striking race on the coast of the N.W. of France and in the Channel Islands. The scaling is then very dense, the colours saturated and vivid, both in the indigo or the deep bronzy green sheen and in the red, the spots of forewing smaller, on an average, than anywhere else in Central Europe, and the marginal band of the hindwing broad. As a matter of fact, Tutt

and Oberthür remark that some specimens differ in no way from some *syracusia* and that the latter is simply a further development of *orobi*. I must add, however, that this is true of many males, but that the females rarely can be compared with those of the southern races, judging from my series of the dunes of Plouharnel, near the Quiberon peninsula, in southern Brittany, collected by Le Pontois. He informs me that in that locality the *sermaculata*, Obth., form is met with quite frequently. This is very interesting, because it seems to be in connection with the fact that *subsyracusia* comes nearer to *filipendulae* in general aspect than any other race of *trifolii*, by its scaling, colouring and spotting. One might have expected the sixth spot to appear more frequently in the races, which, on the contrary have a tendency to increase the extent of the red scaling. Instead, Oberthür says he knows of no other specimens with it but two from Lectoure and a few from Rennes.

Race *orientalis*, Hormuzaki, *Soc. Entom.*, 1902, p. 139.—I am not acquainted with this race, described as a large form with small spots from the Bukovina, so that I can only place it here tentatively.

(*To be continued.*)

A List of Spiders found by Mr. H. Donisthorpe at Bordighera in northern Italy.

By A. RANDELL JACKSON.

In January, February and March, 1925, Mr. H. Donisthorpe collected, amongst other animals, a number of spiders, in the Italian Riviera. The following is a list of their names with a few remarks on them. The Mediterranean basin is a well-marked subdivision of the Palaearctic area, and although it possesses a number of genera, which do not struggle much further North, most of our genera are represented there. Usually, however, the species are different. The present list contains thirty-seven species, of which seven only occur in Britain and thirty do not. Of the thirty-eight genera, no fewer than thirty occur in Britain and eight do not.

The mild climate of the Riviera should make it a good place for Winter collecting, but the large number of immature specimens in Mr. Donisthorpe's collection would suggest that more identifiable species would have been found later in the year.

In the following list the species, which occur in Britain, are indicated by an asterisk.

Araneæ.

Nemisia carminans, Latr.—An adult and a young female. This spider is better known as *N. moggridgii*, Camb. Several trap-door nests found were probably made by this species.

**Dysdera erythrina*, Walck.—Both sexes, adult and immature—a common species in southern England.

Dysderina loricata, Sim.—A female of this curious scutate Oonopid was found. The species reaches southern Germany.

Gnaphosa corticola, Sim.—A single female. The species appears a very rare one; a single specimen from Ardèche being the only previous record.

Pterotricha exornata, C.L.K.—A single immature female.

Drassodes severus, C.L.K.—Two females.

Drassodes hispanus, L.K.—Three females.

Drassodes macellinus, Thor.—Two males and one female, the latter immature.

Zelotes oblongus, C.L.K.—A single female.

Chiracanthium fulvo-testaceum, Sim.—A single female, probably of this species. Females of this genus are very difficult of determination.

Mesoteles tenuissimus, L.K.—A single female.

Phrurolithus flavitarsis, Luc.—Although immature, this specimen is readily identifiable by its unmistakeable colouration.

Micrommata ligurina, C.L.K.—An adult male. Many immature female *Micrommatae* were taken and probably these are of the same species.

**Anyphaena accentuata*, Walck.—Two young females.

**Thomisus albus*, Gmelin.—An immature female.

Xysticus graecus, C.L.K.—Two adult females of this fine species.

**Oxyptila atomaria*, Panz.—One female. This is a fairly common British spider.

Phlegra bresnierii, Luc.—Immature examples of both sexes.

Saitis barbipes, Sim.—Male and female immature.

Menemerus semilimbatus, Hahn.—An adult male and a number of females, adult and immature.

Cyrba algerina, Luc.—Three immature females of this very distinct species.

Evophrys rufibarbis, Sim.—Three females.

**Aelurillus insignitus*, Clerck.—An adult female and several immature examples.

Textrix coarctata, Sim.—Four females.

Tegenaria fuesslinii, Pav.—Female, adult and male immature.

Tarantula albofasciata, Brullé.—An adult female and many young of both sexes.

**Trochosa ruricola*, de Geer.—A male, rather smaller and darker than typical British specimens.

Lycosa morosa, L.K.—One female.

Euryopis acuminatus, Luc.—One immature female.

Lithyphantes paykullianus, Walck.—Several females of this large and handsome spider.

Enoplognatha testacea, Sim.—One adult female.

Teutana triangulosa, Walck.—One female. In northern Europe this is a house spider. I have found it indoors in Belgium, and it might easily occur in such situations in Britain.

Labulla rupicola, Sim.—One female.

Lophocarenum ineditum, Camb.—A male and a female adult.

Lophocarenum insanum, Sim.—One female.

**Zilla x-notata*, Clerck.—One female.

Zilla montana, C.L.K.—A number of females.

In addition to the above were a large number of immature individuals. Some of these almost certainly belong to the above mentioned species, others may be different species of the same genera. However, five genera not listed above can be made out amongst them. These are *Titanoeca*, *Philodromus*, *Tibellus*, *Heliophanus* and *Dipoena*,

all but the first of these occur in Britain, but they are all critical genera and identification can only be made from adults.

The following species Mr. Donisthorpe tells me were living with ants. *Euryopis acuminatus*, Luc., *Lophocarenum insanum*, Sim., the *Dipoena*, of which many examples were found, and the single young specimen of *Titanoeca*.

In addition to the spiders, the scorpion *Euscorpius carpathicus*, Linn., was found. Also a few very young Opilionids too immature for identification.

Digne and its Neighbourhood. April-May, 1925

By LIEUT. E. B. ASHBY, F.E.S., F.Z.S.

Leaving London on April 25th I reached Digne on the evening of the next day after a pleasant journey. Between Lyons and Grenoble I noticed a number of Pierids on the wing including *Euchloë cardamines* and *Gonepteryx rhamni* with *Pararge aegeria*. There were possibly some fritillaries but I could not see them clearly enough from the train to identify them. The beautiful lake, which lies along the right hand side of the railway some two miles before reaching the station of St. André le Gaz, was a very striking scene. There is no doubt, a walk around this lake, which I believe is quite practicable, would be profitable entomologically, especially in May and June, the somewhat boggy ground at the end of the lake nearest St. André appearing to be especially inviting to any naturalist who would spare the time to work it. Both sides of the lake are well fringed with woodland running down to the banks accessible from the good path encircling it.

April 27th.—The "mistral" blew all day, not a frequent occurrence at Digne. There was no use for a net, but I managed to find a good number of insects settled, and amongst them a sprinkling of *Glaucopsyche melanops*, *G. cyllarus*, and *Scolitantides baton* all in good condition, a number of Syrphid flies, a freshly emerged specimen of *Brenthis dia*, quite na umber of Coccinellids (*Coccinella 10-punctata* and *C. 7-punctata*) and other beetles, a few moths, a number of bees including the southern form of *Bombus agrorum*, *B. hortorum* and *B. terrestris* var. *lucorum*. In the morning I collected on Mt. St. Vincent behind the cemetery, but quickly found that owing to the wind the higher ground was quite unproductive, and most of my captures were obtained just behind the back wall of the cemetery, which adjoins the old cathedral of Notre Dame du Bourg, it being a sheltered situation. In the afternoon I walked along the Dourbes Road as far as where the road to Villard branches off, but the catch was almost confined to bees and Diptera settling on flowers of dandelion, together with the Rhynchotid *Syromastes marginatus*.

April 28th.—There was a great change to-day, no wind and an intermittent warm sun. I again tried the Dourbes Road going rather farther than on the previous day. The higher levels were unproductive but on the return from the Maison Yvan as far as the Octroi there was excellent collecting nearly the whole way. *Callophrys rubi* were numerous but none too fresh, *Scolitantides baton* and *Glaucopsyche melanops* were in their prime and plentiful. Freshly emerged *Euchloë*

cardamines and *Papilio podalirius* were noted and I captured a *Pontia daplidice* form *bellidice* and saw others. In the afternoon it rained, but throughout the day I was able to add to my store of Coleoptera, Diptera and Hymenoptera, including a fresh *Ammophila sabulosa*.

April 29th.—A gloriously fine morning and I collected on the slopes of Mt. St. Vincent up behind the cemetery wall of the old cathedral. On the narrow zigzag path as I mounted I again found *S. baton*, *G. melanops* and *C. rubi* in numbers, with a few *Pieris brassicae* form *chariclea* and males of *E. cardamines*. The Neuropteron *Ascalaphus longicornis* and a good many bees including *Eucera longicornis* were to be obtained here. Towards the summit there are patches of bare soil here and there with some long grass among which I took *Erebia epistygne* in fair condition. On the green sward around the ruined monastery, with its picturesque old terraces, I took four specimens of *Anthocharis crameri* (*belia*), the first I have ever met with. *Papilio machaon* was also there and the bee *Melecta luctuosa*. On the zigzag path down to the quarry I noted *P. podalirius* and *E. cardamines* again and several wasps with *Pararge megera*, and in the evening when my friends Mr. F. Gilliat and the Rev. S. W. Gilliat arrived I was able to report a very satisfactory and pleasant day.

On April 30th the sun failed to shine and there was slight rain. A walk along the right bank of the river Bléone from the main bridge at Digne as far as the Pont les Arches, very interesting from a botanical point of view, produced more *S. baton* and *G. melanops* resting among broom, the bee *Eucera longicornis* and the two species of Rhynchota, *Pyrrhocoris apterus* and *Spilostethus equestris* with the beetle *Adimonia tanaceti*, Diptera and other Hymenoptera.

May 1st.—On this morning I crossed the Bléone by the Pont les Arches and ascended to the St. Bénoit farm; it being untenanted I collected all around in quiet and in addition to the two "blues" already met with I got some Rhynchota, the wasp *Polistes gallica*, and on the sprigs of broom a fine Ichneumon. The sun did not shine until I was nearly back to Digne, where I found large clumps of *Lamium purpureum* in flower much frequented by *Bombus agrorum* and other bees. In the afternoon I again visited the slopes of Mt. St. Vincent but by the Avenue Paul Martin, as the sun shone on that side. Unfortunately the wind had got up and my collecting was somewhat restricted. Again I found the two "blues" on the broom, a few nearly full-fed larvae of *Melitaea didyma*, and was lucky on my return in capturing a male and a female of the beautiful bee *Xylocopa cyanescens* as they were leaving their retreat in the dry bank edging the path.

May 2nd.—This morning my friends and I motored as far as where the branch road to Villard commences in order to work for *E. epistygne*, but without success. The walk back produced the two "blues" in number and a fair sprinkling of a third, *Glaucopsyche cyllarus*, two females of *E. cardamines*, *Leptosia duponcheli*, and single specimens of *Hamaearis lucina* and *L. sinapis*. Near Maison Yvan, on the hill behind there was a solitary *E. epistygne*, more *L. duponcheli* and good examples of *Fidonia plumistaria*. Here I noted that *Orchis militaris* was in flower. Crossing the brook Miroux I ascended on the opposite slopes, up to the Purgatoire and the ruined chateau, where I took two worn *E. epistygne*. A fine view is obtained from the ruins

looking down over the Baths, which open about May 15th, when the omnibus service recommences.

On May 3rd I went by train to St. Auban and walked through the cork-oak wood parallel with the railway to Les Mées. Along here is the bank of a long railway cutting which forms a fine rendezvous for butterflies. Here I found *Anthocharis tagis* var. *bellezina*, *A. crameri* (*belia*), *Euchloë euphenoides* (with one female), *Hesperia malvoides*, *Colias hyale*, *C. rubi*, the Geometrid *Fidonia plumistaria* with *Ascalaphus longicornis* and several Hymenoptera. Then I crossed over to Les Mées and having met my friends, returned. I noted *Gonepteryx cleopatra*, and captured a nice series of *A. crameri* (*belia*). This walk is rather tiring in the hot sun over the loose stones and as the woods spread over a considerable area one must be quite sure of the track to hit upon the best part for collecting, that bordering on the railway with the long cutting.

May 4th.—This morning I started my setting at 6 a.m. and managed to get my breakfast sufficiently early to allow me to reach the top of Mt. St. Vincent by 9 o'clock. The two "blues" were still common and the females of *S. baton*, were in full perfection. The bee *Xylocopa cyanescens* was getting more common each day, much resembling the allied species *X. violacea* in its manner of flight and in its preference for resting on wooden posts, although it will often rest on rocks and stones. Three more *E. epistygne* turned up, but at this late date, past their prime; April 15th is perhaps about the date for this very local species, according to Donzel. The bee *M. luctuosa* and another Hymenopteron *Cimbex humeralis* were taken, the latter, a new species for me, on Box, with *A. crameri* (*belia*) and *P. daplidice* f. *bellidice*, my bag finishing with a few more Hymenoptera and the beetle *Tricodes alvearius*. On this occasion I saw my first *Zerynthia rumina* var. *medesicaste*, but the capture of a specimen was reserved for my friend the Rev. S. W. Gilliatt who saw another but worn specimen.

May 6th.—After the solid day's rain of the previous day, which apparently was enjoyed only by the countless multitudes of snails and slugs, the weather was improved although the sun shone only intermittently. I collected to-day a large number of larvae mainly from broom and plantain. On the broom I also found a newly emerged *G. cyllarus*. The larvae during the summer produced *Lasiocampa quercûs* and *L. trifolii*. The small yellow *Aspilates ochrearia* was pretty common.

(To be continued.)

CURRENT NOTES AND SHORT NOTICES.

Dr. Hedicke, the Secretary of the Entomological Society of Berlin, is responsible for the issue month by month of a list, *Repertorium Entomologicum*, of the contents of all the chief entomological magazines of the World, and of the entomological contents of the principal journals, whose matter is only entomological in part, indicating at the same time where newly described species, subspecies, genera, etc., are to be found. This will be of considerable use to authors and students as indicating, long before the issue of the *Zoological Record* is possible the sources of the latest developments in all orders, and minimise the possible duplication of descriptions and other work. The annual subscription is quite reasonable, M4. The contents of the *Ent. Record* and of the *Entomologist* are both listed, those of the *Ann. Mag. N.H.*

and of *Nature*. Announcements of important works are also included, like G. J. Arrow's Coleoptera volume of *Fn. Brit. Ind.*, and J. Davidson's *List of British Aphi(di)dae*.

The *Ann. Soc. Ent. de France* are already completed for the year and within the year, a volume of some 450 pages. In the two last parts there is an important series of Notes on the *Actinote* species of S. America and an interesting study of the silk of the social moth of French Guiana, *Anaphe ambrisia*. Most of the other papers are systematic and technical on Coleoptera, Hymenoptera, Orthoptera and Collembola.

REVIEWS AND NOTICES OF BOOKS.

Biologie der Schmetterlinge, by Dr. Martin Hering. pp. 486. Figs. 82. Plts. 13. Price GM. 18. Messrs. Julius Springer, Berlin. 1926.—This is a book of outstanding merit, and should be translated for the English-speaking world. It is not a mere collection of entomological facts, but, in addition, a discussion of the scientific principles underlying, or arising from, these facts. Chap. 1 deals with the general structure and relation of the various body-parts and their developments in the different groups in the four natural stages; even the results of intensive study, such as of the "basal-fleck" of the palpi, of the development of the wing-veins, etc., have been suitably dealt with. Chap. 2 treats of the origin, phylogeny and developmental history of the Lepidoptera, the following six principles being laid down: (1) Originally fore- and hindwings were very similar to one another in both shape and vein configuration. (2) In process of development there followed a simplification of the hindwings. (3) When a sexual difference in the hindwing reduction occurs, the reduction is more strongly expressed in the males than in the females. (4) The reduction in the hindwings follows in the order of from back to front. (5) The reduction of the hindwings may be continued also on the back portion of the forewings. (6) In the forewings the further development brings about a massing together of the veins on the costa. Taking these six principles a tabular arrangement of the whole of the families of the Lepidoptera is given with a phylogenetic tree. Chaps. 3, 4, 5, 6 deal with the ontogeny or individual development, punctuated by four distinct and dissimilar stages. Chap. 3 gives facts as to the ovum and oviposition, the reproductive machinery of the sexes, the probable relationships of cell structures and a discussion of the chromosome hypothesis. The determination of the sex of the ova is discussed, and some curious facts are adduced, *e.g.*, when *Caligo memnon* lays its eggs on a leaf, two are near one another and one quite separate, the latter always produces a female while the other two produce males. Such questions as parthenogenesis, viviparity, are clearly stated with accompanying facts. Chap. 4, the relation of larva and food-plant is dealt with; galls, mines (Dr. Hering is an ardent student of the micro-lepidoptera), and case-bearing are discussed from the point of view of the origin of the habits. It is laid down as an axiom that the pigmentary matter in the larva has its origin in the plant fed upon. In dealing with polyphagous larvae it is stated that they are the oldest phylogenetic forms, while monophagous species are much younger in their origin.

Many curious facts are collected relative to the nearer related species always feeding upon nearly related plants, and corrections are

pointed out which have been made in the classification both of plants and of insects, by considering the relationship of an insect and its food. Such difficult questions as the power of the ♀ in choosing the right plant for oviposition, substitute food-plants and the use of the osmateria are adequately considered. Cannibalism is fully treated of with a list of those species most addicted to the habit, and its relation to parasitism is discussed. There is a long discussion on the hibernating habit in all its bearings, and finally on the proportion of the sexes and the theory of larval parasitism. Chap 5 treats of the external structure of the pupa and of the complete breaking up and re-organisation of the tissues, which occurs in its development; the theory of imaginal discs is stated and discussed, the pupal habits, the cocoon structure, purpose and variety, and the phenomenon of "lying over," which in the case of *E. lanestris* has lasted 5½ years. Chap. 6 deals with the methobs and details of emergence of the imago, with hibernation and aestivation, with protandry and protogyny, and with excretory matter from the recently emerged imago.

The second section of the work deals with the Life of the Imago of the Lepidopteron. Chap. 7, discusses the food habits of the imago, analyses the constituents of the flower contents, states the special relations between certain species and certain plants, the preferences of certain species, the facts and theory of the attraction of "sugar," rotting fruit, sap, ordure, etc. Chap. 8., deals with courtship and generation, the chief and the subordinate structures and functions in generation, special sexual scalings, the general principles of the relations of colour and sex, costal folds and divers other curious indirect sexual features, the vexed question of sexual selection in its bearing on insect relations, irregular union and its suggested causes, and the resultant hybrids and mongrels. Chap. 9. describes the sensory life of a Lepidopteron, the special structures of perception such as hairs, palpi, antennae, ocelli, eyes, tympanal organs, and the many complex minute structures, whose functions as yet are only conjectural. Chap. 10 describes the apparatus of flight and the general wing structure and its adaptability, with notes on the jugum, the frenulum, the patagia, and on winglessness, both partial and complete.—(*To be concluded.*)—Hy.J.T.

The Hon. Treasurer wishes to call attention to the following points:—

(i.) All subscriptions should be sent to him; some are still being sent to Mr. H. E. Page.

(ii.) Subscriptions are due in advance; and it is great convenience to the finances of the Magazine if they are paid in the first three months of the year.

(iii.) For the benefit of any subscribers who may wish to make payment through their Bankers, he will be pleased to forward a Banker's Order Form on application.

(iv.) He would urge those few subscribers, who have not yet paid for Vol. 37 (1925), to do so AT THEIR EARLIEST CONVENIENCE.

(v.) He would again draw attention to the fact that in consequence of the local Borough Council renaming and renumbering the late Victoria Road, Eltham, his address is now "6, Footscray Road, Eltham, S.E.9."

Subscriptions for Vol. XXXVIII. (new series), 10 shillings, should be sent to Mr. H. W. Andrews, *Hon. Treasurer*, **6, Footscray Road, Eltham, S.E. 9.**

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EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. Hy. J. Turner, 98, Drakefell Road, New Cross, S.E.14.

Changes of Address.—E. E. Bentall, F.E.S., The Grove, Witham, Essex.
G. Nicholson, Rosedale, 24, Nuns Moor Crescent, Fenham, Newcastle-on-Tyne.

Duplicates.—Several hundred species of Coleoptera (carded) from Hants and Dorset, including several rare species from the New Forest, etc.

Desiderata.—Scarce and local British Coleoptera (carded).—*A. Ford, 42, Irving Road, Bournemouth, Hants.*

Desiderata.—The Leicester Museum has no British Diptera and requires a typical collection. Can any collectors help us? We offer European Butterflies in exchange..'—"Entomologist," Leicester Museum.

Desiderata.—Ova or pupae of christyi, abruptaria v. brunnea, black consonaria and bidentata, extensaria, curzoni, jasionata, venosata (Shetl.) and other melanic Geometers and Noctuae.

Duplicates.—Very many in first class condition, high-set only f. i. Herminia flavicrinais, Andreas, Nych. dalmatina race andreasaria, Warnecke, about 30 species of rare Acidalias; pupae of Eupithecia illuminata or cash.—*Karl Andreas. Wiesbaden, Goethestr. 23, Germany.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. February 17th. March 3rd. March 17th.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. February 25th, Lantern. March 11th, K. G. Blair, "Some Insect Songsters."—*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.*, J. P. Hardiman, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

All MS. and EDITORIAL MATTER should be sent and all PROOFS returned to Hy. J. Turner, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT *to send us communications* IDENTICAL with those they are sending to other magazines.

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Communications have been received from or have been promised by Messrs. H. Donisthorpe, Dr. Verity, J. H. Durrant, Rev. C. R. N. Burrows, H. J. Turner, A. Sich, K. J. Hayward, Lt. E. B. Ashby, Wm. Fassnidge, Dr. E. A. Cockayne, H. Willoughby-Ellis, Major P. P. Graves, F. Marriner, and Reports of Societies.

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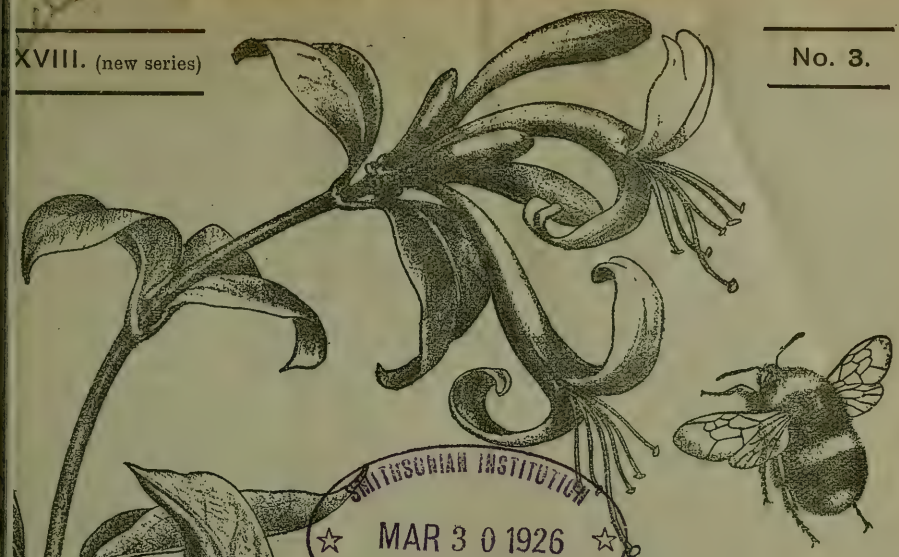

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Thera variata, Schiff., and T. obeliscata, Hb.

By E. A. COCKAYNE, D.M., F.R.C.P., F.E.S.

After Mr. Prout in 1912 so definitely stated his belief that *Thera variata* and *T. obeliscata* are two distinct species, I thought that both British and Continental entomologists had been content to accept his opinion. Last year, however, Mr. H. J. Turner translated a paper by Herr Carl Höfer, in which he expresses the view that *obeliscata* is a species in the making.

The following is an account of an attempt by Mr. H. Worsley Wood and myself to decide the matter. In April, 1925, we beat a plentiful supply of larvae of *obeliscata* at Oxshott, and in May I met with imagines of *variata* in considerable numbers in the New Forest. Both of us obtained fertile pairings of *obeliscata* in captivity, and my females of *variata* laid several dozen eggs, so that this gave us a very favourable opportunity of studying the early stages of both insects and comparing them side by side. Mr. Wood fed one batch of *obeliscata* on spruce and one on pine, whereas mine were fed on pine. In order to have larvae of different parentage I gave him the eggs laid by three females of *variata* and kept those laid by four others myself.

The oval green eggs of both species were laid for the most part singly on spruce or pine needle, *variata* much preferring the tender spring growth. The eggs are rather large and about three dozen is the average number deposited by each female. Those of *variata* appeared, under a low power of the microscope, to be a little smaller and yellower than those of *obeliscata*, but actual measurements showed that in length and width there was no difference. In the sculptured surface, which is a little irregular, I could detect no difference either in the living egg or in the empty shells.

Both Mr. Wood's and my own larvae of *variata* grew quickly and soon outstripped the *obeliscata*. They were also much hardier. Many *obeliscata* of all three broods died at all stages, especially in the first and second instars. Eventually all my *variata* and the survivors of Mr. Wood's produced imagines in August and September, whereas only three from each brood of *obeliscata* did so. One *obeliscata* imago emerged on November 9th, one died pupating in the middle of December, one emerged on January 4th, 1926, one is in the pupal stage now, January 30th, and three are passing the winter in the penultimate instar feeding and growing very slowly.

Mr. Wood received some eggs of *variata* from Herr. Hans Leonhardt of Hamburg and handed the larvae to me in July. They were very small and grew slowly all through August, September and October. The nine remaining ones are still feeding at the end of December, one in the last instar, two in the penultimate stage and the rest in the last stage but two. Neither of us could detect any difference in the young larvae. Later on we both found that they varied considerably in depth of ground colour and in the clearness and whiteness of the longitudinal stripes. In the majority of the *variata* larvae in the last instar the thin ventral line is a clearer yellow than in *obeliscata*, in which it is white or whitish yellow; the spiracular and subspiracular lines also are yellower in *variata*. Below the subspiracular line there is a very distinct white line in *obeliscata*, which in *variata* is scarcely visible. The green ground colour is lighter below the spiracles than

above in *obeliscata*, but this contrast is absent in *variata*. These differences are not constant, but on the whole the *variata* are less brightly marked.

In the penultimate instar a real distinction first became apparent to both of us. The legs of *variata* larvae remained green, those of *obeliscata* became pink, and in the last instar the deep pink legs of *obeliscata* contrasted still more clearly with the green ones of *variata*.

It seems almost incredible that so obvious a difference should have remained unnoticed by the continental authors and by Major Robertson and others in this country, if it be really invariable*. Under these circumstances it is necessary to give our evidence in full. All Mr. Wood's and all my *variata* larvae, more than fifty in number, bred from New Forest ova, had green legs, and the three Hamburg *variata* which are large enough to show this character, also have green legs. On the other hand all the *obeliscata* larvae bred from eggs, which grew to the penultimate instar had pink legs. In April we beat about two hundred larvae of *obeliscata* at Oxshott, where *variata* does not occur, and every one had pink legs. In July I beat some more there and these also developed pink legs in the last stage but one.

Mr. T. M. Nash, who happened to be in the New Forest in July, kindly beat a large number of *Thera* larvae from the spruces, where I caught my *variata* in May, and sent them to me. More than a hundred were received alive and, although the great majority were parasitised, enough survived to help to confirm this point. To my surprise I found several with pink legs and as the larvae grew many more developed them. There were in fact almost as many with pink legs as with green beaten from the spruce. All the pink legged larvae, which I noticed, were put into a separate box, and the eight, which produced imagines, all proved to be *obeliscata*. I ought to have put the big ones with green legs in another separate box, but carelessly omitted to do so. These *Thera* larvae are extraordinarily difficult to see; and, since new food was added to the old, it is easy to understand how a larva with pink legs could be left with the others. I know I dropped one back into the box and I suppose I missed two more. At any rate from the incompletely sorted box twelve *variata* and three *obeliscata* emerged.

I will add one more observation. Near Witley I beat a very small *Thera* larva from an isolated *Abies nobilis*. In due course its legs became pink and it produced a male *obeliscata*.

I think it will be found that in the last two instars there is a constant difference between the larvae of *obeliscata* and *variata*, the former having PINK legs and the latter GREEN ones, and I hope that other entomologists will make careful observations to confirm or disprove this conclusion.

I made some microscopical examinations to try and detect a structural difference and at first thought I had discovered one which was satisfactory. I noticed that on the anal flap of a *variata* larva there

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* Since I wrote this Mr. Prout has kindly shown me his notes on the larvae of *variata*, in which he mentions the green legs. He did not publish the notes because he had only half a dozen larvae and was uncertain as to the constancy of the character.

were five setae on each side, whereas in an *obeliscata* larva there were seven. Unfortunately further investigation showed that the number was inconstant. Of 27 *variata* larvae bred from eggs 15 had five setae on each side, 10 had six, and 2 had five on one side and six on the other side of the anal flap. Of the *obeliscata* larvae bred from eggs all the nine examined had seven setae on each side. The Witley *obeliscata* had six setae on each side. Of Mr. Nash's larvae with pink legs, presumably *obeliscata*, eight had seven setae and four had six, and of his larvae with green legs three had five setae and three had six. This difference is present in the penultimate and in the final instars. The setae were too small to count accurately in living larvae younger than this. Microscopical preparations made from dried larval skins known to have belonged to *obeliscata* and *variata* respectively confirmed these observations and proved that no mistake had been made in examining living larvae. The setae vary considerably in length and thickness in both species. The anal flap appears to me to be more sharply pointed and triangular in *obeliscata* and rounder in *variata*.

My conclusion is that any larva with only FIVE setae on each side of the anal flap is *variata* and any with SEVEN is *obeliscata*, and that six may occur in either species but less commonly.

In both species there are two little conical papillae, one on each side, hidden inside the anal opening, but becoming visible during defaecation. The apex of each papilla is studded with minute spines. Their structure in both species appeared to be identical. Their function seems to be to keep the faeces from soiling the anal prolegs.

Having a larva of *Thera firmata* I examined it and found that its anal papillae had no spines and that it had only four setae on each side of the anal flap.

The pupae of both species varied from pale green to a dark blackish green, but I could detect no difference between them. Even the elaborate arrangement of the fourteen long pink cremasteric hooks seemed to be the same in both.

Mr. Prout in the *Entomologist* says that the genitalia show no satisfactory differences and in Seitz he says that they are distinct. Both statements appear to be based on information supplied by Mr. Pierce. Herr Höfer says that this cannot be distinguished. I had intended to confine myself to the early stages, but these conflicting remarks led me to make seven preparations of the male genitalia of each species and a few of the female. These I compared with the figures and descriptions given in Pierce's *Genitalia of the British Geometridae*. Pierce says that the aedaeagus of *obeliscata* has ten to twelve strong thorns and that of *variata* a double row of many strong thorns and his figures clearly show this difference. In my preparations I came across one aedaeagus of *variata*, which was much broader than any other found in either species and had many more thorns. In all the rest the number of thorns large and small was approximately the same in both, although the large ones were longer in some than in others. There were minor variations in the length and thickness of the aedaeagus itself, the longer belonging as a rule to *variata*. I feel convinced that the two species cannot be differentiated by means of the aedaeagus. Pierce's description also points out a difference in the sacculus and this is shown in the figures, but here again I found con-

siderable variation. The sacculus in one *variata* had a lateral projection even longer and sharper than that in Pierce's figure, but others were as smooth as the smoothest in *obeliscata*. His figures show other differences such as the length of the anellus and the shape of the vinculum, but I think that these are merely the result of a relative difference in the position of the parts due to the mounting. The anellus was broader in two *variata*, but in the rest it was of the same width and length as in *obeliscata*. The number of spatulate hairs on the anellus varied a little, but specimens with nine and ten were seen in each. The vinculum was alike in both. In six out of the seven *variata* the valve was longer and narrower and in *obeliscata* the process on its posterior aspect was separated from the rest of the valve by a slightly deeper indentation. This seems to be the most important difference, but all are small and unreliable. The female genitalia of both are very simple in structure and appear indistinguishable.

Nothing can be added to Mr. Prout's admirably clear account of the differences between the imagines, but further evidence of their specific rank would be afforded, if it could be shown that variations occurred in one, which were without parallel in the other. There is no extreme melanic form of *variata* comparable with that of *obeliscata*, but melanic forms are so local that no weight can be attached to this. *Obeliscata* has no form corresponding with ab. *stragulata*, Hb., but *stragulata* may be a distinct species, and until it has been proved by breeding to be a form of *variata* it cannot be cited in support of this argument.

Variata ab. *albonigrata*, Höfer, and the aberration, which Mr. Prout has described in the appendix to this paper, are forms without parallel in *obeliscata*, and the latter at any rate is free from the objection that it may be due to some peculiar local condition, because *obeliscata* is common in the same wood and must have been subjected to the same influences. The importance of this must not be overestimated, but it is another small point in favour of the view that they are specifically distinct.

The distribution of *variata* in England is probably much wider than our records indicate. The insect is inconspicuous. It sits on the branches in preference to the trunks of the trees, and is very difficult to detect at rest. When disturbed it flies down to the ground or seeks the shelter of another branch as soon as possible. We know that it is found at Chandler's Ford and in the New Forest in Hampshire, in the Witley district of Surrey, near Bracknell, and in two woods near Oxford in Berkshire, and in North Devon, where I took a single female. In the three localities, in which I have taken it myself, spruce, *Picea excelsa*, and pine, *Pinus sylvestris*, were growing side by side and *obeliscata* occurred with it. On reference to my diary I find that the specimen taken on June 10th, 1901, which I believed to be the first authentic British *variata*, was beaten from spruce in Henwood, Boar's Hill, Oxford, a wood, in which there is pine as well as spruce and oak. In spite of this proximity the two insects remain perfectly distinct, and I have never seen one which could not be referred at once to either *variata* or *obeliscata*.

Mr. Turner has pointed out that our *variata* differ from the continental ones and has named the race *britannica*. This difference cannot have developed quickly and proves in a most conclusive way that the species has been established here for a long time.

Herr Höfer speaks of *obeliscata* being a species in the making owing to its isolation. By this I presume he means that the localities on the continent, in which the two insects occur, are isolated, but he also says that *obeliscata* is single brooded and emerges some weeks after *variata*. In England both emerge together in the spring and both have a partial second generation.

In all probabilities they have lived for a great number of years in this country emerging at the same times of the year, inhabiting the same woods, and enjoying ample opportunities of crossing, and yet they have remained distinct. This alone is in favour of the view that they are separate species.

All authors are agreed that *variata* much prefers *Picea* and *Abies* to *Pinus* and *obeliscata*, *Pinus* to *Picea* or *Abies*, although it is less exclusive in its diet. Mr. Prout has pointed out that although too much stress must not be laid upon this preference, it is significant, when considered with the other facts.

We are able to add two more records to those of Raven and Fassnidge of *obeliscata* feeding naturally on spruce. I beat one larva from *Abies nobilis* near Witley and Mr. Nash beat some from *Picea excelsa* in the New Forest. The larvae of *obeliscata* fed from the egg on spruce, throve no worse than those fed on pine, and their food had no effect on the colour of their legs, their anal setae, or on the appearance of the imagines, nor were the larval or imaginal characters of those beaten from spruce altered in any way. This confirms the results obtained by Herr Höfer. In captivity *variata* larva ate *Picea excelsa*, Norway spruce *Pseudotsuga douglasii*, Douglas fir, *Abies pectinata*, silver fir, and *Abies nobilis*, but when a choice was offered they showed a preference for the first two.

As both species were emerging at the same time I made attempts to hybridise them. I had three boxes with *obeliscata* male and *variata* female, and four with *variata* male and *obeliscata* female. In some cases more than one male and female was used and altogether I employed six males and five females of *obeliscata* and seven males and five females of *variata*. From September 14th onwards eggs were laid by two females of *obeliscata* in different boxes and began to hatch on October 1st. Very few eggs failed to hatch and I had 39 hybrid larvae from the one and 33 from the other pairing of *variata* male with *obeliscata* female. The larvae fed well on spruce, but died in the third instar. Evidently the one cross is easy to obtain, but I failed with the other. In the spring I hope to repeat the attempt with a better prospect of rearing the larvae to maturity.

Appendix by L. B. Prout, F.E.S.

Although Mr. H. J. Turner has pointed out (*Ent. Rec.* XXXVII. 25) the distinctive features of our British race, *T. variata*, Schiff., *britannica*, H. J. Turner—purer grey (less brown-grey) colouring and generally more subdued type of markings—and remarked on a certain degree of variability, I do not think any detailed notice of aberrant forms has yet appeared in this country. Indeed my own observation of it hitherto has led me to regard it as relatively somewhat constant, *i.e.*, as compared with several of our variable British "carpets." It is

therefore very interesting that Dr. Cockayne has bred from the New Forest a nice series of a really striking form which may be described as follows.

Ab. **nigrosignata,** ab. nov. Forewing with the ground-colour grey, fully as free from brown admixture as in the other British forms; the principal markings (boundary lines of median area, vein-marks in posterior half of the same, the ill-defined line which passes between the cell-mark and the postmedian and runs parallel with the latter, the shade proximal to the subterminal and the subapical dash) intensified black; basal patch wanting, except for the minute costal element at extreme base; the line or narrow band proximal to the antemedian, on the other hand, very highly developed, partly black; the median band itself on an average broadened. Hindwing rather darker grey than normal with the whitish distal edging of the postmedian line very distinct. Some captured males show a similar tendency in the blackening of the lines and veins and partial suppression of basal patch, but combine this with a browner tone.

Höfer, Carl. *Ent. Record,* 1924, XXXVI., pp. 39-41, 88-90, 119-120, 151-154, 167-169.

Prout, L.B. *Entomologist,* 1912, XLV., pp. 241-246.

Turner, H. J. *Ent. Record,* 1925, XXXVII., p. 25. *Proc. South Lond. Ent. and N. H. Soc.,* 1924-1925, p. 129. *Proc. Ent. Soc. Lond.,* 1924, p. cxxv.

Digne and its Neighbourhood. April-May, 1925.

By LIEUT. E. B. ASHBY, F.E.S., F.Z.S.

(*Concluded from page 30.*)

May 7th.—This morning I took a path which goes up the slope of the mountain on the north bank of the Bleone behind the hospital. At a considerable elevation I found *Erebia epistygne* in some numbers on a dry grassy slope overlooking the valley, but unfortunately most of them were passés. Near an isolated farm building not far from this spot, I found a young stage of the Mantid *Egena empusa*, hanging from a grass stem, to which it assimilated perfectly in colour. For a time I fed it with flies, but was unable to bring it through successfully. Finding little else of interest, I descended into a valley on the western slope towards a stream where plenty of *Euchloë cardamines* and *Melitaea aurinia* race *provincialis* were flying with a sprinkling of *E. euphenoides* and *Polyommatus* (*Agriades*) *thetis*. On the opposite slope towards the path which comes up from Digne station, I took a fine specimen of *Anthocharis crameri* (*belia*). A very fresh specimen of *Bombus sylvarum*, a large species of Ichneumon with other Hymenoptera were taken with the Coleopteron *Trichodes alvearius*. The beautiful orchid, *Orchis militaris*, was now flowering abundantly on all the mountainous slopes around Digne.

May 8th.—A walk up La Collette to the summit produced a fine large female *Meloë proscarabaeus* and other Coleoptera, some *M. aurinia* race *provincialis* and *Brenthis dia*, and on the crags beside the Dourbes road, I found a single specimen of *Zygaena rhadamanthus* apparently just emerged. A bright morning developed into a hopeless day and subsequently all I obtained was a sprinkling of Hymenoptera.

May 9th.—A wet day. I walked along the road towards Seyne to the Beaumont mountain. After passing the quarry beyond Notre Dame, a bridge is reached on the main road and immediately after a path through the fields on the right leads to the Marderic brook. Across this the zig-zag path leads up to Mt. Beaumont. After a considerable climb, a "maison forestière" in a dilapidated condition, but affording shelter from the rain, is reached in a pasture amid pines. Around this several paths can be taken and the whole would, I believe, afford an excellent collecting ground for Erebias, etc., in July-August.

May 10th.—A walk up to the village of Les Hautes Sieyes, an hour from Digne, by way of the water-tower beyond the station, following the telegraph poles by a stony path, produced near the village *A. crameri* (*belia*), *M. cinxia*, *E. euphenoides*, *E. cardamines*, *Scolitantides baton*, *Leptosia sinapis* and numbers of the moth *Fidonia plummistaria*. Lower down *L. sinapis* was more plentiful with *P. thetis*. At the foot of the slope below the stony path runs a stream, which comes down from Courbons. By following this stream, one comes to many patches of good collecting ground, where *Brenthis dia* was obtained. Numerous Coleoptera were noted and the Rhynchotid *Carpocoris purpureipennis*, De G., was taken.

May 11th.—This morning I was on the summit of Mt. St. Vincent by 9 a.m. It was fine but hazy and a good number of Coleoptera and Rhynchota were in evidence on the oak and ash, and several species new to me were taken. I took two *Cimbex humeralis* (Hym.), which seems partial to box. Few butterflies were about, but I found two fairly decent *E. epistygne* and one *A. crameri*. In the afternoon along the bed of the Eaux Chaudes, I took the dragon-flies *Calopteryx haemoroidalis* and *Orthetrum caerulescens*. Everywhere abundant were the little stumpy larvae of *Heterogynis paradoxa* (*penella*), which in mid-June produced me the little black moth. Just below Les Clairières I took one or two females of *Glaucopsyche cyllarus*, a specimen of *M. cinxia* and across the stream a few quite fresh *Hamearis lucina*. A walk up the gorge produced a few "blues" and one *Heodes dorilis*. On the road back I found both sexes of the beetle *M. proscarabaeus*.

May 12th.—This morning I took the 10-35 a.m. train to St. Auban and walked through the cork oak woods to the railway cutting and worked thereabouts pretty hard in a boiling hot sun and a hot wind. Among my captures were *Anthocharis tagis*, *A. crameri*, *E. euphenoides*, *L. duponchelii*, *Melitaea phoebe*, *M. didyma* and *M. cinxia* and a Zygaenid which was subsequently identified as *Z. lavandulae*. There was also a good sprinkling of Coleoptera, Rhynchota and Hymenoptera among my captures. The above "burnet" and the *Z. rhadamanthus* were the only ones taken on the trip. On the way back near the station I netted a good specimen of *Zerynthia rumina* race *medesicaste* on the bugle flowers at 4.30 p.m.

May 13th.—Among the Coleoptera taken to-day was *Dorcadion fuliginator* var. *vittigerum*, Fb., many Rhynchota *in cop.* on the stems of the yellow sinapis, several Hymenoptera and another *Z. rumina* race *medesicaste*.

May 14th.—To-day on Mt. St. Vincent around the ruined Monastery, *A. crameri*, *Papilio machaon* and *P. podalirius* were flying in some numbers. It was, however, too windy for net-work, but I

secured a decent specimen of *Erebia evias* and of *E. epistygne*. The large bee *Bombus lignsticus* was fresh out to-day and I took a good example of *Hemaris bombyliformis*, Och., on La Colette. I had forgotten to mention that Brig.-Gen. Cooke showed me a specimen of *Heodes alciphron* race *gordius*, which he had just taken high above Digne, an unusually early date, as in 1910 it was only on June 4th that it was coming out.

May 15th.—*M. aurinia* race *provincialis* was very plentiful along the Dourbes Road. At several spots where there are small inlets on the left hand side and at damp patches in the road, I found *G. cyllarus* really plentiful and in excellent condition. Another *Z. rumina* race *medesicaste* was taken near Petit Vallon, but the species seems quite rare here now and M. Coulet tells me his experience is the same. A male *Polyommatus semiargus* (*acis*) and the first female of *P. hylas* I had seen, turned up to-day.

May 16th.—At St. Auban. Walking for a mile and a half south, parallel to the railway, to the cutting, is on the whole the best bit of collecting ground in the district at this time of the year. *A. tagis* was plentiful and fresh with a good number of *E. euphenoides* and *M. phoebe*. Three more of the *Zerynthia* (*Thais*) were taken, but, at spots very far apart. There seems no spot here where one sees more than single specimens of this species. The purple meadow clary *Salvia pratense*, and the bugloss, which grow abundantly just outside the station, seem to have an attraction for it. Rhynchota were much in evidence. The collecting was much spoiled by two very violent thunderstorms, which, however, enabled me to capture numbers of *A. tagis* as they flew lazily like *L. sinapis* seeking shelter from the coming storms. This railway bank and the canal and river banks parallel to it abound with many different flowers at this time of the year and make it an ideal ground.

May 16th.—This was my last day at Digne. The afternoon was thundery, but along the Dourbes Road I obtained more *G. cyllarus*, one more *Zerynthia*, several *M. aurinia* and a nice female *H. dorilis*.

May 17th.—My friends went with me as far as Grenoble, where I left them for Paris and London, after an extremely interesting holiday at an earlier time of the year than that I had experience of before in this district.

A Further Study of the Habits of Acanthomyops (Donisthorpea) brunneus, Latr., and the Myrmecophiles inhabiting its Nests.

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

The greater part of my work with ants during 1925 consisted in a further study of the habits of *A.* (*D.*) *brunneus* in Windsor Forest. Last year I published a paper on this ant and the myrmecophiles I had taken with it; the latter reaching a total of 30 species. I have this year increased this number to 50 odd, besides having learnt a little more concerning the life history of some of those taken before.

Although on removing a little of the bark from the trunk, or even the highest branches, of a tree infested by this ant, many workers may be seen in the runs; they quickly scuttle away, and no actual nest can be traced. This is because the nest is situated inside the tree, and

unless it be cut down, one would never find the nest itself. I have been fortunate enough to be present when a number of such trees had to be cut down, and I found that the nest may be situated in the roots, in the centre of the tree, or in one, or more, of the main branches. To mention two cases; the trees were quite solid up to twelve feet in the one, and thirty feet in the other, and thence (in one tree the trunk, in the other a main branch) were partly hollow, and filled with frass teeming with ants—literally thousands in the older tree, which was calculated accurately for me as being 308 years old—and the wood enclosing the frass was all honeycombed, and channelled, with tunnels and galleries, excavated by the ants. The wood of these galleries was very damp, and harboured the ants' larvae and cocoons.

I have several times found solitary young deälated ♀ ♀ in small holes in trees; both high up, and near the ground. It is evident that a young female after the marriage flight founds her colony in this way; as I have also discovered very young colonies consisting of small workers and brood, which have only penetrated a short distance into the wood.

In the paper before mentioned I recorded a mixed colony of *A.* (*D.*) *brunneus* and *A.* (*C.*) *umbratus* in an ash tree in Windsor Forest and pointed out that an *umbratus* ♀ had evidently founded her colony in the *brunneus* nest. This year as the ash tree was in a rotten condition it became necessary to have it cut down; and this was done on June 25th, when I was able to be present. The *umbratus* ☿ ☿ occurred in large numbers, with their larvae, in cells in soft wood, and frass, in the base of the tree; but *brunneus* ☿ ☿ were only present in small numbers. Evidently the host species was gradually dying out.

[Crawley—*Ent. Rec.* **37** 170 (1925)—has suggested "that in nature the host ☿ ☿ (in this genus) desert the nest as soon as the parasitic ☿ ☿ reach sufficient numbers to carry on without them." I cannot agree with this theory at all; as all the evidence we have from observations made in nature points entirely to the host ☿ ☿ dying off in the course of time. In my paper on the Colony Founding of *A.* (*D.*) *fuliginosus*—*Biol. Bull.* **47** 173-184 (1922)—all gradations in the proportion of the ☿ ☿ of *fuliginosus* and *umbratus*, or *mixtus* present in mixed colonies of these ants may be found. In the mixed colony at Lymington, which I discovered in 1897 (this was the first occasion on which a mixed colony of *fuliginosus* and a yellow host species had ever been found, or recorded), the ☿ ☿ of each were present in about equal numbers. In the various cases known of mixed colonies of *Acanthomyops* species, all proportions in the numbers of the ☿ ☿ of host and parasite species present have been observed, including when the host species had almost died out, and only a few of its ☿ ☿ were left.]

To return, however, to our *brunneus*:—the colony in my present observation nest has been somewhat more successful than my previous ones. I obtained this colony at Windsor Forest in January, 1925, and the ants have not died so fast, and they eat honey more freely. By May 6th a number of the larvae had spun up in cocoons; the ☿ ☿ however opened some of these and devoured the contents; they also ate some of their larvae, and some of the larvae devoured their fellows. The colony would never accept young females which I brought home from Windsor; but always killed them. They accepted however, and piled up in a big heap, large numbers of ☿ cocoons brought home

from different *brunneus* nests; all the ants from which emerged; but a few of them proved to be cripples, with deformed legs, and twisted antennae. Some of the ♀ ♀ laid eggs, which produced very small larvae, present on June 14th and subsequent dates (a fresh batch of tiny larvae have recently put in an appearance, December 22nd). A number of these pupated in much shorter time than is usual with workers hatched from parthenogenetic eggs, and from these very tiny ♀ ♀ emerged, smaller than any I have seen in the field. It is hardly necessary to mention that there never was a queen present in this nest. It is equally difficult to find a queen in a nest of *brunneus* as it is with *umbratus* and *mixtus*; and although I have most carefully searched the nests in trees which have been cut down, and have taken home large quantities of the wood and frass from such nests, I have never found a queen.

We will now deal with the new myrmecophiles taken with *brunneus*, and also give a few observations on some of last years captures, the numbers of which are placed in brackets. They all occurred in Windsor Forest:—

COLEOPTERA.

31. *Microglossa pulla*, Gyl.—A specimen of this beetle was taken in a nest of this ant on July 31st. It is usually found with *A.* (*D.*) *fuliginosus*, and more rarely with *Formica rufa*; but also occurs in birds' nests. Reitter also records it with *brunneus* (and the two other above mentioned ants) in Germany.

32. *Microglossa gentilis*, Märk.—Taken in company with *brunneus* on July 9th and 24th. This is its first record with this ant. Usually found with *fuliginosus* and in birds' nests. [Reitter only gives "with ants (*L. brunneus*)" for *Microglossa marginalis*, Gyll. Although I took this species in considerable numbers in a bird's nest (its usual habitat in this country) at Windsor on August 10th, *brunneus* was not present, and I have never found it with that ant.]

33. *Oxypoda recondita*, Kr.—This insect was taken in three different nests (on July 9th, 17th, and October 14th respectively); in one of them over 30 specimens were found. This appears to be considered a very rare species—I have previously taken a few examples only with *F. rufa* and *F. sanguinea*. My friend Major Sainte Claire Deville tells me he has taken it with *brunneus* in France.

33. *Atheta analis*, Gr.—Taken with this ant on August 5th. Usually common with *F. rufa*, and *F. exsecta*, etc.

(7) *Euryusa optabilis*, Heer.—This species turned up much more frequently than last year, and usually in company with the next species. There can be no doubt that this is a regular guest of *brunneus*. I have worked for beetles in many trees at Windsor, but have never seen the beetle away from its host.

(8) *Euryusa sinuata*, Er.—I have found *E. sinuata*, in every nest of *brunneus* that I have been able to investigate properly.

I have kept many specimens of both species of *Euryusa* (and also *Oxypoda recondita*) alive in my observation nest; but owing to the fact that they usually hide themselves among the frass and wood (a little of which I have put in the nest, as I find the ants get on better when these materials are present), they are seldom seen.

33. *Othius myrmecophilus*, Kies.—Taken with *brunneus* on August 26th. This beetle occurs with many species of ants.

34. *Batrisodes venustus*, Reich.—Is evidently a regular *brunneus* guest, as I have taken it on five different occasions in different nests this year, both in the wood mould under bark in company with the ants, and also in the frass from the centre of the nests. It is not nearly as abundant at Windsor as *B. delaportei*; nevertheless I have taken over 20 specimens, and never away from ants. I emphasise this as my friend, Professor Sir T. Hudson Beare when recording the capture of 8 specimens of this beetle by the late Mr. Black and himself in Sherwood Forest, wrote as follows:—"As this species is reputed to occur with ants, I made in each case a very careful examination of the tree or log in order to ascertain, whether there were any ants present, or whether there were any signs of their presence at an earlier period, with a negative result in every case. It seems, therefore that this species is not necessarily myrmecophilous." [*Ent. Mo. Mag.*, **61** 15 (1925)].

Myrmecophilous beetles are sometimes found in the wood mould under bark of trees, which have been deserted by their host species, and it would not be possible to tell from the condition of the tree if ants had been present or not. Also should *brunneus* exist in Sherwood Forest, it might easily be overlooked. It may be as well to review the the captures of this beetle with ants in Britain; and also some continental records. F. Smith captured a specimen in a nest of *Myrmica scabrinodis* in Yorkshire in 1855. [This specimen is now in my British ants' nests drawer.] Smith[1] recorded it as *Batrisus formicarius* a species found with *brunneus* on the continent, and which I have been hoping to take in Windsor Forest]; Crotch[2] records it with *A.* (*D.*) *fuliginosus* at Cambridge in 1862; Fowler[3] took it in an old tree with *fuliginosus* at Sherwood Forest; "in moss near an ants' nest" Ellis[4]; with *fuliginosus* Tilgate Forest, Donisthorpe[5] in 1896; with *fuliginosus* at Cothill, Collins[6] in 1909; with *Formica fusca* in Epping Forest, and its larvae, Donisthorpe[7], in 1912.

1. *Trans. Ent. Soc. Lond.* 1855, 116. 2. *Zool.* 1862, 8140. 3. *Col. Brit. Isles*, **3** 92 (1889). 4. *Vic. Hist. Worcester* 98 (1901). 5. *Trans. Lancs. and Ches. Ent. Soc.* 42 (1905). 6. *Oxford List Supp.* (2) 5 (1910). 7. *Ent. Rec.* **25** 91 (1913).

On the Continent—Märkel [*Germar* **5** 261 (1844)] records it with *brunneus*; Kraatz [*Stet. Ent. Ztg.* 1849, 187] with various species of ants; Fairmaire [*Faun. Fr.* **1** 363 (1854)] with *A.* (*D.*) *emarginatus*; Roger [*Breslau Ent. Ztschr.* 1856, 47] with *A.* (*D.*) *niger*; v. Hagens [*Berlin Ent. Ztschr.* 1865, 3] with *brunneus*; de Saulcy [*Bull. Soc. Hist. Nat. Dept. Moselle* **13** 101 (1874)] with *brunneus*; Reitter [*Ins. Deutschl.* **3** 33 (1882)] with *brunneus*; Wasmann [*Deutsch Ent. Zeits.* **2** 34 (1892)].

Wasmann [*Krit. Ver. Myr. Ter. Art.* 94 (1894)] gives *brunneus* as normal host, more seldom *niger*, etc.; Skalitzky [see Wasmann 1894] with *niger* in Bohemia; Wasmann [*Tijd. v. Entom.* **58** 151 (1915) with *A.* (*C.*) *brevicornis* at Valkenburg.

(To be concluded.)

SCIENTIFIC NOTES AND OBSERVATIONS.

EXPERIMENTAL MELANIC CHANGES.—Dr. Hasebroek of Hamburg, who has done a good deal of work on the chemistry of melanin, has published a paper of great interest to entomologists in *Fermentforschung*, 1925, viii., pp. 199-226, in which he claims to have produced experimentally melanistic changes in Lepidoptera comparable with those, which are met with in industrial districts. Methane used on 14 pupae of the following species, *Aporia crataegi*, *Palimpsestis* (*Cymatophora*) *or*, *Arctia caia*, and *Stilpnotia salicis* produced no effect, but methane and ammonia caused darkening in two out of three *S. salicis*, and of two *P. or* one was the extreme melanic form, var. *albingensis*, Wern. Ammonia, pyridin and chloroform together caused the following changes, a darkening of the ground colour in one of three *Mamestra brassicae*, a smoky border in one of four *A. caia*, and a deepening of the yellow parts in all three *P. rapae* and all five *Papilio podalirius*. Sulphuretted hydrogen caused some darkening in all the species, *T. pronuba*, *P. brassicae*, *M. brassicae* and *P. podalirius*, and one *P. or* var. *albingensis* was bred, but there was another amongst the controls. In this experiment nine out of ten specimens were affected. Sulphuretted hydrogen, ammonia and pyridin together caused marked melanism in the one *P. brassicae* subjected to their influence, and pyridin alone had the same effect on the one *A. caia* and two *P. brassicae* exposed to it. Sulphuretted hydrogen from a gasometer darkened the only *M. brassicae* experimented upon. Sewer gas and gas from decomposing albuminous substances caused considerable melanism in all three *V. polychloros* and in two out of six *A. urticae* and affected other Vanessids to a less degree. In every case the pupae alone were exposed to these chemicals.

Hasebroek concludes that melanism in industrial areas is caused by volatile substances taken in through the tracheae and not, as is generally thought, by substances absorbed from the alimentary canal.

His paper is open to several criticisms. With the exception of *C. or* and perhaps *M. brassicae*, the species employed have not produced melanic forms in manufacturing districts, and the use of Vanessids is particularly unfortunate because they are so readily altered by environmental factors such as cold and heat.

Although controls were used no attempt seems to have been made to eliminate the possibility of melanic specimens arising independently of the chemical agents used. If fewer species had been used, and all the specimens had been picked from stocks proved to be free from melanism by breeding for a couple of generations, the experiments would have been more convincing. That this was not done, is shown by the emergence of a melanic *P. or* amongst the controls.

Increase of pigment does appear to have been brought about in several species, but causing an increase of pigment in an imago is very different from affecting its germ plasm so that melanic offspring are produced. In every case which has been tested the melanic forms found in industrial areas are either Mendelian dominants or recessives, and give rise to a definite percentage of melanic progeny under whatever conditions they are bred.

Until Hasebroek has shown that he can produce melanic specimens from stocks proved to give pale forms only, when not subjected to the

influence of chemicals, and has shown that these melanic specimens produce melanic offspring, which breed on Mendelian lines, even when they are removed from the influence of chemicals, his experiments will fail to convince entomologists, that the melanism he has produced is like the melanism occurring near large towns. It is to be hoped that he will continue his experiments with more suitable material such as *Boarmia*, *Tephrosia*, *Ennomos* and *Selenia*, and that he will breed from his melanic specimens, if he obtains any. On the evidence he puts forward his claim to have solved the problem of melanism cannot be upheld.—E. A. Cockayne.

CURRENT NOTES AND SHORT NOTICES.

The Annual Entomological Club Meeting known as the Verrall Supper took place on the evening of January 20th at the Holborn Restaurant, Kingsway, when about 140 were present. The Menu card contained a short epitome of the history of the Club, and a complete list of the members from the year of its foundation in 1826. Club instituted with eight members in 1826. In 1836 Constitution framed and Bye-Laws adopted. In 1865 Membership was increased to nine. This was decreased again to eight in 1898, when a new Code of Laws was adopted. In 1924 the Code of Laws was modified and the status of Honorary Members altered. The original members up to 1832 were Mr. George Samouelle, Mr. A. H. Davis, Mr. Samuel Hanson, Mr. Edward Newman, Mr. W. Bennett, Mr. J. S. Bowerbank, Mr. E. Doubleday, Mr. J. Hoyer, Mr. F. Walker, and Mr. J. J. Walton. The present members with date of election are: 1892 Mr. Robert Adkin, 1900 Mr. H. Donisthorpe, 1904 Prof. E. B. Poulton, 1923 Mr. H. Willoughby-Ellis, 1924 Mr. James E. Collin, 1924 Dr. H. Eltringham, 1925 Mr. W. J. Kaye, 1925 Lord Rothschild.

In the *Bull. Soc. Ent. de France* for November, M. Demaison contributes some short notes on the genus *Acronicta* and its variation.

The very interesting and instructive little French magazine *L'Amateur de Papillons* has been rather irregular in its appearance last year owing to a long continued strike of the printers. This is particularly unfortunate as the regular production of the very useful Catalogue of the Lepidoptera of France has also been curtailed. In recent issues the genus *Lithocolletis* has been taken up by M. Le Marchand, and there is included a list of the various plants and the species attached to them, which may be a suggestive help to British workers in Micro-lepidoptera.

The *Ent. News* for January gives a coloured plate illustrative of several new-recorded aberrations of Rhopalocera from California by T. D. Gunder of Pasadena. The notes on the illustrations are good and sufficient. Ten species are *Euphydryas*, *Melitaea* and *Brenthis*, 8 being melanic and 2 albinic; one species *Heodes* and one *Plebeius* both melanic and *Parnassius* albinic. Each figure of an aberration is accompanied by a figure of a typical specimen, a plan which adds immensely to the value of the plate.

REVIEWS AND NOTICES OF BOOKS.

Biologie der Schmetterlinge, by Dr. Martin Hering. pp. 486. Figs. 82. Plts. 13. Price GM18. Messrs. Julius Springer, Berlin. 1926.—(*Concluded from page 32.*)—The next chief section deals with more general problems. Chap. 11 is a particularly interesting dissertation on the Distribution of the Lepidoptera, the following six general facts being placed in the forefront.

(1) There are to be found a number of identical genera and species in N. America and Europe.
(2) Identical genera, only in smaller numbers, and nearly related forms, occur in Africa and S. America.
(3) The same fact stands for Northern Asia and Northern America.
(4) Many families, genera and also species are confined to their occurrence in India, Madagascar and S. Africa.
(5) There are often more evidences of identical species occurring in Ceylon (Ind.) and Madagascar, than between the latter and Africa.
(6) Australian species have characteristics close to those occurring in S. America.

Circumpolar, Arctic, Atlantic, Pacific, boreal, alpine, littoral and glacial distribution are all stated and discussed; the methods of distribution, natural and commercial; attachment to special soils *e.g.*, chalk and its connection with plant distribution; the facts and theories of migration and of the sun-loving habit. Chap. 12, Generations problem and Polymorphism. The relation between the length of the period of development and the resultant size of the imagines; the principle that older forms have a longer developmental period than the more recently derived forms; species of large size are regarded as the more generalised forms, small species the more specialised; a genus or species is looked upon as the more primitive, the longer the larval stage in comparison with the pupal period; Seasonal dimorphism; the facts and theories of "wet" and "dry" forms; Sexual Dimorphism and Polymorphism; Protective Resemblance and Mimicry; the Mutation theory; the facts and theories of Migration; Isolation; the Struggle for Existence; the influence of physiological differentiation. Chap. 13 is a full discussion of the probable causes of Melanism and Albinism in all their phases. Chap. 14 considers the Enemies of the Lepidoptera and their destruction; diseases; parasitic attacks; details of economic entomology.

Chap. 15 deals with developments under special circumstances; the water-dwelling Lepidoptera. Chap. 16 is a special chapter devoted to "miners" and their habits. Dr. Hering has made a special study of the conditions, development, and habits of the leaf miners. A detailed account of the sap-feeding larvae is given. It is pointed out that miners are confined to certain families of plants. Chap. 17 discusses lepidopterous gall-making; Inquilines; Gall-makers; etc. Chap. 18, The Relations of Lepidoptera with Ants. Chap. 19 Symbiosis and Commensalism; the yucca moth; *G. syringella.* Chap. 20 discusses the various forms of association, and gives an analysis showing the various kinds of societies perfect and partial. Chap. 21 is devoted to experimental biology; Cold and warmth; Monstrosities; Gynandromorphs; Hermaphrodites; Intersexuality;

facts and theories of aberration; Hybridisation and Mongrelisation; Results of surgical operations. Chap. 22, The Constructive Instinct. Chap. 23, Geographical Distribution. Chap. 24, General biological observations; and finally a short list (2 pages) of Biological Literature dealing with the Lepidoptera. We congratulate the publishers in having secured such a master in entomological science to write this volume, and we congratulate Dr. Hering in having found a publisher to produce his work in such a satisfactory style.—Hy.J.T.

Guide to the Collections of British Lepidoptera in the National Museum of Wales. 1925. 32 pp. & 2 col. plates. Price 6d.—This is one of those admirable little brochures which it is now becoming very usual for the authorities responsible for the management of provincial museums, as well as of our great London museums, to publish from time to time. From the introduction one learns that there are two collections, the Vivian Collection containing over 20,000 specimens of macro-lepidoptera only, and the Griffith Collection with 30,000 specimens including both macro- and micro-lepidoptera. Details are also given of the lives of the two generous donors and of the intrinsic scientific worth of the collections. A second chapter gives the outstanding features of Welsh lepidoptera and specifies many of the racial forms, and sporadic captures, from the Principality. The following chapter gives details of all the historic specimens and striking aberrations contained in the collections, not necessarily of Welsh origin, *e.g.*, *Pieris daplidice*, 5 specimens; *Pararge megera*, lower wings white; *Deilephila euphorbiae*, 6 specimens; *Xylophasia lateritia*, unique, from Glamorgan; *Xylina lambda*, 6 of the 12 known British specimens; *Catocala electa*, one of the three known British specimens; etc., etc. The two plates in colour contain 41 figures of the more remarkable aberrations and rare species in the Collections. In an Appendix is a Key to all the abbreviations found on the labels beneath the specimens. Besides being indispensable to the specialist, this little work is equally useful in showing the intelligent visitor how much beauty and interest there is in the smaller atoms surrounding our everyday life. The general get up is quite a credit to all concerned.—Hy. J. T.

OBITUARY.

Dr. William Bateson, F.R.S., F.E.S.

The death of Dr. William Bateson has removed one of the outstanding figures of his time. By his own work and still more by the immense influence he exerted on the study of evolution and heredity in this country and throughout the world, he has moulded the whole course of biological research and has sown a harvest much of which is still unreaped. It is as yet impossible to assess his work at its true value, but there is little doubt that his name will rank with those of Darwin and Wallace, as one of the great pioneers.

He was born in 1862, the son of the Rev. W. H. Bateson, Master of St. John's College Cambridge, where he was a scholar and was placed in the first class of the Natural Science Tripos and in the first class in Part II.

His first paper was embryological, but he soon turned to the study of comparative morphology and teratology and his results were published in 1894, in his *Materials for the Study of Variation*. The interest he displayed in insects is shown in this classic work by the number of examples he drew from all orders to illustrate hereditary variations and acquired abnormalities. Although the actual laws of growth eluded him, he showed that they are the same throughout the animal kingdom, and, what was at that time more important, he proved that variation is discontinuous. Meanwhile he had seen that the study of heredity by the experimental method was likely to be a most fertile field for research, and there is little doubt that he would have rediscovered the principles enunciated in Gregor Mendel's obscure and forgotten paper had it not been brought to light again in 1900. Experiments, conducted or initiated by him, proved the truth of Mendel's Law, and this proof was laid before the world in his Presidential address to the Zoological Section of the British Association at Cambridge in 1904.

From 1908 to 1909 he was Professor of Biology at Cambridge and in the latter year his Mendel's *Principles of Hereditary* was issued. In 1910 he became Director of the John Innes Horticultural Institution at Merton, to which he attracted young and enthusiastic workers from all parts of the world. The results of some of these researches were published in the *Journal of Genetics*, which he started in 1911, in collaboration with Professor R. C. Punnett, and amongst them are many of great entomological interest. He also drew upon entomology for some of the material embodied in his *Problems of Genetics* published in 1913.

He realised from the first that experiments in heredity were as necessary in the case of animals as in plants, and that insects were particularly suitable, both on account of their numerous and striking variations and their large families, and he maintained this opinion to the end. As recently as last March he presided over a meeting of the Genetical Society to which a number of entomologists were invited in order to show geneticists the wide range of variation in Lepidoptera and special variation in Coleoptera and other orders, investigation of the heredity of which would be likely to yield interesting results.

He was a Vice-President of the Entomological Society of London at the time of his death, and as an Honorary Member of the South London Entomological and Natural History Society he was an interested attendant and frequently an exhibitor at the Annual Exhibition of Varieties.

A Fellow of the Royal Society he was awarded the Darwin Medal in 1904 and a Royal Medal in 1920; he received many honorary degrees and was an honorary member of many learned societies abroad: he was Silliman Lecturer to Yale University in 1907, Fullerian Professor of Physiology to the Royal Institution from 1912 to 1914, and President of the British Association in 1914.

He was universally liked and respected, and a deep sense of personal loss is felt by all who were privileged to know him.

He is survived by his widow, and one son, an undergraduate at at Cambridge.—E.A.C.

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MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7 8 p.m. March 17th. April 7th. May 5th. June 2nd.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. March 25th, Dr. E. A. Cockayne, "Intersexes in the Lycaenidae." April 8th, April 22nd. —*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.*, J. P. Hardiman, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

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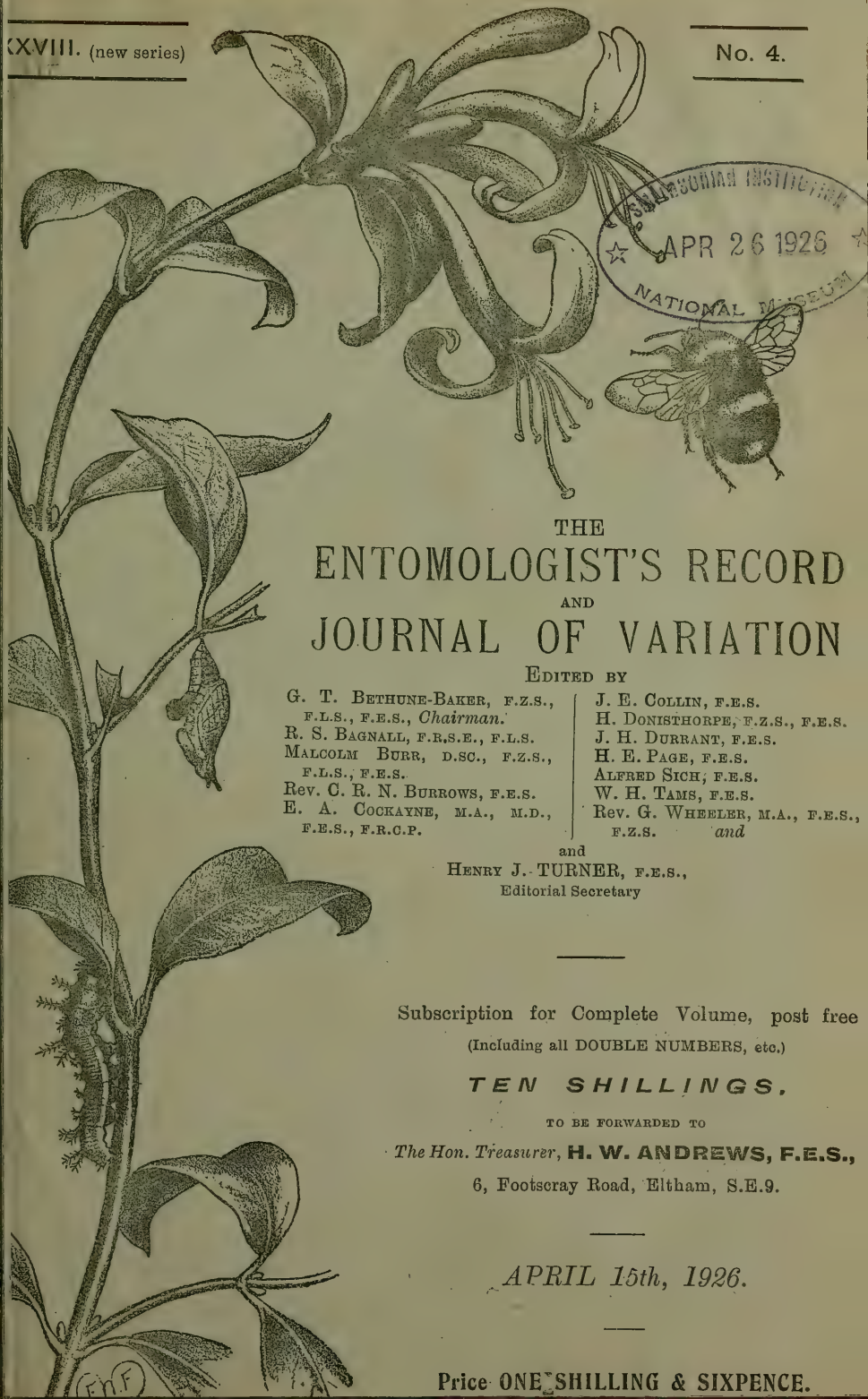

THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

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EDITORIAL.

Reafforestation of Wyre Forest.—Some of our readers will have seen that it is proposed to very seriously change the face of that ancient bit of forest known as Wyre Forest, and to change it in such a way as greatly to alter the fauna and flora of the district.

The proposal is (and I understand it has already been begun) to cut down in a very considerable area all the small and scrub oak, of which there is a great deal, and to plant *Conifers* instead. It will be obvious that this will greatly change the *flora* of the forest, as nothing will grow underneath the conifers, so that the existing low-growing flowers will be exterminated, and with them of course many of the insects of all orders.

A strong group of our Birmingham entomologists have worked and studied the "Wyre" insects for very many years, and we propose to publish in this journal papers dealing with all the better known and larger orders; these papers will not be mere lists of names, but it is hoped that brief biological notes may be given as well.

Mr. W. H. Edwards will undertake the Lepidoptera, Mr. Willoughby Ellis will catalogue, etc., the Coleoptera, Mr. Alfred H. Martineau has promised to be responsible for his groups of the Hymenoptera and especially the Aculeata and the *Chrysididae*, whilst Mr. C. J. Wainwright has kindly undertaken much of the *Diptera*.

All these friends know every yard of the old forest, and their work will at least record what the entomological fauna was before vandalistic hands wrought such a change as is contemplated.

We are very grateful to them for their labour of love, and we know it will be a real labour for it is an interesting and not unprolific area, and we think the papers will be of great interest to our readers. —G. T. Bethune-Baker.

A Month's Collecting in the Pyrenees.

By Wm. FASSNIDGE, M.A., F.E.S.

Auzat (Ariège), 20 kilometres by tramway from Tarascon-sur-Ariège, Midi Railway. Altitude 2,300 feet. Staff map 1 : 80,000, Foix 253, S.W. Hôtel Denjean, Hôtel Augé. Population 1,500.

In his excellent *Catalogue Raisonné des Lépidoptères des Pyrénées*, 1903, Monsieur P. Rondou is unable to give more than half-a-dozen records from the department of the Ariège, so that an apology for one more account of a visit to the Pyrenees seems to be somewhat less necessary than usual. It is hardly surprising that this part of the chain should be so litttle known entomologically, for the villages are not easy of access, the mountains steep and barren, and hotel accomodation, except at such centres as Ax-les-Thermes or St. Girons, not of the best. These considerations however, did not deter my friend Mr. A. E. Burras and myself from choosing deliberately the out-of-the-way village of Auzat as our entomological centre during the whole of the month of August, 1925, and though all our high hopes were not fulfilled, yet we spent a very pleasant holiday among a kindly people,

April 15th, 1926.

who indeed were frankly amused by our antics, yet never for a moment forgot their native courtesy and kindness to the stranger in their midst. Only those who have travelled much in France can realise how rare it is to find a railway porter who insists that the tip you offer him is excessive, or a village inn which contains an up-to-date bathroom—or any bathroom at all, and both these phenomena we found at Auzat.

The village is situated at the meeting-place of two narrow valleys, and is dominated by the huge mass of Mt. Montcalm to the south. The slopes are very steep and rather barren, except where a tiny field has been literally built up on the mountain side. Only rough tracks lead further up the valleys and any long excursion is a toilsome business. In the gorges beside torrent and muletrack the bramble was just coming into full blossom at the beginning of August, and of course it was a great attraction to butterflies. *Dryas paphia*, L., newly emerged, was in great numbers and with it *Argynnis cydippe*, L., and its var. *cleodoxa*, Och. We had hoped to get a series of *Brenthis daphne*, Schiff., but could only find a single worn specimen of this insect at Ax-les-Thermes, when we spent a day there later in the month. The "hairstreaks" swarmed, both at bramble flowers and at the blossoms of the dwarf elder (*Sambucus ebulus*, L.), that grows plentifully by the roadside lower down the valley. *Strymon ilicis*, Esp. was the commonest species; most of the specimens being ab. *cerri*, Hb., while *S. spini*, Schiff., *S. w-album*, Knoch, and *Ruralis quercûs*, L. were all common. *R. betulae*, L., we did not see until nearly the end of the month. We were very disappointed with the "blues" which were comparatively scarce, although we were informed that earlier in the season they had flown in countless numbers. Of *Scolitantides* (*Turanana*) *baton*, Berg., for example, we could only secure two specimens, a male and a female, while *Polyommatus escheri*, Hb., *P. dorylas*, Schiff.=*hylas*, Esp., *Lycaena arion*, L. and *P. thetis*, Rott. (*bellargus*, Rott.) were never really common. Of course we were some weeks late for the Erebias and also the season was by no means a favourable one so far as we could judge. However, we found *Erebia manto*, Esp., flying freely in the pine belt at an altitude of about 5,500 feet, most of the specimens being of the form known as race *gavarniensis*, Warren, =*caecilia*, Hb.,* quite unicolorous and with no markings either on upper or under surface. The best locality we found for this species was the mountain slope facing west some 1,000 feet above the village of Olbier, where it flew in plenty on the edge of the pine forest on a very steep slope, that made its capture difficult. Strangely enough, one specimen of this form was taken at the very end of the month flying over a meadow low in the valley at 2,400 feet, but where it came from remains a mystery. Among the Erebias is a specimen that has been referred to *E. medusa*, F., but as this species has not yet to my knowledge been taken in the Pyrenees, it seems possible that this single specimen is but an aberration of some other species. The Satyrids were most unaccountably absent from what appeared to be a very suitable locality for them. On the journey down, we saw them in plenty at Foix, where the train took an hour's rest by the way, but

* [See *Ent. Rec.* XXV. 273, 294. XXVI. 35, 105, etc.—H.J.T.]

having no net ready, and but little time, could only secure one *Satyrus hermione*, L., picked off a tree trunk during a short interval of shade. Although a fair number of *Apatura ilia*, Schiff., were seen, only three were captured, of which one was brought to us, that had been plucked off the wall of a house as it spread its wings to the rays of the declining sun, with its condition in no way improved by this summary method of capture. Among the skippers the most interesting species were *Erynnis* (*Carcharodus*) *altheae*, Hb., of which a few were taken flying among large numbers of the commoner *E.* (*C.*) *alceae*, Esp., and *Hesperia serratulae*, H.S., which was quite common locally on some of the higher slopes. Altogether we took or saw eighty-six species of butterflies, which compares rather unfavourably with the number seen in the Alps during the same month in preceding years.

Of Heterocera our best captures were made at light. There is at Auzat a huge electric power plant, driven by water from three lakes high up in the mountains. Consequently, the village is very well lit though nearly all the lamps are much too high for convenient working. Four lamps only were of easy access, three close together at the tiny station of the steam tramway, and one at the entrance to the factory. Night after night for a fortnight we worked these lamps to the endless amusement of the villagers, and until the moonlight caused the attraction of light to fail, we had excellent sport. During a period of intense heat that lasted five days, great numbers of winged ants came to gyrate madly round every light for a time, and finally to settle on walls and windows near, literally covering them. Never had we seen so many moths at light before, especially Lithosiids. *Oenistis quadra*, L., *Lithosia* (*Ilema*) *deplana*, Esp., *L. griseola*, Hb., *L. lurideola*, Zinck., *L. complana*, L., *L. palliatella*, Hmpn., *L. lutarella*, L., and *L. caniola*, Hb., were all present, most of them in abundance, while *Miltochrista miniata*, Forst., struck a note of colour among so many drab-hued insects. It may be that the two unusually cold and wet seasons of 1924 and 1925, were favourable to the lichen feeding species, for we found also *Bryophila muralis*, Forst., fairly common, and *B. perla*, F., in great numbers and variety, besides taking a few specimens each of *B. galatea*, Mill., which is not recorded by Rondou, and of *B. raptricula*, Hb., var. *deceptricula*, Hb. Acronictids and Notodontids were also well represented at light so far as species were concerned, but they never abounded. Perhaps the most interesting of them were *Notodonta phoebe*, Sieb., of which about ten were taken, and *Drymonia chaonia*, Hb., var. *lunula*, Grnbg., of which a few worn specimens were noted, although this must surely be a most exceptionally late date for this species.

Right through the month we sugared with praiseworthy perseverance but only moderate success. Moths were never abundant at the sugar and many species were represented by one or two specimens only. Agrotids were very disappointing and Catocalids were not attracted in any numbers. However, we took *Catocala fraxini*, L., *C. electa*, Bkh., *C. elocata*, Esp., *C. nupta*, L., *C. dilecta*, Hb., *C. promissa*, Esp., and *C. conversa*, Esp., together with several *Apopestes spectrum*, Esp., one *A. limbata*, Stgr., and one *Catephia alchymista*, Schiff. During the latter half of the month, we devoted some time each evening to searching for moths on flowers, especially on those of the hemp agrimony and of a species of mint. Many insects visited them, chiefly

Noctuae and Geometers, among them *Noctua margaritacea*, Vill., which usually occurs only at altitudes higher than 1,500 metres, *Miselia proxima*, Hb. (three specimens), which seems to be very rare in the Pyrenees, and *Noctua stigmatica*, Hb., which occurred in fair numbers, although only two specimens are recorded in the Catalogue of Monsieur Rondou. Plusias were found to be very scarce; the only interesting insects taken were one *Plusia gutta*, Gn., at flowers at dusk, and one *P. chryson*, Esp., kicked up by day. This last species is recorded from the Pyrenees in the Supplement, published by Monsieur Rondou in 1916.

Many long and almost wasted hours were spent in beating for larvae. Never in our experience had we worked so hard for such negligible results, so far as larvae were concerned. For my own part, I should have abandoned the attempt almost at once, had it not been that I found Hemerobiids and Chrysopids in large numbers, and had also the good fortune to beat out a specimen of *Drepanopteryx phalaenoides*, L., a Neuropteron I had never seen alive before. But of these and of the Trichoptera and Longicornia taken, some account may possibly appear in the future, nor do I propose to do more than give a list of the so-called Micro-lepidoptera observed.

The names and the order used in the following list are those of the Catalogue of Staudinger and Rebel, 1901, so that reference to Monsieur Rondou's Catalogue is thereby facilitated. I take this opportunity also of thanking Mr. Hy. J. Turner, and the entomological staff of the British Museum for their kind help in the identification of some of the insects captured.

(To be concluded.)

A Further Study of the Habits of Acanthomyops (Donisthorpea) brunneus, Latr., and the Myrmecophiles inhabiting its Nests.

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

(Concluded from p. 43.)

(13) *Batrisodes delaportei*, Aubé.—I have found this beetle in every *brunneus* nest I have examined this year; I must have seen quite 200 specimens first and last. In January I introduced a certain number of living individuals into my *brunneus* observation nest, and some (or all of them!) are alive to-day (December 20th). When the nest is uncovered and the ants all run wildly about, these little beetles put in an appearance, and trot about among the ants in a very important and consequential manner. If an ant runs into one of them by accident, and knocks it over, the beetle appears to be overcome with astonishment and chagrin at the carelessness of its host. I have never seen an ant attempt to attack, nor even to threaten these beetles, and they walk about all over the nest in perfect freedom. On December 2nd I made an observation which helps to show on what these beetles feed. Four *delaportei* were to be seen walking about in different cells in the nest, and two of them were carrying something white in their mouths. On examination with a weak lens, the white objects proved to be young ant larvae!

35. *Ptenidium turgidum*, Th.—Several specimens occurred on October 12th in the centre of a fallen branch, which was all channelled

by *brunneus* and full of the ants and their brood. Matthews [*Trichopterygia* 1872, 78] gives :—" Habitat—Europe. Rare ; taken with ants ; " and Fowler [*Col. Brit. Isles* **3** 141 (1889)] writes :—" In rotten wood ; usually in company with ants."

36. *Dendrophilus punctatus*, Hbst.—This Histerid was twice taken in *brunneus* nests—on July 9th and 17th ; though often found in birds' nests (I have also found it in numbers in old birds' nests at Windsor), cellars, etc., it is nevertheless also myrmecophilous, and has occurred with *Formica rufa*, *A.* (*D.*) *fuliginosus*, etc.

(17) *Ptinus subpilosus*, Müll., was taken with *brunneus* again this year on July 17th.

37. *Dryophthorus corticalis*, Pk.—This weevil was new to Britain when I first discovered it in Windsor Forest on July 9th, 1925 [*Ent. Mo. Mag.* **61** 182 (1925)]. I have since found it in four other trees, and in the utmost profusion ; but only in trees inhabited by *A.* (*D.*) *brunneus*. The beetle occurs in the damp wood, and in the galleries of the ants in the inside of the tree. Its larvae and pupae sometimes being found side by side with those of the ant. The ants walk over, and on the beetle (as *F. rufa* does with the species of *Monotoma*, which inhabit its nest), but never attack it. I introduced living specimens into my *brunneus* nest, where they have lived for months ; but being very lethargic, and mostly resting under the wood and frass, are seldom seen. I think there must be a real association between these beetles and ants : and my friend Major Sainte Claire Deville tells me that *D. corticalis* is also found in company with *brunneus* in France—in the Forest of Fontainebleau, etc.

Hymenoptera.—*Proctotrupidae.*

39. *Conostigmus* n.sp. ?—A number of a *Conostigmus* near to *C. wasmanni*, Kief., was found in company with *brunneus* (and by sieving the frass from their nests) on July 9th and 18th, October 14th, etc. The following species were also obtained in the same manner—39. *C. leptothorax*, Kief. ; 40. *C. lucidus*, Kief. ; 41. *Ceraphron scoticus*, Kief. ; 42. *Belyta nigriceps*, Cam. ; 43. *Aphanogmus aenicornis*, Th. I again have to thank Mr. Claud Morley for kindly naming these parasitic Hymenoptera for me.

Diptera.

44. *Atrichopogon lucorum*, Kg.—In January a number of the curious larvae of this little fly was found in cells, inhabited by *brunneus* and its brood, in wood taken from the centre of a large felled oak. From these many ♂ ♂ and ♀ ♀ of the Dipteron hatched out in April.

Aphidae.

45. *Stomaphis quercus*, L.—On October 1st, ☿ ☿ of *brunneus* were observed attending this Aphid on the bark of a large oak tree. This is the first time I have seen this plant-louse at Windsor, or in association with *brunneus*. (27) *S. longirostris*, F., was again frequently seen, in most nests, and in numbers, this year.

PSEUDOSCORPIONINA.

46. *Chelifer wideri*, C.L.K.—This False-Scorpion was found in numbers with *brunneus*, in the frass, under bark, and in the cells in the wood, inside the trees. Wallis Kew [*Proc. R. Irish Acad.* **33** 12 (1916)] writes of this species that it " . . . . was established by C. L. Koch on Bavarian specimens, found 'in dem faulen Holzstaube einer Eiche'; Simon found it in the Forest of Fontainebleau 'sous les écorces de chênes'; while in Britain we know it from Sherwood Forest, in the old forest-land of Richmond Park, and in a small remnant of forest at West Wickham (Kent), always under bark of old oaks; and unlike other tree species, it is usually found where the space between the bark and the wood is choked with a characteristic reddish powdery débris." This débris much suggests the work of ants to me; and *brunneus* frequently causes such powdery frass under oak bark at Windsor.

MYRIAPODA.

47. *Proteroiulus fuscus*, Am. Stein.—This millepede occurred in exactly the same situations with *brunneus* as the Chelifer before mentioned; and also in considerable numbers, especially in the cells in the heart of the nests. I was fortunate enough to obtain a few ♂ ♂, as the Rev. S. G. Brade-Birks, who kindly identified the species for me, tells me the males in this genus are extremely rare in Britain.

ARANEINA.

48. *Tetrilus arietinus*, Th.—Two adult examples and a number of young of this myrmecophilous spider were found in the interior of a *brunneus* nest on July 9th. Very many of its white egg-sacs occurred, fastened to the wood inside the tree, in which the ants' galleries were excavated. It was subsequently found in other nests, including that of a very recently established colony discovered on September 16th. I have previously taken it in nests of *F. rufa*, *A.* (*D.*) *fuliginosus*, etc., and have observed the egg-sacs fastened to the carton of which the latter ants' nest is constructed.

ACARINA.

49. *Antennophorus* n. sp?—A species of *Antennophorus* was found in some numbers on the ants (chiefly on callows) from a nest of *brunneus* situated in the centre of an oak tree cut down in Windsor Forest on July 9th, 1925. I sent specimens to Father Wasmann, who tells me it is evidently a species new to science. No species of this interesting genus of mites has been recorded with *brunneus* before. Four species previously were known in Britain, all strictly confined to their special host, *viz.*, *A. uhlmanni*, Hall., with *A.* (*C.*) *umbratus*; *A. grandis*, Berl., with *A.* (*D.*) *fuliginosus*; *A. pubescens*, Wasm., with *A.* (*C.*) *flavus*; and *A. foreli*, Wasm., with *A.* (*D.*) *niger*. The genus *Antennophorus* appears to be parasitic, only on ants of the genus *Acanthomyops*: and Wheeler, in 1910, described two new species found on North American species of *Acanthomyops*,—as *A. donisthorpei* and *A. wasmanni*. The great interest attached to these mites is that they rest on the body of their host, chiefly beneath the chin, and are fed by the ants. When

one of these mites wishes to be fed it scrapes the mouth of its carrier, and the ant disgorges a drop of fluid which is devoured by the *Antennophorus*. The Rev. J. E. Hull in a paper in the *Vasculum* [8 126-30 (1922)] pretends that no mite is fed by ants and he writes, "If this be so, Donisthorpe was mistaken, when he supposed that he saw an ant feeding one of these mites," and says the final solution must come from direct observation. Of course this is all pure nonsense. I have kept several species of *Antennophori* alive for months in my observation nests, and have frequently seen them fed by the ants, not only by the ants on which they rested, but by others which have come up and fed them. Also when an ant has been feeding a fellow, the mite on one of them has lent forward and shared in the disgorged liquid. I have frequently recorded these observations, moreover Janet, Karawaiew, Wasmann, Wheeler, and others have all recorded similar facts.

50 (-52 ?) *Laelaps* (*Laelaspis*.) sp ?; *Laelaps* (*Oolaelaps*) sp ? I have taken what appears to me to be a *Oolaelaps*, and one or two species of *Laelaspis*, sparingly in nests of *brunneus*, but have been unable to get them named yet.

FORMICIDAE.

53. *Leptothorax acervorum*, F.—On June 25th, a small colony of this ant with their larvae was found nesting in and under the bark of an oak tree at Windsor Forest in company with *brunneus*. *L. nylanderi*, Forst.; ☿ ☿ also occurred in the same tree.

Miscellaneous Notes from Argentina. II.

By KENNETH J. HAYWARD, F.E.S.

(*Continued from Vol. XXXVII., page 154.*)

DESCRIPTION OF LARVA AND PUPA OF DIONE VANILLAE, L.

LARVA.—Length 28-31mm.

Head brown with five vertical yellowish white stripes and two short spines in front.

Body colouring a series of longitudinal stripes as follows:—A central dorsal stripe of grey bordered by a thin white line, the remaining stripes on either side being in order brown, grey-brown, grey, a thinner stripe of white, brown, yellowish-white, and the lower area of mixed colours that apppear in the upper stripes.

On segments 2 to 11 black hairy spines placed laterally on each of the four grey stripes. On the 12th segment two similar smaller spines. Feeds on *Passiflorae*.

Described from larvae found at Villa Guillermina on 20.II.25, of which the type specimen in spirit will shortly be sent to the British Museum. (No. 5510.)

PUPA.—Suspended from a silk pad. An angulated pupa of 22mm. length. Ground colour brownish-pink more or less suffused and mottled with a darker brown. At the junction of the abdomen with the wing-sheaths above, a pinkish patch about 1mm. wide and extending over two segments in length. The abdomen with a pinkish lateral

stripe, and beneath a pinkish brown line thickening out on each segment with flecks of dark brown at its edges. Head with short process on either side, the termination of which is serrated. Head beneath with much pink. Wing sheaths pink at the inner margins, the outer margin faintly outlined with a very fine black hair line, having on the sheath near the costa a few black wavy lines forming the letter M upright towards the head.

Specimens pupated 20.II.25. Emerged in eight days. Temperature mean maximum 38°C. Mean minimum 25°C.

DESCRIPTION OF THE LARVA AND PUPA OF EUPTOIETA HORTENSIA, BLANCH.

LARVA.—Length 20mm.

Colour throughout medium brown, the larva having a varnished appearance. Head dark brown, glabrous.

On the second segment two black spines 2·5mm. long with fine dark hairs, pointing forwards, and having two black spots between their bases, which spots are sometimes merged.

Body with a broken central dorsal white stripe, this stripe being outlined and traversed centrally on each segment from the fourth to the eleventh by a fine black line.

On segments three to thirteen a dorsal row of short hairy black spines on either side of the central dorsal stripe, a black spot between each spine and the next. An upper lateral row of similar spines similarly spaced with black spots. A lower lateral row of these spines pointing forwards, the body sprinkled with small black spots between these two lateral rows of spines.

Legs and underside very dark brown.

Found in pasture land but food plant not identified.

Type No. 5440 in spirit which will in due course be sent to the British Museum.

PUPA.—An angular pupa suspended from a silk pad by silk threads.

Ground colour entirely bright silver.

The head, spiracles and body spines of the larva reproduced as small conical points of bright gold ·15mm. in height.

Minute black spots as follows.- One in the centre of the head segment, another slightly behind each spiracle, and on the body in positions corresponding to the position of the black spots on the larva, with the addition of a pair of minute black spots between the dorsal spines on segments five to thirteen. The spots between the upper and lower lateral row of spines on segments seven to ten somewhat larger, the lower pairs still more conspicuous.

Antennae of gold partially edged with black the segments marked by transverse black lines. Labial palpi and mandibles gold edged with black. Maxillae of pale gold at first with a few minute black specks and later edged with black so that the gold shows only as a very thin line. Wing cases bright silver, two heavy black streaks ·9mm. long in the basal portion of the discoidal area, two shorter finer curved dashes above nearer the costa, the subcostal nervures partially outlined in black, and with two minute black spots in the submedian area.

Pupated 12.II.25. at Villa Ana. Province of Santa Fe. Argentine. Emerged 22.II.25.

This insect is here continuous brooded, the larva being seen throughout the year, though very scarce in May and June.

DESCRIPTION OF CASE AND PUPA OF OIKETICUS PLATENSIS, BERG.

CASE.—On *Cytisus*.

Suspended by a silken rope of incredible strength and toughness spun in the form of a tube, which the larva is able to open or contract at will.

Size.—Length 75mm., Silken rope 7-11mm. Somewhat triangular in shape being 28mm. in width at 10mm. from the top. Tapering to 6mm. at the bottom.

Constructed of bits of dry stick up to 3mm. in thickness, the thicker pieces showing signs of having been eaten off. The length of these pieces up to 20-25mm. Bound together with fine silk in a cris-cross manner and the centre of the case having a fine web woven over it externally whilst the ends are bare. Tiny bits of dead leaves woven in to the lower end. Imago emerges from a tube at the lower end and this tube which is of thick silk most probably has the same characteristics as that at the top end but I was never lucky enough to see it being used.

PUPA.—Length 22mm., Breadth 6mm. Brown. Only the pupa case from which the imago had emerged available for description.

Case No. 3440. Pupa case No. 3439. Imago No. 3438.

The larva of this insect will exist for long periods without food and without suffering any apparent harm.

PUGNACIOUS ATTITUDE OF PAPILIO HELLANICUS, HEW.

Whilst resting in the forest the other day (22.IX.25) I watched a male *P. hellanicus* that was sunning itself on a projecting twig of the bush in front of me. This butterfly was darting out and mobbing every other insect that ventured anywhere near it, and did not hesitate to so attack a large dragon-fly, which hastily retired. I have previously only experienced this pugnacity amongst lepidoptera in *Hypolymnas misippus*, L., which I once or twice had the pleasure of watching at Aswan, in Southern Egypt. I have never seen it recorded as a trait of the Papilios. The performance continued throughout the time I remained, which was over half-an-hour.

(*To be continued.*)

Remarks on the evolution of the Zygaenae and an attempt to analyse and classify the variations of Z. lonicerae, Scheven, and of Z. trifolii, Esp., and other subspecies.

By ROGER VERITY, M.D.

(*Continued from page 26*).

Race **decreta,** mihi.—By this name I propose designating the dwarf race collected by T. Grosvenor in Sussex, of which he has very kindly sent me a large series of specimens. The majority of individuals resemble *orobi*, but differ from it by their diminutive size (25-30mm. as compared with 30-36): I have before me 20 males and 35 females. The series exhibits, however, a wonderful degree of variability, which makes it extremely interesting and instructive: 4 more males and two

females are like the preceding, but have very long antennae (when they are set parallel to costa they reach the middle of the fifth spot or beyond it in some males), although they are quite of the *trifolii* shape (form **longicornibus**, mihi); 3 males and 4 females resemble *palustrella*, Vrty.; 10 males and 1 female are transitional in general structure to *lonicerae* and like the race I will describe further on as *transferens*; finally, 3 males and 1 female have more marked *lonicerae* features than any others I have seen from the British Isles; I will describe them as *misera*. Grosvenor's locality is remarkable also on account of the frequency with which it produces an entirely black form named *nigricans* by Oberthür, *Ét. Lép. Comp.*, XXI., p. 173, fig. 1876: one in 200 and of these one female to 3 males. The three specimens he has sent me are darker than this figure. This complex race is rendered still more difficult to work out by the fact that it flies mixed with *tutti*, Rebel (=*hippocrepidis*, Stephens), the *Zygaena* which has been such a puzzle for entomologists, including Tutt, who has dwelt on it particularly. They saw there existed a perfect transition from it to *trifolii*, so that, notwithstanding its features obviously similar to those of *filipendulae*, they had nearly come to the conviction that it must be a form of the former. When I wrote my *Essay on the Systematic Study of Variation in the races of Z. filipendulae, L., and its subspecies stoechadis*, Brkh., in the *Ent. Rec.* for 1921, I had not seen *tutti* and I was obliged simply to quote Tutt's conclusions. Now, instead, I have received from Grosvenor two large series and a few specimens from Tutt's very locality, I can, with no hesitation, exclude every doubt and I recognise it as a race of *filipendulae*. One can perfectly well separate all specimens of *tutti* and *trifolii* collected together, except for a few very rare individuals exactly similar to the hybrids obtained by Grosvenor by pairing pure *tutti* with pure *trifolii* in captivity [1]. They are never found in nature in either of the two species, where one of them flies alone. Considering the amount of hybridisation which takes place between the *Sphingidae* belonging even to distinct genera, the specific distinctness need not be put in doubt on this account. The fact that to obtain fertile ova from crossings of nymotypical *filipendulae* and *trifolii* is a very different matter, if possible at all, shows that specific distinctness, however, is not absolute, but varies in degree, some species consisting of diverging series of races, as I have emphasised on other occasions.

Race *duponcheliana*, Obth., *Ét. Lép. Comp.*, IV., p. 495 and 663 and Type figure in the *Ét. d'Ent.*, XX., pl. VIII., fig. 150, from Vernet-les-Bains in the Pyrénées Orientales.—Large series of this race have been collected by Foulquier at Rognac in the Bouches-du-Rhône and one is in my possession. Smaller on the whole than nymotypical *trifolii* and *orobi*; scaling even thinner than in the former; wings narrower; colouring duller; evidently there is a lack of yellow pigment, because the darker pattern is more blackish and the red is of a cold pale crimson tinge and often quite pink; spots on forewing

[1] The specimens he has sent me are, on the whole, like *trifolii* with a distinct sixth spot, but the shape of antennae and wings also point to *tutti*. As the *Sphingidae* hybrids have all been named I should do the same here and call them **grosvenori**, mihi.

very small in male, but usually as in Esper's fig. 5 in female. My specimens of the I gen., of June 15th, are like Oberthür's figure (about 29mm.) or a little larger. The II gen., of September 29th, is instead extremely small (23mm.); its cocoons too are much smaller and white, instead of bright yellow: II gen. **duponcheliella**, mihi.

Race *olbiana*, Obth., *Ét. Lép. Comp.*, IV., p. 496 (1910). Type: figure in Vol. III., pl. XXVIII., fig. 168: Le Ceinturon, near Hyères (Var.).—This race is remarkable because it carries the *trifolii* structure to a degree not attained by any other race: body large and heavy; antennae thick down to their base; wings short and broad, thus having a stumpy and flimsy look in most individuals and particularly in females such as some sent to me by Oberthür, whilst he describes this sex as recalling *lonicerae*; colouring more saturated brighter and deeper than in *duponcheliana*, but like it by its cold tinge, which thus seems to be the characteristic of all the French Riviera: the spots of forewing are small and stand well apart constantly even in the female, so that in this respect the race resembles *lonicerae* and is less *trifolii*-like than any other; the dark band of hindwing is very broad and it tends to prolong itself along the margin and costa. It will be noticed that several of these characters create a resemblance to *syracusia*. A race exactly intermediate between *duponcheliana* and *olbiana* has been collected by Oberthür above Uriage (Isère).

Subspecies **transferens**, mihi.

I think it is right to consider as a third subspecies the following group of races which constitutes the junction between the two diverging series culminating in *trifolii* and in *lonicerae*. These races are on the whole so perfectly intermediate that it is impossible to place them in one series rather than in the other.

Race **transferens**, mihi.—Grosvenor collected on June 23rd, 1921, in Tring Park (Hertfordshire), a series of specimens, part of which he has sent to me, telling me he had puzzled over it, but he could not decide whether they were *trifolii* or *lonicerae*. My opinion is that they cannot be placed in either, because they are perfectly intermediate, except two males, out of eleven, and one female, out of eight, which are quite similar to *palustrella*. The majority, by their longer and sharper antennae and wings, by their smaller spots on forewing and narrower marginal band on hindwing can be described as standing exactly between *palustrella* and the race of *lonicerae* I will call *britanniae*. Oberthür in the *Ét. Lép. Comp.*, IV., p. 511 (1910) dwells on the interest of a series from Southern Wales in his possession, which had been named *lonicerae* by Claxton, but which he was convinced were *trifolii*, "notwithstanding their long and pointed antennae." It may be like the Tring series or, if the wing features are distinctly of *trifolii*, it may be *longicornibus*, Vrty., but in this case the antennae could scarcely be very pointed. In describing race *decreta* from Sussex I have already stated that a certain number of its individuals can be ascribed to *transferens*. These may be considered to constitute its centre of variation, from which three lines radiate to *trifolii* form *decreta*, to *palustris* form *palustrella*, and to *lonicerae* form *misera*.

Race *intermixta*, Vrty., *Ent. Rec.*, 1925, p. 76.—Spain, the country of *trifolii*, does produce a race which points markedly to *lonicerae*, just

as Italy, the country of *lonicerae*, produces occasionally races and forms pointing to *trifolii*, as we will see. Querci and Romei have collected at Orihuela, m. 1700, near Albarracin, a large series of *Zygaenae* of this species, which flew in company with *Z. filipendulae* race *gemina*, Burgeff, although its emergence was already advanced when the latter began to appear. The geographical variations of the two species are so exactly alike that in this case, as in that of *hibera* and *seeboldi*, found together at Cuenca, on the opposite side of the same Sierra, and in that of *australis* and *kindermanni*, as we have already seen, it is very difficult to separate all the specimens correctly. The slightly more saturated and brighter colours of the *filipendulae* and their smaller spots on forewing (especially the fourth and the fifth) are the most constant and reliable characters to go by, although others, such as the longer and more pointed antennae and the broader margin to hindwing, are useful in some specimens to confirm them. After we had separated the species, there were about 200 specimens of the one in question here. Out of these I picked out the most extreme variations for my collection. In doing this I found that the males most *trifolii*-like in structure and markings are quite similar to the *centralitaliae*, Vrty,, and *siciliae*, Vrty., forms of Italy, that is to say that they would only just fall within the limits of subspecies *trifolii*; of these there is a considerable number; the opposite extreme, in this sex, consists of a few, which resemble *brevicornibus*, Vrty., and would thus fall within subspecies *lonicerae*; the mass one cannot ascribe either to one or to the other of the subspecies. The females, on the whole, stand nearer to *lonicerae* than the males, because none are as *trifolii*-like as those of *centralitaliae*, whilst quite a number are similar to those of *etruriae* and *pauperetincta*, that is to say that they are distinctly *lonicerae*; the mass, however, are transitional. This race points, besides, constantly to *lonicerae*, by its indigo sheen in both sexes, only slightly greenish in a few females, and by the narrower marginal band of hindwing; the spots of forewing are never confluent to any degree on upperside in either sex and only in one male and in two females is there a suffusion of sparse red scaling on underside. A couple from the Escorial (Madrid) lent to me by Turati, seem transitional to *syracusia* by their heavier build and by the broader margin to hindwings.

Race **dimorphica**, mihi.— At S. Fili, m. 900, on the Coast Range of Calabria, Querci has collected in the first days of June a striking race, particularly remarkable by its sexual dimorphism unequalled by any of the others. Turati has sent me three males collected by Krüger lower down, at Paola, on the sea-coast identical with mine. This race can only be compared to *olbiana* and it is not surprising, considering that many Lepidoptera of Calabria resemble the races of the Alps more than they do their neighbours of Central Italy. The males have the same heavy build and the same antennae, very thick as far down as their base, but they are a little longer and more pointed. The dark markings are very blackish and dull; the band of hindwing as broad as in *olbiana*; the red spots of forewing as small. One would not hesitate to classify this sex as a well characterised *trifolii*. The females, on the contrary, not only point to *lonicerae*, as Oberthür says of those of *olbiana*, but actually are identical with the *lonicerae* races of Central Italy by their long, thin and pointed antennae and wings, as well as by their markings. The race, on the whole cannot thus be considered either a *trifolii* or a *lonicerae*.

Subspecies *lonicerae*, Scheven.

Group I. (*britanniae*) :—Race **britanniae,** mihi.—T. Grosvenor has sent me another little series of specimens collected by A. Smith in July, 1921, at Warthill in Yorkshire. This too is interesting, because it is another of the races, which exhibit transitional features and which are thus difficult to classify correctly. I submitted it to the judgement also of Mr. Bethune-Baker, when he called on me in Florence, greatly to my pleasure, and he too declared he did not feel equal to placing it. His first impression was exactly what mine had been at first, that is to say that it was a very small (30-34mm.) northern race of *palustris*, similar to *palustrella*, on account of the length and shape of the antennae and wings, but he subsequently agreed with my remark, that both the antennae and the wings are a little too elongated and sharp at apex, that the spots of the forewing are too small in size and have no tendency to blend even in the female, and that the marginal band of the hindwing is much too thin in both sexes to consider this race a *palustris*. All these characters are too *lonicerae*-like to place it in any other subspecies, but it certainly stands apart from the other races I am acquainted with, as a grade lower than the rest, in the direction of *palustris*. A grade still further down brings one to *transferens* and *longicornibus*, which, as we have seen, cannot any more be considered *lonicerae*.

Group II. (*silana*) :—This group of races of Peninsular Italy, as I have noted in the Introductory remarks, rarely produces, even individually, the *lonicerae* structure to its fullest extent. On the other hand, individuals with a distinct *trifolii* structure are much rarer still and only known from one locality, as we shall see. Instead, individuals with shorter antennae and wings than the rest are met with not unfrequently in most localities, and might at first sight be mistaken for *trifolii*. That is why I think they should be recorded particularly and distinguished by the name of **brevicornibus**, so as to draw attention to them and false information avoided about the existence of *trifolii* where it does not occur. This has happened, for instance, with Stefanelli, Curò and others when dealing with Tuscany. The form mentioned above differs from it in lacking the characteristic thickness and blunt point of antennae, the broad wings, rounded at apex, the usually large and partly confluent spots of forewing and the red suffusion, which connects them on the underside. Notwithstanding, it seems to be a first grade in the *trifolii* direction of variation, and that is why it is comparatively frequent in this species, owing to the tendency of the latter to split into the two groups with the *trifolii* and with the *lonicerae* structure. Stunted individuals with very short antennae are also met with in this species as in others, but in this case their teratological origin is revealed by the distorted neura. Instead *brevicornibus* falls within the range of normal variation in *lonicerae*. We will see I possess specimens of a corresponding form in my series of the most robust and extreme *lonicerae* of the giant alpine race from S. Tyrol and other localities of the Alps. I think the name of *brevicornibus* should be used, whatever race of Group *silana* one may be dealing with, simply placing the name of the latter before it. In some localities it seems as if it even prevails and in this case it constitutes a secondary race. Thus, in Tuscany on the Futa Pass road

at La Traversa, 900m., there exists what can be called "race *etruriae* secondary race *brevicornibus*." Such cases no doubt, have been the cause of Stefanelli's and Curò's error and I have myself been in doubt about it, but Mr. Bethune-Baker has quite confirmed my latest conclusion that it is not a *trifolii* race such as *syracusia* ; it particularly resembles, on the contrary, form *siciliae*, Vrty.

(To be concluded.)

Digne and its Neighbourhood. April-May 1925.

By LIEUT. E. B. ASHBY, F.E.S., F.Z.S.

Additional Records :—The Heterocera bred since my return, and other species subsequently identified were

Bred.—*Pachygastria trifolii, Lasiocampa quercûs, Leucoma chrysorrhoea* (*similis*), *Coscinia cribrum, Ocneria detrita, Calymnia trapezina, Olindia ulmana* and *Epichnopteryx pulla*. Further identifications, or accidentally omitted.—*Zygaena lavandulae* ab. *consobrina, Z. rhadamanthus, Saturnia pyri* (*pavonia-major*), *Acontia lucida, A. luctuosa, Bryophila perla, Ortholitha plumbaria, Chesias rufata* and *Crambus chrysonuchellus*.

The Rhynchota subsequently identified were—*Brachypelta aterrima, Carpocoris fuscispinus, Chlorochroa juniperina, Palomena prasina, Dolycoris baccarum, Piezodorus incarnatus, Eurydema festivum, E. oleraceum* var. *annulatum, Jalla dumosa, Syromastes marginatus, Spilostethus equestris, Pyrrhocoris apterus, Rhinocoris* (*Harpactor*) *erythropus, Centrotus cornutus* and *Triecphora sanguineolenta*. [Arranged by Puton's *Cat. Hem. Fn. Pal.*, 1899.]

The Neuropteron *Rhaphidia xanthostigma*.

CURRENT NOTES AND SHORT NOTICES.

The *Lepidopterorum Catalogus* has now reached its 32nd part. The last two are part 31, dealing with the *Aegeriidae* (*Sesiidae*), and part 32, dealing with the *Cochlidionidae* (*Limacodidae*) ; K. W. von Dalla Torre and Embrik Strand are the compilers of the former and R. van Eecke of the latter. The get-up is as usual excellent, and the margins are unusually wide in this publication allowing for marginal notes almost unlimited. When the sections are exhaustively done and most of them are exhaustive, these catalogues are a real help to all future workers, for they may be sure that practically every reference concerning a species is recorded and further search unnecessary and unproductive.

It may be useful to our readers to give the Nomenclature in the *Aegeriidae* as it affects our 14 British species, with the correct spelling of the specific names.

Aegeriidae, Stephens.

Synanthedon, Hüb.	*andrenaeformis*, Laspeyres. [*Sesia.*]
,,	*culiciformis*, Linneus. [*Sesia.*]
,,	*formicaeformis*, Esper. [*Sesia.*]
,,	*myopiformis*, Borkhausen. [*Sesia.*]
,,	*scoliaeformis*, Borkhausen. [*Sesia.*]
,,	*spheciformis*, Schiffermüller & Denis. [*Sesia.*]
,,	*tipuliformis*, Clerck. [*Sesia.*]
,,	*vespiformis*, Linneus. [*Sesia.*]

Dipsosphecia, Spuler.	*ichneumoniformis*, Schiff. & Denis. [*Sesia.*]
Pyropteron, Newman.	*chrysidiformis*, Esper. [*Sesia.*]
Chamaesphecia, Spuler.	*muscaeformis*, Vieweg. (*philanthiformis*, Lasp.) [*Sesia*].
Sphecia, Hübner.	*crabroniformis*, Lewin. (*bembeciformis*, Hb.) [*Trochilium.*]
Aegeria, Fabricius.	*apiformis*, Clerck. [*Trochilium.*]
Paranthrene, Hübner.	*tabaniformis*, Rottemburg (*asiliformis*, Schiff.) [*Sciapteron.*]

Sesia as pointed out many years ago is the name of a genus of the *Sphingidae*.

From the December issue of the *Trans. and Jour. of the Lewes Sci. and Lit. Society*, we learn that the active work of the members of the Society and that of their enthusiastic Secretary, Mr. E. J. Bedford, has succeeded in its laudable object, the acquirement for the local Museum of the Jenner Natural History collections mainly of British insects. The collection was largely a local one and should prove of great value as an educative factor in the activity of the museum authorities. There were nearly a hundred subscribers to the fund.

The *Bull. and Ann. Soc. Ent. Belgique* contains an article on the wasps *Vespa vulgaris* and *V. germanica* in which is discussed at length the suggestion that they are hybrids; a large number of facts are produced in evidence from many experiments.

Iris for December has an interesting account of the collecting journey of Herrn Hopp to Colombia in May and June, 1924. There is a general description of the area visited, an itinerary of the occurrences and an annotated list of the Macrolepidoptera met with, illustrated by 9 figures of new forms. A new aberration of *Aglais urticae* is described; ab. *lydiae* stands near ab. *ichnusoides*, from which it differs in degree of dark suffusion of all the wings. There is a list on the last page of over seventy new species, forms, genera, etc., which have been described in this magazine during the year.

Fascicule 1 of the *Memorie della Soc. Ent. Ital.*, consisting of 112 pages, deals with the genus *Apion* as it occurs in Italy.

The *Revue Mensuelle de Soc. ent. Namuroise* from January, 1926, appears under a new title, *Lambillionea*, as a monthly review of the Union of Belgian Entomologists. The new title is derived from the name of M. Lambillion, the late founder, and sponsor for so many years. There does not appear to be any new features but the sphere of action of the members and supporters will be extended. The majority of the subscribers are intensive students of variation and numerous are the forms, particularly of the Rhopalocera hitherto unrecognised, which they have pointed out and described in the *Revue*. The contents deals with the Fauna of the restricted area of Belgium only.

We have received the *Annal. Naturhist. Mus. Wien*, for 1925. This worthy volume consists of over 200 pages, small folio, with 11 plates. Seven of these plates are devoted to details of the *Sepsidae* (Dipt.), illustrating the Monograph of the family by Dr. Duda. Three other plates are attached to the Revision of the race forms of *Philosamia cynthia* by Dr. Rebel. These two papers take up nearly 180 pages of the volume.

REVIEWS AND NOTICES OF BOOKS.

THE INDUCTION OF MELANISM IN THE LEPIDOPTERA AND ITS SUBSEQUENT INHERITANCE. J. W. H. Harrison and F. C. Garrett. Proc. Roy. Soc. ser. B, vol. 99, no. 696, February, 1926. pp. 241-263.—This paper is of the greatest importance to biologists, because it clearly proves that acquired characters can be transmitted, and shows how they may arise through changes in environment, and so throws fresh light on the processes of evolution. It is of special interest to lepidopterists, because it goes far to explain the rapid increase in melanism, which has taken place in the recent past, and is still taking place to-day. Every criticism has been anticipated and met by the most careful precautions. The following is a summary of the experiments.

Selenia bilunaria from Abbot's Wood, Sussex, were bred long enough to prove that no recessive factor for melanism was present in the strain, and melanic forms were produced in two different ways, by lead and manganese salts in the food, in two different years. In the original broods in which melanics appeared the ratio of type to melanic, 26 to 1 and 29 to 2 respectively, was not Mendelian, but the offspring of the melanic form in subsequent generations gave rise to melanics and types in Mendelian ratios, proving it to be a recessive. These were fed on hawthorn containing a very small amount of manganese, and controls fed on the same food remained typical.

With *Tephrosia bistortata* from Kent melanism was brought about by feeding on hawthorn leaves known to have a high manganese content, gathered from a hedge where melanic Geometers occurred. One black insect appeared with 96 types in the fifth generation, and its offspring bred as Mendelian recessives.

T. bistortata of mixed Hants and Cleveland ancestry gave rise to a specimen with a broad black streak on the right costa, and this proved to be genetically homozygous for melanism, although only a small part of its soma was melanic. This melanic form too was recessive.

Tephrosia crepuscularia from Staffs. fed on hawthorn with a high manganese content gave one melanic to 23 types, and the melanic form was proved by breeding to be a dominant.

In all cases controls were kept going from the same strains and fed on ordinary food, but in no instance did a melanic appear. The salts used were lead nitrate and manganous sulphate, 1 gram to a litre of water, and the stems of cut hawthorn were placed in the solution for 24 hours before it was given to the larvae, this period being found sufficient for all the leaves to have become fully impregnated.

A convincing part of the proof is, that melanics first appeared in non-mendelian ratios, and that once they had appeared they bred as recessives or dominants like the similar melanic forms of the same species found wild in industrial areas. The artificial production of a dominant, as well as recessives, is most important because it disposes of the least suspicion that melanism was latent in the strain used. The insect with a black streak on the costa, which had all black offspring, proves that a germinal mutation was caused by the food of the larva.

It is to be hoped that similar experiments will be carried out by independent workers; speedy confirmation of results, which prove that acquired characters may be inherited, a subject of acute controversy for many years, is in the highest degree desirable.—E.A.C.

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Desiderata.—The Leicester Museum has no British Diptera and requires a typical collection. Can any collectors help us? We offer European Butterflies in exchange..'—"Entomologist," Leicester Museum.

Desiderata.—Ova or pupae of christyi, abruptaria v. brunnea, black consonaria and bidentata, extensaria, curzoni, jasionata, venosata (Shetl.) and other melanic Geometers and Noctuae.

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MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. March 17th. April 7th. May 5th. June 2nd.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. March 25th, Dr. E. A. Cockayne, "Intersexes in the Lycaenidae." April 8th, April 22nd. —*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.*, J. P. Hardiman, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

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No. 5.

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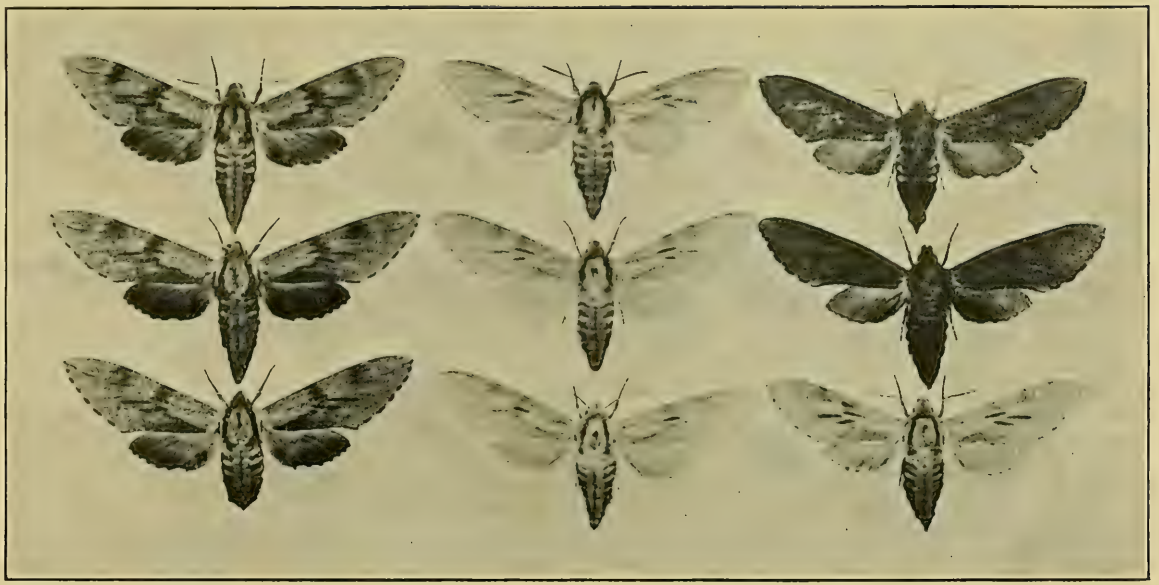

The Entomologist's Record. *Photo. E. A. Cockayne.*

Hyloicus pinastri.

Male and two females of typical *pinastri*.

Male and two females of ab. *albescens*.

Male and female of ab *unicolor*, Tutt. Male slightly damaged. Male ab. *albicolor*.

EDITORIAL.

LYCAENA ARION. AN APPEAL FOR ITS PRESERVATION.—The Committee appointed by the Entomological Society of London to secure the preservation of certain species of British Lepidoptera whose existence is at present threatened, are taking measures, which it is hoped will assist the Cornish race of *Lycaena arion* to maintain itself. They are satisfied it still exists in certain of the localities where it was abundant twenty or thirty years ago though in greatly reduced numbers. They are of opinion that if this race, the finest of all British local forms, of our, in certain respects, most interesting and beautiful butterfly, is to continue to exist, it is absolutely necessary that collecting of it should cease until the stock is replenished. They therefore appeal to all Entomologists to assist by every means in their power to protect it for the present by not collecting specimens themselves, and by using their influences with those who would otherwise do so.

There seems very little doubt, but that *L. arion*, if sympathetically treated, will in a few years attain much of its former abundance. Entomologists, who contemplate visiting N. Cornwall for the purpose of collecting other insects will assist the Committee and avoid difficulties by writing to me. I will then put them in touch with residents who are interested in the preservation of this butterfly.—H. M. EDELSTEN, *Hon. Sec.*, "Hillside," Lindfield, Sussex.

[We shall be pleased to receive suggestions and comments.—EDS.]

New Aberrations of Hyloicus pinastri, L., and their mode of Inheritance. (Plate I.)

By E. A. COCKAYNE, D.M., F.R.C.P., F.E.S.

One of the most interesting and finest exhibits shown at the Annual Exhibition of the South London Entomological and Natural History Society in 1925 was the series of *Hyloicus pinastri*, L., bred by Mr. M. Mactaggart. In addition to the typical form three striking aberrations were represented, two of which, so far as I am aware, have never been taken before either in this country or abroad. As he had bred them for three generations I felt sure he must have sufficient material to show their mode of inheritance and wrote asking him to publish it, but instead of doing so he has most kindly given me full particulars with permission to communicate them to this journal.

I will begin by describing the new aberrations.

Ab. **albescens**, ab. nov. Ground colour of head, thorax, abdomen and wings cream colour; forewing thinly dusted with brown scales, the two transverse lines and the space between them along the inner margin pale buff, apical stripe pale buff or obsolete, white discal spot almost invisible on the light ground colour, the three central longitudinal streaks light brown or pale buff; hindwings cream with thin dusting of brown scales; fringes white with pale buff chequers at nervures; longitudinal stripes on thorax light or fairly light brown; longitudinal stripes on abdomen light brown or greyish brown.

Ab. **albicolor**, ab. nov. Ground colour of head, thorax, abdomen and wings cream coloured; wings, especially hindwings, rather heavily dusted with brown scales giving them a light brown tint; apical stripe and transverse lines on forewings very light brown; the three central

streaks fairly dark brown ; discal spot white ; fringes white with light brown chequers at nervures ; thoracic stripes dark brown ; abdominal stripes fairly dark brownish grey ; rest of abdomen heavily dusted with brown scales. The name is intended to indicate the union of *albescens* and *unicolor* in this aberration.

Both aberrations lack the grey appearance of the type.

The third aberration should, I think, be referred to ab. *unicolor*, Tutt. This was described from a single specimen in the British Museum derived from the Leech collection and labelled Berlin. Presumably it came from the Mützell collection, so that it is unlikely that it was really taken near Berlin. Mr. Mactaggart's specimens are a good deal darker than the one in the Museum, but that is old and probably it has faded, and they have only a few light scales near the apex and hinder angle of the forewings instead of a thin powdering of light scales all over them. The figure in Seitz is much browner than the original and conveys no idea of the depth of colour of the Suffolk examples, which are nearly black. The blackness is relieved by the chequered fringes, which are white in the middle of each interneural space. The ventral surface of the palpi are white and there is a white stripe just above the eye; the hairs on the proximal part of each abdominal segment are white and form a lateral row of spots, and in the males a tuft of white hairs springs from the proximal part of the first three abdominal segments in the line of the subdorsal stripe ; the distal extremities of tarsi and tibiae are white also.

The capture of the original specimens was reported in the *Entomologist*, 1922, LV., p. 236, but Mr. Mactaggart has given me fuller particulars. After many days of fruitless search all were found in an area not much larger than a lawn tennis court ; on August 1st, two pairs (males worn), on August 3rd, one pair (male worn) and one female just expanding its wings, on August 9th two pairs (males worn), on August 12th one male newly emerged (empty pupa case found), on August 14th one female (worn), on August 15th one pair (male worn), and on Angust 16th one female newly emerged. Although further search was made until the end of the month no more were taken. Excluding the worn specimens which may have flown from a distance, the others, eight females and one male, were probably the offspring of a single female. All these except one were typical, the remaining one a female being ab. *albicolor*. This female found paired with a typical male was the insect from which all those bred in 1923 and 1924 were descended, and these broods prove that both ab. *albescens* and ab. *unicolor* are simple Mendelian recessives and that ab. *albicolor* is a recessive homozygous for *albescens* and *unicolor* as well. The fact that it is the double recessive no doubt accounts for its darker coloration, the double dose of the factor for black modifying to a small extent the whitish tint of *albescens*.

In the bred male *albicolor* the left hindwing is darker than the right as the photograph shows quite clearly.

If w be taken as the symbol for *albescens*, which I will call white, and b for the black *unicolor*, W and B will be the symbols for the corresponding dominants, and any insect with W and B in its constitution will have a typical facies. The original typical male was in all probability one of the same brood as the female and was heterozygous for white with its constitution WwBB (zygotes WB and wB), the

female *albicolor* being wwbb (zygotes wb and wb). The expected proportions in such a mating are 50% WwBb, typical in appearance, and 50% wwBb, white. The actual members of the brood, which emerged in June, 1923, were 7 types, 5 males and 2 females, and 6 white, 2 males and 4 females, and the result is as near the expected equality as the uneven number permits. No *albicolor* were bred, nor were they to be expected, if my assumption that they are recessive for both aberrational forms be correct. Two of the typical specimens were paired, both heterozygous for both white and black, WwBb. The anticipated result of this mating is 1WWBB, 2WWBb, 2WwBB, 4WwBb, all nine typical, 1 wwBB, 2 wwBb, all three white, 1 WWbb, 2Wwbb, all three black, and 1 wwbb, *albicolor*. The actual result was 26 typical, 12 males and 14 females, 11 white, 6 males and 5 females, 11 black, 4 males and 7 females, and 1 *albicolor*, a male. The anticipated ratio of type : white : black : *albicolor* : to the nearest round number in this brood of 49 was 28 : 9 : 9 : 3, which is very close to the actual figures 26 : 11 : 11 : 1. These were bred in May and June, 1924 and a single pairing between two typical specimens was obtained but no eggs were laid. Had this pairing been successful there were four possible results, all types, type : white 3 : 1, type : black 3 : 1, or the 9 : 3 : 3 : 1 ratio as in the 1923 brood. White crossed with black might give any one of four results, all types, type : white 1 : 1, type : black 1 : 1, or type, white, black and *albicolor* in equal numbers. Two whites, two blacks or two *albicolor* paired together would give all whites, all blacks or all *albicolor* respectively.

Mr. Mactaggart is to be congratulated on his good fortune in finding a double recessive as well as on his skill in breeding from it so successfully and his care in recording his results so accurately. The likelihood of anyone repeating the experiment is very small.

Pinastri can scarcely be regarded as native in the sense that many of our moths are, if it be true that the pines in the midland and southern parts of England were all destroyed and that the tree was replanted in comparatively modern times. There is however, little doubt that it introduced itself naturally. Tutt on the strength of a letter in the *Ent. Record*, VII., p. 218, thought that a few pupae placed for a joke in a small Suffolk wood accounted for their presence, but this hoax occurred in 1880 or 1881 and the moth had been seen in 1875 at Woodbridge, in 1876 at Wickham Market and in 1877 at Tuddenham, Waldringfield and Woodbridge, and its larvae at Leiston in 1878 and 1879. It seems to have been as common and as widely distributed before 1880 as it is at the present day.

It is possible that the aberrations are of recent origin and that *unicolor* arose independently here and on the continent, but on the other hand they may have existed in Suffolk for many years. *Pinastri* has never been taken in very large numbers, if one may judge by the summary of the captures of the last fifty years published in the *Entomologist*, 1925, LVIII., pp. 224-225, by the Rev. T. N. Waller and supplemented by the editor. Uncommon recessive forms of so scarce a species may easily have escaped observation especially if restricted to one wood.

Between July 24th, and August 12th, 1922, I saw 28 *pinastri* all typical in the district bounded by Leiston on the North and Woodbridge on the South in six different woods, but like Mr.

Mactaggart I found them very local. Most of them were newly emerged females and I took one or two day after day in five small areas. In other parts of the same woods I never found one, and in some woods, although I searched nearly every day, I never saw a specimen at all. They were resting at a height of two to twelve feet up the trunks in every case except one on the sheltered side. The single ones were sitting vertically head upwards and the pairs had also aligned themselves in the long axis of the tree sometimes with the male and sometimes with the female uppermost. I found one female which was beginning to lay its eggs on the bark of a pine and which must have been paired with a male sitting a few inches away, but the eggs were infertile.

Mr. Mactaggart says he tried to obtain eggs from every female except the newly emerged ones and got hundreds, but 40 to 60 per cent. proved to be infertile, and he only succeeded in bringing to maturity about 30 per cent. of the larvae from the earliest brood; the rest, about 400, were killed by frost in October.

The infertility of the eggs or their inability to develop does not seem to be selective picking out those homozygous or heterozygous for the aberrational forms, because with the exception of *albicolor* they appeared in more than the expected numbers. Inbreeding may be the explanation, but it is not probable in the case of an insect with so powerful a flight. The fact is interesting and merits further investigation. Infertility coupled with the lateness of the larvae and their susceptibility to frost perhaps accounts for the relative scarcity of *pinastri* and its inability to spread in this country.

Butterfly.

While turning over the pages of that wonderful work of Scudder, *The Butterflies of New England*, the most striking of the earlier of the modern intensive methods of study and the work which, our revered late editor once told me, was the model incentive of his own studies, I came across the following interesting note in an "Excursus."

"As to the very word 'butterfly' itself, there has been much written, but, strangely, as it seems to me, the persons best qualified by their philological learning are least assured concerning the derivation of the name. Skeat and Murray can hardly be entomologists. 'It has amused many to devise guesses to explain the name,' says Skeat. Mr. Frederick Clarkson, in the *Canadian Entomologist* (XVII. 44) thinks there is a good reason to believe that the root meaning of the word 'dates back to early Egyptian history, and as a hieroglyphic it is synonymous as representing the qualities of completeness and perfection which characterise the soul.' All of which I, in my ignorance, judge to be humbug. One distrusts much of the reasoning drawn from hieroglyphs, for it would seem in general that almost any meaning can be drawn from them by dilettanteism if only sufficient ingenuity is put in. An English writer, whose name I do not now recall (was it Miss Mitford), has strenuously upheld the idea that a butterfly was simply a *better* sort of fly, laughing to scorn the common notion, which seems to me, as I think it must to all entomologists, to be unquestionably the correct one, that the word is simply an expressive name given to

the commonest form of butterfly that is found in Europe, where the name arose, namely the butterflies of the genus *Eurymus* [*Colias*], which are ordinarily of much the same kind of yellow that one finds on the buttercup, whence the name of both. One feels the greater confidence in this because the term is applied in so many different languages in much the same way. In Anglo-Saxon it is 'buttor-fleoge,' which is simply 'butterfly'; while some of the variations of this term in other languages are the Dutch 'botervlieg,' earlier 'botervlieghe,' the German 'butterfliege,' and the earlier German form 'buttervogel.' Other variations of the same name will appear in the poetical quotations from different languages which we have scattered throughout the present work. Murray, in his New English Dictionary, gives various extracts showing the early use of this name, the earliest in the Anglo-Saxon being as far back as 1000 by Aelfric. Chaucer gives it in another form: "swich talkying is nat worth a boterflye.'"—[Hy.J.T.]

Remarks on the evolution of the Zygaenae and an attempt to analyse and classify the variations of Z. lonicerae, Scheven, and of Z. trifolii, Esp., and other subspecies.

By ROGER VERITY, M.D.

(*Continued from page 62*).

Race *apenninica*, Rocci, *Atti Soc. Ligustica Scienze Nat.*, XXXII., n. 2, p. 2 (1921).—Size smaller than in any other Italian race: 26 to 30mm. of expanse in male, 30 to 35mm. in female; these measurements do not fully convey the smallness and frailness of some individuals, because the wings are very elongated, and sharp at apex, but in reality they are very narrow, so that their surface is very limited; antennae also more slender than in the other Italian races; dark scaling rather deep in tone, with a moderate sheen; the red spots of forewing are smaller than in any other races known, and the marginal band of hindwing is broad in both sexes; tinge of red often rather faded. Rocci's "types" were from the Apennines above Parma and Reggio, collected by Col. Parvis in July and August, from 400 to 800m. I possess a series collected by Querci farther east at Palazzuolo di Romagna, 700m., but on the same Adriatic watershed, so that I conclude it is the race of the northern slopes of the Apennines. A single specimen of this species found on Mt. Mosca, 1300m., above Lucca, is the minutest female I have ever seen anywhere (25mm.); it probably belongs to this race.

Race **pauper**, mihi.—In the Sibillini Mts. (Marche) Querci has discovered, at very high altitudes, in surroundings unusually alpine for this region, inhabited by perfectly distinct species and races from those found lower down, from the upper Fergna Valley, 1400m. up to 1700m., towards the lofty summits of Pizzo Tre Vescovi, a very distinct race of *lonicerae*, which exhibits the features characteristic of high-mountain races in this genus: small size (30 to 33mm. in both sexes); wings in both sexes very narrow, markedly more so than in any other *lonicerae* I have seen, except some *apenninica*; scaling thinner than in any other race; tinge very pale and dull: red of a pinkish carmine, cold in tone; dark markings of a gray tone, with extremely slight sheen, usually greenish in both sexes and much less than in *apenninica*,

etruriae or *vivax*; size of red spots and dark marginal band of hindwing as in race *etruriae*.

Form **centralitaliae**, mihi, of *trifolii*, Esp.—The only specimens with a distinct *trifolii* structure and aspect Querci and I have ever met with in Peninsular Italy are three males and three or four females detected amongst the series of *lonicerae* race *pauper*. One male is perfectly identical with Esper's nymotypical form by all its features. The two others, which I name *centralitaliae*, are strikingly different and give the impression of being intermediate between the former and *lonicerae* form *brevicornibus*, Vrty., by their more pointed wings and antennae, although, on the other hand, they are respectively too broad and thick and too markedly short to fall within the limits of *lonicerae*, like the latter. The spots are not very large and not confluent above, but connected on the underside by a red suffusion; tone of red as in *pauperetincta*; band of hindwing not broader than in *pauper*. Two of the females have as short antennae as I have ever seen in any *trifolii*; scaling thin, as in *pauper* and of the same dull tinge, bluish gray and pale pinkish crimson; spots very large and confluent as in Esper's figure 5; marginal band of hindwing narrow. Bethune-Baker has seen these specimens and he is also of opinion they are unquestionably *trifolii*. Two or three others are transitions to *pauper*, so that *centralitaliae* is evidently not a race, but produced by the tendency of *pauper*, as of other races, to split in a *trifolii* and in a *lonicerae* form.

Race **pauperetincta**, mihi.—In the Sibillini Mts., as one proceeds downwards, the high mountain characteristics of *pauper* gradually disappear; at Bolognola, 1200m., in totally different surroundings, form *pauper* is no more found, even individually, and *lonicerae* acquires, in the majority of individuals, features intermediate between those of *pauper* and those of *etruriae*, I am about to describe, whilst individuals perfectly similar to the latter make their appearance. The prevailing intermediate form I take as nymotypical of *pauperetincta* exhibits the large size and more robust structure of *etruriae*, but its tinge resembles more that of *pauper* by the colder carmine tone of red and the duller dark markings, with a very poor sheen; the thickness of the scaling is about intermediate and so is the shape of the wings, which is a little more elongated and pointed than in *etruriae*

Late emergence form *autumnalis*, Vrty., *Bull. Soc. Entom. Ital.*, XLVII., p. 73 (Dec. 16th, 1915).—At Bolognola, Querci has observed a second emergence, which in some years is quite abundant; it begins after the first storms which, at the end of August, break the summer heat and drought, and it lasts, in some cases, till late in September. As the first emergence takes place from the end of June to nearly the end of July, Querci feels quite sure the second is not a second generation, but simply consists in the laggard individuals, which are not sufficiently grown when the drought comes on and which get stunted by scanty and dry food. They are small, frail and pale as compared with the first emergence, but they differ from race *apenninica* by having narrower and at the same time less pointed wings, by being paler and more translucent, recalling *pauper*, and by the spots of forewing not being as small as they often are in *apenninica*.

Race **etruriae**, mihi.—On the southern watershed of the Apennines, in Tuscany, the widespread race is a very distinct and striking one; its antennae are shorter and thicker and its wings shorter,

broader and more rounded at apex in the majority of individuals, than they are in most races of *lonicerae*, so that they evidently point to the *palustris* structure; the dense scaling and vivid colouring increase that effect; individual variation, however, is considerable and one meets both with very long antennae and with the very short ones of *brevicornibus* quite frequently. The forewing is of a deep tone, shot with a brilliant purple, which tends to greenish less than in most races, even in the female. The red spots are limited in extent, never confluent and of a rich, saturated tone. The marginal band of hindwing is slightly broader than in the Alpine *alpiumgigas*. Expanse of male 28 to 33mm., of female 32 to 36mm.; much larger and heavier, as compared with *apenninica* and *pauper*, than these figures convey, on account of their short wings. My "typical" series is from Mt. Senario, 800m., near Florence, where it varies less than in other localities. I have also collected it at Piteglio, 700m., in the Pistoiese Apennines, and at the Abetone Pass, 1300m., in the same mountains, which are, notwithstanding the altitude, considerably drier and less Alpine in character than the Sibillini Mts. In this last locality I met with a remarkable individual, which has the whole of the hindwings overshaded with dark grey, shot with purple, except a round spot of red at the end of the cell. This is evidently form *nigra*, Dziurzinski, described in the African race *seriziati*; his name must apply also to European specimens, although, as Oberthür rightly remarks, the description of "black" is not correct. In Tuscany it is purely an aberration as there is no tendency to vary normally in this direction.

Race *vivax*, Vrty., *Boll. Laborat. Zool. Portici*, XIV., p. 38 (June 20th, 1920).—This is a near ally of *etruriae*, but it differs from it constantly by its longer and more pointed antennae, much less variable than in the latter, by its narrow and more pointed wings and by the greater extent of the dark scaling: the red spots of forewing are smaller; the dark marginal band of hindwing has a marked tendency to be broader, often reaching in both sexes half the distance between the margin and the end of the cell and not unfrequently reaching the latter, so that in extreme examples the red is reduced to a band in the middle of the wing, cut by thin black streaks along the nervures (form *posticeobscurata*, Vrty., *l.c.*). This race has been found by Querci in the region where *Z. transalpina* produces its very dark race *latina*, Vrty., so that surroundings seem to have considerable bearing in producing *vivax*, which, as compared with the other races of *lonicerae*, can be considered its most melanic one. My "typical" series was collected at the end of June near Atina, 500m., in the Mainarde Mts. (prov. of Caserta). One male stands out amongst the rest by its shorter antennae and by its rather large, irregular, red spots, which are partly confluent on underside. Mr. Bethune-Baker expressed the opinion that it is a *trifolii*, but I must say I think it more correct to consider it simply a *brevicornibus*, Vrty., such as occur more frequently in race *etruriae*. Anyhow it is instructive, showing how all races of *lonicerae* can burst out individually in the *trifolii* structure.

Race *silana*, Burgeff, *Mitteil. Münchner Entom. Ges.*, 1914, p. 63, pl. III., f. 112-114.—When I described *vivax* I did not know Burgeff's description and figures of the race from the Sila in Calabria. The characters he mentions are the broad dark margin of hindwings, the saturated and bright tone of red and the vivid sheen on forewing.

These and other features, visible in the figures, seem to be very similar to *rivax*, but the shape of the wings in the male points to the other Calabrian race I have described as *dimorphica*, and in most species the races of the Mainarde and those of Calabria have turned out to be different from each other, so, for the present, I keep them as such also in *lonicerae* till series are compared. Instead I think that Stauder's name of *herthae* is an absolute synonym of *silana*. He evidently was quite unaware of Burgeff's name and description when he created that name in *Societas Entomologica*, 35, p. 23 (1920), for specimens collected by him on Mt. Martinello in Calabria. The upshot of his long description seems to be that of *silana*. Turati's *minima* from Fossiata, August 1st (*Boll. Soc. Ent. Ital.*, LV., p. 119, October, 1923) is obviously a dwarf form of *silana*, as all the features mentioned by him, except size, are those given by Burgeff and by Stauder.

Group III. (*lonicerae*).

Race **magismaculata**, mihi.—The specimens I have from Geneva and from Mayrhofen, in the Tyrol, stand out amongst the others of various regions of Central Europe, by the very large size of the spots of the forewing, which are in the male sex quite as large as they ever are in the females of other localities, and which are often connected on the underside by streaks of red, such as usual in *trifolii*, but not in *lonicerae*, by the extremely thin marginal band of hindwing, and also by their rather warmer and brighter tone of red, whilst the sheen on the dark parts of the wing is rather more vivid and more green than usual. The antennae are very long and end in long sharp points, so that this race is distinctly a *lonicerae* and there can be no question of its being a *trifolii*, as the markings might suggest in some individuals. The wings too are remarkably pointed and the outermargin of both fore- and hindwings is very straight in many individuals. All these features are more pronounced in the Geneva examples than in the Tyrolese ones.

Race *lonicerae*, Scheven, *Naturforscher*, X., p. 97 (1777).—The unfortunate way this name was created makes it rather difficult to fix the nymotypical race, except by assuming that it is the one of the neighbourhood of Regensburg. The only character mentioned by Scheven is that there are five spots, as contrasted with the six of *filipendulae*. He adds these always pair true, so that he concludes they are two species. He then quotes *Schäffer's* fig. 16-17 on pl. XVI. of the *Icones Ratisb.* These figures in reality, rather than *lonicerae*, suggest *angelicae*, which is abundant at Regensburg, by their small size, by their antennae and other features, but they are so rough that nothing definite can be inferred from them and the best thing one can do is to keep the name as it was put into use by early writers. The race, which is broadspread in the whole of Central Europe and which varies remarkably little both individually and geographically, as noted by all authors, falls in naturally as the nymotypical one. The only local variation I detect in it is in size. I possess series from Brandlberg and Gammersdorf, in Germany, and specimens from Paris, which all vary from 28 to 32mm. constituting a small secondary race, worth distinguishing as **minuens**, mihi. Tutt's name of *minor* was given to extremely small accidental dwarfs of 22 to 24mm., "constantly met

with," but this name cannot stand, because Tutt himself had used it already for the ordinary *trifolii*, to contrast it with his *major* = *palustris*; the name of **minutissima** might replace it.

Race **misera**, mihi.—In the wonderfully variable series of specimens collected by Grosvenor in Sussex, in which I have already noted the existence of pure *trifolii*, of *palustrella* and of *transferens*, there exist most highly characterised *lonicerae*, which are striking by their extremely long, slender and pointed antennae and by their long, narrow wings, very sharp at apex; spots of forewing rather larger and more irregular than in most *lonicerae* and recalling the race I have from Geneva, in this respect; marginal band of hindwing very thin; colouring bright; the dark scaling has a notably brilliant sheen, greenish in both sexes; the red is warmer and less saturated than in race *britanniae* and most British ones, owing evidently to a greater admixture of yellow, which also explains the tendency to green of the dark markings. The expanse of wings is about 30mm., and this would be, more or less, the average of the northern *lonicerae*, but *misera* in reality is distinctly frailer and smaller than the average.

Race **glaciei**, mihi.—In cold localities of the Alps and, no doubt, chiefly at high altitudes one meets with a race, which differs from the following widespread one, by its rather smaller size, narrower and more pointed wings and especially by its thinner scaling, so that the tone of colour is less bright and colder and the sheen much lesser; the red spots of forewing are also smaller. I collected this race in the Formazza Valley, at 1400m., standing between the Rhône Valley and the Canton Tessin and beaten by glacier winds, so that all the Lepidoptera exhibit their features of the highest altitudes. A large female from Courmayeur seems a transition to *glaciei*, but such individuals occur in the following race.

Race **alpiumgigas,** mihi, = *major*, Frey, *Lep. der Schweiz*, p. 67 (1880).—This name I restrict to the large race, with rather a broad band to hindwing, and a rich tone of colour, which inhabits most localities of the Alps and the Pyrenees and which does not vary much locally, except that it exhibits in many cases a transitional aspect to *glaciei*; the races differing most markedly from the latter seem to be those of the low warm valleys. Frey mentions as first locality St. Nicolas in the Visp Valley; his name of *major* unfortunately cannot stand, because Esper had used it for a totally different form of *Z. filipendulae*. Tutt says (*Brit. Lep.* I., p. 468) that a very similar race to *major* exists in Armagh (Ireland).

Form **alpiumnana,** mihi, of *trifolii*, Esp.—In a large series of *alpiumgigas* collected by the late A. Wagner in the Isarco Valley (S. Tyrol), chiefly along the road from Waidbruck to Castelruth, and purchased by me from his widow, I find several specimens, which stand out from the *lonicerae* by their *trifolii* structure: they are much smaller, the antennae are short and thick, the wings short and broad; the spots however show no tendency to confluence. The extreme examples are obviously stunted weaklings and the rest are transitions, which I feel sure do not authorise one to state that *trifolii* exists as a subspecies, or even as a race in S. Tyrol.

In the Alps *lonicerae* is very often found in company with a *Z. filipendulae* subspecies *stoechadis*, which produces five-spotted males and these resemble the former so much that it certainly requires an

experienced eye and some attention to distinguish them, but I can affirm most positively, that there certainly is no real transition between the two species in the Alps, nor anywhere else, as I have stated in my paper on *Z. filipendulae*. Lately I have had a good opportunity to take up this question again in the Valle Anzasca, at the foot of Mt. Rosa (*) and at Oulx in the Susa Valley, where appearances are as suggestive of transition as can be, and I have been able to separate all specimens to my full satisfaction. The distinctive characters between the *loniceraeformis*, Vrty., individualsof *Z. filipendulae* and the true *lonicerae* are the same as those I have pointed out in the races of Peninsular Italy in *Ent. Rec.*, 1921, p. 86.

Race *latomarginata*, Tutt, *Brit. Lep.*, I., p. 468 (1899).—This is, according to its author, the most striking race in Britain, from Filey, on the Yorkshire coast. He described it as being of large size (34-49 mm.), with broad forewing, rich tint, and exceptionally broad marginal band to hindwing, reminding one of *medicaginis*.

(*) Two female *lonicerae* I have met with in this locality, at Vanzone, are worth recording: One is ab. *citrina*, Spey., of a clear yellow, the other has the five spots united on upperside by a thick suffusion of red scales, similar to that seen on the underside of *filipendulae*, whilst on the underside the whole forewing is red, except a band along the outer margin, so that it is evidently a transition to ab. *incendium*, Obth. I suggest naming it **rubrosuffusa**.

Miscellaneous Notes from Argentina. III.

By KENNETH J. HAYWARD, F.E.S.

Colias lesbia, F.—Variation in.

This insect, which is a plague in the afalfa growing districts, has been comparatively scarce in this portion of the Chaco forest until this year, the increase being entirely due to the fact that we now have two small patches of afalfa, whereas formerly none was grown here. The afalfa in question consists of two adjacent plots measuring 100 metres square and 50 metres square respectively, and was sown last winter. The difference made in the number of *lesbia* in the district is remarkable.

C. lesbia is given to the usual *Colias* variations. The white female form is extremely common and, in my experience, exceeds the normal yellow form. It is of course impossible to make a definite statement on this point without vast quantities of material covering many districts and seasons, but at Villa Ana the preponderance of the white form is definite. During the lean seasons of this insect, more white form have been encountered, and my figures for the present season have never fallen below a 3 to 1 proportion in favour of the white form, the average being nearer 5 to 1, and recently out of 72 specimens, 40 were white females, 27 were males, and only 5 were females of the yellow type, though I was trying to get a series of the latter. The possibility of the yellow female being overlooked is small, since the somewhat lighter yellow enables them to be very easily distinguished, and further they very quickly lose their bloom and become faded through contact with the clover in the duty of egg-laying. A few days ago—January 24th, 1926—I noted during the day 11 pairs

of *lesbia* in cop. Of these 9 were male × white form female. As in *Colias croceus* the shade of white in *C. lesbia* var. *heliceoides* varies from pure white through all the shades of cream and yellow to merge into the normal form.

As usual in *Colias*, male variation is rare, and I have yet to take a primrose male (cf. *C. croceus* ab. *cremonae*). I have this year, however, taken a single specimen of a very light male (thinking it was a female) the colour of which I can only describe as light pink-tinged buff. This colour I have never seen in *croceus* although I have taken most of the types of variation of that insect. Also I took a very small male, measuring with wings set so that the inner margins lie in a straight line only 29mm. Two very worn females have been netted that showed a tendency to a form corresponding to the form *aubuissoni*, Cdj., of *croceus*, but not definite enough to be able to say that the hind-wings were entirely white form. The finest aberration that I have taken is undoubtedly a gynandromorph of which the following description is warranted :

Left side female, the white form predominating but having a streak of the normal yellow colouring along and parallel to the costa on the forewing and a patch of yellow on the outer third of R1 to R4, this yellow suffused with the violet lustre so prominent in the species when fresh. The outer marginal band narrowed as far as R4 and then normal to the costa. Hindwing normal white-form female. Beneath with normal markings, the colour corresponding to that of the white or yellow form according to the colouring of the upperside. Right side forewing female, hindwing male. The yellow colour predominating but with white streaks as follows. On the forewing: lower part of the cell, this patch extending as a narrow band to the margin in R5 and the lower part of R6 and with a wedge downwards into the middle third of R3. Along the lower portion of R2 to the margin and united with the wedge from the cell just mentioned. A portion of yellow is enclosed by the union of these streaks. A small wedge in the lower corner of R4 adjoining the margin. On the hind-wing from the base through the centre of the discocellular cell to the margin but forking before reaching it. A shorter streak below in lc extending a short distance along vein 2. As on the left side the yellow colouring with strong violet lustre. Beneath as on the left side with typical female markings on the fore- and male on the hindwing.

The following varieties of *lesbia* have been named from Argentina by Köhler in his *Fauna Argentina I. Rhopalocera* (Sonderbeilage de Zeitsch. für Wissenschaftliche Insektenbiologie Bd. XVIII. Heft 12.15 Dec. 1923), but are unknown to me ; *obscura*, and the female forms *flaveola*, *micans*, and *maculata*.

Description of the Larva of Precis lavinia, Cr.—Length 38mm. to 42mm.

Head yellow-brown with black face, the latter with a yellow spot placed centrally, two small spines, yellow, hairy, black tipped.

Body deep velvet black above with the central dorsal area covered with minute grey specks forming a wide line. A lateral row of yellow spots, one on each segment, each bearing a short hairy spine metallic blue ⅔rds, black ⅓rd. Below a lower lateral stripe of dirty yellow with

a brighter yellow protuberance on each segment bearing a black tipped yellow hairy spine. Between this and the underside a silvery white narrow stripe. A central dorsal and upper lateral row of hairy spines from each segment, the bases and main portion of the spine bright metallic blue. Underside dark grey, fleshy, legs and pro-legs yellow, the legs having each two very short yellow spines at their bases.

Remains in the pupal state from 10 to 14 days according to the season.

Specimen larva in spirit numbered 5546 sent to the B.M., South Kensington.

Digne and its Neighbourhood. April-May, 1925.

By LIEUT. E. B. ASHBY, F.E.S., F.Z.S.

Additional Records.—The Coleoptera identified with the kindness of the staff of ehe British Museum and other friends were:

Staphylinidae—*Ocÿpus morio*, Gr. Cantharidae—*Telephorus fuscus*, L., *Rhagonycha fulva*, Scop., *Malachius aeneus*, L., *M. bipustulatus*, L., *M. carifex*, L. Coccinellidae—*Hippodamia 13-punctata*, L., *Coccinella septempunctata*, L., *Halyzia 14-guttata*, L., *Chilocorus bipustulatus*, L. Buprestidae—*Anthaxia cyanicornis*, Fb., *Agrilus biguttatus*, F. Oedemeridae—*Ischnomera coerulea*, L. Tenebrionidae—*Opatrum sabulosum*, L. Cerambycidae—*Clytus mysticus*, L., *C. arietis*, L. Chrysomelidae—*Clytra tridentata*, L., *Gynandrophthalma nigritarsis*, Lac., *Cryptocephalus moraei*, L., *C. schaefferi*, Shrnk., *C. violaceus*, Laich., *Timarcha* (?) *tanaceti*, L., *T. violaceo-nigra*, D.G., *T. tenebricosus*, F., *Chrysomela polita*, L., *Phytodecta rufipes*, D.G., *P. viminalis*, L., *Exosoma lusitanica*, L. Curculionidae—*Otiorrhynchus tenebricosus*, Hbst., *Polydrosus cervinus*, L., *Rhynchites pubescens*, Fb. Scarabaeidae—*Valgus hemipterus*, L.

The Diptera identified were: Bibionidae—*Bibio marci*, L., *B. hortulanus*, L. Tipulidae—*Pachyrrhina pratensis*, L. Stratiomyidae—*Chloromyia formosa*, Scop. Leptidae—*Leptis scolopacea*, L. Bombylidae—*Bombylius venosus*, Mik. Empidae—*Empis tessellata*, Fb. Syrphidae—*Chilosia vulpina*, Mg., *Melanostoma mellinum*, L., *Leucozona lucorum*, L., *Syrphus ribesii*, L., *S. balteatus*, D.G., *S. tricinctus*, Fln., *Sphaerophoria menthastri*, L., *S. nigricoxa*, Zett., *S. nigrizans*, Zett., *Xanthogramma ornatum*, Mg., *Volucella bombylans*, L. and var. *plumata*, D.G., *Eristalis tenax*, L., *Merodon clavipes*, Fb., *Xylota segnis*, L., *Sericomyia borealis*, Fln., *Chrysotoxum festivum*, L., *C. bicinctum*, L. Conopidae—*Physocephala rufipes*, F. Tachinidae—*Gymnochaeta viridis*, Fln.

The Hymenoptera identified were: Aculeates—*Formica fusca*, L., *Camponotus cruentatus*, Latr., *Halictus xanthopus*, Kirb., *Nomada succincta*, Pnz., *Osmia cornuta*, L., *Anthophora acervorum*, Smith. Braconidae—*Macrocentrus marginator*, Nees. Tenthredinidae—*Allantus perkinsi*, *A. meridianus*, *A. marginellus*, *Arge enodis*, *Athalia glabricollis*, *Chalicodoma pyrenaica*, *Dolerus pratensis*, *Macrophyia rustica*, *Rhogogaster punctulata*, *Tenthredella livida*, *T. temula*, *T. mesomela*, *T. olivacea*, *Tenthredopsis excisa*.

A Month's Collecting in the Pyrenees.

By Wm. FASSNIDGE, M.A., F.E.S.

(*Continued from page 52.*)

Papilio podalirius, L. (we were surprised not to take *feisthameli*, Dup.); *P. machaon*, L., imagines and larvae; *Parnassius apollo*, L.; *Aporia crataegi*, L., imagines and larvae; *Pieris brassicae*, L.; *P. rapae*, L.; *Pontia daplidice*, L.; *Euchloë euphenoides*, Stgr., 1 ♂ seen; *Leptosia sinapis*, L.; *Colias hyale*, L.; *C. croceus* (*edusa*), F., and var. *helice*, Hb.; *Gonepteryx rhamni*, L.; *G. cleopatra*, L., 2 ♂♂ seen; *Apatura ilia*, Schiff., 3 taken, many seen; *Limenitis rivularis*, Scop. (*camilla*, Schiff.), all worn; *Pyrameis atalanta*, L., larvae and imagines; *P. cardui*, L., larvae and imagines; *Vanessa io*, L.; *Aglais urticae*, L.; *Eugonia polychloros*, L.; *Euvanessa antiopa*, L.; *Polygonia c-album*, L.; *Melitaea cinxia*, L.; *M. phoebe*, Knoch, smaller than type; *M. didyma*, O., ♂♂ very bright; *M. athalia*, Rott.; *M. parthenie*, Bkh.; *M. dictynna*, Esp.; *Brenthis euphrosyne*, L., a few; *B. dia*, L.; *B. daphne*, Schiff, 1 worn specimen at Ax; *Issoria lathonia*, L.; *Argynnis aglaia*, L.; *A. cydippe* (*adippe*), L., and ab. *cleodoxa*, O.; *Dryas paphia*, L.; *Melanargia galathea*, L., very abundant; *Erebia epiphron*, Kn., race *cassiope*, F.; *E. manto*, Esp., and race *gavarniensis*, Warren = var. *caecilia*, Hb.; *E. stygne*, O.; *E. euryale*, Esp.; *E. tyndarus*, Esp.; *Satyrus hermione*, L., at Foix only; *S. semele*, L.; *Pararge aegeria*, L.; *P. megera*, L.; *P. maera*, L.; *Aphantopus hyperantus*, L., common; *Epinephele jurtina*, L., and race *hispulla*, Hb.; *Coenonympha arcania*, L., very abundant; *C. pamphilus*, L.; *Strymon* (*Thecla*) *spini*, Schiff.; *S.* (*T.*) *w-album*, Knoch.; *S. ilicis*, Esp., and race *cerri*, Hb.; *Ruralis quercûs*, L.; *R. betulae*, L., at Ax only; *Heodes virgaureae*, L.; *H. hippothoë*, L. (No. 510 Stgr.); *H. alciphron*, Rott., var. *gordius*, Sulz; *H.* (*Rumicia*) *phlaeas*, L.; *H. dorilis*, Hufn.; *Lampides boeticus*, L.; *Plebeius argus*, L. (*aegon*, Schiff.); *P. argyrognomon*, Brgstr.; *P. medon* (*astrarche*), Brgstr.; *Scolitantides baton*, Berg., a few; *Polyommatus icarus*, Rott.; *P. hylas*, Esp.; *P. escheri*, Hb.; *P. bellargus*, Rott.; *P. coridon*, Poda.; *P. semiargus*, Rott.; *Lycaena arion*, L.; *Lycaenopsis argiolus*, L.; *Adopaea lineola*, O.; *A. flava* (*thaumas*), Hufn.; *Thymelicus acteon*, Rott., a few; *Urbicola comma*, L.; *Augiades sylvanus*, Esp.; *Erynnis* (*Carcharodus*) *lavaterae*, Esp.; *E. alceae*, Esp.; *E. altheae*, Hb.; *Hesperia carthami*, Hb.; *H. sao*, Hb.; *H. serratulae*, Rbr., H.-S.; *H. alveus*, Hb.: *H. cirsii*, M.D.

Bombyces.—*Amorpha* (*Smerinthus*) *populi*, L., larvae; *Protoparce convolvuli*, L.; *Hyloicus pinastri*, L., larvae; *Theretra porcellus*, L., 1 larva; *Sesia* (*Macroglossa*) *stellatarum*, L.; *Cerura bifida*, Hb., larvae; *C. vinula*, L., larvae; *Drymonia chaonia*, Hb., ab. *lunula*, Grnbg.; *Pheosia tremula* (*dictaea*, L.), Cl.; *P. dictaeoides*, Esp.; *Notodonta ziczac*, L.; *N. dromedarius*, L.; *N. phoebe*, Sieb. = *tritophus*, Schiff.; *N. trepida*, Esp., 1 larva; *Pterostoma palpina*, L.; *Phalera bucephala*, L.; *Pygaera curtula*, L., 1 specimen at light; *P. anachoreta*, F., 1 larva; *Thaumetopaea pityocampa*, Schiff., ova, larvae and imagines; *Orgyia gonostigma*, F., larvae; *O. antiqua*, L., larvae; *Dasychira fascelina*, L.; *D. pudibunda*, L.; *Nygmia phaeorrhoea*, Haw. (*chrysorrhoea*, L.); *Leucoma chrysorrhoea*, Esp. (*similis*, Fuess); *Lymantria dispar*, L., a ♂ of this species with a large patch of ♀ coloration on the left forewing was

taken; *Psilura monacha*, L.; *Malacosoma neustria*, L.; *Lasiocampa quercus*, L.; *L. trifolii*, Esp.; *Macrothylacia rubi*, L., larvae; *Gastropacha quercifolia*, L.; *G. populifolia*, Esp., 1 larva; *Saturnia pavonia*, L.; *Aglia tau*, L., a few larvae; *Drepana falcataria*, L.; *D. binaria*, Hufn; *Cilix glaucata*, Sc.

Noctuae.—*Acronicta leporina*, L., larvae and imagines; *A. aceris*, L.; *A. megacephala*, F.; *A. psi*, L.; *A. auricoma*, F.; *A. euphorbiae*, F.; *A. rumicis*, L.; *Craniophora ligustri*, F.; *Agrotis janthina*, Esp.; *A. linogrisea*, Schiff.; *A. fimbria*, L.; *A. interjecta*, Hb.; *A. pronuba*, L.; *A. comes*, Hb.; *A. triangulum*, Hufn.; *A. baja*, F.; *A. c-nigrum*, L.; *A. stigmatica*, Hb., common; *A. xanthographa*, F.; *A. rubi*, View.; *A. brunnea*, F.; *A. depuncta*, L.; *A. margaritacea*, Vill.; *A. multangula*, Hb.; *A. plecta*, L.; *A. nigricans*, L.; *A. tritici*, L., and var. *aquilina*, Hb.; *A. segetum*, Schiff.; *A. trux*, Hb., not common, but fine forms; *A. crassa*, Hb.; *A. prasina*, F.; *Mamestra nebulosa*, Hufn; *M. brassicae*, L.; *M. oleracea*, L.; *M. pisi*, L.; *M. chrysozona*, Bkh.; *Dianthoecia proxima*, Hb.; *D. capsincola*, Hb.; *Bryophila galatea*, Mill., 2 specimens; *B. muralis*, Forst.; *B. perla*, F., and var. *pyrenaica*, Obth.; *B. raptricula*, Hb. var. *deceptricula*, Hb., 2 specimens; *Apamea testacea*, Hb.; *Hadena adusta*, Esp., a very dark form; *H. monoglypha*, Hufn.; *H. lateritia*, Hufn.; *H. secalis*, Bjerk; *Polia dubia*, Dup.; *P. chi*, L.; *Dipterygia scabriuscula*, L.; *Chloantha hyperici*, Fb.; *Callopistria latreillei*, Dup., a few; *Brotolomia meticulosa*, L.; *Mania maura*, L.; *Leucania l-album*, L., a few; *L. conigera*, F; *L. albipuncta*, F.; *L. lithargyria*, Esp.; *Caradrina exigua*, Hb.; *C. quadripunctata*, F.; *C. respersa*, Hb.; *C. morpheus*, Hufn.; *C. alsines*, Brahm.; *C. ambigua*, F.; *Amphipyra tragopogonis*, L.; *A. pyramidea*, L.; *Calymnia trapezina*, L.; *Cosmia paleacea*, Esp.; *Xanthia fulvago*, L., ab. *flavescens*, Esp., 1 specimen; *Calophasia lunula*, Hufn.; *Cucullia lychnitis*, Rbr., larvae; *C. absinthii*, L., larvae; *Heliothis dipsacea*, L.; *H. peltigera*, Schiff., larvae and imagines; *H. armigera*, Hb., larvae; *Acontia lucida*, Hufn. var. *albicollis*, F.; *Erastia pusilla*, View., 1 specimen; *Rivula sericealis*, Sc.; *Emmelia trabealis*, Sc.; *Scoliopteryx libatrix*, L., larvae; *Abrostola triplasia*, L.; *Plusia chrysitis*, L.; *P. chryson*, Esp., 1 specimen; *P. gutta*, Gn., 1 specimen; *P. iota*, L.; *P. gamma*, L.; *P. interrogationis*, L., a few; *Euclidia glyphica*, L.; *Grammodes algira*, L.; *Catephia alchymista*, Schiff., 1 specimen; *Catocala fraxini*, L.; *C. electa*, Bkh.; *C. elocata*, Esp.; *C. nupta*, L.; *C. dilecta*, Hb.; *C. promissa*, Esp.; *C. conversa*, Esq.; *Apopestes spectrum*, Esp.; *A. limbata*, Stgr., 1 specimen; *Toxocampa craccae*, F., very common; *Hypena proboscidalis*, L.; *H. rostralis*, L.; *Habrosyne derasa*, L.; *Thyatira batis*, L. [Staudinger's *Cat.*]

(To be continued.)

NOTES ON COLLECTING, etc.

Grapholitha servillana, Dup., in South Hants.—Although I had very occasionally beaten out from sallow this pretty little Tortrix, it was not until this winter that I secured a long series. I began by careful search for the "gall-like swellings" said to be made by the larvae in twigs of sallows in woods, and met with no success at all. Only by chance was the first mine found at a great distance from any wood, by the bank of the derelict canal that lies between Southampton and Eastleigh. Having made quite sure that the full-fed larva found inside the almost invisible swelling—not very "gall-like" after all—

really was that of *G. servillana*, the task of finding other mines was a comparatively simple one, for they proved to be quite plentiful. By every roadside, where sallow grows in hedge and ditch, they may be found more or less freely, preferring perhaps damp, low-lying situations. They occur commonly in lanes by the edges of woods and sparingly in the most open woodland clearings, but I have not yet found a mine in the more sheltered parts of our woods. All mines found so far have been in young shoots of sallow, but I suspect that occasionally the larva mines in birch, for I found two mines similar to those of *G. servillana* in birch twigs, both unfortunately unoccupied.

The mine itself is very short, varying from 22-28 mm. in length, and is bored in the very heart of the twig. The exit hole is covered by silk mixed with reddish frass and is situated usually about 4mm. immediately above a bud. No frass is extruded unless the exit hole be uncovered, in which case the larva proceeds to stop up the gap with frass and silk. The exit hole is not at the extreme top of the mine, and the space above it is packed quite tightly with frass, though there is also frass at the bottom of the mine. There are many galls and swellings in sallow twigs, but the tenanted mine of *G. servillana* is quite easily distinguished by the presence of the exit hole situated as described.

December and January are the months when the mines are most easily detected, for the buds of the sallow have not then altered the slim outline of the twig. The larva is probably full-fed by the time the leaves fall and the sap ceases to flow, at any rate before December, while the birds have barely begun their patient search. In February the buds are everywhere bursting, and a large number of mines have been ripped open by birds—a very simple matter in the case of these slender twigs. Of mines taken on March 17th, only three out of twenty-eight contained living larvae, so that the morality during the winter seems to be very heavy. Larvae taken in December may be quite easily forced to yield moths in about six weeks. The cut twigs should stand in water and be subjected to a temperature of from 70-80° F. In my own case the source of heat is the kitchen gas stove, which is not used by night, so that the temperature varies considerably. Emergence takes place very much after the manner of an Aegeriid, and the empty pupa case is left protruding. The moth hides in the darkest corner of the cage and is sometimes difficult to box owing to its habit of jumping sharply away, in which again it resembles the clearwings.—W. Fassnidge (M.A., F.E.S.), 47, Tennyson Road, Southampton.

CURRENT NOTES AND SHORT NOTICES.

In the 2 last numbers of *Zeit. fur Wiss. Insektenbiol.*, H. Stauder continues his fully detailed account of the Lepidopterous fauna of the Illyro-Adriatic Zone including the Islands; C. Jaap contributes to the history of the Galls of Thuringia; H. Stichel continues his account of the *Riodinidae* (*Erycinidae*) of S. America; Th. Dobzhansky deals with the *Coccinellidae* of the mountains of Turkestan; H. Wünn writes on the Aphids of Alsace-Lorraine; and there are long articles in the Supplement on the *Cryptinae* (Ichneu.) and the *Lomatia* (Dip.).

In the *Deutsch-ent. Zeit.*, November, is an article on *Brenthis pales* and its forms *isis* and *arsilache*, by E. M. Dadd; K. Pfomkuch gives another contribution to Ichneumonology dealing with *Hemiteles*

species; A. V. Stackelberg writes a revision of the palaearctic genus *Zelima* (Dip. Syrph.); Dr. Vitzthum deals with Parasitism on the bee *Odynerus delphinatus*; there are several other contributions and the Proceedings of the ordinary meetings of the Deuts. ent. Gesell.

In the *Rev. Mens. Namur.* for October, M. l'abbe Cabeau publishes the following new form of *Aglais urticae*, L., ab. *albapicta*. "Anticis insuper alis regionem subapicalem exornat macula alba late effusa." On the upper side of the fore-wings is a very diffuse white spot covering the apical region and is a very prominent feature. In the December number M. F. Derenne publishes the following new forms.—*Colias hyale*, L., ab. *immaculata*. "Posticis insuper alis immaculatis." The hindwings above without black markings; *Leptosia sinapis*, L., ab. *minor*. Much smaller. As a supplement to each part of the Revue there runs a series of additions to the *Catalogue des Lep. de Belge* of the late M. Lambillion, bringing his work up to date.

REVIEWS AND NOTICES OF BOOKS.

Ueber Chinas Pyraliden, Tortriciden, Tineiden nebst kurze Betrachtungen, zu denen das Studium dieser Fauna Veranlassung gibt. [A Biographical Study]. pp. 128. With 2 plates. By Aristide Caradja (Prince). Academia Romana. Ser. III. Tom. III. Mem. 7. 1925. Bucharest.—This work is not a mere list of the species recorded as having come from China, but an intensive study of the collections made by Herr Hoene in the years 1917-1923, with all that could be obtained from the Staudinger Firm and from the author's extensive private collections. There are 726 forms dealt with, of which 325 are new to the Chinese fauna and 91 are new to science. More than 600 are Pyrales; the new Tineids and Tortricids are described (in English) by Edw. Meyrick; and many species were sent to the British Museum where they were compared by Mr. H. W. T. Tams with the Hampson arrangements of the Pyralid group. The whole work is printed in German and thereby rendered accessible to a much larger circle than if the author had used his native Roumanian. The first portion of some 36 pages is a Biographical Essay of considerable importance, summing up the results of the study and stating the inferences to be made from a comparison of China geographically with the adjacent areas of the great Indo-Malay Region, from the point of view of their lepidopterous inhabitants. In some parts the line of separation between the palaearctic and subtropical faunas is very sharp, for example, north and south of a line from Nanking west to Hangtschou, well demonstrated by the *Pyralidae*. The Pyralid fauna in South and West China is a purely Indian one with a high percentage of endemic species and forms. Close comparisons are made with the faunas of the various groups of islands, and suggestions made as to where there were land bridges in distant geologic times. The author apologises for any errors there may be in the text and in the production of the plates, stating the impossibility of getting the efficiency one expects in more western countries. However we must congratulate him for carrying through a piece of real work, which wanted doing, to the best of his opportunities. It will form a necessary step to all further work in China.—Hy.J.T.

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Large numbers of living larvae of *Hyponomeuta* spp. from Hawthorn, apple and Euonymus. It is essential that host plants should be specified and larvae from each host plant kept separate. The original colonies should be preserved and not mixed with others.—*W. H. Thorpe, B.A., Zoological Laboratory, Cambridge.*

Desiderata.—The Leicester Museum has no British Diptera and requires a typical collection. Can any collectors help us? We offer European Butterflies in exchange..'—"Entomologist," Leicester Museum.

Desiderata.—Ova or pupae of christyi, abruptaria v. brunnea, black consonaria and bidentata, extensaria, curzoni, jasionata, venosata (Shetl.) and other melanic Geometers and Noctuae.

Duplicates.—Very many in first class condition, high-set only f. i. Herminia flavicrinais, Andreas, Nych. dalmatina race andreasaria, Warnecke, about 30 species of rare Acidalias ; pupae of Eupithecia illuminata or cash.—*Karl Andreas. Wiesbaden, Goethestr. 23, Germany.*

Change of Address.—A. Fergusson, Esq., F.E.S., to 433, Kilmarnock Road, Newlands, Glasgow.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. March 17th. April 7th. May 5th. June 2nd.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. March 25th, Dr. E. A. Cockayne, "Intersexes in the Lycaenidae." April 8th, April 22nd. —*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.*, J. P. Hardiman, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

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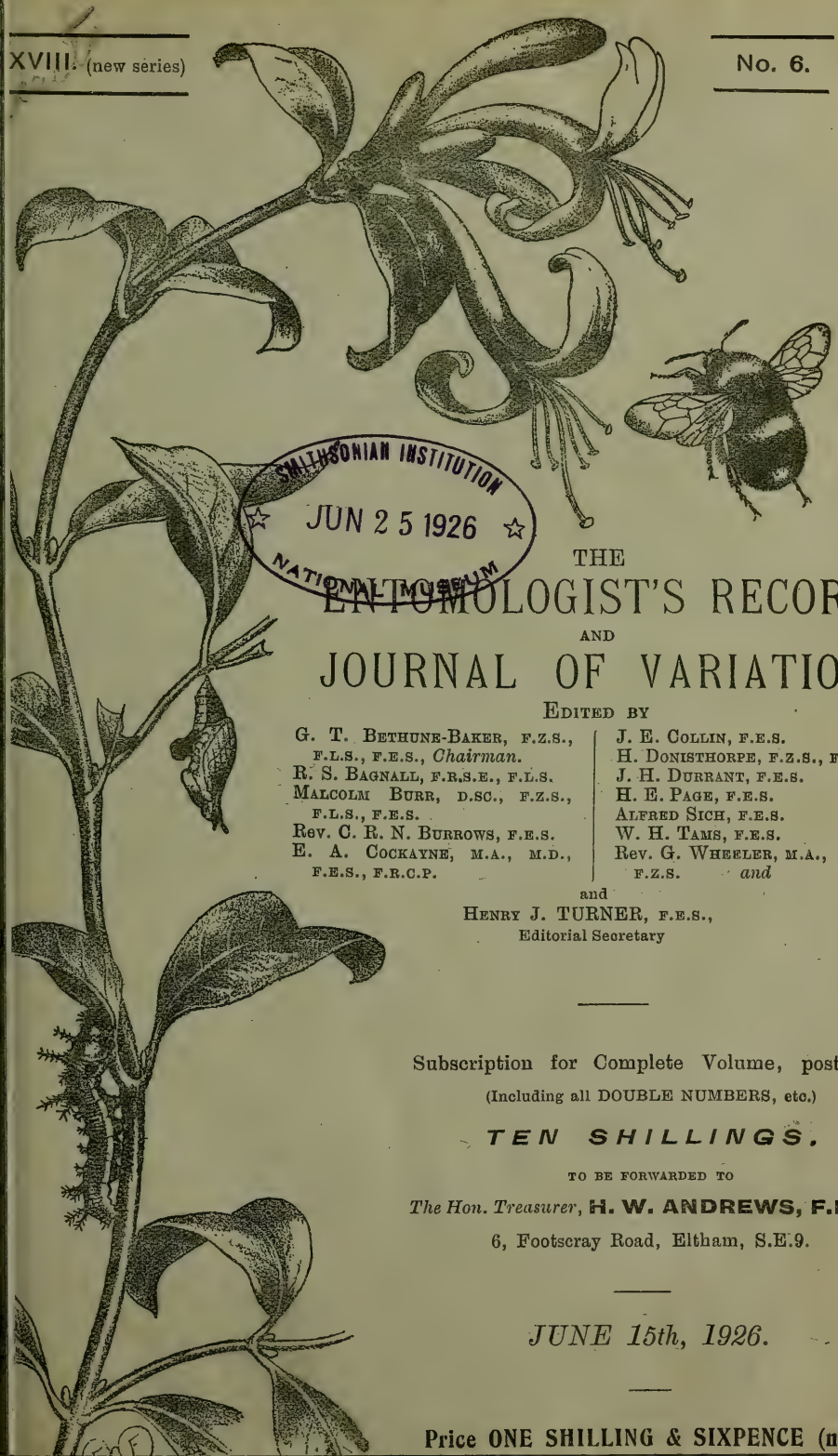

THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

EDITED BY

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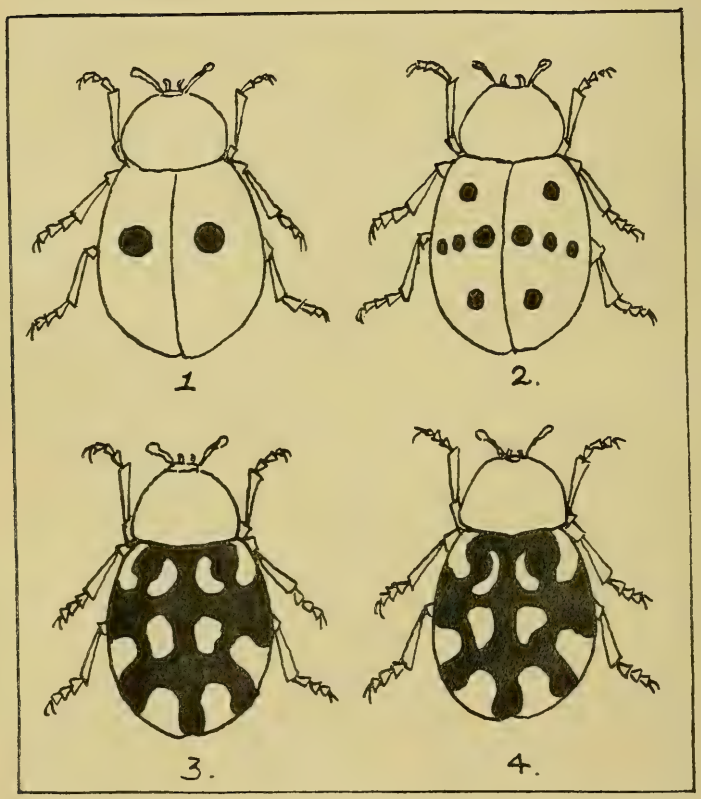

The Entomologist's Record. *del. F. Marriner.*

1. *Adalia bipunctata*, L. 2. *Coccinella variabilis*, Ill.

3. Bred Specimen of Hybrid called "K" in the Notes, and for which name *Coccinella biabilis* is proposed.

4. Specimen of 3 taken wild.

A natural Coccinella Hybrid.

A Hybrid Coccinellid. (Plate II.)

Notes by T. FRED MARRINER, F.E.S.

Since 1921 I have been carrying out breeding experiments in connection with several species of our British *Coccinellidae* and I am told it is quite time I published, at least some of, my notes. Certainly, during this period I have got together quite a mass of notes, but for the most part, they are, up to the present, only notes, and they will require sorting and arranging. Even then, I am afraid, our Editors would look askance at the number of pages that would be required for their accommodation. There are, however, certain portions which might prove of immediate interest, and which might induce others to attempt work along the same lines, not only for the sake of verification of my own work, but because there is so much yet to be done.

There is only one of our British *Coccinellidae* which shows more variation than *Adalia bipunctata*, and that is *Coccinella variabilis* (*10-punctata*). Most of the work done in connection with the variations of *A. bipunctata* has been done by Meissner and Schroder, and their classification of the variations depends almost entirely upon elytra coloration.

Briefly put there are two principal forms (a) the Type, in which the elytra are reddish with a black spot of varying size and shape about the middle of each elytron, (b) a form in which black preponderates with reddish spots, varying in number and size upon each elytron.

The best known of these variations are *4-maculata* with two red spots in each elytron, and *6-pustulata* with three red spots on each elytron. There are very numerous other variations, some of the more persistent and pronounced of which have been named, but, roughly speaking, all may be classed under heads (a) and (b), above. So far we have not very complete, reliable statistics to go upon, but, taking the country as a whole, except in certain localities, the red varieties appear to be the commoner. Personally, I have noted, that in all localities where I have made observations, the red varieties predominate in the earlier broods of the year before the hottest weather sets in, whereas, if later, July, August, and September prove fine and hot, then I have found the black forms to predominate. I have noted this on more than one occasion, but my observations are necessarily confined to north country hunting grounds. In a favourite resort of mine my figures for June, 1921, are 30% black forms and August, 1921, 82% black forms, and these are about the average for all the years I have visited that particular area. I have found both red and black forms in hibernation, and on pairing *4-maculata* with *4-maculata* the only 3 survivors to the imago stage were *4-maculata*. A male *4-maculata* paired with a female of type form of *bipunctata* resulted in 5 imagines, 3 of which were *4-maculata* and two not quite, but nearly, type form. In 20 experiments of mating two type forms no really black form resulted, though some of the imagines did approximate to *4-maculata*, but with the red coloration different from that in what is known as *4-maculata*. With these observations to guide me I experimented and found—

1. Type form *bipunctata* is more difficult to rear than darker forms, and especially in the larval stage, where the least neglect or inadequacy of food supply is immediately fatal.

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2. Dark forms (b) will live and thrive in a temperature which kills off lighter or type forms (a).

3. Dark forms are more catholic in the matter of food and not so liable to die off at once if supplies get low.

There is another curious feature worth noting in connection with *bipunctata* in my local collecting grounds. The numbers of type form, always fluctuating from year to year are, I believe, becoming now gradually less. In some areas here it has not been seen for some years now; 1921 was the last year when I myself noted it in any quantity in any of our country areas. On the other hand the black forms seem to be on the increase, at any rate in late summer, when most of my outdoor work in the woods is done.

But by far the most interesting portion of my study has been that in connection with what I have discovered to be a hybrid. Space will not permit of a complete record, so a few notes must suffice for the present occasion. *Bipunctata* is both polygamous and polyandrous. As has been stated above, if a male of type form be mated with a female of type form the resulting imagines are as a rule type forms, though there is an occasional approach to black form. When a male of type is wedded to a female *4-maculata* the results with me at any-rate, have tended to *4-maculata*. *A. bipunctata* will mate readily with *C. variabilis* or with *C. 14-guttata*, and it was an accidental mating of *A. bipunctata* female with male of *C. variabilis* in one of my breeding boxes, which originated my experiments with the form so well-known to collectors, so often classified by them as *C. variabilis* and of which as yet the origin has not been stated.

Throughout my experimental notes I have referred to this hybrid as 'K' and will continue for the present so to call it. I had two facts to go upon (1) I had taken 'K' quite freely in August and September in a locality where *A. bipunctata* and *C. variabilis* were both fairly common, the latter especially so. (2) This specimen 'K' accidentally bred from a mating of a female *bipunctata* with a male *variabilis*. Further matings were tried with a fairly stable preponderance of 'K' variety resulting in every case. These were followed by mating 'K' with 'K.' According to the law of Mendelism the the result should have been either nil or a reversion to one of the type forms. There were certainly some reversions to type mostly of *variabilis* with an occasional type *bipunctata*. That there were not more of the imagines showing reversion is, I think, to be explained by the fact that only a small proportion of the ova in any case came through the larval and pupal stages successfully. Those who have tried breeding *Coccinellidae* will understand this. Now I found that these 'K' forms were much more hardy than the normal or type forms of either *bipunctata* or *variabilis*. They will stand, without harm, greater variety in feeding, periods of food scarcity, and greater extremes of temperature. When food is more plentiful they are also much more voracious than either of the type forms. In all those I have bred during 5 seasons, and in all those I have taken wild of 'K' there has been practically no variation in elytra markings except occasionally in the size of the spots and the shade of light and dark colours, and the colour of the legs which are sometimes black, sometimes light.

To come to a fine point of distinction, if the characteristics of *A. bipunctata* and *C. variabilis* as given by Fowler be applied to 'K' I

doubt if a single specimen would be found which tallies exactly and wholly with either, yet every specimen I have taken or bred has some of the characteristics of both, and this, once its origin is recognised, is only natural. Taken on the whole however, and including all points (black legs, etc.), upon which the classification is usually made, I find the hybrid leans more to *Coccinella* than to *Adalia*, and therefore propose for it the name hyb. **biabilis**, so as to include both its undoubted progenitors, and denote its true origin.

Here we have what may be termed a Natural Hybrid hardier than either of its progenitors. As to its distribution, it is to be found wherever the two forms *bipunctata* and *variabilis* are found together, though I may add that locally this hybrid has spread from such areas and is now to be found in almost any part of the countryside around the woods, where I first came across it. Correspondents tell me they have taken it in similar areas where the two types are found together in South East and Midlands. On the other hand, so far as my present data go, 'K' is not found in localities, where only one of the two *bipunctata* or *variabilis* is found, but upon this point I want more data. I have taken it on oak, beech, pine, fir, whin, garden rose, and by sweeping low herbage, under or near these trees. In captivity I have fed it on aphis from rose, beech, pine, and on honey and crushed plum and nettle pollen when aphis failed.

If one might be permitted to theorise upon this insect, one is inclined to say that here is probably a new species in process of evolution. Of hybrid origin it is worthy of note that so far I have only succeeded when starting with the *female* of *bipunctata* and male of *variabilis*. With male *bipunctata* and female *variabilis*, I have not so far been successful in producing any imago of 'K' type. This insect has become fairly common in nature and can be taken when neither of its original progenitors are to be found, simply, I am led to believe, because it is more hardy. To argue that its production is contrary to the laws of hybridisation is not to allow for the fact that in the breeding of any Coccinellid in captivity and in nature, only a small percentage of the ova ever get through to maturity, and naturally the weakest perish, while the strongest and sturdiest survive, and this fact would seem to show that 'K' is a sort of survival of the fittest and probably a new species taking the place of less hardy species, at least in the North here. To really settle the matter more data must be accumulated and more experiments must be made, and I should be pleased to hear the results of any collecting experiences or breeding experiments, which might be helpful towards this end.

Description.—*Coccinella* hyb. **biabilis**, varies from oval convex to hemispherical, thorax black, sometimes light at anterior angles or margins, sometimes spotted. Elytra finely punctured, the transverse fold of *variabilis* sometimes present, often absent. Legs either black or yellow, underside dark, often black. Elytra with 5 yellowish (varying to very reddish yellow) spots, as in diagram, on black, dark brown, or yellowish brown ground. Spots vary in size but the shape of the two lunar spots is an unvarying characteristic. Occasionally the 2 apical spots joined at apex.

Distribution.—So far recorded from Kent, Sussex, Essex, Hants, Cumberland, but probably everywhere where *bipunctata* and *variabilis* are found together.

A new Species of Zygaena from Spain.

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

In the late Autumn of last year Signor Querci sent me, among other insects, a most interesting lot of species of the genus *Zygaena*, and among them was a series of a small peculiar little species, which he sent me under the name *stoechadis*, but I felt sure at my first glance that they could not be that insect and I put them down at once in my mind as *Z. meliloti*, Esp., but rather more densely scaled; they were the same dull neutral blackish colour when looked at flat in front of one, but in certain lights sideways there was a slight bluish tone in very fresh specimens. They were however a puzzle, and the more I looked at them the more sure I was they had nothing to do with *stoechadis* and that they must be *meliloti*. This species, however, has not been recorded from Spain. They were captured in company with *trifolii*, Esp., at Llobregat near Barcelona. There was only one thing to do to make certain of the species, *viz.*, to make preparations of the genitalia. This I have now done and the specimens are neither *stoechadis* nor *meliloti*, but a new species holding possibly a similar relationship with *Z. astragali*, Bkh., as does *meliloti* with *filipendulae*; this, however, requires, more investigation. It will be remembered that in the genitalia of the latter species the tegumen is highly bifurcate, being divided into two long curved finger-like sclerites. *Z. meliloti* has the same formation and so belongs to the *filipendulae* section and not to the *lonicerae*, Geh., section, which has not the finger-like sclerites. I do not consider *filipendulae* and *lonicerae* are nearly related as does Dr. Verity; the genitalia shows them to belong to two different sections of the genus and this new species, which I propose to call *Z. elorinda*, belongs to the *lonicerae-trifolii* section, where the tegumen is very shortly bifurcate being merely divided into two broad short sub-triangular lobes. I will now describe the species.

Zygaena **clorinda,** *sp. nov.*—♂. Upperside. Primaries dull bronzy blackish, in a side light with a greenish blue tone, with two basal red dashes, sometimes quite separated by the neuration but not always; two red spots in the median area, that near the base of the cell, small and oval, that below the cell is further out and large: a fifth spot at the end of the cell. Secondaries carmine red inclined to be somewhat hyaline, the dark bluish black border very broad to the anal angle. ♀ like the male but the primaries are perhaps slightly bluer in tone of colour.

Below, the spots in both sexes are as distinct and separate as above there is no trace of any suffusion.

Expanse ♂ 28, ♀ 26 mm.

Hab., Llobregat, Catalonia—October. (Querci.)

Types in my collection 12♂♂, 10 ♀♀.

The genitalia—the tegumen is shortly bifurcate being divided into two short sub-triangular lobes; the harpagines (clasps) are large and irregular in their lower outline being waved, the apices being furnished with an abundance of long hairs, not extending down along the lower margin much, as in *meliloti*; the oedaeagus is large, provided with a very large armature of long tusk-like sclerites arising from a closely shagreened cushion, whilst in the lower apex of the penis-

sheath there is a small cluster of short teeth. Comparing it with *meliloti*, as already stated, the latter has the tegumen deeply bifurcate forming two long finger-like processes, the front part of the clasps is furnished much more copiously with long hair extending over nearly half of the organ and not at all confined to the apex, whilst in the oedaeagus the shagreened base from which the armature arises is smaller and less heavily scaled, but the armature at the base of the penis-sheath is very much larger with a great mass of scaling.

It seems to me that, as is so often the case in other families, we have different sections of this genus, which vary along analogous lines as in other sections, and we shall find quite similar variations in the *astralagi-angelicae-lonicerae* group as we get in the *filipendulae-stoechadis-ephialtes* group, only the latter has developed more than the former at present.

I have much pleasure in dedicating this species to Signora Querci, who has done almost as much as her indefatigable husband in the exploration of the Lepidoptera of their own land, as also of Spain during the last two summers. She has accompanied her husband in all his excursions, and little passes her keen eye and quick hand.

Collecting in the Balkans in 1925.

By P. P. GRAVES, F.E.S.

I. Corfu and Athens.

I unfurled my net for the first time after three years in the Near East on July 4th last at Corfu. I stayed five and a half days on the island and collected daily, but limited my researches to three spots only, the gardens that surround the lovely villa called Mon Repos in the suburbs of Corfu town, the rough country on each side of the mouth of the River Potamos (the river is what its name means and there is no adjective, *e.g.*, Aspropotamo or Mavropotamo as is usual with other Greek streams, I suppose because there is no other important stream in Corfu island), and finally the olive woods about 12 miles S. of Corfu, on the coast 4 miles S. of the village of Benitza.

Though the season had been early and droughty, butterflies having been rare in the spring according to Mr. Wyndham Forbes who visited the island then, I found fair numbers of the Lycaenid second broods and of some of the Satyrids, which I wished to take. *Papilionidae* were rare. I took one battered *Papilio machaon* on the little islet of Vido in Corfu harbour, and saw a couple of uncatchable *Iphiclides podalirius* in gardens. Of the *Pieridae* I found plenty of fine second brood *Pieris brassicae*, far fewer *P. rapae* presenting no remarkable features, and scarcely any *Pontia daplidice*. *Colias croceus* were frequent and small and a few *Gonepteryx cleopatra* of the Greek race, in which the female is tinged with a rather orange yellow on the upper side and which has, I think, been named by Dr. Verity, flew in the Mon Repos Gardens. *Leptosia sinapis* with many ab. *diniensis* flew chiefly in the shady olive woods on the hillsides near Benitza.

I was too late for the majority of the Vanessids, which in the Near East, in my experience, retire to aestivate before the beginning of July. I speak here of low elevations South of the main Balkan chain and below the Asia Minor Plateau level. They are seen occasionally

in the autumn, emerge on fine winter days and appear in spring just as they do in Central Europe. *Polygonia egea* was of course out, and *Pyrameis cardui*. I saw only one *P. atalanta* and it was in bad order. I took a single *Melitaea didyma* at Benitza, an early specimen of the second brood answering to *dalmatina*, Stgr., which is in many parts of the Near East the second brood form of *M. didyma* race *occidentalis*, Stgr. But the finest Nymphalid by far was the magnificent and huge local race of *Dryas paphia*, which Dr. Buresch of Sophia has very rightly named *kerkyrana*. It was not common and not easy to catch, but occurred in all the places which I visited. The female is of an exceptionally bright orange brown ground colour, the dark markings in both sexes are large, the ground colour of the male bright and in both sexes the silver markings on the underside are strongly developed, quite unlike most of the Greek specimens in the British Museum Collection which are of the *anargyra* form in this respect. I took one worn *Limenitis rivularis* (*camilla*) at Mon Repos.

Of the Satyrids *Pyronia* (*Epinephele*) *ida* was disappointingly rare. I only saw half-a-dozen all told, mostly females, and none of these at Benitza. Very large *E. jurtina*, of a *hispulla*-like form in general, abounded in the thick and well-watered Mon Repos Gardens, but I failed to find *E. lupinus* anywhere. Of the Pararges, *P. megera* and *P. maera*, were very uncommon. The former seemed on the way to race *lyssa*, Bsd., while the latter was race *orientalis*, Stdgr. *P. aegeria* was transitional to the typical Southern race, but in this connection I should like to say, that there seems to me to be a marked difference between the *P. aegeria* of Syria and Greece and those of S.W. Europe. I do not know quite what to call my Corfu *P. aegeria*. They seem to me to agree on the whole with specimens from Tuscany in the British Museum Collection. The species was frequent, though often worn in the Mon Repos Gardens, and rare elsewhere. There too fresh females of *Dira* (*Pararge*) *roxelana* occurred, but the males were worn out. *C. pamphilus* race *marginata*, Rühl., was abundant and variable giving me some nice aberrations. Two Satyrids proper occurred; *S. syriaca* abounded in the Olive Woods where *Hipparchia semele* was rare, while *H. semele* swarmed under the thick shrubberies of Mon Repos, where I scarcely saw any *S. syriaca*, and was often in perfect condition. I should call the race trans ad. *cadmus*, Frühst., rather than *senthes*, Frühst. Above the coast beyond Benitza I found a few *Melanargia larissa* of the S. Albanian race, which Frühstorfer rightly says is identical with Freyer's figure (*Beitr.*, Pl. 73, 1) and has named race *freyeri*. I was, however, too late for the main emergence of this fine *Melanargia*. In this connection I may say, that the first figures of *larissa*, which are to be found in Hübner-Geyer (fig. 896-899), but, as far as I know, lack any text, resemble Constantinople specimens so much as to justify the assumption that the type came from there or thereabouts. The general confusion of the Balkan Peninsula in the period 1815-1830, the widespread prevalence of brigandage in that period in Asia Minor and Syria and the risk and difficulty of travelling in the interior, even on the few main routes, suggest that the butterflies and moths recorded from 'Turkey,' without further detail, in that period and a little later, were mostly taken near Constantinople, Smyrna and Salonika, relatively, though only relatively, safe hunting-grounds for the Aurelians of the day.

Of the Lycaenids I found few species. *Heodes* (*Rumicia*) *phlaeas* was heavily suffused and large. *Lampides boeticus* not rare, *Syntarucus telicanus* represented by a single male and *Plebeius medon* race *calida* and *Polyommatus icarus* race *zelleri*, Vrty., which were abundant. A curious little "blue" extremely resembling a Nazareth specimen recorded in the *Trans. Ent. Soc. Lond.*, 1925, pp. 60, 61, wants further investigation. I added a new species to the insular fauna in *P. thersites* of which I took five specimens at Mon Repos and S. of Benitza. The two females taken have the blackish submarginal spots on the upper-side of the hindwings outwardly lined with blue, but I have no proof that this is a racial character.

I expected few Grypocera but not as few as I actually noted. These were, one ♀ *Erynnis alceae* race *australis*, a single rather worn ♀ of *Adopaea flava* at Benitza and worn *Thymelicus acteon* at several places, one so weather-beaten and large and damaged, that I thought I had a battered *Gegenes lefebvrii* in my possession. Of the Heterocera I must say something on another occasion. Mr. Wyndham Forbes has very kindly given me a list of the butterflies which he noticed in the spring on the island. These include the following:—*E. ausonia* (*belia*), one of the first brood near Gasturi on April 11th, second brood more plentiful, first seen on May 20th. *G. cleopatra* frequent, April 13th. *Euchloë cardamines*, April 13th. *Scolitantides baton*, from April 19th, not common. *Cupido minimus*, April 29th. *Lycaenesthes argiolus*, April 13th. *Glaucopsyche cyllarus* and *Callophrys rubi* were taken on May 6th on the Aghia Deka Mountain with *Pararge megera*, *C. cardamines* and *C. croceus*. In May *M. didyma* first appeared on the 18th, *L. rivularis* and *M. larissa*, on May 20th. A single *Papilio alexanor* occurred on May 24th. *Plebeius argus* (*aegon*) was taken on May 20th. Only one or two worn *M. cinxia* were seen on May 11th. Between June 22nd and June 25th, when Mr. Forbes returned to the island, *D. paphia* was frequent.

On July 11th and 12th I was at Athens. I put in an hour's collecting near Daphne on the 11th in a high hot wind. Few insects were out. These included a few *Hipparchia anthelea* race *amalthea*, a new species to me, with a flight, which seemed to me intermediate between that of *H. semele* and *H. briseis*. With it I took a simgle ♀ *Satyrus fatua* and two ♂s of a fine race of *S. statilinus*. *P. daplidice*, *E. alceae*, a huge ♀ *P. machaon*, *P. cardui* and three very nice *Chilades trochilus*, my first European specimens of this species, were likewise noted or captured. Next day I collected a little on the rough ground beyond Kephisia at about 1,000 feet. It was far too late in the afternoon to do much but I took *S. statilinus*, *P. medon*, worn *M. larissa* and two or three females of a *Hyponephele* which were in bad order, but appeared to me to be *H. lycaon* and not *H. lupinus*. I may add here, that during the last days of February and the beginning of March last year, I saw or took *L. argiolus*, the two common whites, *P. daplidice* race *bellidice*, *G. cleopatra*, *C. croceus* and *P. megera* near Athens, and on March 8th on the railway between Salonika and Keuprülü, during a halt near the gorge in the Vardar Valley known as the Iron Gate (Demir Kapu), I recognised *P. rapae*, *P. napi*, *P. daplidice*, *G. rhamni* and *I. lathonia*.

(To be concluded.)

Butterfly Collecting in the Belgian Ardennes.

By GEORGE TALBOT, F.E.S., and JOHN B. HICKS, F.E.S.

Undoubtedly there are few localities in Western Europe which are more picturesque, and at the same time more interesting to the lepidopterist, than the Belgian Ardennes. In certain districts this forest region offers a considerable variety in the way of butterfly fauna, some examples of which are particularly worthy of note. Such a district is that of the neighbourhood of Virton, a small town near the extreme Southern frontier of Belgium, where that country drives a wedge into France.

It was owing to the kindness of Mr. Francis J. Ball, who is resident in Belgium and one of the leading authorities on Lepidoptera in that country, that the writers of this article were able to make their expedition into the most promising parts of the Ardennes to collect on behalf of Mr. J. J. Joicey's Hill Museum at Witley. Mr. Ball gave us, not only the benefit of his knowledge of the localities and their butterflies, but also the benefit of his company and that of his sons, Messrs. John and Antoine Ball. In addition to this, his automobile was a very great boon to us, enabling us to see much beautiful scenery and many interesting towns en route, besides eliminating the necessity of frequent changes of train, which otherwise would have been the case.

On the evening of Tuesday, June 18th, having journeyed from Brussels by way of Namur, Dinant and the Meuse, we pulled up at the door of the Hotel du Cheval Blanc, which was to be our headquarters during the stay at Virton. It is an old, rambling house, thoroughly comfortable and recommendable, and supplying excellent beverages, which are so welcome after a hard day's collecting in the broiling sunshine; in fact, a hotel thoroughly in keeping with its rustic surroundings. Here we were greeted by the sixth member of our genial party—M. Franz Derenne, Secretary of the Société Entomologique Namuroise. And on two occasions we were joined by M. l'Abbé Cabeau, another enthusiastic lepidopterist.

Our stay at Virton—from the evening of Thursday, June 18th, till the morning of Monday, June 22nd—was everything that could be desired; pleasant, with fine weather, and quite profitable from an entomological point of view, but no sooner had we left Virton and were on our way northward to our next hunting-ground, than the rain started to pour in torrents, choosing for its début a moment when the car had a bad puncture! But in spite of these inconveniences we reached Hockai, some four miles east of Spa, in the course of the afternoon. Hockai stands very high, at an elevation of 580 metres above sea level; consequently at the time of our arrival it was enveloped in the clouds, making the beautiful surrounding scenery invisible. The rain continued its steady downpour all through that night and the following day, with no prospect of ceasing, so that, in spite of the comforts of the Beau Séjour Hotel, we all agreed to abandon our entomological expedition on the morrow, and return to Brussels. This we did reluctantly, on Wednesday, June 24th, with self-promises to come again next year, if possible, and hopes for "better luck next time."

Brigadier-General B. H. Cooke, in his interesting account of a

summer in the Hautes Pyrenees, particularly mentions the friendliness and politeness of the inhabitants of that region. Exactly the same may be said of the Walloons of Southern Belgium, who are courtesy itself. An amusing incident occurred at a wayside inn, where the proprietor and his wife, on ascertaining that we were Englishmen, insisted on hunting up their small offspring in order to shake hands!

Our three days of collecting in the neighbourhood of Virton were divided as follows:—

(*a*) June 19th. Harnoncourt and Torgny. Here the ground consists of hills of jurassic limestone, from 400 to 600 feet high, crowned by woods. The uncut grass by the borders of these woods fairly swarmed with *Coenonympha arcania*. This district, like all others in the places which we visited, is a veritable paradise for the botanist. The Bee Orchis (*Ophrys apifera*) was conspicuous by its abundance.

(*b*) June 20th. Vallée de Rabais. A beautiful wooded valley, a few miles in length, favoured by *Aporia crataegi*, the swift-flying *Limenitis populi*, *C. arcania*, and other interesting species. By the banks of the stream watering this valley there is much marshy ground; this was the haunt of *C. tiphon*, *Melitaea aurinia*, *Brenthis ino*, *Heodes hippothoë* and others.

(*c*) June 21st. Vallée de la Claire Eau. A densely wooded valley between Buzenol and Ethe, about 6 miles long, even more picturesque than the last, and watered by a pretty stream which unfortunately in spite of its name, is not good to drink. Here the swampy ground was the haunt of *Zygaenidae* (*Zygaena* and *Procris*) in abundance. Specimens of *H. hippothoë* with ab. *confluens*, and many other aberrant forms were also taken here in a certain restricted area.

Our first day at Harnoncourt and Torgny was too windy with little sun. The second day at Rabais was hot. The third day at la Claire Eau was not so fine and mostly cloudy, and rain fell about 4.30 p.m. and continued. The fourth day was a very stormy one and the route lay through Martelange, Bastogne, Houffalize, Vielsalur, Stavelot, Spa and Hockai. We had the pleasure of a visit at Hockai of Monsieurs P. Delcour and Herment, two ardent entomologists from Spa. They reported that previous to the bad weather *Colias palaeno* race *europome* was common, and *Brenthis aphirape* f. *haverkampfi* had been taken, This curious form, resembling indeed a distinct species, was discovered by Mr. F. Ball and seems to be restricted to Hockai, where it flies in company of typical *B. aphirape*.

On the whole our tour was not the success it should have been on account of bad weather and the early season, which accounted for the worn condition of most specimens.

It is worth noting that at Torgny, *Polyommatus coridon* occurs with specimens which possess the scale structure of *hispana*. This fact was established by Mr. Ball. Mons. Derenne informed us that he collected some of these *hispana*-like specimens there in August. He took also *P. thersites* and *P. icarus* at this time. Mr. Ball took the *syngrapha* form of *coridon*. Mons. Derenne found very wet weather at Virton in July, but was able to obtain specimens of *Apatura iris* and of *A. ilia*. At the end of July he took *Erebia ligea*, L., at Spa.

The following species were obtained by us during the three days collecting, and all the specimens were placed in the collection of the Hill Museum, Witley.

We are indebted to Mr. L. B. Prout for determining the *Geometridae* and to Miss A. E. Prout for the list of *Noctuidae*.

Pieridae.

Colias palaeno race *europome*, Esp.—Not taken by us. Occurs at Hockai near Spa. The Hill Museum was presented with a series by Monsieur P. Delcour who visited Hockai with better luck than we did on another occasion.

C. hyale, L.—A single worn ♀ taken in the Vallée du Rabais.

Euchloë (*Anthocharis*) *cardamines*, L.—Several seen, mostly of large size. Vallée du Rabais, de la Claire Eau, and at Harnoncourt. Took 2 ♂♂, 1 ♀.

Pieris rapae, L.—1 seen in V. de Rabais.

P. napi ab. *impuncta*, Rob.—1 ♂ Vallée du Rabais, 1 ♂ Harnoncourt.

P. brassicae, L.—1 ♀ V. de Rabais.

Aporia crataegi, L.—Vallée de la Claire Eau and Rabais, 3 ♂♂. Mr. Ball says this used to be common at Moorsel-lez-Alost and North Belgium, but has now entirely disappeared from that locality.

Gonepteryx rhamni, L.—1 ♂, 2 ♀♀. V. de Rabais. Very worn indeed.

Nymphalidae.

Limenitis populi, L.—This species was seen mostly in the Vallée du Rabais but also at Claire Eau and was difficult of capture. One female was noted but not taken. A series of 6 ♂♂, including one transitional to ab. *tremulae*, Esp., of which typical examples were taken by others of our party.

Dryas paphia, L.—Vallée du Rabais, 1 ♂.

Brenthis ino, Rott.—Very common in the Vallée de la Claire Eau and also found in the Vallée du Rabais.

Brenthis selene, Schiff.—V. de la Claire Eau, 2 ♀♀.

Melitaea dictynna, Esp.—V. du Rabais and V. de la Claire Eau, a series of both sexes.

M. cinxia, L.—V. de la Claire Eau and V. du Rabais, a few but worn.

M. athalia, Rott.—Harnoncourt.

M. aurinia, Rott.—V. de la Claire Eau, and Rabais, 5.

Satyridae.

Coenonympha arcania, Rott.—Common at Harnoncourt and in the V. de la Claire Eau.

C. typhon, Rott., race *philoxenus*, Esp.—V. du Rabais and Claire Eau, 5♂♂.

C. pamphilus, L.—Harnoncourt and V. de la Claire Eau, and Rabais, a few.

Epinephele jurtina, L.—Common at Harnoncourt and V. de la Claire Eau.

Aphantopus hyperantus, L.—Vallée de la Claire Eau, 1♂; V. de Rabais, 1♂.

Erebia medusa, F.—V. du Rabais, 1 ♀.

Pararge aegeria, race *egerides*, Stgr.—Harnoncourt 1 ♂, V. de la Claire Eau, 1 ♂.

P. megera, L.—V. du Rabais, 1 ♂.

Lycaenidae.

Heodes hippothoë, L.—V. du Rabais, 1 ♂. Commoner in the V. de la Claire Eau, and in one area most of the specimens were aberrational, both sexes showing asymmetry in the markings of the underside. One fine ♀ ab. *confluens*, Grh., was taken by Mr. Hicks. On the underside this is nearly black with some yellow basal scaling on forewing. On the upperside the ♀ ♀ were very light to very dark on the forewing, one dark specimen having the red marginal line of the hindwing absent on one wing.

H. dorilis, Hufn.—V. de la Claire Eau, 1 ♀.

Callophrys rubi, L.—V. du Rabais, 1 ♀ worn.

Polyommatus semiargus, Rott.—V. du Rabais and V. de la Claire Eau, a few of both sexes.

P. icarus, Rott.—Harnoncourt, 1 ♀, V. de Rabais, 1 ♂ aberration with pale underside, and basal spots of forewing indistinct.

Cupido sebrus, Bdv.—Harnoncourt, 1 ♀.

C. minimus, Fuess.—Harnoncourt and Claire Eau, 2 ♂ ♂, 2 ♀ ♀.

Glaucopsyche cyllarus, Rott.—Harnoncourt, 1 ♂.

Plebeius medon, Esp. (*astrarche*, Bgstr.).—V. du Rabais, 1 ♀.

P. argyrognomon ♀ *f. unicolor*, Favre.—V. de la Claire Eau, 1 ♀.

P. argus, L.—V. de la Claire Eau, 1 ♂.

Hesperiidae.

Adopaea flava (*thaumas*), Hufn.—V. du Rabais, 4 ♂ ♂.

Augiades sylvanus, Esp.—Common in all localities.

Erynnis (*Carcharodus*) *alceae*, Esp.—V. du Rabais, 2 ♂ ♂.

Hesperia malvae, L.—V. de la Claire Eau and V. du Rabais, 4 ♂ ♂.

H. sao, Bgstr.—Harnoncourt, 1 ♂

Cyclopides palaemon, Pall.—V. de la Claire Eau, 1 ♂.

Zygaenidae.

Zygaena trifolii, Esp.—Common in the V. de la Claire Eau. Two specimens of ab. *trivittata*, Spey.

Z. filipendulae, L.—A few in the V. du Rabais and V. de la Claire Eau.

Procris statices, L.—Very common in the V. de la Claire Eau and V. du Rabais.

Arctiidae.

Diacrisia sannio, L.—V. du Rabais 2 ♂ ♂ 1 ♀.

Spilosoma purpurata, L.—V. du Rabais, 1 ♂.

Liparidae.

Arctornis l-nigrum, Mull.—V. du Rabais, 1 ♂.

Drepanidae.

Drepana falcataria, L.—V. de la Claire Eau, 1 ♂.

NOCTUIDAE.

Gortyna ochracea, Hb.—V. de la Claire Eau, 1 ♂.
Mamestra oleracea, L.—Common in the district, and taken in the hotel.
Trachea atriplicis, L.—V. de la Claire Eau, 1 ♂.
Apamea basilinea, F.—1 ♂.
Xylophasia rurea, F.—V. de la Claire Eau, 1 ♂.
Mamestra pisi, L.—V. du Rabais, 1 ♂.
Euclidia glyphica, L.—Harnoncourt and V. du Rabais, common.
E. mi, Clerck.—Vallée du Rabais, 2 ♀ ♀.
Acontia luctuosa, Esp.—Harnoncourt, 3 ♂ ♂.
Hydrelia uncula, Clerck.—V. de la Claire Eau, 1 ♂.
Erastria deceptoria, Scop.—Harnoncourt, 1 ♂.

GEOMETRIDAE.

Odezia atrata, Linn.—Vallée du Rabais, 5 ♂ ♂.
Scopula ornata, Scop.—Harnoncourt, 2 ♂ ♂.
S. floslactata, Haw.—Vallée de la Claire Eau, 1 ♂ (worn).
Sterrha humiliata, Hufn.—Harnoncourt, 2 ♂ ♂.
S. herbariata, Fabr.—Virton; Vallée de la Claire Eau, 2 ♂ ♂.
Camptogramma bilineata, Linn.—Harnoncourt' 3 ♂ ♂.
Mesoleuca albicillata, Linn.
Epirrhoë alternata, Mull.—V. de la Claire Eau, 2 ♂ ♂; V. du Rabais, 2 ♂ ♂.
Lygris mellinata, Fabr.—Harnoncourt, 1 ♂.
Chloroclystis rectangulata, Linn.—V. du Rabais, 1 ♂.
Minoa murinata, Scop.—Harnoncourt, 1 ♂.
Euchoeca nebulata, Scop.—Harnoncourt, 1 ♂.
Ematurga atomaria, Linn.—Harnoncourt, 6 ♂ ♂; V. du Rabais, 1 ♂, 1 ♀.
Isturgia limbaria, Fabr.—Harnoncourt, 1 ♂.
Bupalus piniaria, Linn.—Harnoncourt, 1 ♂.
Cabera pusaria, Linn.—V. du Rabais, 3 ♂ ♂; V. de la Claire Eau, 1 ♂.
Pseudopanthera macularia, Linn.—V. du Rabais, 1 ♂; (ab.) V. de la Claire Eau, 1 ♂.
Opisthograptis luteolata, Linn.—Harnoncourt, 1 ♂.
Angerona prunaria, Linn.—V. du Rabais, 1 ♂, 1 ♀.
Semiothisa notata, Linn.—Harnoncourt, 1 ♂.
Ectropis extersaria, Hb.—Virton dist., 1 ♂.
Boarmia (?) *punctinalis*, Scop.—V. de la Claire Eau, 1 ♀ worn.
Lomaspilis marginata, Linn.—V. du Rabais; Harnoncourt, 2 ♂ ♂.

PYRALIDAE.

Spilodes urticalis, L.—Harnoncourt and V. de la Claire Eau, 1 ♂, 2 ♀ ♀.
Scopula lutealis, Haw.—Harnoncourt, 1 ♀.

The following notes were made by Monsieur F. Derenne on species observed by him at Buzenol (Vallée de la Claire Eau) on June 21st.

Brenthis ino, Rott.— Very abundant and mostly typical of Belgium with very distinct black markings. A certain number of specimens

were less distinctly marked and were transitional to the form described by Cabeau under the name of ab. *graciliens* (*Rev. Soc. Ent.* 1925, p. 7). I have a ♂ and ♀, the ♂ being well characterized.

Heodes hippothoë, L.—Amongst typical examples I found two males. In one specimen the underside has the antemarginal dots partly obliterated, especially on the left side, and on the left hindwing these dots are slightly elongated. In the other specimen on the underside, all the spots (excepting the cell-spot) are obliterated on the left forewing; the other three wings are normal. These specimens were taken in the area where, as was already noted by Mr. Ball, the specimens show abnormalities. Amongst the females taken were three remarkable specimens. The first one very dark with only a trace of copper-colour on the forewing, approaching the alpine form *eurybia*, O. On the hindwings the red band appears very distinct on the otherwise shaded wing. On the forewing below nearly all the spots are obliterated. The second specimen is a little lighter than the first. On the underside the spots of the forewing are large, on the hindwing the upper basal spots are united in a streak. The third specimen on the upperside forms a transition between the other two and the typical form. On the underside of the left wings the spots are partly obliterated especially towards the disc.

Epinephele jurtina, L.—A ♂ showing traces of albinism on all wings, and another having the right forewing completely tinged with white.

Limenitis populi, L.—A ♂ ab. *tremulae*, Esp., forming a well-marked transition to ab. *diluta*, Spl.

NOTES ON COLLECTING, etc.

A Simple Breeding Cage.—Collectors in out-of-the-way places, where labour and and material are difficult to obtain, and especially those in tropical and sub-tropical regions, where intense heat and dampness quickly ruin light wooden breeding cages, may be glad to hear of a simple, but at the same time strong and efficient, cage that can be made out of old tins, requiring but little skill, and costing in most cases nothing.

Suitable tins, which should if round have a measurement from lid to bottom greater than the diameter, or if square equal to or greater than the width of any side, are procurable anywhere. The author uses a square tin that is locally used for half kilos of tobacco, and for smaller larvae half pound Capstan tins, or similar four ounce tins, or 50 cigarette tins. The half kilo tin measures roughly 7″ high by 5″ by 3½″.

From each of the larger sides of the tin, a panel is cut, leaving about half an inch of tin on each side, except the bottom where not less than one inch to one and a half inches should be left, to enable the tin to be filled to this depth with suitable pupating material. The tin is in most cases most easily cut with an old pair of scissors. In the case of thicker tins shears may prove necessary. Before covering the sides a hole of about ¼″ diameter is punched in the bottom of the tin more or less centrally, and a piece of ¼″ pipe or piece of tin bent into pipe form is soldered or clipped inside the tin, in length sufficient

to reach above the pupating material, and destined to allow the stem of the foodplant to pass through into a vessel containing water. This pipe being fixed, it only remains to cover the open sides, which can be done, either by sticking mosquito netting over the opening with some suitable gum or glue (or if this wont stick, with thick paint, the edge of the tin being painted, the netting laid on the paint, and when dry another coat of paint added.). If a really substantial cage is required the opening in the sides is covered with wire gauze and soldered on. Cages so made are capable of being packed with small articles for transport with resultant economy of space. As a refinement the outside of the cage may be painted. In any case each tin should be numbered for identification, not on the lids which may be accidentally changed, but on the side of the tin itself. Should the surface of the tin prove too slippery for larvae pupating above ground, the inside may be painted, which will give it sufficient roughness, or by means of one or two small holes punched in a side and a couple of brass paper clips, a piece of cork or cardboard can be attached.

In the case of round tins the panels are cut out opposite one another. It is possible to cut out three panels, but this is unnecessary and only gives extra work.

The lid of the tin is used for examination of the contents of the cage, and if these cages are arranged to rest over, say a trough or long tin container of water, the minimum time is lost in feeding, etc.—K. J. Hayward (Capt., F.E.S.).

CURRENT NOTES AND SHORT NOTICES.

Dr. Walther Horn, of the Deutsches Entomologisches Museum, Berlin, has sent a copy of No. 12 of his "Supplementa Entomologica." It contains, as far as he has been able to obtain the necessary information, a list of all the known Entomological Collections past and present, the name of the maker, its place of origin, and its present locale if known, *e.g.*, Haworth, Adrian Hardy, Collection sold by auction in 1834; part through J. F. Stephens to the British Museum; part to the Oxford Museum, to the Tring Museum, etc. Brown, Henry Roland, European Lepidoptera to the Hope Museum Oxford. Stainton, Henry Tibbats, Lepidoptera to the British Museum. West, William, Hemiptera to the British Museum, Coleoptera to S. R. Ashby. And so on through the work, of more than 130 pages with some 25 items on a page. It must have been a laborious compilation and is most interesting for reference. Of course there will be found omissions, but the bulk of this information having been published will be an incentive to all who possess further facts or who can correct the present issue, to come forward and help to add a supplementary volume. We congratulate the indefatigable compiler and welcome the production, which, to our own knowledge, has been put together under very difficult and trying local circumstances.

The recent failure of the communications in and around London has considerably interfered with the programme of the usually well-attended natural history societies. On May 5th the meeting of the Entomological Society of London was abandoned; although several members turned up, a meeting at eight o'clock was too late for last

trains, etc. The South London Society on May 13th met with eight members. At 7.10 p.m. the meeting ended, there having been one exhibit of Diptera by our Treasurer, Mr. Andrews. The Society has since abandoned all its field meetings until further notice owing to the uncertainty of the running of trains.

SOCIETIES.

The Entomological Society of London.

The exhibits made at the meetings in February, March and April were as follow:—

February 3rd.—Professor E. B. Poulton, F.R.S., exhibited specimens sent by Dr. Kunhi Kannan of Bangalore demonstrating the fact that the larva of *Hyperechia xylocopiformis*, Walk., preys upon the larva of *Xylocopa tenuiscapa*, Westw., in S. India; also an example of a rare Brenthid beetle, *Platysystrophus sallei*, introduced in American oak.

Mr. T. Bainbrigge Fletcher exhibited and made remarks upon photographs and coloured drawings of two remarkable caterpillars from Assam.

Mr. E. Marks exhibited and made remarks upon examples of *Papilio podalirius* ab. *undecimlineatus*, and of a variety of *Euvanessa antiopa*.

March 3rd.—Mr. H. Donisthorpe exhibited an observation nest of *Acanthomyops brunneus* and made remarks on the myrmecophiles associated with this ant.

Dr. K. Jordan discussed the Dutch form of *Chrysophanus dispar* and exhibited British, Dutch, German and Hungarian examples of this butterfly.

Mr. G. Talbot, on behalf of Mr. J. J. Joicey, exhibited examples of *Papilio jordani*, Fruh., from N. Celebes, and of *P. idaeoides*, Hew., from the Philippines.

March 17th.—Dr. E. A. Cockayne exhibited a specimen of *Cosymbia linearia*, Hb., ab. *fasciata*, Prout, from Epping Forest.

Mr. G. Talbot exhibited abnormal examples of *Morpho menelaus*, L., from French Guiana, and of *Charaxes doubledayi*, Auriv., from the Kameruns.

Professor E. B. Poulton exhibited and made remarks upon the following:—

(*a*) The tailed *niavoides* female of *Papilio dardanus* race *hodsoni* taken with its model in South West Abyssinia by Mr. Arnold Hodson.

(*b*) A procryptic Tettigoniid (Locustid) and moth taken in Costa Rica by Mr. C. H. Lancaster.

(*c*) Insects, etc., of bionomic interest collected in Uganda by Dr. G. D. H. Carpenter.

(*d*) *Melanitis leda* with injuries probably caused by house lizards captured in Batavia by Mr. H. W. Simmonds.

(*e*) The migration of *Belenois mesentina*, at Nairobi, by Rev. Canon K. St. Aubyn Rogers and Dr. V. G. L. van Someren.

(*f*) Further confirmation of attacks by larval *Hyperechia* on the larvae of Xylocopid bees at Nairobi, by Dr. V. G. L. van Someren.

(*g*) Ants and their mimics collected at Como by Mr. S. Stuart Light.

April 7th.—Mr. H. M. Edelsten, on behalf of Mr. Gurth Edelsten, communicated particulars of the larva and pupa of *Rhodafra opheltes*.

Mr. N. D. Riley, on behalf of Mr. T. F. Marriner, communicated some notes on a Coccinellid believed to be a hybrid between *Adalia bipunctata* and *Coccinella variabilis*.

REVIEWS AND NOTICES OF BOOKS.

British Spiders; their Haunts and Habits.—By Theodore H. Savory. Oxford, at the Clarendon Press (Oxford University series), 180 pp., 34 figs., 6/- net.—More than enough books on British Lepidoptera and British Coleoptera have been written and even other orders have received much attention both from writers and collectors, but the Spiders apparently have been consistently avoided, for there exist only Blackwell's great work in the Ray Society publications (1861), Staveley's epitome of the same (1866) and O. P. Cambridge's "Spiders of Dorset" (1880), the first and the last very difficult to obtain and even then costly, to help the collector to name his captures. Beyond this less than a dozen writers have given occasional faunistic papers to the magazines.

This admirable little book has made a capital introduction for a future larger and more pretentious modern systematic work on the British Arachnida. Not only is it a book for beginners but it goes much further.

The first of the two parts of the book is devoted to a general account of a spider's existence, its instincts and senses, its behaviour in captivity with illustrations of cages for observation, the structure of the spider and its relation to its environment, with the necessary details of classification based on the variation of this structure. There is little technicality in this part, which forms most interesting reading.

Part two is almost purely systematic, but arranged in such a way as to attract. There are a dozen chapters for the twelve larger families. In each chapter the family habits are discussed, with reference to the more commonly occurring species, succeeded by an analysis of the genera and the names of the species in each. Various diagrams illustrate the more difficult points of structure in the classification and an Appendix gives hints as to the collection and preservation. There is also a glossary of terms. The value of the book is greatly enhanced by the Bibliography "an almost complete list of books on spiders published in Europe and America, with notes on the most important," to which are added references to a few papers, both British and foreign, which may be helpful. This book forms a much needed, up to date preliminary section to the three systematic works referred to above; it is quite up to date in its science, and should find its way into the hands of many a field worker, who will be enabled to track down the family and genus of his captures, with much greater ease than in those three works, referring to them for the final determination of the species. —H.J.T.

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Desiderata.—The Leicester Museum has no British Diptera and requires a typical collection. Can any collectors help us? We offer European Butterflies in exchange..'—"Entomologist," Leicester Museum.

Desiderata.—Ova or pupae of christyi, abruptaria v. brunnea, black consonaria and bidentata, extensaria, curzoni, jasionata, venosata (Shetl.) and other melanic Geometers and Noctuae.

Duplicates.—Very many in first class condition, high-set only f. i. Herminia flavicrinalis, Andreas, Nych. dalmatina race andreasaria, Warnecke, about 30 species of rare Acidalias ; pupae of Eupithecia illuminata or cash.—*Karl Andreas. Wiesbaden, Goethestr. 23, Germany.*

Change of Address.—A. Sich, Esq., F.E.S., to Grayingham, Farncombe Road, Worthing, Sussex. T. F. Marriner, F.E.S., to Cumwhitton House, Cumwhitton, Cumberland.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. October 6th, 20th. November 3rd, 17th. December 1st.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. June 24th, R. Adkin, "Balance in Nature." July 8th, 22nd.—*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.*, J. P. Hardiman, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

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In North East Siberia.

By MALCOLM BURR, D.Sc., F.E.S.

It was my good fortune in the summer of 1925 to go on an expedition to north eastern Siberia. This promised to be of great interest, for although the fauna is not very rich, it contains a number of recently described and little known species. The region, too, has been little explored, at least entomologically, and promises good material for the study of geographical distribution. It was of especial interest for me, for although I had collected Orthoptera in Mediterranean latitudes from Baku to the Cape Verde Islands, I had never seen sub-arctic conditions. At the same time, it was extremely tantalising, for the object of my journey was business, not entomology, and I had to snatch such opportunities of a little scratch collecting, as and when I was lucky enough. I arrived late in the season, at the beginning of September, and had no collecting apparatus other than my fingers and a bottle of vodka to kill and preserve the specimens. Still, I succeeded in bringing home nearly a hundred Orthoptera, and Mr. Uvarov has been kind enough to verify and correct my improvised determinations. There are 19 species among them.

My basis of operations was Irkutsk, which is six days in the express east of Moscow, on the Trans-siberian Railway, but here I was able to put in only a short walk in the fields in the dull suburbs of the city. I found a few *Stauroderus bicolor* and *Chorthippus albo-marginatus*, both species that are quite common in England.

On September 4th I left by motor for Kachug, a port on the upper reaches of the great river Lena. The distance was 225 miles and as it had to be done in the day, there was little time to collect by the wayside. Still, we luckily enough had a small breakdown involving about twenty minutes delay near a village called Zherdovka, about 37 miles to the north of Irkutsk, in the hill country, and not for the first time in my life did I bless a compulsory stoppage by the road, for it gave me a chance to pick up a few Orthoptera. On a grassy slope by the edge of a wood I heard a buzz of a familiar intonation, evidently Decticine, and was delighted to catch a male *Gampsocleis seldakovi*. This far-eastern species has been described under many names, among others by myself, nearly thirty years ago, in this magazine (*Ent. Rec.*, 1899, XI., p. 297). In habits and appearance it recalls our *Decticus verrucivorus*, but in the genus *Gampsocleis* the ovipositor is curved downwards, which is very characteristic. It is a most interesting genus. The west European species, *G. glabra*, is a handsome fellow, especially the big bright Spanish form, and has a wide distribution, but sporadic and is nowhere common. This, too, is green or sometimes brown, with black spots on the elytra. Another species is mottled greyish brown, the green disappearing soon after the last moult, which suggests that green is the original colour of the group, and brown a later acquisition. The same thing occurs in the grey species of *Metrioptera*; this greyish brown species is *G. abbreviatus*, which occurs in southern Dalmatia and is abundant on the plains of Macedonia, and I have referred to it in field notes from that country in the *Ent. Record* (XXVIII., 1916, p. 190). In the extreme Far East there is an all green species, *G. ussuriensis*, the only known member of the group to retain this uniform until I stumbled across the splendid *G. shelkov-*

nikovae in the Transcaucasus. This so closely resembles our familiar *Tettigonia viridissima*, that specimens were not discriminated in collections. But in the field its very different voice and habits are quite distinctive. (Vide *Ent. Rec.*, XXVII., 1915, p. 255.)

Two more interesting species at the same spot were *Celes skalozubovi*, a striking black Oedipodid with crimson wings, which here in far Asia replaces the local and erratic European *C. variabilis*, and *Stauroderus hammarstroemi*, Miram, described from the river Yenisei and also recorded from the Altai mountains.

At a rest for lunch at the post-house in the village of Manzurka, about 135 miles north of Irkutsk, I was able to steal out for a few minutes and on the green edging of the arable by the road side picked up *Gomphocerus variegatus*, F. de W., a species with a wide distribution in Siberia, Mongolia, Western Asia, and recorded from the Caucasus, and very likely identical with *G. livoni*, Azam, from the south of France. I also found its near relative the boreal and alpine *G. sibiricus* familiar to collectors in Switzerland from the curious clubbed tibiae of the male. The only other grass-hopper here was *Chorthippus albomarginatus*.

From Kachug we proceeded by river, the mighty Lena, which I believe is exceeded in length only by the Amazon and the Mississippi. At Zhigálovo, where we stopped the night, I was able abundantly to disprove the widespread belief that *Blatella germanica* and *Cimex lectularius* do not live in amity. On the contrary, I found that they get on splendidly together, which reminded me of the old picture in "Punch," when the butler was reading out the war news to the other servants and, referring to the operations on the rivers Bug and Dnieper, exclaimed, "Heavens, I should not like to be there; they are fighting at a place where the Bug and the Nipper meet in the same bed."

In the forest near Zhigálovo I picked up a few ants which Mr. Donisthorpe has named as *Acanthomyops* (*Donisthorpea*) *alienus*, Forel, but the only Orthoptera, that I could find, were *Gomphocerus rufus*.

My remaining chances of collecting were confined to the few spots where the steamer on which we were now to travel for ten days stopped to lay in fuel from the stacks of timber ready on the banks. The first time, on September 11th, was at a place called the Rizhski Pristan, near the settlement of Riga, about 270 miles below Zhigálovo. Here in the undergrowth of the partially cleared forest I found a small grasshopper, which I took to be a species of *Chrysochraon*, which it closely resembled in appearance, but it turns out to be its near relative *Podismopsis poppiusi*, a genuine subarctic species recently described by Miss Miram from near Archangel; its distribution had been already traced through Siberia across the Yenisei to the Lena, and as far south as the Altai mountains. Another interesting Asiatic grasshopper was *Prumna primnoa*, F. de W., which closely resembles the boreal *Podisma frigidum*, for which I at first mistook it. It occurs in Mongolia and the extreme east of Siberia, on the Amur and the Pacific coast. It was hopping clumsily in the herbage, and in every way resembles its allied Posidmas. At the same place I picked up a couple of males of *Metrioptera brachyptera*, together with a macropterous male; this form is far from common, and the only other one I have come across was in Normandy. (*Bull. Mus. d'Hist. Nat.*, p. 104, 1911).

Our next stop was at a place called Nizhnaia Suhovskaia, on September 13th, about fifty or sixty miles above Ust Kut. Here the forest was fairly well cleared, but the banks were very steep and were slippery with pine needles and the ground littered with the dead and rotten trunks of the virgin jungle. I heard a Decticine buzz and moved *Decticus verrucivorus*, but was unable to catch one. Another prominent chirper was *Tettigonia cantans*; these, which seemed to me to be a little smaller than the Swiss form, had not the sense to know that the bracken on which they were sitting had turned brown and so threw up their grass green colouring in relief and made them prominent. I have noticed the same thing in Macedonia, where the sluggish, fat, bright green apterous Phaneropterids showed up conspicuously, when they would insist on sitting on the blue thistle, though they were admirably concealed when on the green herbage. Thus protective coloration may be a source of danger when not properly applied, in the same way that arctic hares and ptarmigan, which had turned white in anticipation of the snow, advertised their presence so conspicuously during the short period between the completion of the change and the fall of the snow that we found shooting them very greatly facilitated. *T. cantans* is an alpine form in Europe, but in Russia is found widely over the plains and is the common herbage-songster of the forests around Moscow.

Arcyptera fusca was prominent at the same place; the male was active in the sun, hopping and flying freely, settling with a *twizz-whirr-twizz*; the *twizz* is short but the *whirr* is just like a clock running down suddenly. *Pruinna primnoa* was well in evidence here too; the male is a rich deep green when alive, but, like all its relatives, turns to a dull blackish brown on drying. *G. rufus* was there and the inevitable *St. bicolor*, as well as another *Stauroderus* which may be new, but, unfortunately, I took a couple of females only and they are indeterminable. I took a single *Bryodema tuberculata*, which I was glad to see in nature; it is a Mongolian steppe form that occurs sporadically in the plains of eastern Europe as a relic of the post-glacial steppe period.

On September 13th, we stopped again, this time at a place called Ulkanskie Opeki, about seventy miles north of Kirensk. It was half past ten in the morning and although the sun was shining, Orthoptera were not very much in evidence, and I did not find many species. The locality was flat and densely wooded, but partly cleared and cultivated. Here among long grass I found *Podismopsis poppiusi* again in considerable numbers and also *Chorthippus longicornis*. I am very glad that Mr. Uvarov with other modern orthopterists recognise the validity of this species, first championed by my good friend the late Captain Finot, and defended by me in the *Ent. Rec.* XI., p. 244 (1899). It may yet turn up in this country. I have found it in swarms in the boggy parts of the park of Fontainebleau. Other species at Ulkanskie Opeki were *G. rufus*, *Omocestus viridulus* and *Om. haemorrhoidalis*.

On September 14th, we stopped for a short time at the town of Kirensk, an important settlement founded by the Cossack pioneers in the XVIIth Century; it boasts a remarkable antiquity, a well preserved monastery of larch logs with windows of mica. While we were waiting here, another boat, bound upstream, called at the same port, a most unusual occurrence, as there is but little traffic on the river. Among the passengers strolling ashore I saw a man with a butterfly

net and at once accosted him as a colleague and a brother in these wildernesses, to be greeted to my great astonishment, which was rivalled by his amazement, "Malkom Arturovich! What in the name of Heaven are you doing here?" It was Lev Valentinovich Bianki, son of the late V. Bianki the distinguished ornithologist, whom I had last seen, with his father, when we were all guests of A. B. Shelkovnikov in the Transcaucasus ten years previously (vide *Ent. Rec.* XXVII. p. 253 (1915). He was returning from an expedition for the Academy of Sciences to Northern Siberia and was naturally surprised to meet me at so remote and unlikely a spot. It was good indeed to meet an old friend so unexpectedly, although on an expedition one is sure to meet some acquaintance. But our conversation was unfortunately brief, for the whistles blew and our ways diverged.

I had no more chance of collecting along the river and on September 20th reached my destination, a small mining settlement some fifty or sixty miles from Bodaibo, a township dependent upon the mines, about 225 miles up the Vitim, a tributary of the Lena. Bodaibo is a townlet with a population of four or five thousand inhabitants, important as being the administrative centre of the region. Attached to the school there is a small museum, with a few not uninteresting specimens, chiefly mineralogical and ethnological; there are a few insects, from the immediate neighbourhood among which I noticed *Decticus verrucivorus*, *Gomphocerus sibiricus*, *Prumna primnoa* and two species of *Acrydium*; these looked like *A. subulatum* and *A. bipunctatum*. I was very sorry not to come across any *Acrydium* myself, as possibly the Scandinavian *A. fuliginosum* and perhaps some other of the little-known species occur in this part of Siberia.

I made my home for the winter at the mines; the climate was subarctic and the autumn nearly over when I arrived. I did find a couple of sluggish *Ch. bicolor* as late as September 23rd. This is an extraordinarily vigorous species, which accounts for its great abundance throughout Europe and for its wide distribution. It is almost the last grasshopper to disappear in England as it is in Siberia, and I have noted that in the lofty mountains of northern Spain, in the Picos de Europa, this was the only Stenobothrid that succeeded in preserving its wings among the thorns of the stunted scrub growing on the alpine pasture, while *Om. viridulus* at the same place was invariably mutilated.

Of other insects I have little to say. I saw no Lepidoptera except a couple of small and dingy Micros fluttering among the shrubs on October 13th, two days before the snow came. At Ulkanskie Opeki there was a big black *Rhyssa* with its ovipositor deeply buried in a trunk, and a small dusky dragonfly, perhaps *Sympetrum scoticum*, but collecting without a net was too difficult.

A striking feature of the vast forests are the great conical ants nests, tapering up to a height of three feet or more, mostly made of larch needles. The ant, according to Mr. Donisthorpe, is our common *Formica rufa*, L., and the nest may be 60 or 70 years old. Another feature is the swarms of small black biting-flies, probably *Simulium*, which persecute the natives, who, in many places, wear veils and gauntlets to protect themselves when working.

Of the more obscure insect forms, I took a pair of fleas off a Dwarf Pica (*Lagomys pusillus*), which Dr. Jordan has identified as *Cerato-*

phyllus armatus, Wagn., which was known from the same host from the Transbaikal country. And off a ptarmigan I took a couple of Mallophaga which Dr. Waterston has identified as *Lagopaeus affinis*, Children, a species described nearly a century ago from a Hudson Bay grouse.

On October 15th the snow fell and that put an end to Entomology; there remained the daily communion with *Blattella germanica* and *Cimex*, which flourished in the overheated rooms in which we lived, in contrast to the frost outside, which the thermometer sometimes showed to be below a hundred degrees.

Zygaenae, Grypocera and Rhopalocera of the Cottian Alps compared with other races.

By ROGER VERITY, M.D.

Reports of Lepidoptera collectors in 1925 have almost invariably been very unsatisfactory, owing to rain and cold during the greater part of the summer. I must thus deem myself particularly lucky in having struck a region, where I did very well, and in having discovered a locality, where a remarkable number of species are gathered together in a very small area. The region is the Upper Susa Valley, from Oulx, m. 1100, to Cesana, m. 1300, and thence to Clavières, m. 1800, on the French frontier of the Col du Mont Genèvre and at the source of the Dora Riparia, and, on the opposite side of Cesana to the Col de Sestrières, m. 2035. The remarkable spot is the rifle-range just above Oulx, in the bed of the aforesaid stream, at the foot of a precipitous rocky mountain side rising several hundred yards above it on its north side, so that it forms a regular sun-trap and it shelters it from most winds. The wind is a feature of the Susa Valley. Every day it blows from about 10 a.m. to sun-set, evidently owing to a draught from Savoy into the Po Basin. It is the most invigorating air I have ever breathed, but after a time it becomes rather trying to one's nerves. As an entomologist I owe it a debt of gratitude, because it was that perpetual wind, which allowed me to collect every day, from June 28th to August 17th, by sweeping the clouds from the Valley on to the mountains on either side, where torrents of rain could be seen falling, whilst Oulx was in the sunshine. The wind also had the effect of inducing the butterflies to collect in sheltered spots, such as the one I have described, so that in an area about half a mile long and 300 or 400 yards broad, I actually found 10 species of *Zygaenae*, 16 of *Grypocera* and 76 of *Rhopalocera* and I was able to collect and set 1800 specimens, mostly in excellent condition. On the northern side of a small rocky spur, which closes the valley nearly entirely, but for a narrow gorge, just above Oulx, there lies a marshy zone, cooler and damper than the rifle-range. It was interesting to observe how the species, which occurred in both spots, emerged fully two weeks later in the former and did not produce the second generation observed in the latter, although the distance between the two was only of a few hundred yards, apart from the high ridge which separated them. Cesana I visited several times and I found there an excellent collecting-ground near the well-known green-marble quarries, in glades in a larch-wood. Although that locality is only 200m. higher than Oulx and only five miles from it, emergence

of early species was nearly a month later, so that it afforded a good opportunity of finding some, which were quite over at Oulx. We shall also see that the races of these two localities are in several species remarkably different. As a matter of fact Cesana, in several cases, resembles Clavières more than Oulx, although its position and general aspect seems much more different from it than from those of Oulx. I made an excursion to Clavières on July 29th, when a few warmer and clear days gave me a chance. It is an excellent locality for high-mountain species and races, which fly in large numbers at the very doors of the comfortable Hotel built two years ago. The Col de Sestrières I visited on August 8th. It is a barren pass covered by a peat-bog and swept by winds or wrapped in clouds alternately, so that butterflies are confined to little gullies, where they seek shelter, and the number of species is very small as compared with Clavières. What was very striking in all the Alpine regions I am dealing with, was the nearly total absence of *Erebia* species, except *neoridas* late in the season at Oulx, and *tyndarus*, at Sestrières. It is unaccountable how Alps, so rich in other genera, can be so poor in that one, which is usually a feature of these mountains. Some species have, no doubt, escaped my notice, but, anyhow, it can be inferred they are local and scarce. The dates in the following list cover the period during which freshly emerged individuals were observed, the old ones, which often go on flying for some time, having been disregarded. Those of Clavières and Sestrières I have not repeated in connection with each species, as I have only collected there once, on the days stated above. Cav. Gianelli of Turin has kindly furnished me with specimens and notes collected at Oulx in June, before my arrival on the spot.

Zygaena purpuralis race *nubigena*, Led.: Oulx (beg. July) and Sestrières.—*Z. sarpedon* race *carmencita*, Obth.: Oulx (Aug. 2nd).—*Z. meliloti* exerge *charon* race *charon*, Hb. with very melanic *italica*, Car., as extreme forms of normal variation: Oulx, near lake (July 15th-20th).—*Z. lonicerae* race *alpiumgigas*, Vrty. (=*major*, Frey., *nom. praeocc.*): Oulx (July 7th-Aug. 15th), Cesana and Clavières.—*Z. filipendulae* exerge *stoechadis* race *medicaginis*, Hb.: Oulx (July 9th-31st). Gianelli informs me that lower down in the Valley, at the Brunetta Fort, near Susa, nymotypical form *stoechadis* occurs frequently, but only one or two of my Oulx specimens are transitional to it.—*Z. transalpina* race *alpicola*, Vrty. (=*alpina*, B., nom. praeocc.): Oulx (July 12th-beg. Aug.) and Cesana.—*Z. achilleae* race *alpestris*, Burg. (=*alpina*, Obth., *nom. praeocc.*): Oulx (July 6th-16th).—*Z. hilaris* race *galliae*, Obth.: Oulx (July 23rd-Aug. 3rd.).—*Z. fausta* race **alpiummicans**, mihi.: Oulx (Aug. 2nd-15th.). By its size and by the extent of the white spaces round the red spots, this race can be described as intermediate between race *fortunata*, Ramb., of Central France, and race *nicaeae*, Stdgr., of the South of France, both of which some extreme individuals exactly resemble; in others, particularly of the female sex, the red spots are larger than in either of these races and partly confluent to a degree, which recalls the Spanish races; the tone of red is of an unusually vivid yellowish crimson, less saturated than in *nicaeae*. No doubt this is the race from the Basses Alpes described by Oberthür in his *Ét. Lép. Comp.*, IV., p. 623.—*Z. carniolica* race *hedysari*, Hb.: Oulx (July 8th-Aug. 15th) and Cesana. Never any red abdominal ring in either sex, except a faint vestige in very

rare individuals; markings extremely variable; white spaces ranging from entire obliteration to considerable breadth in both sexes; they are distinctly yellow in a few cases; in a few males the fifth kidney-shaped spot is reduced to three or four minute red or white specks. This race is, no doubt, the real *hedysari*, originally described from the Piedmontese Alps.

Nisoniades tages race *tages*, L.: Oulx and Cesana in June.—*Erynnis alceae* probably race *alceae*, Esp.: Oulx (suddenly appeared from Aug. 6th to 11th, and then disappeared again). My specimens fall in with II. gen. *aestiva*, Hormuzaki, *Verh. Zool.-Bot. Ges. Wien.*, 1897, p. 164, better, on the whole, than with Esper's figures, but they exhibit considerable variation: some are of a dark blackish brown on both surfaces, others are of a warm chestnut; size of white spaces and light underside bands very variable.—*E. marrubii* (=*boeticus*) race *grisea*, Vrty., presumably with a single generation: Oulx (Aug 7th).—*E. altheae* race *altheae*, Hb.: Oulx (exactly like *alceae*) and Clavières (July 29th), so that probably at Oulx I only came in for II. gen.—*E. lavatherae* race *lavatherae*, Hb.: Oulx (July 7th-Aug. 12th).—*Powellia sao* race *alioides*, mihi: Oulx (beg. July-beg. Aug.) and Cesana. This race consists of 50% nymotypical *sao*, with brick-red underside, 38% transitional forms and 12% of one, which can be described as a further grade along the line of variation leading through the African *ali*, Obth., and then *therapnoides*, Obth., back to *therapne*, Rbr., presumably the most ancient of the series. The features of the furthest European grade, which I name **alioides** from my Oulx specimens, but which I possess also from other regions, are: the large size of the disco-cellular white space on both surfaces of hindwing; on the underside it projects outwardly, and often also inwardly, into a long sharp point; the outermargin of these wings is preceded by a broad white area or by one of a lighter tinge than the rest of the wing, which is tawny; the black internervural streaks are prominent.—*Hesperia carthami* race *carthami*, Hb.: At Cesana (males swarmed July 11th; females from 24th), at Clavières and at Sestrières the race is perfectly nymotypical; at Oulx (all July) it is larger and points to race *speciosa*, Vrty.—*H. serratulae* race *serratulae*, Rbr.: Cesana (July 15th) and Sestriéres; one female at Oulx (Aug. 4th).—*H. bellieri* race **nigropicta**, mihi: Oulx (males July 6th-Aug. 4th; females July 20th-Aug. 16th), Cesana and Claviéres. This race seems to show that *bellieri* and *foulquieri* are co-specific, as suspected by Reverdin from the genitalia. In size it agrees with nymotypical *bellieri*, as figured by Oberthür from Larche (fig. 490 and 1872-6) and it has, like it, the premarginal white lunules of underside of hindwing broad and placed in a straight row, very near their margin. By the extent of the pattern it resembles very much the specimens figured by Oberthür from the hills of the Var (fig. 1865-8) under the name of *foulquieri*, because on both surfaces the white spaces are much less prominent than in *bellieri*; there is, however, at the base of the forewing, above, a slight white dash which does not exist in those figures. The underside of the hindwing is also more like *bellieri*, by its colder more greenish tone. A peculiar feature, not seen in any of Oberthür's figures, is that it is streaked in the internervural spaces with gray, or even with black, so that it is darker, and that the white spaces are often edged with a dark line, somewhat as in *carthami*, but less sharply.

One of my specimens from Claviéres agrees well with the typical figure of *bellieri* and in fact also Oberthür records it from this locality (Col du Mont Genèvre), collected by him in 1906 (Vol VI., p. 88). Two extreme ones from Oulx agree, on the contrary, with the figure of *foulquieri* from Entrevaux (fig. 487-8) by their much larger size, broader wings and prominent white spaces above and with corresponding specimens I have from the Bouches-du-Rhône, by their clear reddish-yellow undersides, with no black powdering.—*H. alveus* race *grandis-alveus-alticola*, Vrty.-Hb.-Rebel: Oulx (July 1st-25th). My first task consisted in sorting out the *bellieri* from the *alveus*, a difficult one on account of the strong resemblance of *nigropicta* to the latter: this I did on the strength of the sharper angles of the wings of the former, of their more silvery sheen, of their bluish hair, of the bracket-like white spaces at the end of the cell of the forewing, of the whiter base of these wings on both surfaces, of the whiter area along the abdominal margin of the hindwing on the underside and of the shape and position of their premarginal white lunules, which are larger, more even in size, and placed in a straighter row, nearer the margin. I then found that the *alveus* of Oulx were still very variable and could be grouped into three lots corresponding to the three forms mentioned above, although my impression is they certainly intergrade into each other and one cannot suspect them to be three species. Race *alveus*, Hb.: At Cesana one only meets with a form corresponding exactly to Hübner's figures. Race *alticola*, Rebel: At Claviéres and at Sestriéres this form entirely replaced the preceding. I apply Rebel's name to it because it seems to me identical with my series from Sulden on the Ortler, only a few miles from the locality of Rebel's "types": the Stelvio. Oberthür's figures 1859-64 in Vol. VII., of specimens from Larche, represent it perfectly and its proximity to the region we are dealing with makes it very natural, but what surprises one is that he should apply to those figures his name of *ryffelensis*, whereas his original figures 470-1 from the Ryffelalp represent an entirely different form. His figures 1855-8 of nymotypical *alveus*, also from Larche, agree exactly with my Oulx and Cesana specimens of this form.—*H. carlinae* race *carlinae*, Rbr.: Only one couple at Oulx (Aug. 7th); abundant at Cesana, Claviéres and Sestriéres.—*H. onopordi*, Rbr. race *conyzae*, Guen.: I. gen. *conyzae* emerged at Oulx till July 5th and corresponds exactly to Oberthür's fig. 530-1 of co-types of La Charnée (Savoy); II. gen. **postgenita**, mihi, emerged from Aug. 2nd-17th. The underside of the hindwing differs nearly invariably from that of the I. gen. by its warmer reddish tone, often very bright. —*Adopaea lineola*, race *ludoviciae*, Mabille, with individual variations extending as far as *clara*, Tutt, described from Larche, Useigne, Courmayeur as racial: Oulx (end of June to Aug. 10th); Claviéres.—*A. flava* race **macta**, mihi=*major*, Tutt (nom. praeocc. in *lineola*)* recorded by him also from Torre Pellice; Oulx, Cesana, Clavières.—*Thymelicus acteon* race *acteon*, Rott.: Oulx (from July 15th).—*Augiades sylvanus* race *sylvanus*, Esp.: Oulx (from end of June); Cesana.—*Urbicola comma* race *alpina*, Bath: Oulx (Aug. 9th-16th); Cesana.—

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* I do not see why the same varietal name should not be used in allied species. —E.A.C. Nor do I.—H.J.T.

Heodes virgaureae race *inalpinus*, Vrty.: At Cesana (July 15th-24th) the race seems quite similar to that of the Baths of Valdieri in Marit. Alps and a single male from Clavières seems the same. Race *zermattensis*, Fallou: Sestriéres.—*Chrysophanus hippothoë* race *eurybia*, O.: Sestrières. Courvoisier is mistaken in stating (*Entom. Zeit. Guben.*, 1912, p. 52) that this name should be replaced by the older one of *euridice*, Esp., because the latter name was created, before Esper, by Rottemburg, and it is simply a synonym of *hippothoë*.—*Loweia alciphron* race **ultragordius,** mihi; Oulx (July 10th-Aug. 5th). Large size: male of a lighter and paler, clear pinkish-yellow ground colour than I have seen in any other race; no violet sheen; all the dark spots are very small in both sexes, so that the female contrasts particularly with Sulzer's *gordius* figure from the Grisons and the regions south of these, such as Chiavenna ("aus Bündten"), in which they are very large, especially in the premarginal row; underside of a lighter and colder gray than in most races. The Maritime Alps race is quite different (for it Turati and I have revived de Prunner's name of *columbanus*) and so are those described by Frühstorfer.—*Lycaena alcon* race *alcon*, F.: Oulx (July 8th).—*L. arion* race *obscura*, Frey: Oulx (a fresh female as late as July 28th); Cesana, and Clavières. Very small average size.—*Glaucopsyche cyllarus* race *cyllarus trans. ad alpina*, Rott.-Trti, and Vrty.: Oulx (May, only females fresh in June).—*Cyaniris semiargus* race *montana*, M.-D.: Oulx (all worn at end of June, but one perfectly fresh male on July 23rd), Cesana and Sestriéres. Race *montana trans. ad cimon*, M.D.—Lewin: Clavières. —*Latiorina glandon* race *glandon*, de Prunn.: Clavières. Described from these same Alps, this is certainly the nymotypical race. The specimens I have collected at Sulden, on the Ortler, are similar to it, but those from the Stelvio and from the Schmalz Kopf are markedly poorer in pigment and much lighter in tone on both surfaces, so that they constitute a distinct more eastern race, which can be called **dealbata,** mihi. Ghiliani was, no doubt, perfectly right in stating that de Prunner's *orbitulus* is the species known as *pheretes*, Hb.; Kirby suggests timidly that the former name should replace the latter and Courvoisier courageously adopts it. As to the species usually called *orbitulus*, Ghiliani makes out it is de Prunner's *glandon*, and it seems to me the description fully justifies this conclusion. Thus, this name should be revived and adopted for it, especially as, otherwise, one would be at a loss as to the name to use. Kirby's use of *orbitulus*, Esp., is a mistake, considering this name was previously erected by de Prunner, and Courvoisier's use of *rustica*, Edwards, is a still greater mistake, considering its more recent origin than others given to forms of the species, amongst which *aquilo*, Boisd., is, I think, the oldest.—*Vacciniina optilete* race *cyparissus*, Hb.: Sestrières.—*Aricia donzelii* race *donzelii*, Boisd.: Cesana and Clavières.—*A. chiron* race *chiron*, Rott.: Oulx (end of June all worn) and Clavières.—*A. medon* race *medon*, Hüfn.: Oulx (July-Aug.), Cesana, Clavières and Sestriéres. All the same race, usually called *allous*, Hüb., or *alpina*, Stdgr., when *astrarche*, Bgstr., was used as the specific name.—*Plebeius argus* race *philonomus*, Bergstr., according to the way Tutt applies this name, exactly similar to the couple from Larche (Basses Alpes) figured by Oberthür, *Ét. Lép. Comp.*, IV., fig. 315-6: Oulx (end of June to July 20th, and one fresh male on Aug. 10th).—*P. idas*, L. = *argyrognomon*, Bergstr., according to various

authors (see descriptions of following races in the *Ann. Soc. Ent. France*, 1926): Race *magnalpina*, Vrty.: Cesana (July 11th-Aug 1st). Race *alpina*, Berce: Oulx, in stony bed of Dora Riparia, in dry and warm spot, from Aug. 3rd to 16th, evidently being the II. gen. and the I. gen. having flown in June. Race *calliopides trans. ad alpina*, Vrty.-Berce: Oulx, in swampy meadow by the lake, with a northern exposure (middle of July, with a single generation). Race *calliopides*, Vrty., with individuals transitional to *alpina* by the characters of the underside of the wings, but not of the upperside. One remarkable male I have described (*l.c.*) as form *bellierides*: Clavières. Race *calliopides*, Vrty.: Sestrières.—*Polyommatus tithonus*, Hb.=*eros*, O., race *tithonus*, Hb.: Cesana (July 15th-24th) and Claviéres. Ghiliani is probably perfectly right in referring *bramafama*, de Prunner, to this insect and Kirby makes a mistake in referring it to *coridon*, which de Prunner quotes and describes quite differently, but, on the other hand, the description contains no elements furnishing a sure clue, so that I do not feel justified in proposing to revive the name for the species.—*P. icarus* race *icarus*, Rott.: Oulx. I. gen. *icarus*, Rott. (June); II. gen. *ovalisignamosa*, Ball (Aug. 3rd-16th). The latter is smaller on an average than the I. gen., but only extreme individuals are *minor*, Cock., and none reach the still further degree of *pusilla*, Gerh.; on the underside metallic scaling at base of wings reduced to half the extent; tone of grey in male slightly fulvous; tone in most females distinctly lighter and more fulvous. After due consideration, I think the above definition of the summer generation is necessary and that it applies to that of many dry localities of Central Europe, although I perfectly agree with the statement of several authors that the distinction is far less marked than in the southern race *zellerica*, Vrty., with its II. gen. *aestivalis*, Tutt, or *nana*, Grund. At Oulx the II. gen. was only produced in the dry, stony bed of the river in a southern exposure. A few hundred yards away, but on the northern side of a spur of rocks, the I gen. was still on the wing on July 20th and no other was produced. At Clavières it was emerging on July 29th. Race **rufoprivata**, mihi: Sestrières, 2035m., on a peat-bog. Underside of male of a cold, dark grey; that of female exactly of the same colour, which is, to my knowledge, a character not yet recorded from any locality; lunules of the underside constantly pale yellow in both sexes; those of the female on the upperside small and slightly warmer in tinge; this sex has on this same surface a broad powdering of a colder silvery blue than is usual in *icarus* and the fringes are entirely snow-white.

(*To be concluded.*)

Corticaria corsica, Bris., a species of Coleoptera new to Britain.

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

"*Corticaria corsica*.—Elongata, nigro-picea, pube tenui depressa obsita, elytris ferrugineis, ad scutellum infuscatis. Antennae thorace paulo breviores, testaceae. Thorace subcordato, ante medium rotundato ampliato, crebre ruguloso-punctato, acute denticulato denticulis versus basin acutioribus. Elytris tenuiter, confertissime striato-punctatis, interstitiis seriato-punctatis. Pedes ferruginei.—Long 2 mill.

"Un peu plus grande que la *serrata*, un peu étroite, plus parallele; élytres plus finement striées-ponctuées, les points des intervalles un

peu plus fins que les points des stries. Les tibias antérieurs sont presque droits ; le premier article des tibias antérieurs est un peu dilaté dans le mâle. Corse (Damry)." H. Brisout.—*Bull. Soc. Ent. France*, 1878, 96.

On May 18th last, I captured a *Corticaria* in Windsor Forest, which neither Mr. Blair nor I could name, either with the collections in the British Museum, or by Fowler, Reitter, etc. Having sent it to my friend Colonel Sainte Claire Deville, he eventually identified it as *Corticaria corsica*, with the description of which, and with a French example he kindly sent to me, it exactly agrees.

I took the species by scraping off the white dry paper-like wood from a hanging dead oak-bough, and sieving it over paper. Subsequent visits produced a small series from this bough, and also from the same kind of wood scraped from a standing oak.

Brisout compares it with *C. serrata*, and his distinctions are just; but it comes nearer to *C. linearis*, Pk., and *C. appelsheimi*, Reitt. *C. corsica* has been found in the south and middle of France, etc., as well as in Corsica.

A Month's Collecting in the Pyrenees.

By Wm. FASSNIDGE, M.A., F.E.S.

(*Concluded from page 78.*)

Geometridae (corrected to Seitz = Prout).—*Pseudoterpna pruinata*, Hufn., *Hemistola chrysoprasaria*, Esp. (*Geometra vernaraia*, Hb.), *Chlorissa* (*Nemoria*) *porrinata*, Hb., a few, *Ptychopoda* (*Sterrha*) (*Acidalia*) *rufaria*, Hb., *P. eburnata*, Wocke. (*A. contiguaria*, Hb.), *P.* (*A.*) *laevigata*, Sc., *P.* (*A.*) *herbariata*, F., *P.* (*A.*) *dilutaria*, Hb., and race *holosericata* (*interjectaria*, Bdv.), *P.* (*A.*) *inornata*, Hw., *P.* (*A.*) *aversata*, L., *Acidalia immorata*, L., 1 specimen, *A. rubiginata*, Hufn., at Tarascon-sur-Ariège only, *A. marginepunctata*, Göze, *A. adjunctaria*, Bdv., *A. nigropunctata*, Hfn. (*strigilaria*, Hb.), *A. imitaria*, Hb., *A. ornata*, Sc., *Cosymbia* (*Ephyra*) *porata*, F., *Rhodostrophia vibicaria*, Cl., *Timandra amata*, L., *Rhodometra* (*Sterrha*) *sacraria*, L., not common, *Lythria purpuraria*, L., *Larentia clavaria*, Haw., (*Ortholitha cervinata*, Schiff.), *Ortholitha chenopodiata*, L., (*limitata*, Sc.), *O. moeniata*, Sc., locally common, *O. bipunctaria*, Schiff., *Lithostege griseata*, Schiff., *Anaitis praeformata*, Hb., *A. plagiata*, L., *Triphosa dubitata*, L., *Lygris prunata*, L., *Lygris dotata*, L., *Cidaria* (*Thera*) *juniperata*, L., larvae, *C.* (*T.*) *firmata*, Hb. var. *ulicata*, Rbr., bred from larvae, *Cidaria* (*Dysstroma*) *immanata*, Haw., *C.* (*Calostigia*) *aptata*, Hb., *C.* (*C.*) *olivata*, Schiff., *C.* (*C.*) *salicata*, Hb., *C.* (*C.*) *didymata*, L., *C.* (*Xanthorhoë*) *fluctuata*, L., *C.* (*X.*) *montanata*, Schiff., *C.* (*X.*) *ferrugata*, Cl. ab. *unidentaria*, Hw., *C.* (*Ochyria*) *designata*, Rott., *C.* (*Dasyuris*) *flavicinctata*, Hb., *Cataclysme riguata*, Hb., *C.* (*Euphyia*) *cuculata*, Hufn., 1 specimen, *C.* (*Epirrhoë*) *galiata*, Hb., *C.* (*E.*) *rivata*, Hb., *C.* (*E.*) *alternata*, Müll. (*sociata*, Bkh.), *C.* (*E.*) *tristata*, L., *C.* (*E.*) *alchemillata*, L., *C.* (*E.*) *minorata*, Tr., *Hydrelia flammeolaria*, Hufn. (*luteata*, Schiff.), *C.* (*E.*) *bilineata*, L., *C.* (*Coenotephria*) *berberata*, Schiff., *C.* (*C.*) *rubidata*, F., *Asthena albulata*, Hfn. (*candidata*, Schiff.), *Eupithecia oblongata*, Thnbg., *E. euphrasiata*, H.S., *E. icterata*, Vill. (*subfulvata*, Hw.) and var. *oxydata*, Tr., *E. millefoliata*,

Rossl., *E. impurata*, Hb., *E. graphata*, Tr., *E. innotata*, Hufn. var. *tamarisciata*, Frr., *E. sobrinata*, Hb., *Gymnoscelis pumilata*, Hb., *Horisme* (*Phibalapteryx*) *vitalbata*, Hb., *Ellopia fasciaria* (*prosapiaria*, L.) var. *prasinaria*, Schiff., *Selenia bilunaria*, Esp., *Crocallis elinguaria*, L., *Angerona prunaria*, L., 1 specimen, ♀, *Macaria alternaria*, Hb. (*Semiothisa alternata*, Stph.), *Biston* (*Amphidasis*) *betularia*, L., *Boarmia* (*Cleora*) *rhomboidaria*, Schiff., (*gemmaria*, Brahm.) and var. *abstersaria*, Bdv., *B.* (*C.*) *repandata*, L., *Pachycnemia hippocastanaria*, Hb., *Gnophos furvata*, F., *G. obscurata*, Schiff., *G. glaucinaria*, Hb., *G. mucidaria*, Hb., *G. myrtillata*, Thnbg. var. *obfuscaria*, Hb., *Ematurge atomaria*, L., *Selidosema taeniolaria*, Hb., *Itame fulvaria*, Vill. (*Thamnonoma brunneata*, Thnbg.), *Chiasmia* (*Phasiane*) *clathrata*, L., *Crocata* (*Cleogene*) *peletieraria*, Dup.

Nycteolidae.—*Hylophila prasinana*, L., larvae, *H. bicolorana*, Fuess., 1 specimen.

Bombyces.—*Diacrisia* (*Spilosoma*) *mendica*, Cl., larvae, *Phragmatobia fuliginosa*, L., *Diacrisia sanio*, L., *Arctia caja*, L., *A. villica*, L., *Callimorpha quadripunctaria* (*hera*), Poda., *Coscinia striata*, L., a few, *Hypocrita jacobaeae*, L., larvae and imagines, *Nudaria mundana*, L., *Miltochrista miniata*, Forst., *Paidia murina*, Hb., a few, *Endrosa irrorella*, Cl., *Oenistis quadra*, L., *Lithosia deplana*, Esp., *L. griseola*, Hb., *L. lurideola*, Zinck., *L. complana*, L., *L. caniola*, Hb., *L. unita*, Hb. (*palliatella*, Hmpn.), *L. lutarella*, L., *Zeuzera pyrina*, L., *Hepialus sylvina*, L., 1 specimen.

Zygaenidae.—*Zygaena purpuralis*, Brunnich, 2 specimens, *Z. trifolii*, Esp., *Z. filipendulae*, L., *Z. transalpina*, Esp., *Z. ephialtes*, L., ab. *medusa*, Pall., very local, *Z. fausta*, L., a few, *Procris* (*Ino*) *geryon*, Hb.

Sesiidae.—*Trochilium apiformis*, Cl., empty pupa cases common, *Aegeria ichneumoniformis*, F., a few.

Pyralides.—*Aphomia sociella*, L., *Crambus inquinatellus*, Schiff., *C. tristellus*, F., and var. *aquilella*, Hb., 1 specimen, *C. latistrius*, Hw., *C. conchellus*, Schiff., *C. pinellus*, L., *C. myellus*, Hb., *C. staudingeri*, Z., a few, *C. falsellus*, Schiff., *C. hortuellus*, Hb., *C. culmellus*, L., *C. pascuellus*, L., *Homoeosoma sinuella*, F., 1 specimen, *H. nimbella*, Z., 1 specimen, *Ephestia kühniella*, Z., *Euzophera pinguis*, Hw., 1 specimen, *Asarta aethiopella*, Dup., 1 specimen, *Salebria palumbella*, F., *S. obductella*, Z., *S. semirubella*, Sc., *Dioryctria splendidella*, H.S., (*abietella* Zinck.), *Acrobasis tumidana*, Schiff., *Endotricha flammealis*, Schiff., a pest, *Aglossa pinguinalis*, L., *Pyralis farinalis*, L., *Cledeobia angustalis*, Schiff., *Psammotis hyalinalis*, Hb., *Eurrhypara urticata*, L., *Scoparia frequentella*, Stt., *Sylepta ruralis*, Sc., *Orenaia alpestralis*, F., *Evergestis sophialis*, F., *Nomophila noctuella*, Schiff., *Phlyctaenodes palealis*, Schiff., *Diasemia litterata*, Sc., *Cynaeda dentalis*, Schiff., *Pionea ferrugalis*, Hb., *P. forficalis*, L., *Pyrausta fuscalis*, Schiff., *P. nubilalis*, Hb., a few, *P. alpinalis*, Schiff., *P. cespitalis*, Schiff., *P. purpuralis*, L., *P. aurata*, Sc., *P. nigrata*, Sc., *P. cingulata*, L.

Tortrices.—*Cacoecia costana*, F., *Tortrix* (*Cnephasia*) *longana*, Hw., *T.* (*Sciaphila*) *penziana*, Thnbg., *Euxanthis* (*Xanthosetia*) *zoegana*, L., *Argyroploce* (*Penthina*) *oblongana*, Hw., *A.* (*Orthotaenia*) *striana*, Schiff., *Epiblema* (*Caloptria*) *caecimaculana*, Hb., *E.* (*Eucosma*) *graphana*, Tr., *E.* (*Grapholitha*) *penkleriana*, F.R., *Hemimene* (*Dichrorampha*) *simpliciana*, Hw.

Tineae.—*Harpipteryx scabrella*, L., *Plutella dalella*, Stt., *Parasia lapella*, L., *Oecogenia quadripunctata*, Hw., *Pleurota schlaegeriella*, Z., *Psecadia pusiella*, Roemer., *P. bipunctella*, F., *Depressaria applanella*, F., *D. nervosa*, Hw., *Lecithocera luticornella*, Zell., *Penestoglossa* (*Typhonia*) *dardoinella*, Mill.

Alucitides.—*Oxyptilus teucrii*, Jordan, *Platyptilia acanthodactyla*, Hb., *Alucita pentadactyla*, L., *Marasmarcha phaeodactyla*, Hb., *Pterophorus monodactylus*, L.

Note :—The Melitaeas of the *athalia* group taken at Auzat have been submitted to Capt. A. F. Hemming, who refers them to *M. dictynna*, Esp., race *vernetensis*, Obthr., and to *M. deione*, Hb. *M. athalia* is therefore to be deleted from the above list.

Miscellaneous Notes from Argentina. IV.

By KENNETH J. HAYWARD, F.E.S.

Correction.—Miscellaneous Notes from Argentina. I., page 153, *Ent. Record*, November, 1925, line 2, should read " . . . . yellow and white laurel (*H. hediondo* and *C. preta*) and the fruit bearing Nangapirú (*A. pitanga*)," instead of as printed. K.J.H.

The scent of Catopsilia cipris, F.—I have been able to examine a fair number of this species during the past 1925-6 season, and without exception, the females have borne a very strong scent of fresh salt butter. I cannot compare the scent to anything else. The scent is so marked, that I at first noticed it through accidentally damaging the abdomen of an insect in the net. The scent is discernable after several hours in the cyanide bottle, and faint but definite in some cases a fortnight (and probably longer) after capture. The males do not carry this scent, and on the only occasion on which I have been able to discern any odour in connection with the male, I would compare it to the scent of the primrose. It was very faint. A chemist to whom I submitted specimens agreed to the scent of butter, and at the same time likened the smell to that of butyric acid.

The egg of Catopsilia cipris, F.—Noticing a female of this species hovering over a Leguminous bush early in February of this year (1926), I searched for eggs, and found several of the same laid at the extreme end of the leaf fronds on the upper side, some on young leaves and others on the old shoots. The egg is oval, tapering at each end, at the free end to a point. Length 1mm. Diameter at its greatest 0·4mm. There are 14 longitudinal ribs with the surface between them outcurved. The egg is also more slightly ribbed circumferentially throughout. When first laid white, shortly assuming a yellowish tinge. On the second day the egg commences to turn orange from the free end, this colour gradually spreading downwards over the whole egg. My larvae emerged the seventh day, being rather less than 1·1mm. in length, very frail, of a light honey colour, and thickly clothed with lighter hairs. I found it impossible to keep the foodplant alive in water, and the nearest source of the same being over a mile away I was not able to carry the breeding process any further. Eggs are laid in September and in February, but as the

insect is on the wing continuously from September till the month of April it is highly probable that there is a more or less continuous brood. The eggs noted above were laid on *Prosopis nigra* (?), Hieron (*Leguminosae*), locally known as "Algarrobo."

The Egg of Lerodea eufala, Edw. (Hesperiidae).—Whilst on the outskirts of the forest at Villa Ana on February 7th, of this year (1926), I noticed a specimen of *Lerodea eufala*, Edw., alight on a leaf stem of a species of *Cyperus* and curve its abdomen to the midrib of the leaf. Examination revealed an egg, but further search failed to produce any further specimens.

This egg, laid at 10.05 a.m. was round, of 0·9mm. diameter, slightly flattened at the fixed end, and perfectly smooth and glossy. The two following days brought no change, but on the third day after laying, a small brown spot appeared in the egg becoming more pronounced towards evening. The young larva emerged before 6 a.m. on February 11th, the egg stage having lasted about four hours under four days.

The young larva was of 1mm. length, a very pale yellowish white, with a dull black head, but died the third day, seemingly without having fed on the *Cyperus* leaf.

The egg was laid with great deliberation on the part of the parent, a great number of trials being made before just the right spot was found.

The *Cyperus* sp. cannot be further identified by the Botanical Laboratories of the Ministerio de Agricultura de la Nacion, to whom I submitted specimens, and is possibly undescribed, though very common in this neighbourhood.

NOTES ON COLLECTING, etc.

The Foodplant of Calymnia pyralina.—In 1923 I captured in a wood in the Oxshott district, flying to the light of an acetylene lamp, two specimens of *C. pyralina*. In May, 1924, Dr. Cockayne and I visited this wood in search of the larvae. We found no elm or apple and no larvae were taken. In a clearing in another wood, about a mile away, we took rather more than a dozen larvae from elm. These were all full-fed and we were obviously too late. In 1925, Dr. Cockayne took a great many larvae in the same place.

On Sunday, May 30th this year, I visited the spot and found the trees had been cut down. On the accessible branches of two tall survivors and on various little bushes of elm, I took, however, 14 larvae of *C. pyralina*.

Last Sunday, June 15th, I was beating in another part of this wood, half-a-mile from the clearing referred to, and took 4 *C. pyralina* larvae. The first was beaten from a hawthorn bush, near which was no other tree or shrub than blackthorn. The second from a tangle of hawthorn and oak. The third (200 yards from the first capture) from elm, and the fourth from a hawthorn growing under an elm tree. I think hawthorn has not previously been recorded as a food-plant of this species.—Harold B. Williams (LL.D., F.E.S.).

Irregular Union between Pieris napi and Euchloë cardamines.—On April 30th a ♂ *Pieris napi* and a ♀ *Euchloë cardamines* were found "in cop," on a flower head of *Cardamines pratensis* at 2 p.m. s.t. My attention was drawn to the paired insects by the persistent fluttering of a ♂ *E. cardamines* around the plant. Placed under a large sleeve with a growing plant of *C. pratensis*, they separated at 4·30 p.m. and the ♀ lived until May 14th, when it was found dead at the bottom of the sleeve, having been evidently killed by some bird as the head and part of the abdomen were missing. A number of ova were laid (twenty-two in all) some of which had begun to change colour on the 11th. The *P. napi* was much worn, but the *E. cardamines* appeared to be freshly emerged.—Thomas Greer.

Yellow male of Euchloë cardamines.—In the Torrent river valley on May 8th, *E. cardamines* were flying in dozens and I captured a ♂ of a beautiful pale sulphur colour, with discal area and veins of the hindwings distinctly marked with bright sulphur. This locality is a sheltered valley in the hills with a large swamp at its lower end, and the forms of *E. cardamines* to be found here are finer and more strongly marked than in any other locality, which I have explored in this part of Co. Tyrone.—Thomas Greer.

New and unexpected food-plants of Abraxas grossulariata.—I have been rather interested to find *A. grossulariata* larvae feeding upon the leaves of a pear tree, and also, in the same orchard, upon the flowering currant although other and more usual foodplants were present in abundance. I took a number from each and fed them upon the leaves of the plants they appeared on until they pupated, and am awaiting the result to note if there should be any variation due to their choice of these foodplants, which, so far as I know have not hitherto been recorded.—T. F. Marriner (F.E.S.), Cumwhitton, Carlisle.

CURRENT NOTES AND SHORT NOTICES.

A meeting of the Entomological Club was held at Eastbourne by the invitation of Mr. Robert Adkin during the week-end commencing June 5th, 1926. Members present in addition to the Host—Messrs. H. St. John K. Donisthorpe, H. Willoughby Ellis, Jas. E. Collin, W. J. Kaye. Visitors present—Messrs. W. G. Sheldon, A. L. Rayward, E. Step, Dr. E. A. Cockayne, Mr. R. A. Adkin, Dr. Malcolm Burr, Messrs. G. C. Leman, H. J. Turner, Capt. N. D. Riley.

The guests were received at "Hodeslea" by Mr. and Mrs. Adkin when luncheon was served at one o'clock. In the afternoon the party made a collecting excursion on to the Downs, on the return from which a business meeting of the Club was held and supper was served at six o'clock, Mr. Robert Adkin in the chair. During the evening Mr. Jas. E. Collin exhibited a series of specimens of *Platychirus tarsalis*, Schumm., a Syrphid fly, always considered a rarity, caught by himself in Woodditton Wood (Cambs.) on May 22nd and 23rd, 1926, and previously recorded from only Gloucestershire, Somerset and Lancashire and known to occur in Denmark and Central Europe down into Styria and Moravia.

Accommodation was provided by the host for members and visitors, who were able to stay the week-end, and on Sunday morning an excursion by motor cars was made to the pretty village of Jevington, where insects of many orders were found to be abundant. After luncheon Mr. Adkin's collections and fine library were inspected with very much pleasure and in the evening the guests were entertained to dinner by Mr. and Mrs. Adkin at the Grand Hotel. The whole meeting was of a most successful character and the guests departed on Monday morning after a very pleasant visit.—H.W.-E.

SOCIETIES.

The South London Entomological Society.

The more interesting exhibits were :—

December 10*th*, 1925.—Mr. A. de B. Goodman exhibited, a very rare *Melitaea*, *M. casta* from Lieristan, *Polyommatus superba* from Anterior Asia, and *Lycaena* (?) *diana* from Kagysman.

Mr. Blenkarn, a teratological specimen of *Philonthus varius* v. *bimaculalis* with a double claw on R. hind leg, and the local beetle *Catops nigricans*, from Ditchling.

Mr. K. G. Blair, the nymph of a cockroach *Nyctibora noctivaga*, found in a box of bananas of N. American origin.

Mr. Rait-Smith, some remarkable forms of *Polyommatus coridon* taken this year in the I. of Wight, including a gynandromorph and asymmetrically marked specimens.

Capt. Crocker, a *Melitaea cinxia* shewing homoeosis on the underside.

Mr. A de B. Goodman, lantern slides of various species of *Ascalaphus* from S. France.

January 14*th*, 1926.—There was an Exhibition of Insects other than European.

January 28*th*, 1926.—Annual Meeting.—The reports of the Council and Treasurer and the Balance Sheet were read and adopted.

The new Officers and Council were declared elected.

The President (Mr. T. H. L. Grosvenor) read the Annual Address. Votes of thanks were passed to the retiring Officers, and a special vote of thanks to Mr. A. W. Dods who was retiring as Librarian after fifteen years service.

February 11*th*, 1926.—Dr. Cockayne showed a white aberration of *Zygaena trifolii* from Swanage.

Mr. Grosvenor, a similar aberration, bred from the Sussex Weald.

Mr. Barnett, a long series of *Dianthoecia conspersa* from Croydon, and gave a copy of the portrait of Doubleday for the Society's album.

Mr. Turner, about 50 species of Exotic Coleoptera from Madagascar, New S. Wales, Java, the Cameroons, Corea, etc.

Correction.—"Butterfly Collecting in the Ardennes." *P. argyrognomon* should be *P. argus*, L., and *C. sebrus* should be *Cupido minima*, Fuess.—G.T.

Subscriptions for Vol. XXXVIII. (new series), 10 shillings, should be sent to Mr. H. W. Andrews, *Hon. Treasurer*, **6, Footscray Road, Eltham, S.E. 9.**

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EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr. Hy. J. Turner, 98, Drakefell Road, New Cross, S.E.14.

Duplicates.—Several hundred species of Coleoptera (carded) from Hants and Dorset, including several rare species from the New Forest, etc.

Desiderata.—Scarce and local British Coleoptera (carded).—*A. Ford, 42, Irving Road, Bournemouth, Hants.*

Wanted for Biological Study.

Large numbers of living larvae of *Hyponomeuta* spp. from Hawthorn, apple and Euonymus. It is essential that host plants should be specified and larvae from each host plant kept separate. The original colonies should be preserved and not mixed with others.—*W. H. Thorpe, B.A., Zoological Laboratory, Cambridge.*

Desiderata.—The Leicester Museum has no British Diptera and requires a typical collection. Can any collectors help us? We offer European Butterflies in exchange..'—"Entomologist," Leicester Museum.

Desiderata.—Ova or pupae of christyi, abruptaria v. brunnea, black consonaria and bidentata, extensaria, curzoni, jasionata, venosata (Shetl.) and other melanic Geometers and Noctuae.

Duplicates.—Very many in first class condition, high-set only f. i. Herminia flavicrinais, Andreas, Nych. dalmatina race andreasaria, Warnecke, about 30 species of rare Acidalias ; pupae of Eupithecia illuminata or cash.—*Karl Andreas. Wiesbaden, Goethestr. 23, Germany.*

Change of Address.—R. S. Bagnall, to 13, Learmouth Terrace, Edinburgh.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. October 6th, 20th. November 3rd, 17th. December 1st.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. July 22nd. August 12th, 26th.—*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.*, J. P. Hardiman, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

All MS. and EDITORIAL MATTER should be sent and all PROOFS returned to Hy. J. Turner, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT *to send us communications* IDENTICAL with those they are sending to other magazines.

Reprints of articles may be obtained by authors at very reasonable cost if ordered *at the time of sending in MS.*

Articles that require Illustrations are inserted on condition that the Author defrays the cost of the illustrations.

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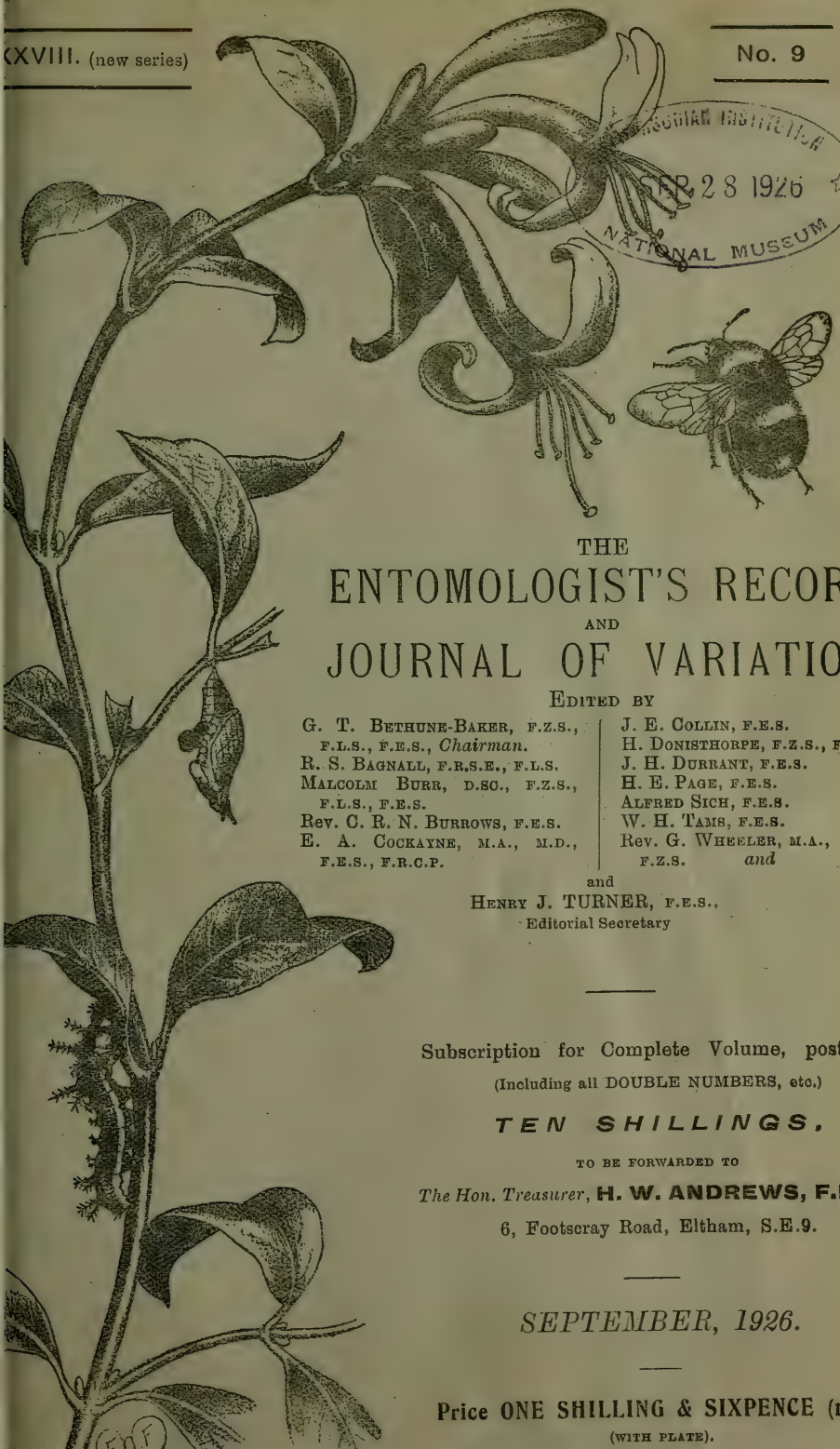
XXVIII. (new series)

No. 9



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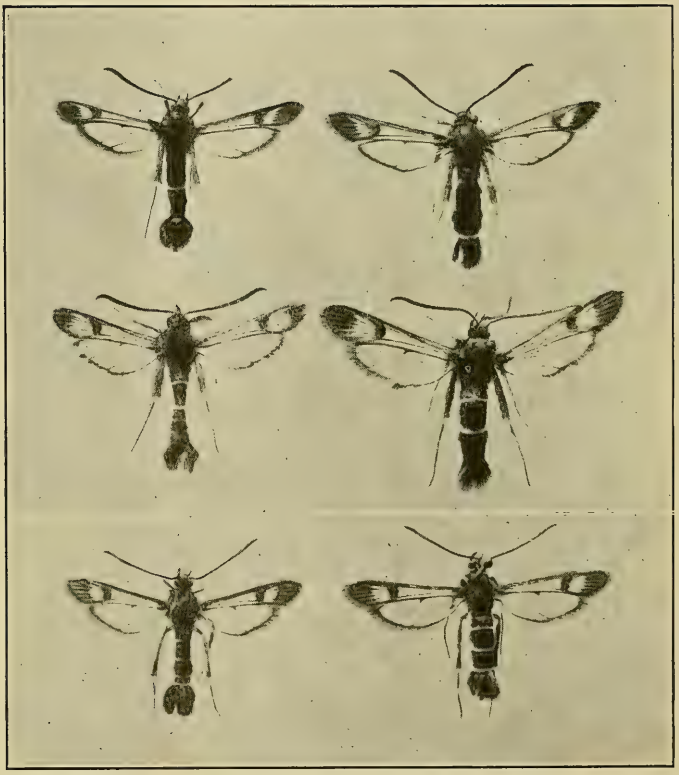
It is hoped next month to complete the two supplements, the Geometer List and the Hampshire Paraneuroptera. There are also two important articles to come shortly, the second portion of Major P. P. Graves' "Collecting in Macedonia," and a summary of two valuable collections of Heterocera made in Macedonia during the war. In addition there will be commenced shortly as previously announced a further supplement on the entomological Fauna of the Wyre Forest.

The pressure on our space is so great that Reports of Societies have to be curtailed or omitted altogether, rather than published so much out of date.



The Entomologist's Record. *Photo H. Main.*

1-2. *Synanthedon flaviventris* (new British species).

3-4. ,, *andrenaeformis* (for comparison).

5-6. ,, *tipuliformis* ,,

A new British Species.

A new British Aegeriid :—Synanthedon flaviventris, Stgr.

(*With plate III.*)

By Wm. FASSNIDGE, M.A., F.E.S.

On June 9th, 1926, there emerged in my forcing-cage an Aegeriid which I saw at once could not be referred to any of the known British species. A few days later, when time permitted, I identified it as *Synanthedon flaviventris*, Stgr., a species hitherto recorded only from northern Germany and the Russian Baltic provinces, and my identification was subsequently confirmed. The insect had emerged from a swelling in a sallow twig, gathered with others during a search in February and March for mines of *Grapholitha servillana*, Dup., and for the galls made by larvae of *Saperda populnea*, L.

I am able to give the following account of the manner in which this species was discovered in the Southampton district. About three years ago, I found in sallow at about five feet from the ground, a larva, which I thought must be that of *Sphecia crabroniformis*, Lewin, in its early stages. In subsequent years I searched patiently during the winter months for more larvae, finding, however, very few. All attempts to rear the moth proved fruitless, and this failure confirmed my assumption that the species must be *S. crabroniformis*, which requires at least two years to attain full growth. I was never satisfied on the point, however, and in a paper read before the Entomological Society of Hampshire and the Isle of Wight in February, 1926, I restated my doubts, suggesting that the larvae might possible be those of *Synanthedon formicaeformis*, Esp., which are stated by some continental authorities to feed sometimes in stems of sallow, and adding that I hoped to be more successful this year in my attempts to breed the moth and to settle the question.

Diligent search among sallow during the winter yielded large numbers of mines of *G. servillana*, a considerable number of galls of *S. populnea* and five or six possible mines of the unknown clearwing. As I expected to be away from home from April 1st to 28th, I could not hope to force any insects until after my return, but, nevertheless, I stood all the mixed twigs and galls in water together, and placed them in the forcing-cage. Examination at the end of March, when numbers of *G. servillana* had been successfully forced, showed that at least three larvae of this unknown clearwing were still feeding and alive. I had previously split the twigs from the top and found the larvae feeding head upwards, so that they were forced to stop up the crack with frass. At intervals after my return home at the end of April I examined the mines, taking two larvae completely out in a vain attempt to determine the species, and thus of course ruining all chance of rearing those two individuals. Two other larvae died or dried up, leaving me in mid-May with two which were apparently still feeding, or at any rate preparing their exit holes and constructing their cocoons. From these two mines a ♀ specimen emerged some time during the morning of June 9th, and a ♂ specimen at 10·30 a.m. on June 22nd. Mr. Hy. J. Turner informs me that he also succeeded in breeding one ♀ of this species from a mine I sent him along with twigs containing larvae of *G. servillana*.

I am able at present to give but meagre information concerning the life-history and habitat of this insect. In shape the gall-like

swellings made by the larvae almost exactly resemble those made by young larvae of *S. populnea*, when this beetle chooses sallow instead of the more usual aspen. They are distinguished by their smaller size from the swellings tenanted by full grown larvae or pupae of *S. populnea*. The two mines I possess are in sallow twigs nearly as thick as an ordinary pencil, and the swellings are about one inch in length. The larvae appear to have bored first round the stem more or less horizontally, then into the centre of the twig and upwards until fullfed. How exit is arranged for in nature I cannot say, for by splitting both these mines I provided an easier way out than would normally be present. Most probably *flaviventris* resembles in its life-history its very near neighbour *Synanthedon tipuliformis*, Clerck. As to habitat and foodplant I cannot yet speak with any claims to completeness. I have found mines in both broad-leaved and narrow-leaved sallow growing in and near swampy ground. I believe the insect prefers sallows growing outside and on the outskirts of woods to those that grow in shady places, for up to the present, I have not found a mine in the latter situation. I anticipate that the species will be found to have by no means a local distribution, nor do I think it is confined to the south of England, but this point will quickly be settled if those entomologists who are interested will utilise some of their winter leisure for a careful search of the sallows in their district.

From the continental authorities we find that this insect was discovered in 1883, and described by Staudinger in the *Stettiner Entomologische Zeitung*, Vol. 44, page 177 (1883) under the name of *Sesia flaviventris*. It is said to prefer stunted bushes of the coarser leaved varieties of sallow growing on moors and in wet meadows. It has been found up to the present in Mecklenburg, Pommerania, Hamburg, Kiel, Silesia (not Saxony), St. Petersburg and Oblonetz.

Bibliography.—Staudinger. *Stett. e. Z.* XLIV. 177 (1883): Stange. *l.c.*: Staudinger. *Cat.* I. 401. (1901): Bartel, *Pal. Gross-Sch.* II. 335. (1902): Lüders. *Zeit. f. wiss. Ins.* I. 382. fig. (1905): Schütze. *Ent. Zeit.* XXI. 216. (1908): Trautman. *Int. Ent. Zeit.* II. 269. (1909): Rebel. *Berge. Schm-buch.* ed.9. 465. (1910): Spuler. *Schm. Eur.* II. 308. plt. 79. (1910); Meder. *Int. Ent. Zeit.* IV. 269. (1911): Seitz. *Gross-Schm. Pal.* II. 384. plt. 51d. (1912): Tomala. *Rov. Lapok.* XX. 195. (1913): Tomala. *Ent. Rund.* XXXI. 19. (1914): Meder. *l.c.* 30. (1914): Wagner. *l.c.* 34. (1914): Zukowsky. *Int. Ent. Zeit.* XV. 66. (1921).—Hy.J.T.

The above discovery by our valued correspondent of such an important addition to our lepidopterous fauna suggests to us that possibly other species may be awaiting the assiduous collector in the future. The late Dr. Chapman had a suspicion that sundry tunnellings in the stems of the gorse were lepidopterous, but did not succeed in finding the makers. Appended is a short list of species which occur on the continent in not very far removed parts and which might possibly be turned up in the southern and central parts of our Island.

No doubt during the coming winter and spring our southern entomologists will search the sallows and large-leaved willows in their neighbourhoods for all galled stems, and next year we may know more about the distribution of this new-found Britisher: probably, like *S.*

andrenaeformis, it will prove to be well distributed with its food-plant, and common locally.

Aegeria melanocephala in *Populus tremula*, deep in wood.

Bembecia hylaeiformis in *Rubus idaeus* (raspberry) and Blackberry (rarely).

Synanthedon cephiformis in cancerous growths on trunks, twigs and larger branches of *Abies alba*, *Picea excelsa*, and *Larix europaeus* attacked by fungus.

S. conopiformis in old diseased or dead oak in cancerous swellings; also in mistletoe stems near the base of the plant.

S. stomoxyformis in medlar twigs and stems.

Dipsosphecia uroceriformis in roots of *Dorycnium herbaceum*, probably also in *Ulex* basal stems.

D. astragali in *Astragalus* roots.

D. megillaeformis in roots of *Genista tinctoria*: sunny places.

Chamaesphecia doryliformis in roots of Sorrel (*Rumex*).

Ch. empiformis in roots of *Epilobium angustifolium* and *Euphorbiae*.

Ch. leucopsiformis in roots of *Euphorbiaceae*.

Ch. triannuliformis in root stalks of *Rumex acetosella*, etc.

Microsphecia tineiformis in stalks of *Echium vulgare*.—H.J.T.

Description of a new form of Acraea from the Cameroons.

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

In a collection that I obtained some time ago from the Cameroons was an *Acraea* that puzzled me at first on account of its large size and dull but uniform coloration. It proves however to be a large form of *A. wigginsi* but it is so distinct that it has evidently become a good local race.

Acraea wigginsi race **occidentalis,** forma nova.

♀ upperside: both wings entirely pale tawny ochreous with practically no dusky suffusion at all.

Primaries with a large spot beyond the middle of the cell, a smaller one closing the cell, with a small patch of grey scaling between this and the white transverse markings; a posterior row of five black spots, the upper two edging the patch of grey, the third shifted inwards, the fourth, large, shifted further inwards, the fifth reniform and large, shifted well outwards between veins 1 and 2; a broad white transverse bar from the costa to about, or below vein 4; beyond this the apex is blackish extending down the termen to vein 3; a terminal row of ochreous spots from the apex to vein 2.

Secondaries: with base restrictedly black, not extending to vein 7 of the cell; a large black spot near the end of the cell; a posterior row of eight fair sized black spots, the upper four in almost a transverse straight line, the lower one touching vein 4; the fifth shifted far in, in the angle between veins 2 and 3, below which are the sixth and seventh which are confluent, the eighth small in the marginal fold (in one specimen there is a small spot in the angle of veins 3 and 4); a broadish black terminal margin, in which is a series of internervula ochreous spots from the anal angle to the apex.

Underside. Primaries like the upperside except that the black

apex is dusted entirely with ochreous and there are no terminal ochreous spots.

Secondaries, cream colour with an interrupted rosy irregular broad band from the costa to the inner margin extending across the end of the cell and bordered exteriorly by the black spots of the upperside which are more prominent even than on the upperside; interiorly it is also bordered by a black spot below the costa, another at the end of the cell and four spots from below the cell to the abdominal margin: there is no terminal black margin, but the terminal row of internervular spots is creamy white, very prominent and finely edged internally with black lunules.

Expanse 64 mm.

Hab. Bitjé, Cameroons (G. L. Bates).

Type in my collection. 4 ♀ s.

There is one specimen in which the whole of the upperside of the primary is quite dusky grey, the pattern is, however, the same, whilst the secondaries are almost straw colour—the underside is typical.

This is a very much larger form than Neave's specimens from the Victoria Nyanza region (64 mm. compared with 53 mm.), the colouring of the West African form is much duller than the Eastern one and there is usually no dark suffusion of the primaries, whilst the spots both above and below are greatly enlarged and prominent in my subspecies. It is a large handsome race.

Miscellaneous Notes from Argentina. V.—Life-history of Papilio hellanichus, Hew.

By KENNETH J. HAYWARD, F.E.S.

Introductory.—My first introduction to *Papilio hellanichus*, Hew., and incidentally my first visit to the Chaco forests took place on Sunday, November 23rd, 1923, five days after my arrival at Villa Ana. New to the country and its fauna I trod warily fearing rattlesnakes and all kinds of other loathsome creeping things, and with the luck of the beginner disturbed and just glimpsed a forest cat, rare in this district and of which I have never seen another. Suddenly I came on a considerable glade, since the scene of many useful captures, and in one corner, *P. hellanichus* was floating lazily round some scrub. My Seitz *Macrolepidoptera* having stated that the earlier stages were unknown, I searched assiduously for the larvae on every possible occasion, a quest that was only finished in September of 1925. At first I considered this Papilio somewhat rare, but since I have extended my hunting grounds, I have found it common and exceedingly easy to catch, since, unlike other Papilios that I have taken, it does not appear scared if an ineffectual sweep of the net fails to entrap it, and even if actually touched only removes itself a very short distance. Whilst found everywhere around this district it is noticeably more common in one or two certain spots, and when these had been discovered, I commenced a long search over every tree and bush that these contained. I beat persistently and tried every method to locate the foodplant, but without result, and now that it has been identified I notice that in none of the spots, where the insect flies abundantly, does this plant grow. As a matter of fact I think its predilection for these spots is

due to their being little else than suntraps, the imago being above all a sun lover and found on the wing throughout the hottest part of the day. Apart from searching these spots I had formed certain opinions on the possible foodplant and gave the species of these families a good deal of attention, securing other larvae but not the desired Papilio. As results now show, I was very far off the mark.

In September of 1925, having somewhat more time at my disposal than previously, I decided to try a Spring offensive against this insect, and realising that I should only discover the larva by luck, I decided to start at the other end and obtain eggs from the imago and feed various plants to the young larvae till I could find something they would eat. Females were easily obtained and confined in large light cages or left free in my bedroom with a choice selection of foodstuffs collected with some discrimination from their favourite haunts. Most of the month passed and no eggs. One by one the females gave up and died. There was now only one thing for it and that rather a long chance. I decided to locate a wild female depositing in the open. For many days I gave up my siesta and rushed off to the forest between lunch and three o'clock, at which hour I had to be back in the office. Many times I was on the point of collecting the precious egg only to find the so thought female was a simple male sunning itself. However, strange to say I really did encounter a female ovipositing on October 1st. It was a scorching midday and I sat down in a small clearing to think about the foolishness of tramping about a something forest on such a something hot day, when presently a *hellanichus* started hovering over a small twig of *Berberidaceae* and after due deliberation she came to rest on a twig and having gained her balance the abdomen was sharply curved under a leaf, two quick stabs given, and she flew off to hover and repeat the process on another leaf. Needless to say I picked the plant to pieces leaf by leaf and in all I secured three eggs. The following day I returned to the spot and on another plant of *Berberis* secured further eggs and three larvae just emerged and potentially *hellanichus*. These afterwards proved to be as expected. I collected a large bundle of the foodplant for feeding purposes and on searching this found further eggs and larvae. This material has enabled me to breed through the insect, and the following descriptions may enable other collectors to have the same pleasure.

Egg.—Being without a microscope I can give but a cursory description of the egg. They are laid singly on the underside of the leaf or the leaf stem of *Berberis rusci/olia*, Lam., and are highly procryptic, exactly resembling the small round swelling at the base of the leaf stalk. The egg is dark green at first and firmly fixed with some sticky secretion. A dead female known to have laid no eggs was dissected and found to contain 57 perfectly formed ova, so we may fairly safely consider the number laid to be between 50 and 60 on an average per female. The egg is 1·4mm. in diameter and, magnified to the limit of my glasses (x 20), appeared to have a roughened surface (Resembling the roughness of the skin of an orange), and a slightly defined difference in colouring at the spot where the larval head later appears.

The second day brings no change, but on the third day the colour begins to change to a dark yellowish green, this colour being reached on the fourth day. On the fifth day the aforementioned spot at one

pole becomes greyish, and on the 6th day this spot is more distinct. the ground colour having paled, with the exception of a greenish curved area around this spot. Seventh day colour still paler. Eighth day the egg had become a very dirty yellow and the green area round the pole darker. On the ninth day the egg became greyish and the contents indistinctly visible within. The larva emerged late on this day, breaking through the shell and not afterwards consuming it as is the case with some species. The larva was at this period 1·7mm. long.

First instar.—Head jet black, very shiny, sparsely clothed with fine short dark hairs. Thoracic segments dark mahogany with a retractile process in the form of a Y-shaped fleshy horn and a lighter process on the first thoracic and two small shiny tubercles behind. On the second thoracic segment eight similar, light mahogany processes in a forward-curved ring starting from the lower lateral line at the back of the segment and curving forward almost to the segmental fold at the dorsal line. On the third thoracic four similar processes placed in a line transversally dorsally with two smaller ones behind. Body of dark mahogany colour having an oblique yellow patch running back from the lower lateral line on the first abdominal and meeting dorsally on the 4th abdominal segment, carried through faintly as a dorsal line to the 6th abdominal where it spreads over the whole dorsal area running obliquely back to the lower lateral line on the 7th abdominal and obliquely upwards to the centre of the dorsal area on the penultimate segment. The anal segment black clothed with short dark hairs. Seventh and eighth abdominals each with two yellow processes on the dorsal area, those on the eighth more pronounced and horn-like. A pair of light mahogany tubercles similar to those on the thoracic segments on each of the 5th and 6th abdominals. An indication of a white lower lateral line.

Second instar.—At the end of 10 or 11 days the larva passes into its second stage having reached a length of 14mm. The colour and markings are but little changed. Head shiny, dark mahogany. Thoracic segments of the same colour, the first segment having a projection over the head carrying a horn-like process that it can project or withdraw at will. This process is edged frontally with dirty yellow. A diamond shaped shade of white, pink-flushed, on the first and second thoracic segments low down laterally, the major axis obliquely downwards. Flecks of the ground colour on this area. The wart-like processes of the first stage repeated proportionately enlarged and of a lighter colour than the ground. These processes are very "glassy" in appearance. Ground colour of the abdomen deep mahogany, a pink-flushed white area covering the dorsal area, its edge running obliquely to the lower lateral line forwards from the 5th to the 2nd abdominal segment, and back to the 8th abdominal, the area being limited dorsally on the 2nd abdominal by a V-shaped collection of spots of the ground colour, and terminated on the eighth by two horn-like processes. Dorsally the whitish area carries a row of faint greyish brown spots placed on the 4th abdominal in the form of a diamond, and repeated on the 5th and 6th (the light area itself is here diamond shaped) and on the 7th as a uniform cluster of dots. On the 5th and 6th abdominal segments two wart-like processes similar to those on the thoracic

segments. The 12th segment greyish-brown terminating in white. This white is a continuation of a line extending right along the abdominal segments. Thoracic legs and underside similar to upperside in colour, underside of abdominal area greyish white. As the larva grows the pink flush leaves the white area until the latter is almost pure white.

The process on the first thoracic segment has a small round bright yellow addition anteriorly. Just before moulting the larva changes slightly in colour, the dark mahogany becoming dark olive green. The second moult takes place about the 20th or 22nd day when the colour scheme is completely changed and the larva is not recognisable as the same. The length has now reached 27 to 30mm.

Third instar.—Head and anal segment smooth dull grey. (The fleshy retractile horn light orange.) The ground colour of the larva is now velvet-black, almost completely covered with minute light bluish spots, and relieved with a level bluish green the exact colour of the older leaves of the foodplant. This green is distributed as follows. A narrow collar frontally on the first thoracic segment, which collar widens low down laterally, and bears a light violet spiracle. The second and third thoracic segments green to low down laterally, the third having a slightly raised ring forward dorsally of black colour but not uniting with the black of the ground colour, the ring having on it six ovoid yellow spots corresponding to the wart-like processes above mentioned, each yellow ovoid split from front to back by two fine black lines, the enclosed area being lilac. The lower spot on either side being slightly more raised than the others and of brighter yellow. Terminating the green area on the third thoracic segment is a somewhat similar ridge, the color not so defined. Behind this a complete narrow ring of black, edged posteriorly with deep velvet jet black. The abdominal segments green with a cross of the ground colour running from the fourth abdominal segment across the body to the seventh abdominal and having a small green spot at the point of intersection. The spiracles on the ground colour greenish-blue with a circular terra-cotta spot beneath. Where the green meets the black there is a thin line of deep velvet jet black. A line of speckling with minute bluish spots above the lower lateral area. Beneath greyish black, the forelegs brown and the extremities of the abdominal legs bluish grey. As the larva grows the shade of green deepens and all markings become more pronounced. At about the 38th day the larva ceases to feed being now about 45 to 50mm. in length, varying somewhat. The colour rapidly darkens till the green area has become a dark grey and the black area a dull sooty black. On the 40th day the larva commenced to pupate at noon, spinning a silk girdle by which it suspended itself to the stem of the foodplant. It remained in this position till about mid-afternoon on the 43rd day at which time the metamorphosis to the pupal state was complete as far as external appearances go.

Pupa.—An angulated pupa of the usual Papilio form, suspended below the wing sheaths by a silk girdle, and attached to the object on which the larva has pupated by a tuft of silk at the anal extremity. The pupa sharply angulated at the head and thoracic segments, the

remainder rounded, tapering evenly to the anal segment. Three rows of sharp short projections on either side. The length of the pupa averages 30mm.

Colour earthy grey, flushed all over with a faint reddish brown with irregular grey markings, most pronounced on the underside; these markings similarly flushed with reddish brown. The largest grey marking appears on the first and second thoracic segments just above the wing sheaths. A black colon on either side of the angulated head, in the recess below a whitish mark, laterally four black dashes, and at the back end of each segment a hair line of black terminating centrally in a row of perfect half-circle curves. A somewhat lighter stripe along the dorsum.

A single specimen emerged from the pupa on March 21st, but the remainder appear to be going over till next September. The insect is very common in the spring from September till October and usually not uncommom in the autumn, but this year it appears to be absent. I saw a freshly emerged brood at K.50 on the French railway near this place on November 19th of last year, which might conceivably be the result of September larvae. The few wild pupae that I have found have all been attached high up on the stem of the foodplant, which they so closely resemble.

The foodplant in this district is *Berberis ruscifolia*, Lam. Fam. *Berberidaceae*, known locally as "Quebrachillo" (Little quebracho).

Descriptions from wild eggs, larvae and pupae and early stages bred from wild eggs, all from the neighbourhood of Villa Ana.

Specimens of the early stages have been sent to the B.M. Nat. History under the following numbers. Eggs 6076. Full fed larvae in spirit No. 6263. Pupa under number 6262 and a single bred imago No. 7023.

Zygaenae, Grypocera and Rhopalocera of the Cottian Alps compared with other races.

By ROGER VERITY, M.D.

(*Continued from page 106.*)

P. meleager race **alpium**, mihi: Oulx (Aug. 3rd-11th). Treitschke's name of *steevenii* has been so universally applied to the Alpine race of this species, or rather to its darkest females, that all seem to have overlooked the fact it was created for specimens from Russia. Frühstorfer has described (*Int. Ent. Zeit. Guben.*, 1910, p. 56) some males from the latter region and pointed out their features which are very different from those of the Alps; the females probably differ too, but the name of *steevenii* could be used for the dark individuals of any race. What is, instead, certainly impossible is to apply it to the race of the Alps taken as a whole, which differs distinctly in many localities, such as Oulx, from the nymotypical *meleager* of Saxony, and and which should be distinguished; the males have the marginal black streak more pronounced and also the premarginal dots of hindwings; the female is nearly invariably of a uniform deep blackish brown tinge, with a few traces of silvery blue scaling and hairs at the base and whitish lunules showing more or less: most in my specimens from

S. Tyrol, where both sexes are paler and colder in tinge (race **alpiumclara,** mihi), least in those from the Valais (race **alpium,** mihi). A male from Oulx has a row of pale grey lunules before the premarginal dots of hindwings and a row of corresponding spots on the forewings, so that it is transitional to the fine form figured by Herrich-Schäffer, figs. 244-5, as male of *steevenii*, although there is no absolute connection between them. I name it **superlunulata.**

Hirsutina admetus race **exuberans,** mihi: Oulx (July 25th-Aug. 5th). If, following Courvoisier, we fix on Boisduval as the author of *rippertii*, because Freyer's figure, which has been taken for it, is unreliable, the race of Digne is the nymotypical one of it. Comparing my Oulx specimens with some from that locality, I find they give one the impression of being intermediate between them and the *admetus* of Spain and Asia Minor, being similar to the latter by their larger size than *rippertii*, deeper and colder tone of black on upperside, colder grey underside; the white streak is also less sharp in outline.

H. damon race *ausonia*, Vrty.: Oulx (July 13th-Aug. 5th), Cesana and Clavières. Much smaller than the nymotypical race of the species from Vienna and smaller also than the Swiss races I have before me, so that it agrees perfectly with that of Central Italy, which it furthermore resembles by being of a slightly warmer tinge on the underside of both sexes than the average Vienna specimens. It does not agree with the description of *ferreti*, Favre, except in size.

Agriades thersites race *thersites* (Cant.) Chapm.: Oulx. I gen. *hibernata*, Vrty. (June); II. gen. *thersites* (Aug. 6th-10th). At Sestrières I. gen. on Aug. 8th, and, no doubt, no other follows. Ball has named the II. gen. *chapmani*, taking the first to be nymotypical, but this is a mistake, because Chapman in his original description describes and figures the androconial scales of the II. gen., as stated by Ball himself. The II. gen. of Oulx corresponds exactly to the figures of Cantener by its comparatively short, broad wings, by the rather dark tinge of underside and large black dots, contrasting with the form and race I have called *meridiana*, but which I possess from dry localities also of Central Europe, as far north as Auzay in Vendée.

A. hylas race **micromargarita,** mihi: Oulx (July 4th-24th), Cesana and Clavières. Sufficient stress has not been laid on the fact that the flourishing northern race, as figured by Esper from Saxony, of large size and with a cold, dark grey (nearly blackish) underside, is never met with in the southern portion of Central Europe. In the Alps even the largest races, such as the one of the Baths of Valdieri, 1375m., in the Maritime Alps, which I should name **macromargarita**, or of the Moulinet, near Mentone, are, on an average, smaller and others, such as the one of Oulx, are distinctly so (25 to 28mm. instead of 30 to 32); in Alpine races of all sizes underside pearl-gray, often with a touch of fulvous in its tone; black dots, on the whole, smaller; orange lunules usually rather larger and brighter than in northern *hylas*. Another very distinct race is the one of Vienna I have, of May, from Klosterneuburg: small and frail, with rather narrow wings; blue of male often pale, in some cases distinctly greenish and not too rarely of the *griseoviolaceus*, Obth., aberration; underside darker grey than in the average Alpine form; upperside of female often discolored in tone; underside of both sexes with black markings small and orange lunules inconspicuous. As Courvoisier states that Schiffermüller's name of

dorylas is a *nomen nudum*, rather than create confusion by validating it now, I think it advisable to call this race **enervis,** mihi. A single male of August I have from Dombresson, in the Jura, exactly resembles this race. It would not be surprising if *enervis* in some localities and *micromargarita* in others were found to constitute the II. gen. and their I. gen. was *macromargarita*. I must remark it is quite a mistake to apply the name of *golgus*, Hb., from Spain, to the dwarf specimens of Central Europe; they should be called *minor*, Tutt (Wheeler's measurement of 28mm. is evidently a misprint, as, even diagonally, they are only about 25mm. and between the apices 20 to 22); the former is the II. gen. of Spain and Peninsular Italy, whose I. gen. I have named *correpta*.

A. escheri race *escheri*, Hb.: Cesana. Individual variations of the male sex range here from the form figured by Hübner to one similar to *rondoui*, Obth., described from the Pyrenees, but of which its author states he has found the male also at the Ryffelalp in the Valais; the females, instead, all have very dark fringes, so that they do not correspond to that of *rondoui*, but they are like the one figured by Hübner by their small size, limited fulvous lunules and dark underside. This, no doubt, is the race of most of the higher Alpine localities of the species, but at the Baths of Valdieri in the Maritime Alps, I have found at 1375m. a race quite similar to the following, whilst Cesana is also at 1300m., so that the nature of the surroundings has evidently more influence than actual altitude. Race *balestrei*, Frhst.: Oulx (all July).

A. thetis race *etrusca*, Vrty.: Oulx I. gen. *maja*, Vrty. (June to beginning of July); II. gen. *etrusca*, Vrty. (Aug. 10th). This race stands so near the one of Peninsular Italy that the same names can be applied to it, although the most extreme forms of the latter, with a very light underside, do not seem to be produced in the Alps, where the average is a little darker. It is, however, rather remarkable that in this species the race of the lower localities of the south should be produced as far north as the Valleys of the Alps, whilst in the Apennines, at high altitudes, its I. gen. turns into the totally different frail and pale *apenninogenita*, Vrty.

A. coridon race **rufosplendens,** mihi. Oulx (August). A very distinct race, characterised chiefly by the bright, warm, tawny (saturated fulvous) underside of hindwings in a large percentage of individuals and by the large and vivid orange lunules of many. I have not seen these features in any other race, except the one of Monte Fegatesi and the Fegana Valley, near Lucca, in northern Tuscany, which differs from that of Oulx in that the tawny is never mixed with the grey, as in some individuals of the latter and the females especially, are always of a clearer tinge. On the upperside the marginal suffusion of black in the male is also considerably less in extent and paler in an average, although the Oulx race is already striking in this respect as compared with the other races of the Alps and points markedly by all these characters to *apennina*, Z. I should call the Fegana race, which is a further grade in the same line of variation, **rufoclarens,** mihi. It is surprising how the geographical variation of *coridon* has been neglected: it produces a number of obviously different races, when sufficiently large series are compared to neutralise the confusion created by individual differences. Wheeler

rightly states that all Swiss specimens have pale undersides in the male; I should add that all the Alpine races have also smaller black dots and lunules than those of most other regions. I suggest taking as typical of the average Alpine race that of Waidbruck and Klausen in the Isarco Valley (Eisacktal) and naming it **alpiumpallida,** mihi. The colour of the upperside in the male is of a blue mixed with a touch of green and the marginal band is of average breadth (one third to half the distance between margin and discoidal cell of forewing). In the Jura (my series is from Dombresson) and on the Grand Salève there exists a race **jurae,** mihi, intermediate in tone of colour and size of spots between the preceding and the following; the underside of hindwings is of a pale grey, giving the impression of dirty white, mixed, in some individuals, with a slight touch of fulvous. Towards the west and north-west one then meets with a group of races, which resemble the nymotypical *coridon* of Gratz, in Styria, by their large size, broad wings and especially by the bold spotting of the underside, but which have in the male a totally different look, because the black of the upperside has much less extent and the blue is much clearer and brighter, nearer to sky-blue (much less greenish). I know of three races belonging to this group: Race **insulana,** mihi, in the south of England (typical series from near Sevenoaks, in Kent), with male most markedly of the blue described above and marginal band uniformly black and usually rather narrow; underside greyish, with a very slight touch of fulvous; most females on the upperside brown, with only a few bluish scales at the base of the hindwings; orange lunules small and pale. Race **galliae,** mihi, widespread from Northern France to the Gironde (typical series from Lardy, near Paris) slightly smaller with male of a paler, more milky blue; marginal band often broken by white spaces in rings around premarginal dots, even on forewing; most females of the *mariscolore* (nom. nudum in Boisd.) form, as figured by Gerhard. Race **narbonensis,** mihi, from Provence: my typical series is from St.-Zacharie, on the boundary between the Bouches-du-Rhône and the Var, very large and bright on both surfaces; upperside of male with a narrow and sharp black margin; underside of forewing very white, of hindwing in both sexes of a clear, bright fulvous; premarginal lunules large and vivid; upperside of female of a warm chestnut tone. Some individuals from Vernet-les-Bains, in the Pyrénées Orientales, and from Seva, on the Catalonian watershed, resemble the latter, but the male on the upperside is more greenish, and much broader individual variations lead up to a smaller form falling in the *altica* group. I cannot deal here with the very distinct German group of races, but I must mention that in the north-east of France there are localities, such as the Plateau St.-Claude (Moreuil) in the Oise, where the race differs strikingly from *galliae* by its markedly greener and duller, darker tone on the upperside of the male, by its colder, dark gray underside and by the females being of the brown form, so that it obviously points to the German ones: race **fumosa,** mihi. Turning our attention again to the Cottian Alps, let us observe that race *rufosplendens* of Oulx exhibits a considerable amount of individual variation: thus, 30% of the males have a very narrow marginal suffusion of black and belong to the *angustimargo, subfusca, punctata* forms of Tutt; 2% are *albocrenata*; 15% are *divisa*;

the rest have an uniform suffusion forming an even band, in breadth about one third of distance between margin and end of cell; on the underside about 15% belong to *pallida*, Tutt; as many again to *fuscescens*, and the rest are of the characteristic tawny of this race; of these the paler ones correspond to *fulvescens*. I also have one specimen with forewings gray and hindwings so dark they are almost black (ab. **atrescens**, mihi), and a correspondingly black female. Two of my females (3%) have the hindpart of both fore- and hindwing dusted thickly with silvery blue above. We must now examine a group of races characterised by their small size and usually also by the reduction of black dots and lunules on the underside. Tutt is right in his remark they are not strictly confined to high altitudes, but it is certainly there they prevail. According to him the Basses- and Hautes-Alps is the only region where small size is racial (*Brit. Butt.*, IV., p. 44). We will see he has been rather too sharp in his criticism of Neustatter's statements in the description of race *altica* from Salzburg, and other localities in the Eastern Alps, the first of these races which has been differentiated. In the Western Alps I have collected one, which is parallel with it, and which I name **italagallica**, mihi, at Clavières and at Cesana. It no doubt is that of the Hautes Alps observed by Tutt; in fact, it is the smallest race of the species I have seen (25 to 30 mm. between apexes of forewings), although the measurements Tutt gives are incomprehensible to me. It is thus still smaller than *altica*; male with a still narrower black marginal suffusion, never broken by white rings; underside of hindwing tending more often and more intensely to fawn colour and lunules to be warmer and brighter, showing its proximity to *rufosplendens*: on the whole, however, it is whiter and with much smaller black dots and lunules than the latter. At Digne, in the Basses Alps, an allied race is found, remarkable by the paleness of most individuals, although Rowland-Brown's statement, published by Wheeler (*Butt. Switz.*, p. 32), that "the black of the border has practically disappeared, leaving in some specimens only faint gray ocellations" might convey a somewhat exaggerated idea of it; a prominent characteristic is that on the forewing as well as on the hindwing, there often are premarginal dots surrounded by white rings. Some individuals are in this respect, as also by other features, very similar to the races of the Apennines, but an exceptionally large one in my series is, instead, quite similar to race *narbonensis*. The average size is small, but not as small as in *italagallica*. The underside of the male is still whiter (hindwing either quite white, or of a very pale fulvous), orange lunules paler and often quite yellow, black dots more minute. I name this race **diniae**, noting, however, that it spreads even to the Vaucluse, whence I have it from Mont Ventoux, and probably to the Isère, judging only by two specimens from Uriage, near Grenoble. Also in the Pyrenees there are small races, as in the Alps. The most remarkable one I possess is from Luchon (Haute Garonne): it is as small as *italagallica*, but frailer and slenderer in build; the underside is even whiter and paler on an average than in *diniae*, and a characteristic feature is the extreme minuteness of all the black dots and lunules and of the orange ones, so that I suggest the name of **minutepunctata**,

mihi. Some of my specimens from Gèdre (Hautes Pyrénées) are like these, but others are like the series I have from Bélesta (Ariège), which is similar to *italagallica*, but differs from it by its larger size, paler colouring, marginal black or grey area often broken by white spaces, colder and more gray tone of underside, with larger black dots : race **hispanagallica,** mihi. There thus exists a gradual transition from *alpiumfusca*, through these races and *minutepunctata*, to *asturiensis*, Sagarra, and through it on to *caelestissima*, Vrty., of Aragon. Finally I must note that also the German group of races produces at least one, belonging to these small races. I have a series from Velburg in the Regensburg district (Bavaria). The upperside of the male only differs from *altica* by the slightly darker and more pronounced black markings and the greener tone of blue, but the underside is totally different and perfectly characteristic of the German races, by its cold, dark gray tone and by the very large black dots and lunules, whereas *altica* has, instead, a perfectly Alpine look on that surface: race **germanella**, mihi. The race I have collected at Sulden, on the Ortler, in S. Tyrol, is in every way similar to nymotypical *altica*, from Salzburg, as stated by Neustatter, but specimens from Sistrans, m. 1000, above Innsbruck, differ markedly from it on the upperside by having a broad and even, black suffusion, reaching on the forewing half way between the margin and the end of the cell, instead of a narrow one, light in tone and often broken by white spaces, whilst the underside is quite that of *altica* (very white and with very small black markings) : race **alpiumfusca,** mihi. One specimen from the Sella Joch seems to belong to the same race.

Celastrina argiolus race ? : Oulx. About Aug. 10th, I saw a few individuals appear on the wing, evidently of II. gen.

Cupido minimus race *minimus*, Fuessl. : Oulx (I. gen. in June and one of II. gen. on Aug. 4th), Cesana, and Clavières.

Callophrys rubi form (race?) **pigmentocarens,** mihi : Oulx (3rd June). The only specimen I have is remarkable on account of its discoloured appearance ; it is of a cold tone of dark grey, rendered warmer in certain lights by a slight golden sheen, because the lack of pigment in the scales makes them refract the light more than usual. I have a similar female from Martigny, in the Valais, and one from Waidbrück, in S. Tyrol, so that I suppose this form may be frequent, or even racial, in some localities of the Alps.

Strymon (*Nordmannia*) *acaciae* race **frigidior,** mihi : Oulx (beg. of July to Aug. 10th). Differs remarkably from race *nostras*, Courv., of Central Europe, which I possess from Vienna to Brittany and to the Bouches-du-Rhône, always more or less alike, and from *italica*, Vrty., of Central Italy : it is somewhat larger in size, more robust in structure and it has broader wings than either of these races ; above it is of a deeper and colder black tone than in most localities ; what, however, characterises it particularly is the underside, which is of a dull gray tinge, instead of a warm chestnut one ; it only has an extremely slight golden sheen. It thus approaches the oriental race, named *abdominalis* by Gerhard, but which is, as Courvoisier has pointed out, nothing but Fabricius's nymotypical *acaciae*. It agrees with Gerhard's figure also by the prominant white streak, sharply edged with black internally, by the large orange lunules edged with

thick black ones and with large black dots externally ; the tails too are rather long in some individuals. Specimens I have from the Moulinet, in the Alpes Maritimes, are very similar to *frigidior* of Oulx, but slightly warmer in tone.

Strymon (*Klugia*) *lynceus*, Esp. (=*spini*, Schiff.) race *major*, Obth. : Oulx (beg. of July to Aug. 10th) and Cesana.

Nemeobius lucina race *lucina*, L. : Oulx (beg. of June).

(*To be continued.*)

NOTES ON COLLECTING, etc.

STRYMON W-ALBUM, KNOCH, IN SOUTH HANTS.—As nearly all the very meagre records of the occurrence of this butterfly in Hampshire are from the north of the county, it is interesting to record the discovery of a flourishing colony near Winchester. On July 17th and 18th, my friend Mr. A. H. Sperring and myself observed between forty and fifty specimens settling upon the few remaining privet blossoms in an open space in the woods near Farley Mount. The insect was extremely local, being confined to one favoured corner. So far as I am aware, there was no wych elm in the locality, but closer search revealed a number of very tall young trees, planted probably with the larches among which they grow. There were no branches even moderately low down, so that the larvae must have fed at the very tops of the trees.—W. FASSNIDGE, (M.A., F.E.S.), 47, Tennyson Road, Southampton. *July 23rd*, 1926.

PANCALIA LEUWENHOEKELLA, L., IN MILAN.—I was surprised to find this species among *Viola odorata*, growing in a small garden at the back of the Hotel Manin in the city of Milan. It was first noticed on May 20th, 1926. As several specimens were observed it is evident that the moths are breeding in the old garden. I have always associated the species of *Pancalia* with the short turf of downs, where *Viola hirta* grows, or with sunny hedge banks, but here is one species in a large city on the well-cultivated Lombardy plain. It would interest me to know if any entomologist had found this moth among sweet violets in his country garden.—ALFRED SICH (F.E.S.). *June 18th*, 1926.

CURRENT NOTES AND SHORT NOTICES.

A double meeting of the Entomological Club under the alternate chairmanship of Professor E. B. Poulton and Dr. Harry Eltringham took place at Oxford from Saturday, July 3rd, to Monday, July 5th, 1926.

Members present—Professor E. B. Poulton, Dr. Harry Eltringham, Messrs. Robert Adkin, Horace Donisthorpe, Willoughby-Ellis, Jas, E. Collin and W. J. Kaye.

Visitors present—Messrs. E. Bolton-King, E. B. Ford, G. H. E. Hopkins, W. H. T. Tams, C. A. Wiggins, H. E. Andrews, E. G. R. Waters, Dr. Hanitsch, Dr. F. A. Dixey, Commander J. J. Walker and Dr. Hugh Scott.

Accommodation was provided at Wadham College by the kindness of the Bursar, Dr. Dixey. On Saturday visitors and guests were received at the University Museum Hope Department and luncheon

was provided at Wadham College. During the afternoon the Entomological collections were inspected and tea was dispensed by Mrs. Poulton and friends at about 4.30. In the evening dinner was served at Jesus College, Professor E. B. Poulton, F.R.S., in the Chair and a most enjoyable evening was spent.

On Sunday morning an Entomological excursion was organised in motor cars, but notwithstanding the beautiful weather, insects were very scarce. After luncheon a very pleasant picnic was arranged in boats on the River Cherwell and tea was prepared on the banks some miles up river. In the evening a meeting of the Club was held at Wadham College, Dr. Harry Eltringham in the Chair. Dinner was served in the Hall at 8 o'clock followed by a business meeting; a very pleasant evening was spent and the meeting did not break up until a late hour.

On Monday morning many of the party returned to visit the Hope Department and during the day the guests dispersed after a most successful and enjoyable gathering.—H. W.-E.

REVIEWS AND NOTICES OF BOOKS.

Die Oekologie der blattminierenden Insektenlarven, by Dr. Martin Hering. 260 pp. 2 plts. (1 col. and 1 phot.) 67 text figs. large oct.—It is rarely that one meets with an author who in the first half of one year produces two works of such intrinsic scientific value. We reviewed the first of Dr. Hering's books in the January and February numbers of this journal, and therein called attention to the author's special intensive study of leaf-miners for many long years. In the introduction of the present work, attention is called to the fact, that each species has its own invariable and characteristic method of attacking its foodplant, and to the great advance in our knowledge of the leafminers in the various orders, which has been made in the past decade. The author reminds us that Swammerdam in his wonderful *Bybel der Natuure* (1692) 1737-8, observed the habits of a leafminer (*Lithocolletis alniella*) in the leaves of alder (plt. 44, figs. 18-21). The first chapter deals with the "Definition and Morphology of the Mine," with eleven figures; transverse leaf-sections showing a mine embracing the whole intercuticular space, a mine occupying only the underside portion, another only the upperside portion and a cuticular mine which does not lie in the inner substance of the leaf, but in the outer layer of cells. Desirous of a series of names differentiating the mines, the author has taken the root **nom** of the Greek word *hyponomos* = a mine, and with the aid of a prefix has used "*Caulonom*" for a mine in a stem, "*Carponom*" for one in a fruit, "*Anthonom*" for one in a flower and "*Phyllonom*" for that in a leaf. He has carried his nomenclature still further; an "*Ophionom*" is a serpentine mine, a "*Heliconom*" is a helix-shaped one, an "*Asteronom*" is one which is starlike in appearance, and so forth. Chapter two treats of the mines in leaves and in other parts of plants, referring to combinations where the larva may only mine during an early stage of its life, and to stem-miners which mine in the subcutaneous part only. In Chapter three, those which live their whole larval existence in the mine are termed "stationary miners," others which only live a stadium or two as

such are called "temporary miners." The examples given show the various differences of habit forced on the larvae by the special conditions of the particular plant species they occupy. In Chapter four it is stated that the great majority of true miners belong to the Orders, Lepidoptera and Diptera, and summaries are given of the indications that exist to enable one to differentiate these by examination of the mines. One is reminded of the small circular hole in the epidermis, which always indicates the exit of a *Coleophora* or a *Bucculatrix*; the exception being the large hole made by the escaping full fed larva of *Phyllotoma*. Chapter five discusses the oviposition of mining insects in different Orders, and refers to the remarkable fact that the ichneumon affecting a species can distinguish its particular species from all others under such circumstances. In Chapter six there are discussed the various circumstances which determine the course of the mine, its length, its width, its colour, its variation in character though growth and influential factors such as ichneumon attacks on the larvae, diminishing its power of mining in its due specific course. Chapter seven is a consideration of the larval structure and habits in the initial stage of its mining career. Some of the larvae are sap-feeders, others tissue-feeders, with of course corresponding differences of mouth structures. The larval ocelli, the larval antennae the larval mouth structures and developments are all described and some figured. Chapter eight treats of the duration of the mining life and the variation in the mine during that life, with a section devoted to the consideration of the special case of the genus *Coleophora*, where the body of the larva is in a case outside the mine, which latter only contains at any time the head and first two or three segments of the larva. Chapter nine states, at some length, the special variations in the developmental history of mine-making species from those of the species typical of the various orders, groups, or genera concerned, and the reasons and necessities for such variations, such as the cocoon boring structure in the pupa of *Phyllocnistis suffusella*. In Chapter ten the physiological side of the food assimilation in the mining larvae, is discussed, and two interesting tables are given listing the natural families of plants, which alone are affected by leaf-miners and the various orders of insects which affect each. Only two families of plants have miners from four orders of insects, viz., *Salicaceae* and *Betulaceae* with Lep., Dip., Col., and Hym. No less than 40 plant families are listed, which have no mines affecting them. Monophagous and polyphagous habits are dealt with as well as the very frequent habit of feeding on plants nearly related, of which a large number of cases are detailed. Succeeding chapters deal with the "Disposal of its Excrement by the Miner," "The colour appearances of the Mine," "The Life of the Miners of Waterplants," "Enemies of Miners, Inquilines and Symbiosis Phenomena," "Mines and Galls," "Geographical Distribution," etc. Added are 19 pages of Bibliography, the now necessary accompaniment of a book of any pretention. This book is another of those most valuable summaries of special knowledge, of which a translation should find a ready sale in all English-speaking countries. We heartily congratulate both author and publisher.—H.J.T.

Subscriptions for Vol. XXXVIII. (new series), 10 shillings, should be sent to Mr. H. W. Andrews, *Hon. Treasurer*, **6, Footscray Road, Eltham, S.E. 9.**

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Desiderata.—The Leicester Museum has no British Diptera and requires a typical collection. Can any collectors help us? We offer European Butterflies in exchange..'—"Entomologist," Leicester Museum.

Desiderata.—Ova or pupae of christyi, abruptaria v. brunnea, black consonaria and bidentata, extensaria, curzoni, jasionata, venosata (Shetl.) and other melanic Geometers and Noctuae.

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Change of Address.—R. S. Bagnall, to 13, Learmouth Terrace, Edinburgh.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. October 6th, 20th. November 3rd, 17th. December 1st.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. September 23rd. October 14th, Dr. Imms, "The Hawaiian Islands."—*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.*, J. P. Hardiman, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

All MS. and EDITORIAL MATTER should be sent and all PROOFS returned to Hy. J. Turner, 98, Drakefell Road, New Cross, London, S.E.14

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Communications have been received from or have been promised by Messrs. H. Donisthorpe, Dr. Verity, J. H. Durrant, Rev. C. R. N. Burrows, H. J. Turner, A. Sich, K. J. Hayward, T. Bainbrigge Fletcher, T. Greer, H. Main, G. T. Bethune-Baker, C. J. Wainwright, A. H. Martineau, Dr. E. A. Cockayne, Major P. P. Graves, W. H. Edwards, H. B. Williams, Wm. Fassnidge, J. S. Taylor, and Reports of Societies.

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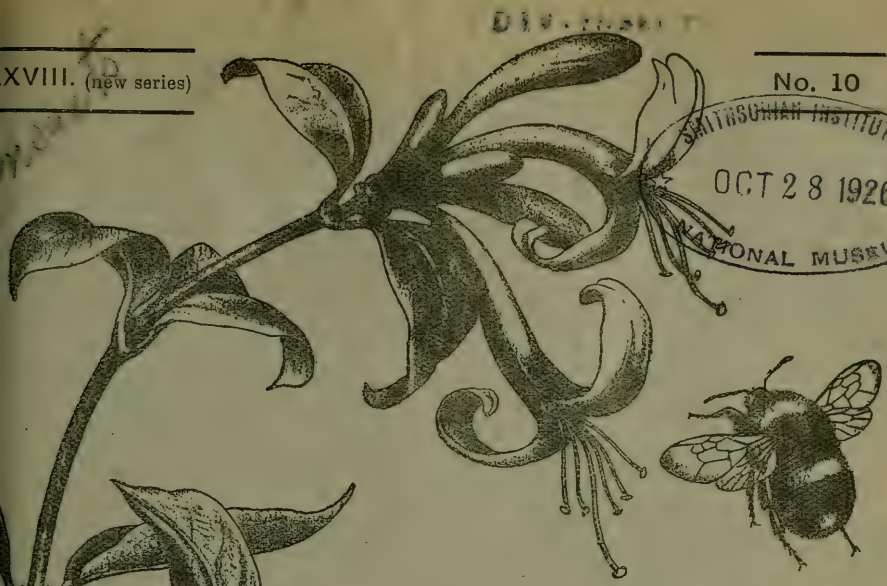
XVIII. (new series)

No. 10



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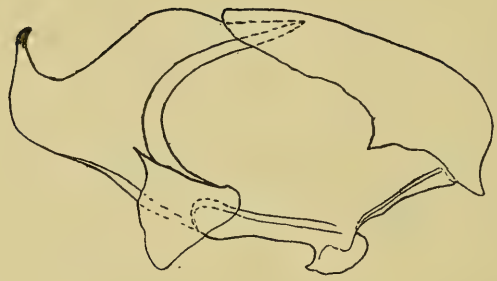

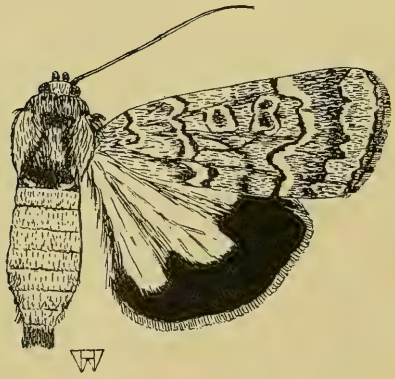

The Entomologist's Record. *del. W. H. T. Tams.*

Lycophotia haywardi, Tams.

Upper fig. Valve of ♂ armature.
Lower fig. ♀ × $\frac{5}{2}$.

A new species of Lycophotia (Noctuidae, Agrotinae) from Cyprus.

(With plate IV.)

By W. H. T. TAMS, F.E.S.

Lycophotia haywardi *sp. n.*

♂ Antennae with the shaft clove-brown; furnished with short bristles less in length than the diameter of the shaft, and with fasciculate cilia as long as the diameter of the shaft. Palpi vinaceous-rufous and mahogany-red mixed, cartridge-buff to white inwardly and in front to near end of second segment. Head burnt sienna and mahogany-red sparsely irrorated with white. Thorax vinaceous-rufous to rufous mixed with some Mars yellow and mahogany-red; the patagia edged in front with white mixed with fuscous-black, the tegulae inwardly edged with white hair-scales. Abdomen Isabella colour, the segments edged distally with chamois, the terminal tuft vinaceous-tawny streaked with white, cartridge-buff and chamois. Pectus cartridge-buff, pale pinkish-buff and light buff mixed; foreleg with the femur vinaceous-rufous to ferruginous, the tibia mostly mahogany-red with the distal sixth white; tarsus with the segments fuscous, each white distally; the other legs similar, but with less mahogany-red, the spurs white; all the legs with a preponderance of white on their inner sides; venter vinaceous-tawny, with a white longitudinal fascia down each side, the segments white-tipped. Forewing with the ground-colour varying from vinaceous-cinnamon to cinnamon-rufous, the fasciae and shades mahogany-red, accentuated by white and cinereous scales; a short oblique sub-basal fascia curved twice (concavity basad in each case) from costa to anal vein, and edged outwardly with pale pinkish-buff to white; an oblique irregularly waved antemedial fascia from costa at one-third to near middle of dorsum, edged inwardly with white from costa to middle of cell, the edging thence pale pinkish-buff to dorsum; claviform vinaceous-pink outlined with mahogany-red, and almost reaching a waved medial shade; orbicular vinaceous-pink ringed with white and outlined with mahogany-red; reniform similar, but with the centre mixed with the deeper tints of the ground-colour; the waved medial shade lies nearer to the postmedial than to the antemedial; postmedial fascia straight from costa to and almost touching the reniform, then sharply oblique terminad to vein M1, there curving round and running for about 1mm. as sharply oblique inwardly, then outcurved (concavity basad) across veins M2, M3 and Cu1, continuing obliquely inwards to below Cu2, thence obliquely tornad to anal vein, and thence, with a slight kink, running into the dorsum at right-angles, the whole fascia edged outwardly with white to pale pinkish-buff; an irregularly waved serrate subterminal fascia, preceded by two splashes of pinkish-buff, one on vein M1 and the other between veins M2 and Cu1, and succeeded by a pale pinkish-buff edging followed by cinereous shading to termen, most marked on the veins; termen finely mahogany-red, fringe of the ground-colour interneurally streaked with pale pinkish-buff. Hindwing light orange-yellow to deep chrome, with a broad fuscous band round the distal third commencing just below the apex, broadening out and forming a point between veins M1 and M3, very narrow at the latter and thence broadening to form a point at the position of the

October 15th, 1926.

obsolete first anal vein (A1), tapering away again to the tornus; a diffuse fuscous streak from wing-base through the cell to the point between M1 and M3, and a similar streak from wing-base to the point between Cu2 and A2; fringe light orange-yellow edged with ivory-yellow. Underside of both wings pale orange-yellow; forewing with some vinaceous-cinnamon suffusion along costa and beyond postmedial fascia, with some admixture of cinereous beyond the subterminal fascia; a broad wedge (apex basad) of fuscous shading from base through the cell to beyond the almost straight postmedial fascia, which is mahogany-red from costa to vein M1, then fuscous to vein A2, where it terminates; hindwing with costa suffused with vinaceous-cinnamon, a mahogany-red postmedial fascia from costa at right-angles, to vein M1, where it merges into the terminal band, which is of the same character as that on the upperside, except that there are no streaks to the base: discocellulars with a fine fuscous line.

♀. Differing from male in having much simpler antennae.

Expanse: ♂ 30mm. (33mm. from tip to tip); ♀ 32mm. (36mm. from tip to tip).

Holotype ♂: Cyprus, Platres, June 1921 (Captain K. J. Hayward).

Allotype ♀: Cyprus, Platres, 29.vii.1921 (Captain K. J. Hayward).

Paratypes: 4 ♂ ♂, Cyprus, Platres, 5000-6000 ft., July 1921, also collected by Captain Hayward. (All in the British Museum).

This beautiful Agrotid recalls the moths of the genus *Calymnia* (*Acronyctinae*), and particularly *C. achatina*, Butl. from Japan, to which it bears a most striking resemblance, and it is remarkable that it should so long have remained unknown. I am a little uncertain as to its correct generic position, as the Agrotid genera are in such a muddle and a revision of the subfamily is urgently needed. Much could be done by a study of the genitalia, for in this division of the *Noctuidae* they are of some value for grouping, as will be readily seen by a comparison of Pierce's figures with the disposition of the British species in volume IV. of the *Catalogue of Lepidoptera Phalaenae in the British Museum*.

(Colours from *Color Standards and Color Nomenclature*, by R. Ridgway, Washington, D.C., 1912).

Miscellaneous Notes from Argentina. VI.—The earlier stages of Papilio thoas race brasilensis, R. and J.

By KENNETH J. HAYWARD, F.E.S.

Introductory.—In previous years I have always found this splendid Papilio scarce and exceedingly difficult to obtain. During the past season (1925-6) the insect was seen with some frequency in September, and by going out for it in the comparatively early morning it was caught with ease, whilst busily engaged in feeding. As the season proceeded it became evident that *thoas* was going to be abundant and the idea of running down its larva, which had previously been put aside as too tall an order, was revived, and the tactics that had proved successful in locating the early stages of *P. hellanichus*, Hew., were employed. Observation showed that the most likely time to find the female ovipositing would be after the morning feeding time and before the intense noonday heat caused the insect to take shelter.

Consequently every opportunity was taken to visit its favourite haunt about that hour, and on February 14th a large *thoas* that on subsequent netting proved to be a full female was noticed hovering around an isolated bush standing a little out from the forest. Although the insect did not alight or appear to oviposit in flight, the persistence with which it returned to the bush after being frightened off pointed to the fact that I had in all probability located one of its foodplants. Diligent search of the leaves however failed to locate any eggs, and I was just turning away when I caught sight of what appeared to be bird excreta *on the underside of a leaf*. This being a somewhat unusual phenomenon I investigated further to find a Papilio larva of advanced size. The bush yielding nothing further, I looked around for more specimens of the foodplant, which at that spot was rather scarce. The first specimen yielded nothing but a further plant gave me two largish eggs, laid on the top side of the leaf, whereas I had been searching the undersides expecting *thoas* to follow *hellanichus* in this respect. The two following days enabled me to collect a fair number of eggs, and larvae in various stages. A percentage of these I have brought through, aided by the fact that the foodplant lives exceedingly well in water and seldom required to be changed before all the leaves had been eaten. In a sub-tropical country this is a great asset to the breeder.

The following descriptions of the earlier stages were made from the material collected.

Egg.—The egg which is always laid on the upperside of the leaf and in various positions, is fairly conspicuous. The female appears to instinctively avoid overcrowding, as however large the bush or however scarce or plentiful, I have only once found four eggs on a single plant. The usual maximum is three, but more often the plant contains a single egg or at most two. A noticeable feature was the large number of empty egg shells that were encountered. The young caterpillar on emerging almost always consumes the greater part of the shell, a point borne out by observation of the bred larvae and also by the fact that when young larvae were found in a wild state, it was unusual to find anything but the base of the egg remaining. But these empty shells were complete except for a small hole in the side and in no single case was a young larva discoverable in connection with them. The obvious conclusion is that the eggs are freely attacked by some enemy, a fact that probably has bearing on its previous comparative scarcity in the district.

The egg is round, shiny, 1·2mm. in diameter, at first a clear transparent bluish white, attached to the upperside of the leaves by a yellowish sticky fluid that hardens immediately, this fluid often extending over the greater part of the egg. The egg-period for eggs laid early in the year is from eight to nine days. The egg rapidly changes in colour to a dark slatey grey, the colour deepening towards the date of emergence. Specimens of the egg have been sent to the British Museum of Natural History under number 6910.

Larva.—The young larva on first emergence measures 2·5mm. in length, and at once proceeds to devour its eggshell, though on occasions this procedure has been omitted. The reason for this omission is most probably to be found in unnatural conditions encountered in the

breeding cage, and from my field observations I think the shell is always eaten.

In colour the larva very much resembles that of *P. hellanichus* at the same point of its history, being chocolate brown with the first thoracic, a portion of the first and second abdominals and segments 8 and 9 dull yellow. On the first thoracic a tiny retractile fleshy Y-shaped horn, reddish brown in colour. As the larva grows the dull yellow colouring becomes whitish. The tubercles and processes described in later stages are present in proportionate size. The young larva rests along the midrib of the leaf, feeding during the cooler hours on the upper cuticle.

Varying with the speed with which the larva has fed up, the second stage commences about the 12th day, the larva now being 8 to 9mm. long. The colour is mahogany brown relieved with lighter brown, the larva having a polished appearance. A wedge of white covers most of the 3rd and 4th abdominals, running obliquely upwards from the whitish underside colouring. The last three distinguishable segments are yellowish white and the larva bears indications of the violet spots described later, the dorsal pairs on the 5th and 6th abdominal segments being very distinct. The retractile Y-shaped process on the first thoracic has proportionately increased in size, and the wart-like processes, that were borne in the first stage but too small to be easily distinguishable, are now more definite, comprising four brown wart-like tubercles dorsally on the first thoracic and a ring of six similar but rather smaller warts on the forward portion of the other two thoracic segments. These warts bear a corona of tiny brown hairs. On the white area of the anal end of the abdomen are two pairs of longer more horn-like processes of the ground colour with black hairs. The thoracic segments are much swollen and the 11th and 12th abdominal segments are also somewhat enlarged.

Final stages of larva.—About the 25th day the larva again changes its skin, entering its final stage in which it reaches a length that varies up to 57mm. Head olive brown. General ground colour dark olive green with irregular brownish and bluish relief. Across the front of the first thoracic and laterally to the third thoracic, a whitish band. The spiracle on the first thoracic stands out brown on this light ground. Frontally on the first thoracic a retractile Y-shaped fleshy process, extended fully when the larva is alarmed and reaching a length of 16mm., light reddish brown in colour. The four dorsal processes on the first thoracic and the ring of six similar processes on the second and third thoracic segments are now represented by a round spot of the ground colour ringed with white. On the second thoracic two dark splashes just above the white lateral area. A V-shaped whitish area running obliquely backwards from the underside of the second to the dorsal area of the 5th abdominal segment, somewhat cloudy on the 2nd and 3rd segments. A similar but whiter area on the remaining segments bordered obliquely downwards from the edge of the dorsal area on the 6th abdominal, the dorsal area of the 6th and 7th of the ground colour broken up by white lines. A large number of irregular violet spots placed as follows :—Four on the frontal ridge of the 2nd thoracic, eight similarly on the third thoracic, a ring of eight on the first abdominal, six on the second abdominal, a dorsal pair on the 5th

and 6th abdominals, with a small dash laterally below, and a pair low down laterally on each of the 4th to 7th abdominal segments. The underside bluish white. The thoracic segments much swollen and somewhat ridged forward.

Foodplant.—*Fagara hyemale* (St. Hil.) Engl. (*Rutaceae.*) Seitz, (*Macrolep. of the World*, V. p. 24) gives *Piperaceae* and *Citrus*.

Pupa.—Pupated from the 39th to the 44th day.

Forms an angulated pupa of 30mm. in length with abdominal segments swelling from 6mm. at the first to 10mm. at the third and then reducing evenly to 3·5mm. at the anal end. Attached to the stem of the foodplant or other site by a silken girdle, and at the anal end, which is flattened beneath, to a pad of silk. The pupa is not easily distinguished from that of *P. hellanichus*, but somewhat larger and lighter in colour, difficult to describe since it has no outstanding features. Colour brownish buff with a considerable number of fine irregular, usually angular-black or dark brown lines, the upper portion of the head and thoracic segments dark brown, the wing-cases with the future venation faintly indicated by black lines. Spiracles coffee brown, that of the first thoracic not distinguishable. The warts on the second and third thoracic segments of the larva represented by small black raised points, the dorsal pair well defined. The first thoracic projecting forwards above, the shield-like dorsal plate with a pair of raised black points forward. On the dorsal area of the abdominal segments a double row of very slightly raised points.

Emergence.—Remained in the pupal state from 13 to 15 days. There is a first emergence in September, after which I have seen or taken fresh specimens at odd times until late December—early January when it appeared to be again common. The final emergence, of which the bred specimens here referred to were a part commences, at the beginning of March.

Pupae sent to the British Museum under No. 7042, and specimens of bred imagines under the following numbers amongst others, 6975, 7017.

Collecting in the Balkans.

II. Northern Greece.

By P. P. GRAVES, F.E.S.

I spent four and a half days (July 15th-19th) at Portaria above Volo after leaving Athens. Portaria is a village on the slopes of Mt. Pelion. It is very healthy and well watered; a cold torrent flows through a gorge in mid-village, and there are numerous springs whence water is carried in runnels, streamlets and pipes through every part of Portaria. There is a really good hotel, the "Theoxenia." Its owner, instead of evolving the management of a hotel from his inner consciousness, or basing it on the cheerfully untidy and insanitary tradition of the Levant, has studied the art in Switzerland. The results are excellent, and the prices reasonable and you can get hot and

cold water ad libitum. I put in my four and a half days there and enjoyed them. The heat was dry, the nights cool and the views really magnificient.

My collecting at Portaria was really only a reconnaissance but so little has been done in North Greece except on the Veluchi Mountains (I do not count Macedonia as faunistically Greek), that I felt I must try to explore as many different types of country as I could. At Portaria the best ground in July was at an altitude of between 800 metres and 1200 metres, say 2500-3700 feet. Here there were abundant shrubs and trees—chestnut, which formed the majority of the woods, a very little oak, willows near the water, plane and a certain amount of bushy scrub, bramble, mullein, a little prickly oak (*Q. cerris*), cistus, broom in plenty and occasional blackthorn bushes. I recognised no *Rhamnus* but no doubt it was there. In some places the trees formed thick copses, with frequent openings and patches of cultivation. The more accessible ground on these slopes was cultivated with fruit trees and vegetables. A species of *Phlomis*, with *Origanum viride*, Boisr. (*O. viridulum*, Heldr.), which was especially common under the trees, and great quantities of *Orobus* and *Dorycnium pentaphyllum*, Scop., were much in evidence in the woods, but the two latter vanished once one had passed the 1300 metre contour. Then came very bare country, dry and burnt, with cistus here and there, stunted blackthorn and patches of dwarfish juniper. At about 4500 ft. began woods of stunted beech trees which persisted to within about 200 feet of the bare top of Pelion, a pile of grey boulders. The geological formation appears to me to be everywhere Cretaceous.

As for collecting I may as well say at once that the higher levels were very disappointing. I saw one *A. urticae* and missed it, also an unidentifiable *Hesperia* which escaped me, and took a very worn *Hallia marloyi*, two fresh *Pieris krueperi* (2nd brood), and two worn and tiny 2nd brood *Melitaea trivia* on the summit of the mountain. A few *Polyommatus icarus*, both worn out 1st brood ♂ and ♀ specimens and fresh 2nd brood males were noted, with one *Issoria lathonia* on the high ground above 4000 feet. The two or three *Heodes* (*Rumicia*) *phlaeas* taken so high were quite heavily suffused, and altogether I got the impression that the drought of the higher levels was inimical to the survival of any characteristic mountain fauna, *I. lathonia* and *Aglais urticae* being the only mountain insects (I am writing of the extreme South of Europe) which I saw. *Hipparchia anthelea* race *amalthea* occurred here and there at all levels. At the same time I must say that I had little luck in my two days, July 16th and 17th on the higher slopes of Pelion. On the 16th, I went to the top and was involved in a brawl with two big sheep dogs one of which came at me, and though he took no pieces off me, tore my net to bits. *Mea culpa*, I had not warned the shepherd to keep his dogs near him and had strayed away from my muleteer. I had no reserve net with me and after my experience of the East, felt that I deserved my disappointment. Next time I went up, the clouds gathered thickly over the higher levels and there was little to be seen or caught.

The lower ground, however, that is to say, the slopes from the level of the village to about 4,000 feet was productive and I found fresh localities daily that gave fresh species. Had I stayed a few days

longer I should have certainly taken more species and specimens of *Carcharodus* and *Hesperia*, in searching for which I had to realise that I was decidedly between the broods, and probably enough more Lycaenids. The commonest Lycaenids were, in the order named, *Polyommatus* (*Agriades*) *thersites* of the 2nd brood, which literally swarmed on the tufts of *Dorycnium* in the woods, *Plebeius medon*, a close second, and *Polyommatus icarus* third. *P. medon* and *P. thersites* seemed in the first part of their emergence, as females were relatively much less common than males, and this was still more the case with *icarus*. *P. admetus* and *P. meleager* were much more local. Indeed I only found the chief haunt of *P. meleager*, of which I had previously kicked up or swept odd specimens in the late afternoons from low plants, on my last morning at Portaria. It was the gorge of the main stream just above the village at a point where a sort of dam had been constructed. Of the Satyrids *Satyrus syriaca*, which seems to take the place of West European *hermione* all over the Southern Balkans, was locally frequent in the woods. *H. anthelea* ssp. *amalthea* occurred everywhere in small numbers and the females were often fresh. Seeing *amalthea* and catching it are, however, not the same thing. *Pieris brassicae*, *P. rapae*, *Colias croceus* and *Leptosia sinapis* were the commonest Pierids, the last named being of large size. No *P. napi* were taken outside a limited area of more or less irrigated or else marshy country near the village, a fact that bears out my impression that this species can only survive the great heat and drought of the southern portion of the Mediterranean subregion in damp and shady places. Even at Constantinople it is comparatively infrequent in bare, open country, though extremely common in woods and sheltered valleys; at Beirut it is apparently confined to the valley of the Dog River, but may also occur in other moist gorges in the Beirut delta. In the Dog River Valley it is to be found with *L. sinapis* race *deserticola*, Vrty., the unhappily named Syrian race of *L. sinapis* which inhabits, not a desert, but a valley with a climate like an orchid house, steaming and damp in summer, dripping with water almost everywhere and full of a rich vegetation. I was between the broods for *Melitaea didyma*, of which I only took a few near the *meridionalis* race. I only saw a single *Dryas paphia* and only *Polygonia egea* was frequent among the Nymphalids. Its chief haunts were in and around the village where abundant *Parietaria* grew on walls and houses. I noted with surprise and pleasure that the form with an almost unicolorous blackish-brown underside occurred among the light coloured *egea*. This form, *j-album*, occurs as the 2nd brood at Constantinople in September and October and goes into hibernation to reappear in early spring. Why it should appear among the *egea* in the hottest days of summer in Northern Greece at a very moderate elevation puzzled me, until I reflected that the proximity of the icy cold runnels and streams that flow down through Portaria village every ten or twenty yards often just below the walls on which the pellitory grows, might have much to say to the appearance of what is obviously a temperature form. Among the Satyrids, which I have not previously mentioned, *Coenonympha pamphilus* was abundant and of the race known as *marginata*, Ruhl., which is widespread in the Near East. *Pararge aegeria* was very rare and the one or two bad specimens which I took were distinctly nearer the Tuscan specimens

in the British Museum than to the *aegeria* of Attica and Syria. The latter may be a distinct race from that of the Riviera and parts of Spain, but I should require a much longer series before I could express any definite opinion on that subject. Two *Melanargia* occurred on the hillsides and had both been clearly abundant, but were past their best. One was *M. larissa* of which I picked up two or three really good specimens which were distinctly of the sub.-sp. *herta*, large and with much reduced black sub-marginal marking and equally reduced basal and costal suffusion, and several really bad ones. It occurred from the village to the dry stony slopes just below the beech woods on Pelion, but was as a rule in no better condition on the heights than at lower levels. The other was a fine, large and very dark race of *M. galatea*. To this race Dr. Verity would probably apply the name *turcica*, B., but I feel that the *turcica* of Boisduval is simply a very exceptional melanic aberration and that the name can scarcely be given to the large dark Balkan *galathea* which occurs on limestone near Constantinople, at Portaria and in other Balkan localities, and though dark enough never reaches the degree of nigrescence depicted in Millière's figure (*Ic.* III., plt. 3, f. 1).

The following is a list of my captures, or of species certainly recognised at Portaria and on Mt. Pelion, July 15th-19th, 1925.

Grypocera

Hallia marloyi, B., Mt. Pelion, a worn ♀.

Nisoniades tages ssp. *unicolor*, Frr.—One seen July 18th. One very fresh male captured on July 19th, near village.

Carcharodus alceae ssp. *australis*, Z.—Just below the village, singly.

C. orientalis, Rev.—One specimen taken, but unfortunately lost subsequently. At the time I noted that it seemed to resemble Constantinople 2nd brood specimens.

Hesperia sps. ?—I saw one battered and unidentified *Hesperia* on Pelion and missed another fresh specimen, which looked like *H. proto*, on difficult ground near the village on July 19th.

Powellia orbifer, Hb.—2nd brood specimens were just beginning to appear on July 19th.

Augiades sylvanus, Esp.—One worn specimen only.

Rhopalocera.

Heodes thersamon, Esp.—One male only in bad order near the village.

H. alciphron ssp. *melibaeus*, Stdgr.—Had been common at lower and middle elevations, but was now in rags. Not so large a race as that of Constantinople.

H. dorilis trans. ad *orientalis*, Stgr.—In small numbers and fresh, above the village. Not unlike specimens from Constantinople, but while these and my Portaria captures have generally very yellow undersides the forewings of the female on the upperside are by no means heavily suffused in either case, and trans. ad *orientalis* appears to me best to describe these intermediate specimens.

H. phlaeas, L.—Not uncommon about the village—generally suffused but less heavily than I had expected. The darkest were taken

high on Pelion. I should say that the variation in suffusion covered the grade *nigrior-eleus*, Vrty. to something near g. aest *aestivus*, Z.

Celastrina argiolus, L.—One fresh ♂ only, at 3300 ft. approx.

Syntarucus telicanus, Lang.—One ♀ only, July 18th.

Everes ? *alcetas*, Hffsg. in Hb.—I only took one crippled ♂ specimen on the last day of my stay in a wood near the dam just above the village. It seems to be *alcetas*.

Plebeius argus (*aegon*), L.—One rather worn ♀ on July 17th, almost certainly of this species, and not *argyrognomon*, Brgstr.

Pl. medon, Esp.—Most abundant and markedly of the ssp. *calida*, Bell. I only took one or two specimens showing any approach to the mountain form with greatly reduced or with no rufous submarginal marking on the upperside of the forewings.

Polyommatus icarus ssp. *zellerica*, Vrty.—Very frequent and quite characteristically Mediterranean in facies.

P. (*Agriades*) *thersites*, Cant.—Most abundant, of medium size, richly coloured on both surfaces though less so than ssp. *gravesi* from the Cedars of Lebanon.

P. meleager, Esp.—I should require more than the ten or a dozen specimens which I took here, all from the wooded ground near the village to form an opinion as to the subspecies to which the Portaria *meleager* should be assigned. Both female forms, the blue and the brown, occurred, and I swept up, without recognising it at the time, a magnificent and almost perfect gynandromorph, left side ♂, right side ♀, a brown form *steeveni*, from a tuft of ? *Orobus*. On my last morning I found the males on *Phlomis*. The whitish pubescence of its leaves formed a good cryptic background against which the pale underside of the insect was not easily distinguished.

P. admetus, Esp.—Here again, though the species was more frequent than *meleager*, I do not feel justified in expressing an opinion on the local race except to say that it was certainly not *ripartii*, Frr.

P. machaon, L.—Rare and in bad order.

Iphiclides podalirius, L.—Very frequent near the village, but not seen above 3500 feet. Large specimens, occasionally rather thinly scaled, all more or less of the summer form *zanclaeus*, Z.

Pieris brassicae ssp. *verna*, Z., g. aest, *aestiva*, Z. (=*catoleuca*, Röb.) —Frequent near the village and occasionally from 3500-4500 feet. The usual large Mediterranean summer specimens.

P. rapae, L.—Very ordinary Mediterranean summer specimens.

P. krueperi, Stdgr.—Two on the top of Pelion and one or two more seen flying about cliff faces on the lower slopes.

P. napi ssp. *meridionalis*, Ruhl.—Not common near village.

Pontia daplidice, L.—Frequent to 4000 ft.

Colias croceus, Fourcr.—Frequent.

Gonepteryx cleopatra, L.—Two or three ♂ ♂; only seen in the village.

(*G. rhamni* ? or *farinosa*).—A very large *Gonepteryx* certainly not *G. cleopatra*, was noted above the village on July 18th, but evaded the net.

Leptosia sinapis, L.—Frequent to 3500 ft., large, almost all *diniensis*, B.

Dryas paphia, L.—One seen near village, but not taken.

I. lathonia, L.—A few seen high on Pelion.

Melitaea didyma trans. ad. ssp. *meridionalis*, Stdgr.—A few, mostly worn, in the woods.

M. trivia, Schiff.—Two dwarfish 2nd brood specimens below the village on July 15th, and two more, very surprisingly on the summit of Mt. Pelion on July 16th, all in poor condition.

Polygonia egea, Cram.—Frequent about the village.

Aglais urticae, L.—On the summit of Pelion only.

Pyrameis cardui, L.—Not common.

Limenitis rivularis, Scop.—A few in good condition about the village.

Pararge maera ssp. *orientalis*, Stgr —Not uncommon and often in good order to 3500 ft. A ♂ almost certainly of the 1st brood, but in fairly good condition, taken on July 16th, was much darker than the rest.

Pararge megera ssp. *lyssa*, B.—Not uncommon with *maera*.

P. aegeria, L.—Very rare.

Dira roxelana, Cram.—A few females still lurked in the chestnut cover in the woods.

Satyrus syriaca, Stgr.—Locally abundant in the woods.

Hipparchia anthelea ssp. *amalthea*, Friv.—Everywhere in small numbers, males in bad order.

Epinephele jurtina, L.—Not uncommon and transitional to the Corfu *hispulla* as far as I could tell from the limited number of usually worn specimens which I examined.

Hyponephele lupinus, Costa.—Not rare locally, but hard to take, flying in very broken ground. I have not enough specimens to judge to what subspecies it should be assigned. It seems to me to be nearer to *lupinus* than to *intermedia*, Stgr.

Coenonympha pamphilus ssp. *marginata*, Ruhl.—Abundant to 4000 ft.

Melanargia galathea, L. ssp. ?—Had been abundant, but was getting over.

M. larissa ssp. *herta*, H.G.—To about 4500 ft.

The total of 50 species in five days is satisfactory for so southern a mountain range. I took a few Neuroptera, Odonata and Lepidoptera-Heterocera most of which have not yet been determined. *Plusia gamma*, *M. stellatarum*, *C. bilineata* with the form *testaceolata*, were the only moths which I saw at all frequently during the day.

Beauvezer, Barrême and Digne in July and August.

By P. HAIG-THOMAS, F.E.S.

My chief object in visiting Beauvezer was to obtain a series of *Erebia scipio*, and much of my time was wasted in unsuccessfully looking for it on the steep screes between the tree-line and the cliffs. I arrived on July 23rd and left on the 30th, putting up at the Alpe Hotel, which stands in its own grounds one kilometre from the village. This is an extremely comfortable Hotel and a long way the best I have met with away from the coast in Provence.

On July 25th, having failed to find *C. scipio* on the lower ground, I walked up the Gorges de St. Pierre with a friend, and crossing the

footbridge at the top of the Gorge followed the zigzag path through the young fir-trees, where *E. euryale* was common, to the foresters house. The path continues to zigzag up to the right of the ridge, but butterflies were commoner on the grassy slopes of the ridge itself, the most interesting being *Polyommatus eros*, *Plebeius* (*Latiorina*) *orbitulus*, *P. pheretes*, *E. mnestra* and *E. epiphron* r. *cassiope*. Rejoining the path near the top of the ridge and following it to the right hand across a steep scree below the first patch of snow we came out on to a flat stony plateau, altitude 6,800 ft. Both here and on the scree *E. glacialis* r. *pluto* a small form was very common and easy to catch, with *E. gorge*, 50% being ab. *erinnys*, one fresh *E. lappona* and *Melitaea cynthia*, males going over but females in fine condition, some of them with a pale blotch on the forewing, were abundant in the grassy patches. Occasionally we netted fresh *E. stygne* of both sexes, but *E. evias*, though common was worn. On the far side of the plateau, which is some 600 yards across, the ground slopes to the South covered with a luxuriant growth of grass and flowers. Here insects swarmed, *E. tyndarus*, *E. mnestra*, *E. epiphron* r. *cassiope*, the common Melitaeas, *P. orbitulus* (not common), *P. eros*, etc. As so often occurs in these parts about 2 oclock clouds began to collect on the high ground and we decided to descend ; on the way home in the Gorge de St. Pierre we took *E. goante* just out, and lower a perfectly fresh ♂ *Papilio alexanor* and saw two or three others worn. I had taken the latter commonly on June 21st, five weeks earlier, near Chaudan Norante some 1,500 ft. lower down.

The following is a list of the species captured during the day. *P. machaon*, *P. alexanor*, *Parnassius apollo* (abundant), *Pieris brassicae*, *P. rapae*, *Anthocharis simplonia* (worn), *Colias phicomone*, *C. croceus* (*edusa*), *C. hyale*, *Strymon* (*Klugia*) *spini*, *Heodes dorilis*, *H. alciphron* r. *gordius*, *P. icarus*, *P. hylas*, *P. escheri*, *P. coridon*, *P. semiargus*, *P. eros*, *Cupido minimus*, *Plebeius pheretes*, *P. orbitulus*, *Brenthis pales*, *Argynnis cydippe*, *A. aglaia*. *A. niobe* r. *eris*, *Melitaea phoebe*, *M. didyma*, *M. athalia*, *M. parthenie*, *M. cynthia*, *Limenitis rivularis* (*camilla*), *Aglais urticae*, *Vanessa io*, *Pyrameis cardui*, *Melanargia galathea*, *Satyrus circe*, *S. alcyone*, *S. cordula*, *Erebia epiphron*, r. *cassiope*, *E. mnestra gorgophone*, *E. euryale*, *E. gorge*, *E. goante*, *E. stygne*, *E. lappona*, *E. tyndarus*, *E. glacialis* ab. *pluto*, *Hesperia malvoides*, *H. carthami* and *Adopaea flava*, fifty species in all.

I first took *E. scipio* on July 26th on the steep screes behind Beauvezer, altitude 4500-5000 ft. It was scarce and rather worn. In the afternoon I crossed the river and tried the screes at the same altitude below the cliffs to the left of the Gorge de St. Pierre and opposite the village which had a northerly aspect. Here I took a fresh ♂ *E. scipio* and several *E. goante* and *E. stygne*. At a little distance it is somewhat difficult to distinguish *E. goante* from *E. scipio*, and as all butterflies here were exceedingly hard to catch, much time and energy were wasted over the unwanted *E. goante*. I also saw several *P. alexanor*.

On the 27th, my son, who, up to now, had devoted his time to fishing, and I spent the day on the screes opposite Beauvezer, where I had been on the previous afternoon. We took six perfect *E. scipio* and saw several others ; whenever pursued they made for a small cliff half way up the scree and settled there out of reach. In fact although we

saw more *E. scipio* here than anywhere else at Beauvezer, we caught very few owing to the difficulty of getting about. On the way down I took a fine ♀ *P. meleager* f. *steveni*, and a few *Plebeius argyrognomon* r. *calliopis* of both sexes, but smaller than those taken at Digne at the end of May. *P. damon* males and females were fresh out.

On the 25th I only got one male *E. scipio* and saw two others with the same insects as on the 27th, except that the ♀ *P. meleager* was typical, and another ♀ *P. alexanor*. On the 29th, I only saw one *E. scipio* which I did not get. I also saw three *P. alexanor* and took *Satyrus actaea* just emerged and a perfectly fresh *Strymon acaciae*.

At Barrême on the 31st, I motored 15 kilometers to Tartonne and walked up to the source of the river Asse, an hour and a half from Tartonne, which rises to the right of the Col de Cime, under the shoulder of the Cheval Blanc. Climbing on to the shoulder and over to the north side, I took six *E. scipio* in good condition and three female *E. glacialis* v. *alecto* and two *E. gorge* ab. *erynnis*, both worn. Probably both species would have been commoner and fresher if I had climbed higher on the Cheval Blanc. Owing to the high wind and cloud coming up, I went down at one o'clock, taking *Satyrus briseis*, *Polyommatus* (*Hirsutina*) *admetus* r. *rippertii* fresh, and *P. damon* common above Tartonne. The next day August 1st was sunless; however I collected a nice lot of full grown larvae of *P. alexanor* Earlier in the year, June 22nd, I had taken *Laeosopis roboris* at Barrême rather worn. The Alpe Hotel at Barrême, though unpretentions in appearance, is clean and the cuisine is excellent, the proprietor and his wife being most obliging. In the evening I left for Digne.

Digne is so well-known to entomologists, that if it were not for the fact, that I was fortunate enough to make some rather interesting discoveries, I should not have presumed to have included an account of my visit in these notes.

On August 2nd, I motored to the village of Cruis on the south side of the Montagne de Lure, hoping to get a series of *Melanargia japygia* r. *cleanthe*. Taking the path at the eastern end of the village, after a mile and half I reached a shepherd's hut with a cistern of excellent water. The mountain has only one spring which was out of my road and so it was necessary to fill up for the next five hours or so. The only insects seen up to this point were *Satyrus briseis*, *S. circe*, *S. hermione*, *Hipparchia semele*, *M. galathea*, *Pontia daplidice* and *P. machaon*. After leaving the hut I entered a dry gorge, but as I climbed higher the grass and flowers became more luxuriant and plentiful. Further up the gorge one passes through a fine forest of beech trees with open glades and grassy slopes. Here butterflies were in the utmost profusion. *P. apollo*, though worn was very abundant, and of a very fine form larger than those I met with near Digne, Beauvezer and Le Lauteret. *Aporia crataegi* was still fairly fresh at the higher levels, *P. brassicae*, *P. rapae*, *Leptosia sinapis*, *L. duponcheli*, *C. hyale*, *C. croceus* (*edusa*), *Gonepteryx rhamni*, *Strymon ilicis* and *S. aesculi* both worn, *Heodes virgaureae*, *H. hippothoë*, *H. alciphron* r. *gordius*, *H. dorilis*, *Rumicia phlaeas*, *P. icarus*, *P. escheri*, *P. hylas*, *P. coridon*, *P. meleager*, *P. semiargus*, *Cupido minimus*, *Plebeius medon* (*astrarche*), *Lycaena arion* (2 specimens, curiously enough nearer to the type than to ab. *obscura*), *Polygonia c-album* (imagines and larvae), *Aglais urticae*, *Euvanessa*

antiopa, *Pyrameis atalanta*, *P. cardui*, *Melitaea didyma*, *M. athalia*, *M. parthenie*, *M. dictynna* (common and females fresh), *Argynnis aglaia*, *A. adippe*, *A. niobe* r. *eris*, *Brenthis dia*, *B. hecate* (one female quite fresh, others worn, had evidently been common a fortnight earlier as I took it first this season near Draguignan full out on June 9th), *Melitaea galathea*, *M. japygia* r. *cleanthe* (only one, quite fresh), *Erebia neoridas*, *Satyrus hermione*, *S. alcyone*, *S. circe*, *S. briseis*, *Hipparchia semele*, *H. arethusa*, *H. actaea*, *H. cordula*, *Pararge megera*, *P. maera*, *P. aegeria*, *Epinephele jurtina* r. *hispulla*, *E. lycaon*, *E. tithonus*, *Coenonympha arcania*, *C. pamphilus*, *C. dorus*, *Erynnis altheae*, 3 species of *Hesperia*, *Thymelicus actaeon*, *Adopaea flava*, *A. sylvanus* and *Nisoniades tages*.

Where the gorge leaves the wood there were scree and grass slopes, altitude 5700 ft, and from here to the summit *E. scipio* was common, easy to catch and in excellent condition. The females were just coming out. The only other butterflies seen on the top were *E. stygne* and *P. machaon*. Altogether I took on this day 71 species, two of which *M. dictynna* and *B. hecate* have not been reported from the Digne district before. In fact there seems to have been some doubt as to whether *M. dictynna* occurred in the Basses Alpes. I feel sure that the Montagne de Lure would be well worth visits earlier in the year. The north side of the mountain is very steep, though *E. scipio* could be seen flying almost everywhere on both sides of the top. On the north side some 800 ft from the summit, the mountain is clothed with pine trees almost to the foot of the valley. The absence of *E. tyndarus* *E. epiphron* r. *cassiope*, *E. mnestra* and *F. goante* seemed remarkable.

On August 3rd I motored to Draix 12 kilometres from Digne and took the path to the Col de Cime. Climbing on to the shoulder of the Cheval Blanc, I found *E. scipio* worn but did not see any females. I was astonished to find *A. niobe* (typical) flying abundantly over the open ground on the Col de Cime. Lower down in the beech woods r. *eris* was common and I only saw one typical *A. niobe*. Other species taken were *P. admetus* r. *rippertii*, *H. virgaureae*, *H. hippothoë*, *P. eros*, *E. ligea* (worn), and a fine ab. of A. *coridon* with only three spots like a Greek π in the centre of the underside of the forewing.

This year insects were generally late in the spring in Provence, so that the date for *E. scipio* may be somewhat misleading. July 15th appears to be the date given for its emergence. But I should imagine that between July 20th and July 30th would be nearer the time. The imagines very quickly get worn and the females do not appear to fly much unless disturbed. I found three males at Beauvezer at a damp place on a path with many Lycaenids some 1000 ft. below the screes, which appear to be their only flight places. So they evidently have a partiality for visiting water where it is available.

NOTES ON COLLECTING, etc.

NOTES ON THE SEASON.—*Aglais urticae*.—On September 5th, I found a large batch (about 200) of larvae feeding, and by the 8th, a number of them had pupated and by the 14th, all had turned. This must be a third brood, as the second brood was out in July, and is I think very unusual in this district. Imagines are still plentiful in the garden, but I have not seen a single *Vanessa io* or *Pyrameis atalanta*.

Pieris brassicae.—These have been exceptionally plentiful in the garden this year, in both broods, and have considerably outnumbered the *P. rapae*, which is not usually the case.—Douglas H. Pearson, (F.E.S.) Chilwell, Notts.

Capture of Sterrha sacraria.—It may be of interest to record that I captured a male of *Rhodometra* (*Sterrha*) *sacraria*, near Swanage, in the Isle of Purbeck, during the afternoon of September 10th this year. It was taken in a valley known locally as Target Bottom, and was in fine condition. There was a strong south-westerly wind blowing at the time.—L. J. D. Wakeley, 11, Crescent Road, Wimbledon, S.W. 20.

Foodplant of Venusia cambrica.—On August 28th I beat two small larvae of *Venusia cambrica* off a birch bush on the bank of the River Ythan, about 200 yards from the nearest mountain-ash. I am convinced that they were feeding on birch, because I had beaten no other tree for half-an-hour. In captivity they ate birch readily and soon became full grown. Mountain-ash, *Pyrus aucuparia*, is the only foodplant for this species given in any of the books I have consulted. —E. A. Cockayne (M.D., M.A., F.E.S.), 116, Westbourne Terrace, W.2.

Polygonia c-album and Limenitis sibilla at Goring-on-Thames.—I have a large border of Michaelmas daisies in my garden here, and on Sept. 30th I was examining the *Aglais urticae*, which were very numerous, for varieties, when I saw a *Polygonia c-album*, which I netted. I took two more during the afternoon and another to-day, Oct. 1st, all perfectly fresh. I have lived here for eight years, but have never seen *P. c-album* here before. *Pyrameis atalanta* and *Vanessa io* are not as common as usual and there appears to be only one *P. cardui*. In 1919 I saw a single specimen of *Limenitis sibilla* flying around the honeysuckle in the garden. This was even more strange, as my house is in the village and at least half a mile from any wood, neither have I even seen *L. sibilla* in the district.—P. Haig-Thomas (F.E.S.), "The Grange," Goring-on-Thames.

The Season 1926.—Until the last few days butterflies have been very scarce this year, hardly even any common "whites." Now there are a lot of *Aglais urticae* and *Pyrameis atalanta*, a few *Vanessa io* and *P. cardui*, and I have taken three *Polygonia c-album*.—Waldegrave, Chewton Priory, Somerset. *Sept. 24th.*

The Season 1926.—Reports of this year's collecting seem to be generally that it was very bad. "Insects were scarce in the Engadine, but the season was extraordinary, the snow in early July as it is usually in May. On July 10th all the lakes on the Bernina Pass were almost all ice." From the Hautes Pyrenées, "We are having simply glorious weather here, but the season is a very bad one again. So far (August 25th) at sugar only two insects have turned up." From the S. of France inland, "As bad as I have ever known." In Tyrone "We have had a very fair season. I found *Agrotis agathina* and *Noctua dahlii* not uncommon at the heather bloom in the end of August." "I have had a very poor season, the Forest was a failure,

very few butterflies about. Have seen two *Colias croceus*, one on Ballard Down in August and a fine female I caught at Dorchester." In the north Midlands, "It seems to have been a poor season generally. *Abraxas grossulariata* were extraordinarily scarce here and I bred nothing worth having. We searched places carefully where last year there were hundreds, and found none at all or only one or two odd ones. I went two or three times for *Polyommatus icarus*, with hope of another gynandromorph, but only saw three or four males." From Harrogate, "I have seen very few insects here, even in the well-flowered gardens one only sees "whites" and no *P. atalanta*, etc." From Bérisal there comes a much more rosy report. In a seven weeks stay "I took nearly ninety species of butterflies, but everything seems to be very late. *Parnassius mnemosyne* was abundant up to August 1st, and I took quite a good male on August 16th. *Erebia ceto*, which Wheeler says is confined to the first two or three weeks of July, was still on the wing as late as August 25th." "Collecting on Majella and the Sirente Hills has been poor owing to the rains all over Italy." I went to a Surrey locality where *P. atalanta* swarms on the scabious flowers with *Rumicia phlaeas* near by, but although the flowers were in the usual abundance, not a wing was in evidence. A walk in the woods at the back of Ranmore Common on one of the few very fine hot days of August, was graced by a fair number of *Gonepteryx rhamni* of both sexes, but nothing else. A walk on the chalk downs where *Polyommatus* (*Agriades*) *thetis* is usually a "sure" capture in August produced only three on another fine day.

The flowers of a *Buddleia variabilis* in the garden attracted by day one *Vanessa io* which stayed all one day and came the next. By night I saw the following species, *Mania typica*, 1 specimen every night for a week, *M. maura*, 1 on each of two nights, *Triphaena pronuba*, 1, *Camptogramma bilineata*, 1, *Alucita pentadactyla*, 1, *Noctua xanthographa* several, *Xanthorhoë fluctuata* 1, *Boarmia gemmaria* 1, *Gracilaria syringella* 1, and *Miana fasciuncula* 1 or 2. The blooms of the *Buddleia* were much infested with earwigs, which were very destructive to the buds and flowers as well as to the young leaves.—Hy.J.T.

CURRENT NOTES AND SHORT NOTICES.

The South Eastern Union of Scientific Societies held its Annual Congress this year at Colchester in June. One of the especial objects of the Union is to urge the activities of local centres to concentrate upon a scientific survey, and, if possible, to facilitate the publication of such surveys. The various societies of Essex, including of course the famous Essex Field Club, with the technical aid of Alderman Benham, published at short notice an admirable *Outline Scientific Survey of Essex* comprising sections by well-known local students in the various branches. Our correspondent Mr. C. Nicholson, F.E.S., is responsible for the section "The Entomology of Essex," and in some 22 pages has most successfully summarised the chief items of entomological interest connected with the county, both historically and faunistically. Mr. Hugh Main, B.Sc. has contributed four plates of photographs from life, of Essex specialities, in his usual effective style. And last, but not least in local importance, is a really good bibliography of no less

than eighty-nine items which deal more or less essentially with Entomology in general and the Entomology of Essex in particular. There is a useful geological map of Essex. pp. 314. price 3/-.

In the *Buchbeilage* to the *Ent. Zeit.* (Frankfort a. M.), March, 1926 is a valuable contribution by Herr Hepp on that rare work known to but few entomologists, Bergstrasser's *Nomenclatur und Beschreibung der Insecten in der Grafschaft Hanau—Münzenberg*, etc., 1778-1780. A very perfect copy was obtained a short while ago by Dr. Verity: our own copy wants eight pages of letter-press and a number of plates. There is no copy in the library of the Entomological Society of London. Herr Hepp discusses shortly all the figures. The work contains a large number of early references for the butterflies, with which, except for a few Coleoptera, it deals exclusively, and although the figures are crude there is much important matter in it for nomenclators. Werneburg also deals with this book in considerable detail. (Beitrage zur Schmetterlingskunde, 1864.)

In the Belgian Journal *Lambillionea* for June a new aberration of *Demas coryli* is described. The characteristic feature of this species is a red brown band running from the thorax to the middle of the wing. In the aberration, there exists only a trace of this band at the base of the wing, it being replaced by a grey-white shade which allows the sinuous lines margining the typical band and the orbicular stigma to stand out in black; the terminal area is deep grey not brownish; the fringe is alternate grey and white. The lower wings are appreciably lighter than in the type, and show no reddish tinge. The head and abdomen are whitish-grey. A small female, captured in the Forest of Soignes. It is named ab. *alba*, by M. Derenne.

In the *Boll. Soc. Ent. It.* for May, Signor Rocci gives notes on the Zygaenid species *Z. erythrus*, *Z. purpuralis*, *Z. cynarae*, and *Z. achilleae*, dealing particularly with the local races. Concerning *Z. purpuralis* in the Italian fauna, he divides the races into alpine, northern and central midland groups.

We have to regret the deaths of two Fellows of the Entomological Society of London. One the Rev. F. D. Morice, M.A., had passed the chair as President and had been on the Council for several terms; he was a most regular attendant at the meetings; the other was Mr. Geo. Lewis, F.L.S. of Folkestone, who had once served on the Council and had been a Fellow since 1876.

The *Bollettino del Laboratorio di Zoologia Generale e Agraria* of the Agricultural Institute of Portici, Italy, is a record of some of the most valuable experimental studies and investigations in obscure life-histories. The work is excellent, the amount is large, and the setting forth in the annual periodical is most highly commendable. The volume for 1925 contains seventeen memoirs illustrated with a large number of figures, mostly composite and several plates, comprising over 300 pages. A posthumous paper of the late Sign. Ragusa deals with the *Zygaenidae* of Sicily. Prof. Silvestri describes a new genus of myrmecophilous Coccids. Sign. Jucci has four articles, two on *Bombyx mori*, its hereditary capacity for growth in different races, and a special case of its fecundity. Sign. Bezzi has two articles on the Diptera of the genera *Gastrozona* and *Taeniostolana* and new species of *Tripaneidae*.

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Desiderata.—The Leicester Museum has no British Diptera and requires a typical collection. Can any collectors help us? We offer European Butterflies in exchange..'—"Entomologist," Leicester Museum.

Desiderata.—Ova or pupae of christyi, abruptaria v. brunnea, black consonaria and bidentata, extensaria, curzoni, jasionata, venosata (Shetl.) and other melanic Geometers and Noctuae.

Duplicates.—Very many in first class condition, high-set only f. i. Herminia flavicrinais, Andreas, Nych. dalmatina race andreasaria, Warnecke, about 30 species of rare Acidalias ; pupae of Eupithecia illuminata or cash.—*Karl Andreas. Wiesbaden, Goethestr. 23, Germany.*

Change of Address.—R. S. Bagnall, to 13, Learmouth Terrace, Edinburgh.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. October 20th. November 3rd, 17th. December 1st.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. October 28th, Races of P. coridon. November 11th, R Adkin, F.E.S., "Species in the making."—*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.*, J. P. Hardiman, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

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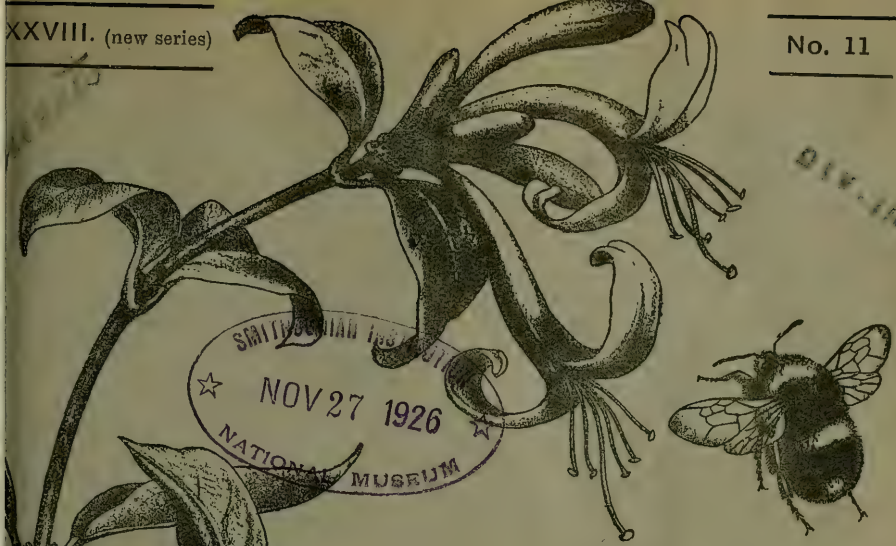

THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

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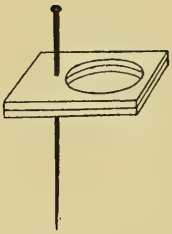

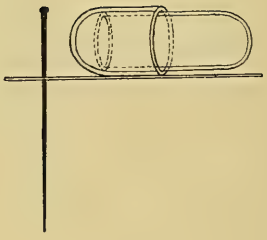

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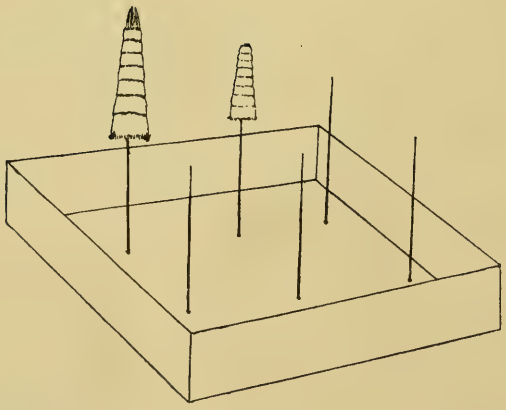

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The Entomologist's Record. *del. W. H. T. Tams.*

"Some Hints on the Preparation and Study of genitalia."

Some hints on the preparation and study of genitalia. (*With plate*).

By W. H. T. TAMS, F.E.S.

In reading from time to time papers, in which use is made of the study of genitalia, I have been struck by various remarks, which have led me to believe that it might be useful to some workers at least, if I published a short account of some of my own methods and observations.

We have still a long way to go, before we exhaust the interesting discoveries that await the investigator, in this most fascinating branch of entomological research. A glance at Rothschild and Jordan's *Revision of the Sphingidae* will convince any intending student of the value of an investigation of the genitalia in taxonomic work. There are numerous other works, which demonstrate the importance of the study of these structures, but it must not be taken for granted that they present an easy method of solving all the problems that confront the taxonomist. To rush blindly into the classification of a group purely on the morphology of the genital armature, because one investigator has succeeded in solving his difficulties in this way, will undoubtedly result in confusion. We have seen systems of classification in which, for instance, the rigid adherence throughout to the scheme laid down by the author concerned has led to the wide separation of closely allied species or genera, and it becomes increasingly evident that the only way to avoid falling into this trap is to test, as far as is possible, the value of the characters selected as a basis for the separation or grouping of species or genera. So we may see that the stalking of certain veins in the wings of insects may have an entirely different significance in different species or groups of species, and because two veins are separate in one species, the fact that they are stalked in another may not signify that the two species are not congeneric, though the same distinctions may have exactly the opposite significance in another group. The same observation is applicable in the case of the genitalia, and it may be pointed out in this connection, that it may be unwise to ignore the genitalia of one sex and to utilise characters based on modifications of the armature in the other sex alone for classificatory purposes.

Owing to the fact that many of the older authors were often misled by remarkable superficial resemblances to associate together species belonging to different genera, subfamilies, or even different families, it has become a common practice to regard these apparent indications of relationship as unimportant. It seems to me that it is much safer to place together two apparently closely related species, and then to exhaust all the means at one's disposal to test the value of the characters used in grouping, or separating, the species, in the particular subfamily concerned, than to select characters and to lay out a scheme of classification based on a knowledge of the value of such characters in other groups, regardless of the incongruous assemblage of species which may result. There are treatises in which the result of such a practice may be observed, and they will provide a happy hunting-ground for the inquirer, who would test the comparative values of characters, whether of neuration, genitalia, scaling or superficial characters such as pattern, colour, etc. Colour may also prove most useful in associating the sexes of one species, but there are many cases, in which to trust to colour would lead to hopeless confusion.

November 15th, 1926.

From the foregoing remarks it will be evident, then, that all available characters should be studied, and moreover, studied with a view to testing their comparative value. That the genital armature, both male and female, exhibits in many groups valuable characters that may be used both in separating and grouping species, has been abundantly demonstrated in various works, but it has been found that cases exist, in which these structures do not provide such characters.

The investigation of the genitalia in what is now regarded as a single species, may provide a valuable contribution to our knowledge of that and closely related species. Similar investigation of a whole genus would probably often provide even more valuable additions to our knowledge. Apparently unpretentious investigations of this nature may provide us with valuable aid, and may in some cases be as much as a student may find himself able to undertake. But the sooner our knowledge reaches the stage at which it covers much wider fields, the sooner shall we be able to assign proper values to the characters available to the taxonomist, and in this sphere of activity those who are able to undertake investigation on a small scale only, may be in the position to render most valuable and welcome assistance.

As some of the researchers already engaged in this type of investigation use methods differing from my own, an account of the procedure I adopt may lead others to take up work of this kind.

The first method I propose to describe is that used in preparing the male genitalia of *Sphingidae*. The procedure in this case does not entail the removal of the abdomen. Wood naphtha is applied to the terminal segments of the abdomen in order to render the membranes soft (a well-known method of relaxing somewhat amplified), and a fine needle-knife is then inserted between the organs and the walls of the eighth segment. With care the whole armature, comprising the ninth and tenth segments, to which the various parts of the genitalia are more or less firmly fixed, may be loosened sufficiently to make it possible to grip them with forceps and to withdraw them without injuring them. They may then be mounted dry (Dr. Jordan's method), or placed in potash and treated in the manner described below for balsam mounting. I have actually cleaned Sphingid genitalia in potash, afterwards washing out the potash in the ordinary way, dehydrating and then mounting them dry on celluloid, using cement made of celluloid dissolved in amyl acetate, a most useful preparation. Dr. Jordan uses a specially made card-board mount, consisting of two pieces of card, each with a small celluloid or glass window covering an oval hole punched through the card, the two pieces of card forming a capsule, and held together by the pin on which they are mounted. (fig. 1).

Another useful mount consists of a small celluloid capsule of two pieces, one fitting in the other. This can be fastened to a strip of celluloid with the celluloid and amyl acetate cement previously mentioned, and when the genitalia are enclosed the capsule can be lightly sealed with a touch of the cement. (fig. 2).

It is not so easy to remove the genitalia satisfactorily from the abdomen in most other families of moths as it is in the case of the *Sphingidae*, and other methods must be adopted. Whilst the abdomen, taken as a whole makes rather a large mount, there are some families in which it is advantageous to mount the whole abdomen, *e.g.*, in the

Pyralidae and *Psychidae*. The whole abdomen should always be examined before it is decided to discard any portion of it. Apart from the actual genital armature, consisting of the ninth and tenth segments and the various attached processes, particular attention should be paid to the eighth segment, which is often modified, especially the eighth ventrite. This I have found most important in the *Lasiocampidae*.

One of the reasons why I have been induced to write this short account, is the fact that I have several times heard it said, and at least once have seen it stated in print, that the membranous parts become fragile or are lost in the preparation of the specimen. The reason for this I believe to be that nearly every worker regards it as necessary to *boil* the specimen in potash (10%). I can state without fear of contradiction that perfectly satisfactory preparations can be made without the use of *hot* potash, and that with the more delicate insects it is often advantageous to dilute the 10% potash. By avoiding heat, and taking the specimen out of the potash as soon as it is soft enough to handle and dissect, the connecting membranes do not become inconveniently fragile and can be handled with forceps without the danger of tearing them.

My practice is as follows. If the specimen is unique, it is desirable to preserve the abdomen. In the case of hairy-bodied moths like the *Lasiocampidae* this is comparatively easy, but with moths having scale-covered bodies, as for example *Noctuidae* and *Geometridae*, this is more difficult and great care is needed in order to remove the genital armature without rubbing the scales from the abdomen. In those cases in which it is desired to preserve the abdomen, this is never put in potash. Maceration in water is the method used. As the abdomen will not readily absorb water at once, it should be dipped in alcohol (70% to 95%), and the alcohol will immediately permeate the entire specimen, which should then be drained by rolling it on blotting paper, after which it may be dropped into a tube containing water.

Twelve to thirty-six hours will suffice to soften most specimens (usually the shorter time is sufficient). The trace of alcohol prevents advanced maceration and allows softening only. The genital armature (with the eighth segment, or the eighth ventrite only, where necessary) may then be dissected out with ease and transferred to potash for the purpose of cleaning and clearing it of extraneous matter. It is important to note that an excess of alcohol apparently hinders the softening of the muscles, and particular attention should be paid to draining it off on blotting paper. The method of treating the specimen after it has been placed in potash only differs from that of treating specimens placed straight in potash, in that it is not necessary to leave them in that fluid for so long. With regard to the abdomen, as soon as the necessary portion has been extracted, the remainder is transferred at once to 95% alcohol, and then roughly dehydrated by being placed for a short time in absolute alcohol, after which it may be allowed to dry. For drying purposes a row of pins may be stuck through a cardboard box, points upwards, and the specimens placed on the points until they are dry, when they may be reaffixed to the moths to which they belong. (fig.3).

When, owing to the availability of plenty of material, the saving of time and of absolute alcohol is of greater importance than the

preservation of a single abdomen, the abdomen, after being dipped in alcohol (and drained), to ensure rapid penetration, is placed directly into potash. In the case of large moths, *e.g.*, *Saturniidae*, *Lasiocampidae*, etc., twelve hours in potash is advisable. The genitalia of *Noctuidae* may be dissected out after two or three hours in 10% potash, but they make better preparations if, after they are removed from the abdomen, they are soaked in potash, or even in water, for a few hours longer. It is sometimes a distinct advantage to dissect them out and give them a further soaking, as it will sometimes be found that they are held in a solid concretion within the abdomen, almost as if they were set in plaster. Small *Noctuidae*, *Geometridae*, and most *Pyralidae* and such small moths are better treated with diluted potash, and may usually be ready to dissect or clean after three or four hours in a weak solution. The judgment of the manipulator may be exercised as to the advisability of preserving and mounting the whole abdomen.

After the specimen has soaked sufficiently in potash, it is most convenient to dissect out the genitalia, and to remove unwanted scales or hair-scales, in alcohol (70% to 95%), and not in water. The preparations are handled much more readily in alcohol, which in addition appears to remove the potash much more rapidly. Acid alcohol may be used with advantage. Twenty-four hours in clean 95% alcohol takes out most of the potash, and with two or three changes through clean spirit it may be completely removed. The preparation should then be dehydrated by soaking for twenty-four hours in absolute alcohol, after which it may be taken through xylol and mounted in balsam, or it may be kept in cedar-wood oil or clove oil. It is often a great advantage to keep preparations unmounted until they have been studied from every point of view, after which they may be mounted in the most suitable position for comparison with those of related species. Another method that may be used is to take the preparation straight from alcohol to glacial acetic acid, from which it may be mounted in balsam.

With regard to mounting in balsam, this may be done in the usual way with cold balsam, or with practice hot balsam may be used. Mounting in hot balsam has the great advantage that the preparation is held steady as soon as the balsam cools, and if it is found desirable to change its position, a hot needle inserted beneath the cover-glass, after the slide has been slightly warmed, will serve to effect the necessary rearrangement. A great disadvantage of hot balsam is that it becomes dark in colour through the effect of heat on the xylol in which it is dissolved, but it is possible that with some other solvent this might be avoided.

In the case of one or two families of moths the chitin of the genital armature is not only of a dark colour, but the scales and hair-scales are also dark in colour and often firmly attached to the chitin. Lengthy immersion in potash does not seem to materially reduce the intensity of colour, but if the preparations are taken straight from potash and placed in a small quantity of alcohol in a tube, prolonged immersion will steadily reduce the colour to the required degree of translucency. This method is particularly useful in the case of *Syntomidae*, some *Arctiidae*, and *Zygaenidae*.

It is often advisable to separate parts of the genitalia in order to get a better view of some particular structure, and this provides a

weighty argument against the hasty mounting of the whole preparation without a careful preliminary examination and comparison with the armatures of related forms. As a rule it is not difficult to remove one valve, and the aedeagus is usually easily separated. The vesica of the aedeagus is not always expanded, but with careful manipulation this can be effected without much difficulty, and without damage to the delicate membrane.

A hint worth remembering in photographing genitalia mounted in balsam, is that the surface of which it is desired to record the details, should be towards the plate, *e.g.*, if it is desired to photograph a valve (clasp) of the genitalia of an Agrotid (*Noctuidae*), the inner aspect, with the harpe, should face the plate. The same remarks apply in the case of making drawings by projection.

In conclusion, I should like to point out that a simple line drawing of a valve or even of a portion of a valve may often prove of greater value as an aid to identification than a page of letter-press and a coloured plate of the whole insect. One need only mention the case of *Acronicta tridens*, S. & D., and *A. psi*, Linn. as an outstanding example.

Two species of Myrmecophilous Coleoptera New to Britain.

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

(1). *Tachyusida gracilis*, Er.

Oxypoda gracilis, Erichson, W. F. [*Die Käfer der Mark Brandenburg* **1** 351 (1837)].

"*O. gracilis*: Elongata, rufo-testacea, abdomine ante apicem, elytris capiteque pices centibus: thorace basin versus angustato, canaliculato, margine reflexo.—Long. 1½ lin."

There follows a very good description in German. Erichson was evidently not satisfied that this beetle belonged to *Oxypoda*, as he says that from this genus it was very distinguishable, especially by the narrow form and unusually long legs and antennae. Fairmaire and Laboulbène placed it in the genus *Leptusa*. In 1872 Rey [*Ann. Soc. Lin. Lyon* **19** 278 (1872)] erected the genus *Tachyusida* for this species. Reitter [*Fauna Germanica* **2** 81 (1909)] points out that it differs from *Leptusa* by the strong lengthened basal joint of the antenna, the very long first joint of the hind tarsi, and from all other genera of this tribe (*Bolitocharini*—the tarsal formula is 4, 4, 5) by the heart-shaped thorax which is not bent under at the sides, with a distinct side border-line above. He says it has been taken in old tree trunks in the Rhein province, and East Germany, and is very rare. The European Catalogue of Coleoptera gives Germany, France, and Hungary.

This beetle is undoubtedly a myrmecophilous species, and moreover a guest of the ant *A.* (*D.*) *brunneus*, Latr. It is worthy of notice that in the European Catalogue of Coleoptera (1906) the genus *Tachyusida* (*T. gracilis*, Er., is the only species found in Europe, and single species occur in N. America, Japan, and India) is placed next to *Euryusa*, of which all the European species are guests of *brunneus*. I have little doubt that the old tree trunks recorded, were, or had been, inhabited by this ant.

On October 12th, an old dead oak tree in Windsor Forest, which I had known for several years to be inhabited by a strong colony of

brunneus, was cut down for me. The tree was solid up to where the branches commenced but here it was hollow, as also the main branch; and these were split open for me. They were full of frass, teeming with ants, and the hard wood surrounding was all tunnelled with galleries by the ants. Three specimens of this very interesting graceful beetle, which I at once recognised as new to our fauna, were taken by sieving both the frass, and pieces of wood running through it, which were broken up over paper. A large box full of this frass, which I selected from where the ants were thickest, and nearest to their galleries, was packed, and taken to the station for me to take home. The next day and a half, was spent in sieving this frass at home, when three more of this beetle, besides specimens of *Euryusa sinuata*, *Batrisodes delaportei*, *B. venustus*, and the beetle next to be mentioned, were taken.

The behaviour of this insect in the presence of the ants, its rapidity of movement, and the manner in which it raised the tail over the body when it met an ant, all proved it to be a truly ants' nest species; probably belonging to the indifferently treated lodgers. What was left of the tree was again visited on October 16th, and some of the very hard wood, in which the galleries were excavated, and which was still occupied by numerous ants and their larvae, was dug out, and sieved over a sheet, when three more of the *Tachyusida* were secured, as well as some of the other species above mentioned.

As I was unable to satisfy myself with my microscope, as to the number of joints to the tarsi of these beetles, I took them to the British Museum, and Blair and I both endeavoured to make sure on this point without success (Cameron tells me you cannot be certain, unless you use transmitted light to look at the tarsi), and consequently were unable to name it. I submitted specimens to my friend Dr. Cameron, who ran it down as the above species.

(2). *Euconnus* (*Napochus*) *claviger*, Müll.

Müller, P. W. *Nat. Ges. Leipzig* **1** 190 P.f. V., 6 (1822).

"*S. claviger*, Hoffmansegg: nigro-piceus, nitidus: antennis brevibus: articulis prioribus minutis, contiguis, ultimis distantibus maximis; thorace subcordato; postice truncato, lateribus piloso, basi profunde transversim impresso; coleoptris ovatis, glaberrimis: fovea baseos utrinque impressa, fig. 6."

Müller records one specimen from near Berlin under fallen leaves, and one from Saxony. de Chaudoir [*Bull. Soc. Imp. Nat. Moscou* (s.3) **18** 190 (1845)] says it is rare in nests of *Formica rufa*, and *A.* (*D.*) *fuliginosus*, at Kiew in Spring and Autumn; and Kraatz [*Stett. Ent. Zeitg.* **10** 186 (1848)] found it in nests of *F. rufa*, and many times with *fuliginosus* near Berlin.

Skalitzky has taken it with both *A.* (*D.*) *fuliginosus* and *A.* (*D.*) *niger* in Bohemia. The European Catalogue gives Central and West Europe for *E.* (*N.*) *claviger*; and there are five European species of the subgenus *Napochus* (in which the club of the antennae is abrupt and four-jointed, etc.), all found with ants. Only one other of these has been found in Britain—*E.* (*N.*) *mäklini*, Man. (two single, and what might be called "chance specimens," having been taken—one by Joy, in dead leaves, at Bradfield, in 1904; and the other by Walker, when sweeping near Oxford in 1916), and I was able to name my species, and to distinguish it from *mäklini*, with the aid of Reitter's tables. *E.*

claviger is larger than *E. mäklini* measuring 1·4-1·7mm. as against 1mm., the three first joints of the club of the antennae are not so strongly transverse, and the insect is black, not reddish brown. Some eight specimens of this fine addition to our list of the *Scydmaenidae* were taken in company with the *Tachyusida*, recorded above, in the *brunneus* nest in Windsor Forest, and in the frass taken home—October 12th-16th, 1926.

A Note on the Cotton Bollworms of South Africa.

By J. SNEYD TAYLOR, M.A., D.I.C.
Cotton Entomologist, Union of South Africa.

Wherever it is grown, cotton suffers to a large extent from insect pests. Of these South Africa has her share and upon the control of certain of them depends the future of her cotton-growing industry. Prominent among these are the bollworms, all of which belong to the *Noctuidae*, and which cause heavy losses to cotton growers.

The most important of the South African bollworms is *Diparopsis castanea*, Hamps. (Sudan or Red Bollworm), a purely African species, which occurs on cotton throughout the continent. Cotton is the only crop attacked by *D. castanea*, but it has been found breeding upon a few wild species of *Malvaceae*. Eggs are laid singly upon various parts of the plant and the larvae, or " worms," on hatching bore their way into the squares (buds) and bolls or, in the absence of these, into the stems. There is usually only one worm to a boll. Bolls which have been attacked rarely come to anything, often the contents are completely eaten out, if not they may ripen prematurely, in which case they are dwarfed and stunted, or bollrot may set in, which results in the decay of the entire boll. When full-fed the larvae enter the soil to pupate. *D. castanea* is to be found in all stages throughout the season, during which there are four or five generations. Hibernation takes place as a pupa. *D. castanea* causes heavy annual losses to the South African cotton grower; in one field, which I visited recently, at least 90% of the unripened bolls had been punctured.

The next in importance on the list is *Chloridea* (*Heliothis*) *obsoleta** Fab. (American Bollworm) a species of world-wide distribution. The range in food plants is very large; cotton, maize and tomatoes are but a few of the crops which are attacked. The habits and life-history are very similar to those of *D. castanea*. Cotton squares, flowers, and bolls are attacked, also leaves when nothing else is left. The larva does not usually completely eat its way into a boll, but after feeding on one for a time goes on to another and in this way may account for quite a number of bolls. As in the case of *D. castanea*, there are a number of generations during the year, and hibernation also takes place as a pupa in the soil.

Infestations of *C. obsoleta* are sudden, and in this respect it differs somewhat from *D. castanea*, which is always present in varying numbers. These infestations are frequently severe, as in the past season, when many acres of cotton were stripped of squares, flowers and bolls.

*Better known as *armigera*, Hb.—H.J.T.

The third and last is the Spiny Bollworm, a name which in S. Africa embraces three species of *Earias*—*E. insulana*, Boisd.—a serious pest in India—*E. biplaga*, Walk., and *E. citrina*, Saalm.,* the last of which has only lately been recorded on cotton in South Africa for the first time. Squares, flowers and bolls are attacked by the larvae of these species, all of which are very similar in appearance, and there is also a number of wild Malvaceous host plants. The Spiny Bollworm does not usually occur in sufficient numbers to cause serious damage, but fairly heavy infestations sometimes take place, as in the season just over. There are several broods during the course of a season, and pupation takes place in an oval-shaped cocoon attached to the plant or on the surface of the soil. Hibernation, as in the preceding cases, is in the pupa stage.

All these species of bollworms have their egg, larval and pupal parasites, which do useful work, but as cotton during the last few years, has been grown on such a large scale, the balance of life has been upset, an impetus has been given to the pests and the increase of parasites has not been proportionate. Predaceous Hemiptera and wasps, as well as certain birds also, do useful work, but here again the increase has not been in proportion to that of the pests. Artificial control measures, apart from winter ploughing and clean cultural methods are still in an experimental state.

None of the foregoing species must be confused with the Tineid *Platyedra gossypiella*, Saunders (Pink Bollworm), a serious pest of cotton in North Africa and which has also been recorded in East Africa. It occurs also in Asia, America and Australia. The particular danger of this pest is that part of its life-cycle is spent within the seed, and there are very stringent regulations in force in the Union as to the importation of cotton seed and raw cotton products.

Diparopsis castanea, Hamps. *Ann. S. Af. Mus.* II. 294 (1902): *Cat. Lep. Phal. B.M.* VII. 510 (1910).

Chloridea (*Heliothis*) *obsoleta*, Fb. *Ent. Syst. emend* III(I). 456 (1793) = *armigera*, Hb. *Sam. Eur. Schm. Noct.* f. 370 (1827): Dup. *Hist. Nat.* VII. 119: Hamps. *Cat. Lep. Phal. B.M.* IV. 45 (1903).

Earias insulana, Bdv. *Fn. Madag.* 121, pl. 16 (1834).

E. biplaga, Walk. *Cat. B.M.* XXXV. 1773 (1866).

E. citrina, Saalm. *Lep. v. Madag.* I. 178 (1884).

Heterocera from Macedonia, Gallipoli and Central Greece.

By P. P. GRAVES, F.E.S.

Thanks to the kindness of Mr. W. H. T. Tams I have recently had the opportunity of examining two collections of Heterocera, a smaller one made by Major W. M. Martin, R.A. in the Gallipoli Peninsula in 1923, between January and August, which together with the Rhopalocera and Grypocera which he collected have been presented to the B.M. Collection by this officer, to whom I should like to tender my thanks for information concerning the localities in which he collected, and a larger collection made by the late Capt. F. H. Wolley-Dod, whose premature death robbed entomology so cruelly. This second

**E. citrina*, Saal., is a synonym of *E. biplaga*, Walk.—W.H.T.T.

collection was made in 1918 in the S. of Macedonia, notably the Valley of the Vardar and from December, 1918, into the spring and early summer of 1919 at Vralo, generally known to the British Army as Bralo, in Central Greece, and on the S. slopes of Mt. Parnassus at Delphi and Itea. This collection consists entirely of Heterocera. It has been presented to the B.M. Collection by Mr. H. J. Turner, F.E.S.

Some difficulty has arisen in consequence of the illegibility of many of Capt. Wolley-Dod's data labels, scraps of any sort of paper—all that was available during a campaign—inscribed with pencil which has faded to a faint shade. But by careful inquiry and above all by the use of the Austrian maps, which were used by the British Staff and are still the best for the greater part of the Balkan Peninsula, I have, I believe, tracked down the various abbreviations—'Paiz.,' 'Ardz.,' 'Hort.,' etc.—which were employed, and have identified most of the localities. I am the more sure of my identifications since they are confirmed in some cases by the history of the campaign. Here may I say that the place-names spelt in accordance with the system used by the Austrian Staff Maps with its circumflexed c's and z's and other unfamiliar characters were pronounced as in English by 99 per cent of our officers and men at Salonika until they learnt the proper pronunciation from the inhabitants—which many, perhaps most, did not do. On this account I have altered the spelling of the names in many cases to a form that will be more comprehensible to the readers of the *Ent. Record.* Furthermore for the benefit of any reader who may visit Macedonia I have given alternative names of villages, etc., since most villages in Macedonia were binomial or trinomial, the languages in use until recently being Slav (a variant of Bulgar), Greek and Turkish. Now that many Slavs and all the Turks have gone and that Greek refugees from Asia Minor inhabit their villages, the traveller will probably discover that what was called Mehmedli is called Nea Philadelphia and that Byelovo—Ak-keui—and Levkokhori (which all mean Whiteville) has been renamed Galatopolis by refugees from Anatolia with classical tastes. But I shall have done my best!

Capt. Wolley-Dod's material is in excellent order and scarcely contained a bad specimen. Many species are represented by good series, some, in spite of the difficulties of the collector, obliged by his military duties to travel light from place to place, have been bred and the general state of his insects evokes admiration and regret at the loss of so good and keen a naturalist. One species is certainly new to Europe; another, if my identification, which is supported by the high authority of Mr. Tams, is correct, is also new. Others are new for the S. Balkans and for Greece. One gets the impression that certain species, *e.g.*, *P. typhae*, *A.* (*Nonagria*) *sparganii* and *A. geminipuncta* have come down the Vardar Valley from the Danube basin. The abundance of the Geometrids, notably of the genus *Acidalia* (*sensu lato*) is striking. The Zygaenids of the genus *Procris* have not been certainly identified and have been left to Dr. Karl Jordan for determination.

In the account of the specimens in the two collections I use the following abbreviations, most of which are those appearing on the late Capt. Wolley-Dod's data labels.

A. Topographical.

The usual geographical abbreviations, *e.g.*, L. = Lake, R. = River, etc.

Gall. = Gallipoli Peninsula.

Mac. = Macedonia.

Bulg. = Bulgaria.

Eur. = Europe.

Turk. = European Turkey as at present delimited by the Treaty of Lausanne.

As. Min. = Asia Minor.

Place Names.

1. *In Macedonia.*

Ardz. = Ardjan also Hardjinovo (Slav.) and Ardzan (Greek) a village near the N. end of Lake Ardjan a short distance to the W. of the branch railway from Karasuli to Kilindir (q.v.).

Arm. = Armutchi, village and former camp on the Salonika-Doiran Railway about 25 miles N.N.W. of Salonika.

Dud. = Probably Dudular 3 miles N.W. of Salonika.

Furka. = A village in the hills midway between the Vardar and the N. extremity of L. Doiran. Altitude circa 1200 ft.

Hort. = Hortiatch (Hortiaghatch) the village on the slopes of the mountain of that name (highest point Mt. Kotos, 3,800 feet approximately) about 8½ miles E. of Salonika.

Jan, Yan. = Yanesh, Janesh or Eneshovo (Slav.) 1 mile N. of Armutchi.

K.B. = Karaburun, a cape fortified by batteries just S. of Salonika town.

Karas. = Karasuli. Railway Junction on the R. Vardar near the S. extremity of L. Ardjan.

Karali. = Probably the village of that name 1 mile E. of Sedes (q.v.).

Kaz. = Kazanovo or Kazankeui, 5-6 miles W.S.W. of Armutchi.

Kil. = Kilindir on Salonika-Doiran Railway about 3 miles due S. of Lake Doiran.

Kir., generally Kirec. on data labels. Probably = Kiretchkeui (Turkish for Cherryville) = Kretchovo (Slav.). There are several villages of the name in the area where the Macedonian collection was made; I am inclined to support the claims of 2 small villages between L. Ardjan and Armutchi.

Kutch. = Just possibly the many-named Kukus, Kukush, or Kilkis 4 miles E. of Armutchi.

Lag. = Laginova or Laina 4 miles N. of Salonika on the Seres Road.

Lem. = Lembet Camp in the pass 3 miles N. of Salonika.

Neg. = Negovan or Likovan, village on Salonika-Seres Road, 25 miles N.E. of Salonika and about 1,500 ft. above sea-level.

Pazar. = Probably Pazarkeui or Pazarkia (Greek) on S. shore of L. Beshik, E. of Salonika.

Paiz. = Paizanovo (Turk and Slav.) Kiretchkeui (Turk) and Neohori (Greek) a trinomial village about 950 ft above sea-level, about 2½ miles due E. of Salonika where important camps and Head-Quarters were maintained during the campaign.

Sal. = Salonika.

Ser. = Seres, on the E. of the R. Struma, not to be confused with Sed. = Sedes, a village 3 miles S.S.E. of Salonika and now a Greek military aviation centre.

Snev. = Snevtchi, on lower slopes of the Krusha Balkan on Doiran-Seres Railway 10 miles E.N.E. of Doiran.

2. *In Greece.*

Vral. = Bralo on labels, i.e., Gravia-Vralo, a station and during the war a military depot on the Lamia-Athens Railway on the central plateau of the Province of Phocis-Phthiotis N. of the main range of Parnassus and Ghiona. Altitude circa 1400ft-1800ft with much higher mountains in the vicinity.

Del. = Kastro on labels, the latter being the popular name for the classical Delphi on the S. slopes of Parnassus.

Mav. = Probably Mavro near Vralo.

Mes. = ?Masili on the Vralo plain.

Itea. = On N. shore of the Gulf of Corinth below Delphi.

B. Other Abbreviations.

B.M.C. = British Museum Collection.

b.m.e. before a Roman numeral = respectively the 1st-10th, 11th-20th and 21st-last day of the month represented by the Roman numeral.

sp. = species, spec. specs. = specimen, specimens.

Gen. = Generation.

I have given the index number in the third edition of the Staudinger-Rebel catalogue in the case of each sp. In their nomenclature I have generally followed Hampson and Prout (in Seitz) for the majority of the Macro-Heterocera and Hampson in the case of the Pyralids. I wish to thank Mr. Tams and Mr. L. B. Prout for their kind assistance in determining many of the species herein mentioned.

Syntomidae.

4156 *Dysauxes* (*Naclia*) *punctata*, F. Gall. Two specs. both worn.

Arctiidae.

4098 *Nola togatulalis*, Hb. Mac. Paiz. 11.V.1918.

4104 *Celama* (*N.*) *cicatricalis*, Tr. Gall. A very small spec.

4113 *Roeselia* (*N.*) *albula*, Hb. Mac. Hort. b. IX.

4194 *Ocnogyna parasita*, Hb. Gall. A series of 14 males.

4163 *Spilosoma menthastri*, Esp. Mac. Paiz. 6.V.1918.

4249 *Coscinia striata*, Esp. Mac. Arm. e, V. Hort. 2nd. Gen. b. IX.

4203 *Arctia villica*, L. Mac. Arm. and Yan., VI. Greece. Vral. 14.V.1919.

4301 *Ilema* (*Lithosia*) *caniola*, Hb. Gall.

(4248 *Callimorpha quadripunctaria*, Poda, is represented in the B.M.C. by specimens from Macedonia among other Balkan localities, but does not figure in Capt. Wolley-Dod's collection.)

NOCTUIDAE.

2321 *Chloridea* (*Heliothis*) *dipsacea*, L. MAC. A short series, Paiz., e. IV.-b. V.

2325 *Ch.* (*H.*) *peltigera*, Schiff. GALL. A short series. MAC., Arm., Paiz., etc., V., VI.

1843 *Actinotia* (*Chloantha*) *hyperici*, Schiff. GALL. Two specs.

1400 *Euxoa* (*Agrotis*) *segetum*, Schiff. GREECE. Vral. 11.III.1919.

1405 *E.* (*A.*) *crassa*, Hb. MAC. Hort. b. IX.

1345 *E.* (*A.*) *radius*, Haw. = *puta*, Hb. MAC. Kenali, E. of Salonika 24, IX. of the form *lignosa*, God., Sal. 10, VI. *puta*, Hb.

1387 *E.* (*A.*) *obelisca*, Hb. MAC. ? Kilindir, locality doubtful, IX, 1918.

1323 *E.* (*A.*) *forcipula*, Hb. MAC. Arm. b. VI. Occurs in Bulgaria.

1399 *Agrotis ypsilon*, Rott. MAC. Arm. m. VI.

1197 *A. xanthographa*, F. MAC. Kenali, 24, IX.

1152 *A. pronuba*, L. MAC. Arm. e. V., VI. A variable series.

1402* *Lycophotia* (*A.*) *saucia*, Hb. GALL. Two near f. *majuscula*, Haw. MAC. Sal., 24, IV. f. *rufa*, Tutt.

1768 *Mythimna* (*Ammoconia*) *senex*, H-G. MAC. Two perfect specs. Hort. m. XI. Occurs in TURK. and BULG.

1423 *M.* (*Pachnobia*) *rubricosa*, F. GALL.

1125 *Triphaena* (*Agrotis*) *janthina*, Esp. MAC. Arm., 22, VI. One very fresh spec.

1477 *Scotogramma* (*Hadena*) *trifolii*, Rott. GALL., MAC. Various localities.

1515 *Miselia* (*Polia*) *cappa*, Hb. GALL. One.

1513 *M.* (*P.*) *dysodea*, Schiff. = *chrysozona*, Bkh. MAC. Arm. several, V., VI.

2065 *Monima* (*Taeniocampa*) *miniosa*, F. GALL. One very pale spec.

2069 *M.* (*T.*) *rorida*, Friv. GREECE. A damaged but recognisable spec. from Vral. 11.III.1919. Occurs in Bulgaria.

1938 *Leucania* (*Sideridis*) *pallens*, L. MAC. Sal. m. VI.

2221 *Cucullia verbasci*, L. GALL.

2227 *C. blattariae*, Esp. MAC. Arm. 8, VI. Very probably this sp.

2206 *Copiphana* (*Cleophana*) *olivina*, HS. MAC. Paiz. 16, V. 1918.

2211 *Amephana* (*Cl.*) *aurita*, F. = *dejeanii*, Dup. GALL. One.

1759 *Ulochlaena hirta*, Hb. MAC. Hort. m. XI.

1737 *Dorthisa* (*Episema*) *trimacula*, Schiff. = *glaucina*, Esp. MAC. Seres, 27.X.1918.

1738 *D.* (*E.*) *lederi*, Chr. MAC. A specimen taken three days after the above at Seres is extraordinarily like the unicolorous pale ochreous form of *D. lederi* from Palestine. Against its being the similar form *unicolor*, Dup. of *D. trimacula* must be set its less heavy build and the more elongated shape of the fore-wings. At the same time it must be said that *D. lederi* has not, as far as I know, been recorded from Europe.

---

*_Lycophotia saucia_, Hb.
Noctua saucia, Hb. (1802-8)
= _Noctua margaritosa_, Hb. (1809)
Hampson Cat. Lp. Phal. IV. 530, sp. 933 (1903), sinks *saucia*, Hb., having wrongly dated it 1827 !!!!—DRNT.

1761 *Aporophyla lutulenta*, Bkh. Mac. A pair from Seres, e. X. 1918.
1763 *A. australis*, Bsd. Mac. A large series from Arm., Kil., Lag. and other places.
2171 *Lithophane* (*Xylina*) *ledereri*, Stgr. Mac. Hort. 14.XI.1918. Greece. Vral. 11.III.1919. This fine sp. has not, I believe, been previously recorded from Europe. Its previously known habitats are in As. Min.
1821 *Dryobota* (*Dryobotodes*) *roboris*, H-G. Mac. Hort. XI. A good series approaching f. *cerris*. Greece. Vral. 15.XII.1918.
1787 *Antitype* (*Polia*) *canescens*, Dup. Mac. Seres, e. X. b. XI. Of a pale clear grey. Other Macedonian specs. from Kalabak, 1917, in the B.M. C., are also of this form.
1778 *A.* (*Polia*) *rufotincta*, H-G. Greece. Locality doubtful, e, XII. 1918.
2158 *Conistra* (*Orrhodia*) *veronicae*, Hb. Greece. Vral. 13.III.1919.
2124 *Amathes* (*Orthosia*) *circellaris*, Hufn. Mac. Seres, 1, XI.
2125 *C.* (*O.*) *helvola*, L. Gall. One of the f. *rufina*, L.
2127 *A.* (*O.*) *lychnidis*, Schiff. = *pistacina*, F. Greece. Loc. doubtful. 25.XII.1918.
2047 *Amphipyra tragopoginis*, L. Gall. Several. Mac. A good series from Arm. VI. These are larger than the Gall. specs. and than most from W.Eur.
1827 *Dipterygia scabriuscula*, L. Mac. Paiz. 9.V.1918.
1690 *Parastichtis* (*Hadena*) *monoglypha*, Hufn. Gall. One. Greece. Vral. 6.V.1919.
1715 *P.* (*H.*) *secalis*, Bjerk. (Linn.). Gall. One.
1670 *Eremobia ochroleuca*, Esp. Gall. A few.
2111 *Sidemia* (*Dyschorista*) *fissipuncta*, Haw. Gall. One.
1867 *Trigonophora* (*Brotolomia*) *meticulosa*, L. Mac. Seres, 1, XI.
1587 *Bryophila* (*Metachrostis*) *receptricula*, Hb. Mac. Sal. b. VII.
1588 *B.* (*M.*) *ravula*, Hb. Mac. Hort. 26, VIII.
1850 *Polyphaenis sericata*, Esp. Gall. 2 ♂ ♂, 1 ♀.
1115 *Simyra nervosa*, F. Mac. Arm. 6, VI.
1076 *Acronycta aceris*, L. Gall. One male.
1089 *A. tridens*, Schiff. Greece. Vral. 7.V.1919. Genitalically determined.
1102 *A. rumicis*, L. Mac. Arm. and other localities near Sal. 10.V- 2.VII.1918.
1990 *Laphygma* (*Caradrina*) *exigua*, Hb. Gall. Several.
2011 *Athetis* (*C.*) *germainii*, Dup. Mac. A spec. taken at Hort. 5.IX.1918, seems to belong to this small dark sp. not previously recorded from the Balkans.
2019 *A.* (*C.*) *ambigua*, Schiff. Mac. Sal. 12.VI.1918.
2000 *A.* (*C.*) *clavipalpis*, Scop. = *quadripunctata*, F. Mac. A curious aberration, unfortunately in bad order, with heavily marked lines and stigmata, Paiz. 8.V.1918. Greece. Vral. 6.V.1919.
1894 *Phragmatiphila* (*Nonagria*) *typhae*, Thnbg. Mac. One, *ex pupa* from Kirec. probably Kiretchkeui, 5.VII.
1893 *Archanara* (*N.*) *sparganii*, Esp. Mac. A fine bred series dated e.VI. and b.VII. from Kiretchkeui.
1895 *A.* (*N.*) *geminipuncta*, Haw. Mac. Bred from pupa; Kirec. VII.
1913 *Oria* (*Tapinostola*) *musculosa*, Hb. Mac. Arm. VI.

2302 *Panemeria* (*Heliaca*) *tenebrata*, Scop. Greece. Vral. 10.VI.1919.
2493. *Aegle* (*Metoponia*) *koekeritziana*, Hb. Gall. Several, some of the f. *subfumata*, Stgr.
2496 *A.* (*M.*) *vespertalis*, Hb. Mac. Arm. VI.
2498 *A.* (*M.*) *agatha*, Stgr. Mac. Arm. 7.VI.1918. Greece. Vral. 4.V. to 10.VI.1919.
2394 *Eublemma* (*Thalpochares*) *suava*, Hb. Gall. Seven ♀ ♀.
2384 *Ozarba* (*Acontiola*) *moldavicola*, HS. Greece. Vral. V. several.
2490 *Erastria* (*Emmelia*) *trabealis*, Scop. Mac. A long series from various localities. Greece. Vral. b.V.
2376 *Tarache* (*Acontia*) *urania*, Friv. Gall.
2378 *T.* (*A.*) *lucida*, Hufn. Mac. A long series of both broods b.V.-e.VII., those taken early in the season being predominantly f. *lugens*, Alph. while the later ones are oftener *lucida*.
2670 *Catocala elocata*, Esp. Gall. Two fine specs.
2685 *C. conjuncta*, Esp. Gall. Two fresh specs. with the hindwings of a red approaching that of the ssp. *vivida*, Warren in Seitz.
2713 *C. conversa*, Esp. Gall. A few. Mac. A long series from Kil. Sal. and other localities VI.1918.
2714 *Ephesia* (*Catocala*) *eutychea*, Tr. Gall. A short series. Mac. One only, labelled Arm. 29.V.1918.
2644 *Parallelia* (*Grammodes*) *algira*, L. Gall. Mac. Arm. and Paiz., V.1918. Ardjan, 17.VIII.
2289 *Gonospileia* (*Euclidia*) *glyphica*, L. Mac. A series of ten from Paizanovo.
2591 *G.* (*E.*) *triquetra*, F. Mac. Paiz., 29.IV.1918.
2562 *Phytometra* (*Plusia*) *gamma*, L. Mac. Many from various localities taken V., VI., and IX. Gall. Several.
2571 *Ph.* (*Pl.*) *ni*, Hb. Gall. One ♂.
2515 *Abrostola triplasia*, L. Mac. Paiz. 27.IV.
2380 *Acontia luctuosa*, Esp. Gall. A few. Mac. Various localities V., VI., from K.B., IX.
2720 *Apopestes spectrum*, Esp. Gall. Two large specimens. Greece. A very worn specimen from Itea, Gulf of Corinth dated 15.III.1919. Does this species hibernate in the extreme S. of Eur. or has it two broods there?
2721 *Autophila* (*Apopestes*) *cataphanes*, Hb., ssp. *ligaminosa*, Ev. Gall. A short series of both sexes.
2723 *A. dilucida*, Hb. Gall. One. Mac. Lembet, Arm. VI. The Armutchi spec. has unusually clear markings on the forewings. Greece. Vral. 24.III.1919, very worn and perhaps hibernated, cf. *A. spectrum*.
2743 *Toxocampa craccae*, F. Mac. K.B. two worn specs., 29 and 30.IX.
2816 *Bomolocha* (*Hypena*) *obesalis*, Tr. Mac. Sal. 24.IV.
2818 *Hypena obsitalis*, Hb. Greece. Vral. 7.IV.
2819 *H. rostralis*, L. Mac. Paiz. e.IV.
2825 *Rhynchodontodes* (*H.*) *antiqualis*, Hb. Gall. Several fresh specs.

(*To be concluded.*)

NOTES ON COLLECTING, etc.

Late date for Plebeius aegon, Schiff. (=argus, L.).—On Sunday, October 3rd, I caught a male specimen of this species on the heath near Beaulieu Road station. The insect was by no means in bad condition. No other specimens were met with in the course of a short search. Is it possible this can be an example of a second brood, or only a case of retarded emergence?—Wm. Fassnidge, (M.A., F.E.S.), 47, Tennyson Rd., Southampton.

Predacious Diptera.—I should like to put on record the undermentioned examples:—*Asilus crabroniformis*, L., one ♀ taken near Swanley, Kent, on July 22nd, 1926, with victim the coleopteron *Necrophorus vestigator*: and *Eutolmus rufibarbis*, Mg., two ♀ specimens taken near Farningham, Kent, on August 1st, 1925, in each case with the dipteron *Thereva nobilitata*, *L.*, as victim.—H. W. Andrews (F.E.S.), 6, Footscray Rd., Eltham, S.E.9.

Cidaria (Dysstroma) truncata (russata).—I have a brood of *C. truncata*, one of the black forms; will the larvae hibernate indoors? If not what is the best treatment?—C. Nicholson (F.E.S.), 35, The Avenue, Hale End, E.4.

Scarcity of Colias croceus (edusa) in Hampshire.—There have been very few records of this species in Hampshire this season. I caught one rather frayed female specimen on September 23rd, at Barton within a few yards of the sea. Hoping to obtain ova I placed her in a cage with a few sprigs of clover. But although I left her for several days she refused to lay at all. I wonder if *Polygonia c-album* is commencing to spread eastward. Two or three specimens have been recorded from Dorset this year, and last month I met a collector who had obtained a specimen near here. It was a very badly worn specimen, but there was no doubt as to the species. There seems no reason why this species should not occur in this county, it's food plants being very abundant everywhere.—S. A. Jones, "Biskra" New Milton, Hants.

CURRENT NOTES AND SHORT NOTICES.

The event of the entomological season, the Annual Exhibition of the South London Entomological Society, takes place on Thursday, November 25th, at 7 o'clock, at their rooms Hibernia Chambers, adjoining the south western end of London Bridge. There will be no formal meeting, but as last year, it will take the form of a conversazione, and light refreshments will be available during the evening. Notification of all exhibits must be made on or before November 22nd, stating what space will be required so that adequate tables may be arranged without crowding. Visitors interested in Natural History will be cordially welcomed.

We quote from the *Times* of October 1st. Among the interesting details of the work of the Empire Marketing Board, by the Secretary of State for Dominion Affairs, the following item is of more than ordinary interest to us as entomologists. "A capital sum of £15,000 and an annual maintenance grant of £4,000 for five years had been offered to the managing Committee of the Imperial Bureau of Entomology for the establishment, under careful safeguards, of a laboratory

for the breeding and distributing to the Dominions and Colonies of beneficial parasites to control and destroy insect pests. It had been calculated that 10 per cent. of the world's crops were destroyed by insect pests." It is a distinct advance, to feel that the powers-that-be are beginning to be convinced that the science of entomology is really a necessary adjunct in the successful carrying on of world-wide trade and production, and not left to those interested in patent nostrums or to well-meaning amateurs without sufficient knowledge, funds and kudos at the back of them.

The Hon. Treasurer would ask those who have not yet paid their subscriptions for the current (1926) volume to do so without further delay. He would also draw the attention of any subscribers who may prefer *to pay subscriptions through their Bankers* that forms for this purpose may be obtained from him on application.

The 2nd Edition of Mr. Donisthorpe's *British Ants* is now in the press and will be published shortly. A great deal of detailed addition to the distribution, omissions from the former edition, and all the new facts and discoveries will be added, and the synonymy will be brought right up to date.

Two parts of a work on General Zoology, *Zoologie in Grundriss*, by Dr. Walter Stempell, published by Gebrüder Borntraeger, Berlin, have reached us. The work is most profusely illustrated, in the first 160 pages there are no less than 195 illustrations, some of which are composite with 12 to 20 separate figures in each. The scheme of arrangement of the matter is a very thorough and comprehensive one. Although the Insecta must necessarily comprise but a portion of such a work, it is placed in its comparative setting with regard to the other orders of beings. The alternation of generation in the malaria-parasite is very well done and quite originally illustrated. When completed the book will no doubt be one of those basic works upon which future students will ground the lines of their intensive work.

A further section of the Insect Fauna of Hants is to hand, the Hants Orthoptera by F. J. Killington, F.E.S. This will be commenced early in the new year. Further lists are being prepared, Trichoptera and Neuroptera by the same compiler and the Hants Rhynchota by N. P. Jones.

A meeting of the Entomological Club was held at "Durandesthorpe," 19, Hazlewell Road, Putney, S.W., on Thursday, September 23rd, 1926. Mr. H. St. John Donisthorpe in the Chair. The Members present in addition to the Chairman, were Professor E. B. Poulton, Messrs. H. Willoughby Ellis, Jas. E. Collin, and W. J. Kaye. The Visitors present were, Messrs. W. H. T. Tams, H. E. Andrews, K. G. Blair, G. C. Leman, Dr. Norman Joy, and Col. J. Winn-Sampson.

The guests were received in the drawing-room at 6.30 p.m., onwards when tea and coffee were dispensed by Mrs. Donisthorpe. The Chairman's collections were inspected including some interesting work recently carried out by him at Windsor Park. Supper was served at 8 o'clock and the guests dispersed about 11 p.m. after a most enjoyable evening.

Ere this be published many Fellows of the Entomological Society of London will have received the long delayed Part I. of the *Transactions*. The part is devoted to a masterly memoir on the genus *Hesperia*, by B. C. S. Warren, and there are no less than 60 excellent plates in black and white. The new size, small quarto, has quite justified its adaption by the Council.

Subscriptions for Vol. XXXVIII. (new series), 10 shillings, should be sent to Mr. H. W. Andrews, *Hon. Treasurer*, **6, Footscray Road, Eltham, S.E. 9.** (Bankers Payment forms supplied on application.)

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Desiderata.—The Leicester Museum has no British Diptera and requires a typical collection. Can any collectors help us? We offer European Butterflies in exchange..'—"Entomologist," Leicester Museum.

Desiderata.—Ova or pupae of christyi, abruptaria v. brunnea, black consonaria and bidentata, extensaria, curzoni, jasionata, venosata (Shetl.) and other melanic Geometers and Noctuae.

Duplicates.—Very many in first class condition, high-set only f. i. Herminia flavicrinais, Andreas, Nych. dalmatina race andreasaria, Warnecke, about 30 species of rare Acidalias ; pupae of Eupithecia illuminata or cash.—*Karl Andreas. Wiesbaden, Goethestr. 23, Germany.*

Change of Address.—R. S. Bagnall, to 13, Learmouth Terrace, Edinburgh.

MEETINGS OF SOCIETIES.

Entomological Society of London.—41, Queen's Gate, South Kensington, S.W. 7. 8 p.m. October 20th. November 3rd, 17th. December 1st.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. Second and Fourth Thursdays in the month, at 7 p.m. October 28th, Races of P. coridon. November 11th, R Adkin, F.E.S., "Species in the making."—*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.*, J. P. Hardiman, C.B.E., B.A., 1, Chatsworth Road, Brondesbury, N.W.2.

All MS. and EDITORIAL MATTER should be sent and all PROOFS returned to Hy. J. Turner, 98, Drakefell Road, New Cross, London, S.E.14

We must earnestly request our correspondents NOT *to send us communications* IDENTICAL with those they are sending to other magazines.

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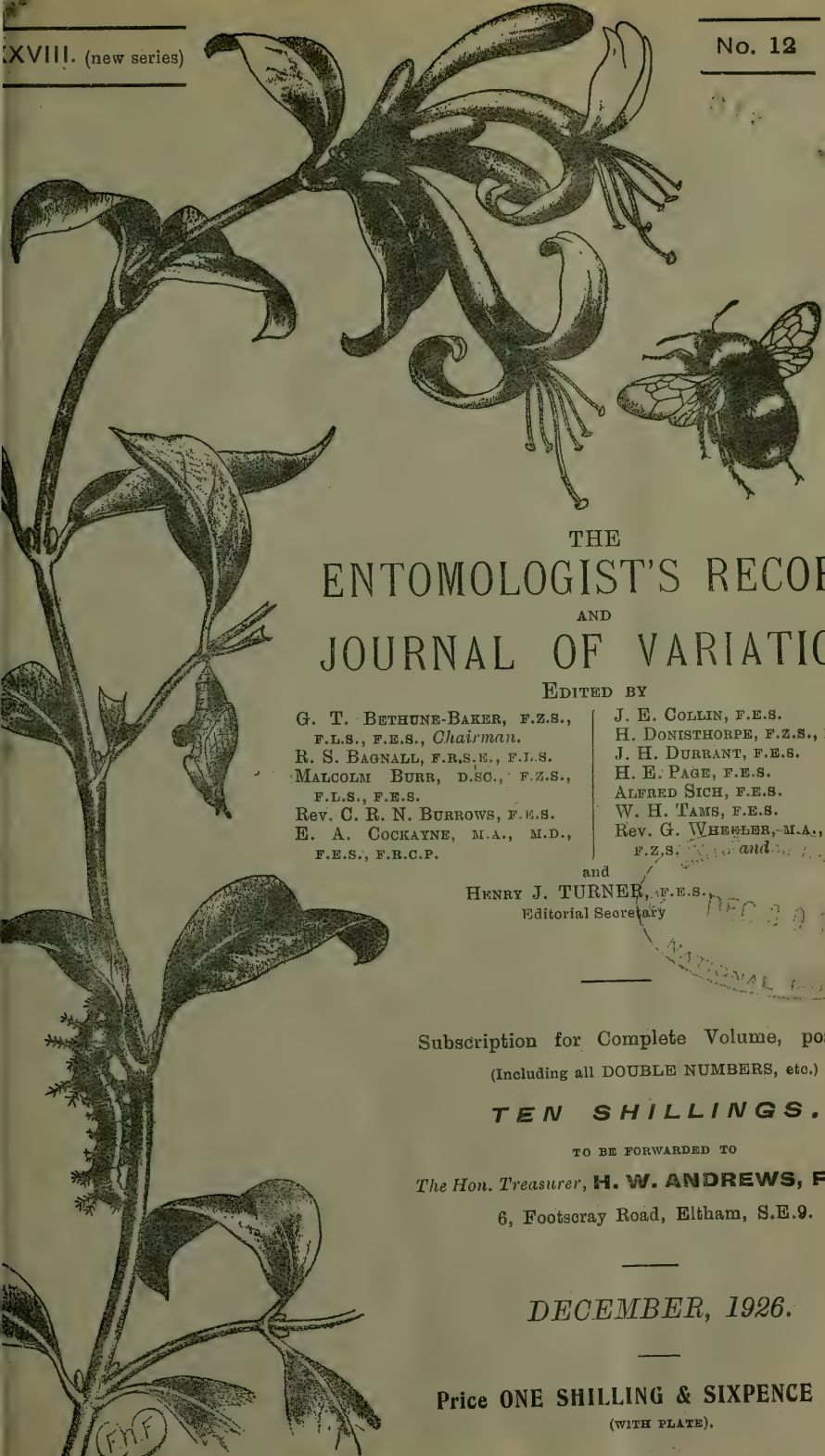

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The Ants (Formicidae), and some Myrmecophiles, of Sicily.

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

Having spent nearly two months in Sicily this year, I took the opportunity to collect as many insects as I could (with the exception of the Lepidoptera); but naturally devoted most of my time to the ants. I first visited Palermo, and excursions were made to localities near by. Later I went on to beautiful Taormina with its Isola Bella, old Castles, and ancient theatres, mountains, cliffs covered with flowers, and Etna with its drift of smoke, and everlasting snowclad summit towering in the distance over all. Here the remainder, and larger part of my stay was made. During the whole of my sojourn in Sicily rain fell on only three days, the rest of the time the sun shone all day long. The bright blue sky, blue and placid sea, and blazing sunshine almost made one wish at times for a cloud or two and breakers on the beach.

As far as I am aware, only two lists have been published of the ants of Sicily—the first was by Prof. T. de Stefani—"Catalogo degli Imenotteri di Sicilia" [*Naturalista Siciliano*, Vol. **8** (1889)], a second edition of which appeared in 1895 in Vol. 14 of the same periodical. The second was published by the late Professor C. Emery in his "Formiche delle Isole Italiane" [*Annali del Museo Civico di Storia Naturale di Genova*, **66**, 250-52 (1915)]. The latter list consists of 60 different kinds of ants, including species, sub-species, and varieties.

Emery added 12 forms to Stefani's last list. The species enumerated had been collected by de Stefani, Emery, Fiori, Ragusa, von Rottenberg, etc.

I reproduce the whole list, bringing it up to date, but only mention the name of those species I did not take. It will be seen that I have added ten forms (which are marked with an asterisk) to Emery's total.

I must take this opportunity to thank my colleagues Professor Carlo Menozzi for kindly comparing some of my captures with Emery's types, and with kind help in identifying the more difficult species; and Prof. F. Silvestri for kindly naming the Lepismas ("Fish Insects")· I am indebted to Mons. Chopard for the name of the little Myrmecophilous Cricket.

FORMICIDAE.

Subfamily Ponerinae.

Stigmatoma impressifrons, Emery.

Sysphincta mayri, Forel.

Euponera (*Trachymesopus*) *ochracea* ssp. *sicula*, Emery.

Ponera coarctata, Latr.

Ponera eduardi, Forel.—I captured a few ☿ ☿ of this species under stones at Palermo on March 21st.

Ponera ragusae, Emery.

Subfamily Myrmicinae.

Stenamma westwoodi, Westw.

Aphaenogaster (*Aphaenogaster*) *sardoa*, Mayr.

Aphaenogaster (*Aphaenogaster*) *testaceo-pilosasemipolita*, Nyl.—I found this ant to be one of the most abundant species, as it occurred

in every locality I visited, in the towns as well as in the country, nesting in walls, under stones, and in the earth. It was also observed under the same stone in company with several other ants, as will be noted later. It collects seeds—on one occasion, I took a fair sized bean from several ☿ ☿ who were carrying it—many Conifer and other seeds being found in the nests. In nearly all the nests examined, the mite *Laelaps* (*Hypoaspis*) *myrmophilus*, Mich., occurred in some numbers. This mite was originally described by Michael in 1891 from specimens found in numbers with *A. testaceo-pilosa* in Corsica. The "Fish Insect" *Lepisma wasmanni*, Mon., was found with this ant under stones at Mondello, on March 17th. The little white woodlouse, *Platyarthrus hoffmanseggi*, Brdt., and the tiny Spring-tail *Cyphodeirus albinos*, Nic., were also not infrequent. The last two creatures are found with most species of ants everywhere. Of other myrmecophiles the following beetles were found—*Stenosis brenthoides* v. *sicula*, Sol., in a colony under a stone in the Cathedral garden at Monreale on April 3rd; *Coluocera formicaria*, Mots., a small roundish yellow species, at Capo St. Andrea on April 7th, and *Merophysia formicaria* v. *sicula*, Kies., of the same colour and general appearance but narrower, at Taormina on April 17th. Of spiders, *Zodarion elegans*, Sim., was found in a nest under a stone in the Excelsior Palace Hotel at Palermo. This spider is recorded by Wasmann as having been taken by Simon in nests of *Aphaenogaster* in France. Young individuals of *Synageles* sp., and *Chiracanthium* sp., both very ant-like in appearance, were taken under a stone in company with this ant at Taormina on April 18th. A few Aphids were found in a colony of *semipolita* at Taormina.

Aphaenogaster (*Aphaenogaster*) *testaceo-pilosasemipolita* var. *ionia*, Emery.

Aphaenogaster (*Attomyrma*) *subterranea*, Latr.

Aphaenogaster (*Attomyrma*) *crocea* ssp. *sicula*, Emery.

Aphaenogaster (*Attomyrma*) *gibbosa* ssp. *fiorii*, Emery.

Aphaenogaster (*Attomyrma*) *splendida*, Rog.

Aphaenogaster (*Attomyrma*) *pallida*, Nyl.—I found ☿ ☿ on paths in the Hotel gardens at Palermo, and small colonies under stones at Taormina, Capo S. Andrea, Isola Bella, and Mola.

Messor barbarus ssp. *barbarus* var. *capitatus*, Latr. (v. *nigra*, Er. André).—This is another ant one continually meets with walking in tracks, carrying seeds, in gardens, fields, and over roads, etc. It nests under stones, in the ground with grains of earth over the nest and in burrows in banks, etc. The ☿ ☿ collect all kinds of curious and large seeds, and even large beans—in the Hotel garden at Palermo, they were very unhandy with some winged seeds, which always got stuck in the entrances to their nests. On April 16th at Taormina a colony was found under a large stone, whose seed chambers were full of seeds, but also contained some little pebbles, and a quantity of little bits of broken glass! It is difficult to suggest why the ants should have taken the trouble to carry in such useless objects. On March 20th, at Palermo, I picked up a winged female on the road, and many males were resting on one side of some trees near the road. Many guests occurred in the nests of this ant. The one which pleased me most was the little cricket *Myrmecophila* (*Myrmophilina*) *ochracea*, Fisch., as I had never taken one of these insects before. I first found it on April 7th, in a nest of this ant under a stone at Taormina, when seven specimens were

secured. Subsequently it was found in many nests all over the district, and also at Mola. *Lepisma aurea*, Duf., all sizes, *Platyarthrus hoffmanseggi*, and *Cyphodeirus albinos* were generally present with this ant. Of beetles the most interesting was the little oval, yellow Heteromeron, *Oochrotus unicolor*, Luc., which was found on several occasions, sometimes six or more being present in one nest. *Messor barbarus* is its normal host, and J. J. Walker found it in some numbers with that ant at Gibraltar and Tangier. *Colnocera formicaria*, and *Meraphysia formicaria* v. *sicula* were sometimes found at Taormina in company with the *Oochrotus*, or with each other in *Messor* nests. On April 17th, at Taormina in a large colony of this ant a number of larvae of a little Homopteron, *Tettigometra*, sp.? (probably *T. brachycephala*, Fieb., teste China) occurred. Wasmann records 12 species of this genus with ants from different places. At Taormina on April 21st and at Mola on 24th, I found large numbers of a big grey woodlouse, *Porcellionides myrmecophilus*, in several *Messor* nests.

* *Messor barbarus-structor*, Latr., teste Menozzi.

According to Emery's "Ants of Italy," typical *structor* only occurs in France. I found a small colony at the foot of a wall in a field at Palermo, and another under a stone by the side of a cliff road at Taormina. It, however, occurred in the greatest profusion in Palermo itself—very many ♃ ♃ and ☿ ☿ were to be seen at the base of a wall, extending the whole length of a long street from the town to the sea, dragging along beans, grain, bits of vegetables, etc., and entering holes in the pavement at the foot of the wall.

Messor barbarus ssp. *structor* var. *tyrrhena*, Emery.

Oxyopomyrmex santschii, Forel. (*O. santschii* var. *siciliana*, Karawiew, and Emery's Sicilian list).—I captured ☿ ☿ of this ant walking about on the paths in the garden of the Excelsior Palace Hotel at Palermo in March.

Pheidole (*Pheidole*) *pallidula*, Nyl.—Not uncommon in most localities, nesting under stones, and in wood-mould in olive trees, etc. It occurred in the same street, and over the same area, in Palermo, as that described for *Messor structor*. In this place its ♃ ♃ had very brightly coloured heads, and were very conspicuous, causing me to think at first it might be some imported species. On March 17th, in Mondello, in a colony under a stone in which 4 deälated ♀ ♀ were present, I took a specimen of the beetle *Thorictus grandicollis*, Germ. I found this beetle with the same ant at Bordighera, in 1925, and in Hetschko and Wasmann's list of the species of the genus *Thorictus*, *P. pallidula* is given as one of its normal hosts. On April 21st, at Taormina some green Aphids were found with this ant.

Monomorium (*Xeromyrmex*) *salomonis* ssp. *subopacum*, F.Sm.

Monomorium (*Monomorium*) *minutum*, Mayr.

Solenopsis fugax, Latr. (teste Menozzi).—A number of small ☿ ☿ of this little thief ant was found in a nest of *Aphaenogaster semipolita*, under a stone at Capo S. Andrea, on April 9th; and again on April 26th, on Isola Bella, in the wood-mould of a partly hollow olive tree in company with *Pheidole pallidula*, and *A.* (*D.*) *brunneus* var. *nigrobrunneus*. I had hoped that they might be Emery's *S. latro* ssp. *sicula*, but Menozzi who has compared them with that type, has pointed out to me, that they do not agree in several important particulars.

Solenopsis latro ssp. *sicula*, Emery.

Cremastogaster (*Acrocaelia*) *scutellaris*, Ol.—Workers were to be found on most olive and other trees in, and around, Palermo, and Taormina. Several specimens of *Lepisma lucasi*, Grassi, occurred with ☿ ☿ of this ant on a large olive at Taormina, on April 7th.

Cremastogaster (*Acrocaelia*) *laestrygon*, Emery (*auberti-laestrygon*, Emery's Sicilian list).—Colonies were found under stones, etc., at Mondello, and Taormina; one being in the court yard of the ancient Castle at Taormina.

On April 7th, at Taormina, specimens of *Stenosis brenthoides*, occurred in four nests of this ant under stones. A colony, nesting at the roots of a plant on the cliff above Taormina, had constructed an earthen chamber in which a number of Aphids was present. ☿ ☿ were also carrying several white globular objects, which looked like Coccids.

Cremastogaster (*Orthocrema*) *sordidula*, Nyl.—Not uncommon at Taormina. On April 16th, a large colony under a stone contained a number of larvae of a *Tettigometra* (possibly *T. longicornis*, Sign., teste China. Edmonds sent me specimens of this species which he had taken with *C. sordidula* var. *flachi*, in Salonika in 1917), which the ☿ ☿ quickly carried into safety.

Leptothorax (*Leptothorax*) *rottenbergi*, Emery.—I never found the nest of this ant—a few ☿ ☿ were taken walking on a wall at Taormina, and a deälated ♀ walking over a rock.

* *Leptothorax* (*Leptothorax*) *niger*, Forel.—This species had not been found in Sicily before. On April 7th, I found a colony, nesting in a tuft of grass, which consisted of 3 deälated ♀ ♀, and many ☿ ☿ and brood; and on 18th, a small colony was found in an earth cell under a stone in the centre of a nest of *Camponotus atlantis-nylanderi*—one deälated ♀ and a certain number of ☿ ☿ present. Both these colonies occurred at Taormina, where I also took odd ☿ ☿ walking on rocks. On April 24th, I found a small colony under a stone in the Castle grounds at Mola.

Leptothorax (*Leptothorax*) *tuberum*, ssp. *tuberum*, F.

Leptothorax (*Leptothorax*) *tuberum* ssp. *nylanderi*, Först.

Leptothorax (*Leptothorax*) *tuberum* ssp. *interruptus*, Schenck.

Leptothorax (*Leptothorax*) *tuberum* ssp. *angustulus*, Nyl.—I took a few ☿ ☿ of this ant walking on a wall at Taormina on April 8th.

Leptothorax (*Leptothorax*) *tuberum* ssp. *angustulus* var. *kraussei*, Emery. (var. *obscurior*, Emery's Sicilian list)

Leptothorax (*Temnothorax*) *recedens*, Nyl.

Tetramorium caespitum ssp. *caespitum*, L.

**Tetramorium caespitum* ssp. *caespitum* var. *brevicornis*, Emery.—I found a large colony of this variety, which is new to Sicily, under a stone at Taormina on April 22nd. It has occurred in Sardinia and Corsica.

Tetramorium caespitum ssp. *semilaeve*, Er. André.—This subspecies was abundant in all districts, nesting under stones. It seemed to me to be a more gentle ant than true *caespitum*, and the form to be next mentioned, and a number of myrmecophiles were found in its nests. Two colonies at Palermo occurred under the same stones as *Aphaenogaster semipolita*. The following beetles occurred in its nests—*Eustemmus antidotus*, Germ., Isola Bella, April 11th. *Thorictus grandicollis* at Palermo on March 16th. *Stenosis brenthoides*, Rossi, Taormina, April 7th, *Coluocera formicaria* in several colonies at Taormina.

Dichillus (*Dichillocerus*) *pertusus*, Kies., occurred in several nests at Taormina and Mola, etc., sometimes two specimens in the same nest. *Lepisma aurea*, Duf., *Platyarthrus hoffmannseggi* and *Cyphodeirus albinos* were also present.

**Tetramorium caespitum* ssp. *ferox* var. *diomedaea*, Emery.—I found colonies of this form which had not been found in Sicily before, at Mondello, Castelbuono, Capo St. Andrea, Taormina and Mola. In one colony at the last mentioned locality, in which a very small deälated ♀ occurred, many little seeds were present. Another colony found at Taormina, on April 14th, contained many winged females. Most of the colonies were large, and populous, the ☿ ☿ being fierce. On April 12th, I noticed in the square in Taormina a colony of this ant which was nesting in the stone-work of the gutter near the curb, and near by was a colony of *Messor barbarus* v. *capitatus*. The ☿ ☿ of the latter kept bringing out bits of plaster and stone from the entrances of their nest; the *Tetramorium* were walking in files to a dead bee. When a *Messor* got near to a *Tetramorium* it appeared to salute, but was driven off, as also when it approached the bee, by the smaller ants. Sometimes a *Tetramorium* ☿ attacked and closed with a *Messor*, when they rolled over together, but as soon as the *Messor* could escape, it ran away, the *Tetramorium* walking slowly off unhurt. On March 17th at Mondello several specimens of the Proctotrupid *Conostigmus allotropus*, K., were present in a populous colony under a stone. The only myrmecophile I ever found with this ant.

(To be concluded.)

Heterocera from Macedonia, Gallipoli and Central Greece.

By P. P. GRAVES, F.E.S.

(Concluded from page 158).

Liparidae.

939 *Lymantria dispar*, L. Gall., Mac. Arm. VI.
913. *Euproctis chrysorrhea*, L. (*auriflua*, Hmps.) Mac. Sal. 18.VI.

Sphingidae.

752a *Celerio lineata*, ssp. *livornica*, Esp. Mac. Arm. 21.V.-23.VI.
768 *Macroglossum stellatarum*, L. Mac. Various localities. Gall.

Ceruridae.

789 *Exaereta ulmi*, Schiff. and Denis. Mac. Paiz. 7.V.1918.
?824 *Notodonta tritophus*, Esp=*torva*, Hb. Greece. What appears to be an aberrant female of this sp. is among Capt. Wolley Dod's Vralo captures. It is dated 7.IV.1918. New to Greece.
830 *Spatalia argentina*, Schiff. Mac. Paiz. 7.V.1918.

Geometridae.

3687 *Myinodes interpunctaria*, HS. Gall. One worn specimen.
2859 *Aplasta ononaria*, Fuessl. Gall. One only. Mac. Single specimens Yan. 9.VI. and Arm. 10.VII. Greece. 11&12. V.1919 from Masili and Vralo respectively.
3683 *Orthostixis cribraria*, Hb. Gall. One spec.

2907 *Chlorissa* (*Nemoria*) *pulmentaria*, Guen. Gall. Two. Mac. Paiz. 9.V. and Neg. 7.VII.

2898 *Microloxia* (*Eucrostes*) *herbaria*, Hb. Gall. A few worn specs. Mac. Karali 24.IX.

3124a *Rhodostrophia tabidaria*, Z. Gall. A few. Mac. A well marked series from Arm. and other localities, VI.1918.

3139 *Timandra amata*, L. Mac. Karas. 10.VIII.

3053 *Acidalia rubiginata*, Hfn. Mac. A variable series taken V.1918 at Paiz. and Arm. including both dark *rubiginata* and pale *ochraceata*, Stgr.

3054 *A. turbidaria*, Hb. Gall. One ♀. Mac. Ist Gen. Arm. 20.V. IInd (or IIIrd) Gen. smaller and paler in ground colour from Karali 24.IX.

3064 *A. marginepunctata*, Goeze. Gall. Mac. A large series of both Gens. Paiz. e. IV. Arm. e. VI. ? Kilkis m. VII. Greece. Vral. Del., etc.. V.1919.

3091 *A. flaccidaria*, Z. Mac. Sal. 15.VI.1918. Two specs.

3093 *A. imitaria*, Hb. Mac. One only, data-label illegible.

3095 *A.* (*Scopula*) *ornata*, Scop. Gall. Several specs. Mac. Ist Gen. Paiz. 12.V. Arm. VI. IInd (or IIIrd) Gen. from Furka and Snevtchi taken X.1918 are smaller and have thinner lines and less grey markings in the distal area.

3097a *A.* (*S.*) *violata*, Thnbg. ssp. *decorata*, Bkh. Greece. Mav. V.1919.

3066b *Glossotrophia* (*A.*) *confinaria*, HS. Mac. Karali, 10.IX.

2934 *Ptychopoda* (*A.*) *ochrata*, Scop. Mac. Arm. VI. and near Sal. 6.VII.

2939 *P.* (*A.*) *consanguinaria*, Led. Gall. Several rather large specs.

2953 *P.* (*A.*) *dimidiata*, Hfn. Mac. Kir. 2.VII.

P. (*A.*) *albitorquata*, Püng. Mac. Arm. 24.V.1918. Greece. Itea, 21.IV.1919. One only from each locality.

2981 *P.* (*A.*) *sodaliaria*, HS. Gall. Worn specs. more resembling this sp. than they resemble *camparia*, HS. Mac. Arm. 29.V. Greece. Mas. 20.V.1919.

2983 *P.* (*A.*) *seriata*, Schrk. = *virgularia*, Hb. Mac. Arm. 3-11.V. and of a later Gen. 27.IX.

2995 *P.* (*A.*) *subsericeata*, Haw. Mac. Paiz. 8-10.V. IInd Gen. rather smaller from Negovan, 7.VII.

3023 *P.* (*A.*) *elongaria*, Rbr. Gall. One unusually dark spec. Mac. Ist Gen. Arm. e. V. and b. VI. IInd (or IIIrd.) Gen. Karaburun 10 and 15.IX. These last are pale and weakly marked specs. Another small spec. taken by Capt. Waterston at Sal. 27.VII.1917 is in the B.M.C.

3031 *P.* (*A.*) *politata*, Hb. Mac. Arm. e. VI. Sal. 6.VII.

3011? *P.* (*A.*) *incarnaria*, HS. Gall. A worn spec. most resembling this sp.

3032 *P.* (*A.*) *filicata*, Hb. Mac. Paiz. 27.IV.-5.V. Greece. Vral. 5-12.V.1919.

3038 *P.* (*A.*) *dilutaria*, Hb. Mac. Arm. e. VI.

3043 *P.* (*A.*) *degeneraria*, Hb. Mac. A series from Paiz., Snev. and Sal. 8.V.-10.VI. Greece. Vral. b.m. V.1919.

3112 *Cosymbia* (*Ephyra*) *puppillaria*, Hb. Mac. Arm. 23.VI. Greece, Vral. m. V.

3143 *Rhodometra* (*Sterrha*) *sacraria*, L. Gall. Mac. A series including one spec. approaching *sanguinaria*, Esp., and some small late season specs. from Hardz., Furka, Karali, etc. VIII.-X.

3147 *Lythria purpuraria*, L. Genitalically determined as this sp. A long and most variable series. Mac. Paiz. 5.V., fairly typical. Hadjikeui (I cannot find this locality) *mevesi*, Lampa, 20.V. *mevesi* and *lutearia*, Vill. or approaching it. Arm. Neg. VI. b. VII. Greece. Small spec. with dark forewings of f. *deceptoria*, Vill.. from Mav., Vral., Delphi, etc., 9.III.-5. IV.1919, *sordidaria*, Zett. Vral. 21.IV. a form nearer *purpuraria* from Delphi, 27.IV. These dates give the impression that in the hotter parts of Greek Macedonia, where spring begins earlier than on the plateau of Central Greece the Ist Gen. is over by b. V., while a second approaching and evidently reaching *lutearia*, appears late in May and continues into July. On the other hand it may be that there is only one Gen. from early spring to midsummer passing through the forms *deceptoria*, *purpuraria*, *mevesi* to *lutearia*, as the summer advances.

Anaitis efformata, Guen. Gall. Small specs. L. B. Prout det.

3220 *A. plagiata*, L. Gall. One large spec. Mac. Paiz. 25.IV-3.V.

3195 *Lithostege farinata*, Hfn. Mac. Arm. e. V.

3344 *Cidaria* (*Larentia*) *fluctuata*, L. Gall. Mac. Paiz. e. IV.

3378 *C.* (*L.*) *obstipata*, GF. = *fluviata*, Hb. Gall.

3373 *C.* (*L.*) *biriviata*, Bkh. = *pomoeriaria*, Ev. Mac. Paiz. b. V.

3340 *C.* (*Calostigia*) *salicata*, Hb. Gall. A short series, pale, but less so than *probaria*, HS. Mac. One spec. of the f. or ssp. *ablutaria*, Bsd. Hort. 4.IX. Greece. Small and pale examples nearer *probaria* than those from Gallipoli, Vral. etc., III.IV.

3419 *C.* (*Larentia*) *cupreata*, HS. Gall. A few.

3430 *C.* (*L.*) *permixtaria*, HS. Gall. One.

3431 *C.* (*L.*) *corollaria*, HS. = *unicata*, Guen. Mac. Paiz. 7-12.V. and Arm. VI

3666 *C.* (*Phibalapteryx*) *polygrammata*, Bkh. Mac. Pazar. 1.IV. Arm. 3-10.VI.

3481 *C.* (*L.*) *bilineata*, L. Mac. Fairly typical from Paiz. V. and ? Kazanovo (apparantly in the Krusha Balkan), 29.IX. Greece. Mav. etc., IV.V. typical.

3417 *C.* (*L.*) *riguata*, Hb. Mac. One only, Paiz. 5.V.

3513 *Eupithecia* (*Tephroclystia*) *extremata*, F. Mac. Paiz. b. V. Greece, Vral. 10-15.IV.1919.

3512 *E.* (*T.*) *breviculata*, Donz. Greece. Vral. 15.III. Two only.

3643 *E.* (*T.*) *oxycedrata*, Rbr. Mac. Furka, 10.X.

3571 *E.* (*T.*) *virgaureata*, Dbld. Greece. Vral. 15.III.

3636 *E.* (*T.*) *innotata*, Hfn. Gall.? Two very worn specs. may belong to this sp. Mac. Pazar. 6.IV.

3628 *Gymnoscelis* (*T.*) *pumilata*, Hb. Gall. Several. Greece. Vral. V.

3465 *Asthena albulata*, Hfn. Mac. Two from Paiz. b. V.

3673 *Horisme* (*Phibalapteryx*) *corticata*, Tr. Mac. Paiz. 6-18.V.

3701 *Ligdia* (*Abraxas*) *adustata*, Schiff. Mac. Paiz. 5-8.V.

3702 *Bapta distinctata*, HS.=*pictaria*, Curtis. Gall. One approaching *orientalis*, Stgr.
3747 *Dasycorsa* (*Dasycephala*) *modesta*, Stgr. Gall. Two large specs. Greece. Vral. 8.III. New for Greece.
3761 *Opisthograptis luteolata*, L. Mac. Paiz. 6.V.
3773 *Pseudopanthera* (*Venilia*) *macularia*, L. Mac. Lem. 10.IV. Paiz. e. IV.-b. V. Greece. 2-7.IV. in Vralo Dist, etc.
3780 *Eilicrinia trinotata*, Metzner. Mac. Paiz. 1-8.V.
3796 *Erannis* (*Hybernia*) *bajaria*, Schiff. Gall. A long series. Greece. Vral. January and February, 1919.
3830 *Zamacra flabellaria*, Heeger. Gall. Several.
3822 *Biston graecarius*, Stgr. Gall. A very dark male.
3845 *Hemerophila abruptaria*, Thn. Gall. A good series.
3839 *Nychiodes obscuraria*, Vill.=*lividaria*, Hb. Gall. One, too worn to place racially. Mac. Two, Arm. VI. One very worn, the other on the whole resembling *dalmatina*, F. Wagner.
3853 *Synopsis sociaria*, Hb. Gall. Near *propinquaria*, Bsd. Mac. Arm. 27.V. Greece. Vral. 10.V.
3876 *Boarmia rhomboidaria*, Schiff.=*gemmaria*, Brahm. Gall. Arm. etc. VI.
3901 *B.* (*Ascotis*) *selenaria*, Schiff. Gall. One.
3922 *Gnophos stevenaria*, Bsd. Gall. One. Mac. Yan. 9.VI.
3933 *G. ambiguata*, Dup.=*opthalmicata*, Led. Greece. Vral. 16.IV.1919., very worn. This sp. is, I believe, a new record for Greece.
3929 *G. sartata*, Tr. Gall. Mac. Ardz., Sedes, Furka., Lag., etc., IX.X. Greece. Vral. IV. This sp. is generally frequent in the S. Balkans in my experience.
3961 *G. gruneraria*, Stgr. Greece. Vral. Two good specs. of this rare sp. dated 11.IV.
4000 *Ematurga atomaria*, L. Mac. Sal., Neg., etc., VII., Karas. 4-10.VIII; most are more or less of the race *orientaria*, Stgr.
4003 *Selidosema plumaria*, Schiff.=*ericetaria*, Vill. Mac. Doubtful locality, 29.VI. IInd Gen. Hort. 5.XI.
4032 *Chiasma* (*Phasiane*) *clathrata*, L. Mac. Sedes, 25.IV. Paiz. e. IV.V.
4033 *Ch.* (*Ph.*) *glarearia*, Brahm. Mac. Arm. 2-16.VI.
4059 *Dyscia conspersaria*, Schiff. Gall. One.
4077 *Aspitates* (*Aspilates*) *ochrearia*, Rossi. Gall. Mac. Ist Gen. from Paiz., Yan., Sal., etc., IV.V. A very small late brood from Karali, 25.IX. Ser. 26.X.
4079 *Perconia strigillaria*, Hb. Greece. Vral. 14.V.1919.
3690 *Chemerina caliginearia*, Rbr. Gall. A series of 8 specs.

Saturniidae.

1034 *Saturnia pyri*, Schiff. Gall. Very large specs.
1037 *S. pavonia*, L. Mac. Snev. 20.IV.

Lasiocampidae.

956 *Malacosoma neustria*, L. Gall.
958 *M. franconica*, Esp. Mac. Arm., etc. VI.1918.

964 *Eriogaster catax*, L. Mac. Ser. 30.XI. This record makes Capt. Graham's record of the larva from Constantinople (Eur.), to which there is reference in *The Entomologist*, Vol. LVIII., p. 291, appear much more probable.

970 *Lasiocampa quercus*, L. Mac. Sal. X. One worn female.

Lemoniidae.

1015 *Lemonia taraxaci*, F. Mac. Hort. 10.XI.

Limacodidae.

1440 *Cochlidion limacodes*, Hfn. = *avellana*, Kirby. Gall.

Psychidae.

4463 *Phalacropteryx albida*, Esp. Mac. Sal. 13.IV.1918.

4520 *Psychidea graecella*, Mill. Pazar. 2.IV. Greece. Vral. 14.III. Delphi 5.IV.

Zygaenidae.

4333 *Zygaena punctum*, O. Gall. 4 ♂ ♂ 3 ♀ ♀. Mac. Two only. Greece. Vral. A series of specimems much smaller than those from Gall. and Mac.

4352 *Z. filipendulae*, L. Mac. Neg. 17.VII. Arm. VI.

4323 *Z. purpuralis*, Brunn. = *minos*, Fssl. Mac. A few.

3304 *Procris* (*Ino*) *amasina*, HS. Gall. 2 ♂ ♂ 1 ♀.

(Two other sp. of *Procris* from Greece and Macedonia have not yet been identified).

Cossidae.

4689 *Dyspessa ulula*, Bkh. Gall. A few. Mac. A short series which seem to be *ulula*, Bkh. rather than *infuscata*, Stgr. Paiz. 8-10.V.

4692 *D. salicicola*, Evers. Gall. A pair. Mac. Arm. a short series 9.VI.-5.VII. From 'Kuc' (? Kilkis) comes a specimen taken 30.VII. with ivory white forewings lacking the small spots of *salicicola*.

4713 *Phragmataecia castaneae*, Hb. Mac. Paiz. 8.V. ♂. 29.V. ♀.

Drepanidae.

1057 *Cilix glaucata*, Scop. Mac. Paiz. 18.IV.-5.V.

Pyralidae.

II. 15 *Lamoria anella*, Schiff. Gall.

II. 174 *Talis quercella*, Schiff. Gall. One only.

II. 185 *Topeutis* (*Scirpophaga*) *praelata*, Scop. Mac. Very large specs. from Arm. ? Kilkis and Sal. 29.V.-2.VII.

II. 510 *Etiella zinckenella*, Tr. Gall. Several.

II. 564 *Pima* (*Epischnia*) *boisduvaliella*, Guen. Gall. A very large spec.

II. 766 *Myelois cribrella*, Hb. Mac. Locality uncertain.

II. 787 *M. ceratoniae*, Z. Gall. One spec.

II. 836 *Pyralis farinalis*, L. Gall.

II. 825 *Aglossa pinguinalis*, L. Mac. Paiz. 7.V.
II. 885 *Actenia brunnealis*, Tr. Mac. K.B. 10 and 15.IX.
II. 891 *Botys* (*Cledeobia*) *moldavica*, Esp. Gall. A few.
II. 1014 *Evergestis frumentalis*, L. Gall. A few.
II. 1039 *Nomophila noctuella*, Schiff. Gall. Mac.
II. 1099 *Cynaeda dentalis*, Schiff. and Denis. Gall. One very large spec.
II. 1115 *Metasia suppandalis*, Hb. Gall. A short series.
II. 1151 *Hapalia* (*Pionea*) *ferrugalis*, Hb. Gall. Several.
II. 1262 *Pyrausta cingulata*, L. Gall. Two specs.
(II. 1291 *Noctuelia floralis*, Hb. Mac. A spec. taken by Capt. Waterston at Sal. in the B.M.C.).
II. 1303 *N. isatidalis*, Dup. Gall. A large spec. I have recently received this sp. from Constantinople, Eur.

Aegeriidae.

I. 4628 *Chamaesphecia miniacea*, Frr. = *minianiformis*, Auct. Mac. A series of 8 specs. including three ab. *pepsiformis*, Ld., all from Arm. 13-20.VI.
I. 4634 *Tinthea* (*Paranthrene*) *tineiformis*, Esp. Mac. Arm. 20.VI.

Plutellidae.

II. 2486 *Orthotelia sparganella*, Thnbg. Mac. Three fine specs. from Sal. and Negovan 2-5.VII.

Gelechiidae.

II. 3086 *Pleurota metricella*, Z. Gall. One ♂.
II. 3179 *Depressaria comitella*, Led. Gall. One.
II. 3200 *D. atomella*, Hb. Gall. One.

Tineidae.

II. 4511 *Euplocamus anthracinalis*, Scop. Greece. Delphi 18.IV. Two specimens.
II. 4514 *E. ophisa*, Cr. Greece. Vral. a fine pair 20.V.

Hepialidae.

I. 4727 *Hepialus sylvinus*, L. Mac. Locality doubtful. One rather small spec.

Zygaenae, Grypocera and Rhopalocera of the Cottian Alps compared with other races.

By ROGER VERITY, M.D.

(*Continued from page 126.*)

Gonepteryx rhamni race *rhamni*, L.: Oulx (old individuals seen at end of June; emergence of males from July 17th, of females from Aug. 6th) and Cesana.

Colias phicomone race **pulverulenta**, mihi: Oulx (sporadic at the beg. of Aug.), Clavières and Sestrières in large numbers. Esper described the species from Styria and his figures represent the race of that region: large size, bold pattern on upperside, females often

distinctly yellow, instead of white, underside of both sexes very yellow and with nearly no dark suffusion. Frühstorfer overlooked this fact and named the race of Mt. Dachstein *periphaes*; he sent me three of his "co-types," two of which I have figured in *Rhop. Pal.*, pl. XLIX., figs. 24, 25, and I see they agree exactly with Esper's figures. Instead, the well known races of the Alps of Switzerland and Italy, which should have been differentiated, have been neglected to this day. In the series of my collection I detect two races: One is smaller and it has a darker underside as the forewing is usually more or less extensively dusted with dark grey and so is the hindwing, which is of a cold tone of green. I name it **pulverulenta** from my Sestrières, m. 2035, series, but that of the Simplon and that of Sulden, m. 1800, on the Ortler are very like it. The other race points to Esper's by its large size, and clearer and yellower underside, although it is markedly smaller and less bright than the latter and the female is normally white. I take the series I have collected in the Vallasco, above Valdieri, in Maritime Alps, as typical of it and I call it **alpiumnitida,** mihi. Specimens from Albula in the Engadine, seem similar to it. The few specimens I have from Clavières point to a transitional race, with both forms as extremes of individual variation, and probably such is the case in most localities. The upperside markings characterise the Pyrenean race *oberthüri*, Vrty., but do not afford marked local features in the Alps, as a rule: everywhere one meets with individuals in which the dark pattern is limited in extent, such as my fig. 2 of pl. XLII., which recall the Asiatic *C. melinos*, Ev., and which might be called form **melinoides,** mihi, and others more or less entirely darkened, such as my fig. 23 of pl. XLIX. (form *saturata*, Aust.), which recall certain *C. eocandica*, Er.

C. hyale race *calida*, Vrty.: Oulx. I. gen. *vernalis*, Vrty. (June); II. gen. *calida*, Vrty. (end of July, beg. of Aug.). Most individuals belong to a large and very bright yellow form. A single male I have collected at the Baths of Valdieri, m. 1375, in the Maritime Alps, is still larger, but contrasts with Oulx ones by its pale tone and very broad black bands, which make it resemble the Asiatic race *alta*, Stdgr., as figured in *Rhop. Pal.*, pl. XL., fig. 39. This giant form (45mm. between apexes), which may be racial, must be differentiated as **uber.** A female I have from Lausanne probably belongs to it: it measures 46 mm. and it has broad marginal bands.

C. croceus race *croceus*, Fourc.: Oulx. As the nymotypical form occurred sporadically all through July and August, the I. gen. *vernalis*, Vrty., must either not exist or fly very early in June, but the comparison with *hyale*, of which the I. gen. was still emerging at the beginning of July, makes it about sure that *croceus* has only one generation emerging during two months.

Leptosia sinapis race *magna*, Vrty.: Oulx. I. gen., *lathyri*, Hb. (end of May); II. gen. *magna*, Vrty. (a few at beg. of Aug.).

Anthocharis cardamines, L., race *montivaga*, Trti. & Vrty.: Cesana (July 15th); no doubt also at Oulx in early June.

A. euphenoides race **alpium**, mihi.: Oulx (May and beg. of June) and Cesana (first half of July). The species was described from Marseilles and the same race seems to spread from the Pyrénées Orientales to Digne. The one I have found at Cesana is, on the contrary, strikingly distinct from it. I take it to be the race of the

highest Alpine localities inhabited by the species. It is considerably larger than any other and quite a giant as compared with *calleuphenia*, Butler, described from Gibraltar and renamed *andalusica* by Ribbe on the strength of Sheldon's description in the *Entomologist*, 1908, p. 241. The small individuals of Cesana are like the large ones of Provence, about 35 mm., whilst most of them measure about 40 mm. Another feature is the absence on the underside of the hindwings of the silvery white patches, more or less broad and confluent, which usually break the yellow ground colour between the cell and the outer-margin in the nymotypical race. On the upperside of the male the black suffusion along the inner edge of the orange patch is also less dark and sharp.

Euchloë ausonia race *marchandae*, H.-G.=*simplonia*, Fr. : Oulx (first half of June), Clavières (July 29th) and according to Ghiliani, Sestrières.

Pontia daplidice race *daplidice*, L. : Oulx (July).

Pieris napi race **bryoniella,** mihi : Clavières. There are two extreme male forms in the Alps, which are lumped under the name of *bryoniae*, O. As they are often racial they are well worth differentiating : one is larger ; I have figured it from the Simplon in *Rhop. Pal.*, pl. XXXII., fig. 25 ; the other is smaller and it has more pronounced black streaks extending from outer-margin of both fore- and hindwings inwardly, along the nervures and a more pronounced discal spot in most individuals ; the Asiatic specimens I have figured on pl. XLIX., fig. 6 and 8, are quite like it on the upperside. My Clavières examples are very characteristic of the second form described and so is one I have from the Colle di Tenda, whilst all the Baths of Valdieri ones are of the Simplon form. To the latter I restrict Ochsenheimer's name ; he only informs us his "type" was a female received from an entomologist of Geneva. Another race I have from Hinter Tux, in N. Tyrol, is remarkable in the female sex by its small size, and by the intensity and brightness of the yellow colour on both surfaces ; the nervural bands are of a warmer chestnut tinge, and broader, but otherwise of uniform breadth from base to outer-margin, as in *interjecta* and *radiata*, Röber, of Vienna ; the discal spots are small ; underside nervural streaks very heavy and dark. I name it **flavosatura,** mihi. A further lot collected by Wagner in South Tyrol, unfortunately with no exact locality and date on labels, but presumably from Waidbruck or Klausen, can be described as transitional between the preceding and the *interjecta* of Vienna. It has the small size and the vividly yellow females of the former, but the nervural streaks are narrower in this sex and even extremely thin in the basal part of the wing, in some individuals, whilst in both sexes they are very thin and of a light colour on the underside, exactly as in *interjecta* : race **flavointerjecta,** mihi. Finally, I must record the unexpected discovery I have made in 1924 at Vanzone, m. 700, in the Anzasca Valley, at the foot of Mt. Rosa ; it is that *bryoniae*, in the broad and usual sense of the word, is not confined to a single-brooded race, as all authors invariably state particularly, but, on the contrary, that it can be produced in three generations : the I. in May and early June, the II. in the first half of July, the III. from the 7th to the end of August. In the two latter the males vary from Esper's *napaeae* (the true Alpine one, figured by him, as I have pointed out in *Ent. Rec.*, 1922, p. 133 and 140) to *leovigilda*, Frhst., those of the II. gen.

being on an average only a little larger and with nervural streaks of underside more pronounced than those of III. gen. The females divide into two lots, about equal in number and with very scarce intermediate forms, according to the rule I have described in *bryoniae* (*l.c.*, p. 130): one consists of white *leovigilda*, with, roughly speaking, the usual small black *napi* markings, the other consists of a *bryoniae*-like yellow and very dark form on the upperside; the latter is very similar in general appearance to my figures 26 and 48 of pl. XXXII. of *Rhop. Pal.*, but it is larger and with considerably larger apical and discal spots; it recalls in this respect the *neobryoniae*, Shel. = *bryonides*, Vrty. (pl. LII., fig. 21), of the Baths of Valdieri, although the very much thicker nervural pattern and its usually warmer brownish tinge give it quite a different look; the insect is also less large, and often of a deeper tone of yellow. My Vanzone series of the III. gen. is more variable individually than that of the II. gen.: besides the two very different forms similar to fig. 26 and 48, mentioned above, some are transitional to the other lot in the sense they have quite a limited black pattern, but the ground colour is bright yellow (f. *sulphurea*, Schöyen); others are like Seitz's figure of the Austrian form *meta*, Wagner, in *Gross-schmett.*, pl. 21. I take as typical of the III. gen. the average form, more similar to my fig. 48, and I name it **metabryoniae**, noting that also that specimen of fig. 48, from Besançon (Doubs), is different from the Austrian *meta*, well figured by Seitz. The II. gen. of Vanzone differs from the III. gen. by its still broader nervural pattern, recalling *bryoniae* more markedly; along the outer-margin the streaks often blend into a continuous dark area and even on the hindwing there sometimes is a marginal area suffused with dark scaling; on underside the neuration of the forewing has thin gray streaks, as in *bryoniae*, and the streaks of the hindwing are more pronounced, *i.e.*, about the same as in Esper's *napaeae*. This generation I call **bryonapaeae,** extending the name to the race, as a whole. On the summit of Mt. Mottarone, m. 1400, above Lake Maggiore, whilst on my honeymoon after my marriage with Donna Giulia Gallarati Scotti dei Principi di Molfetta of Milan, I collected, about July 20th, 1922, another interesting race of *napi* and evidently its II. gen. The males are like small *napaeae*, with dark markings of a grey tone; the female can be compared with my fig. 48, but it differs from it in the opposite sense to *metabryoniae*, in that the dark pattern is of a perfectly cold tone, lighter and lesser in extent in the basal half of wings, so that it is obviously a transition to *leovigilda*: race **verbani,** mihi. A few days before, on the opposite side of the lake, I had, at the same altitude (Passo di Colle), witnessed the emergence of a II. generation, which consisted in the entirely different *tenuimaculosa*, Vrty., (*Rhop. Pal.* pl. XXXII., fig. 16), in the same way as at the Baths of Valdieri. Also at Oulx, a few old individuals I found at the end of June consisted in that form, exactly like the Tuscan one in the female sex, larger in the male one, as at Valdieri. The III. gen. of Oulx emerged from July 30th to mid-August; it scarcely differs from the II. gen. except that the males are smaller and in consequence quite like the Tuscan ones, but the dark markings of the upperside are greyish, instead of deep black; the females exhibit the same feature in most specimens. I saw a yellow one, but I was unable to capture it. The few tattered males of the I. gen. I found surviving at Cesana in July belong to my race *umoris*.

P. ergane race *ergane*, H.-G.: Cesana (July 25th), near green-marble quarry in a glade in a larch-wood. The discovery of this species as far westward and northward is a most unexpected one. It is very surprising that in the Alpine region, where collecting has been carried on to an extent unknown to others, the existence of such a conspicuous butterfly should have been utterly unsuspected till quite recently, when Turati found one male at Primaluna, in the Sassina Valley, near the Lake of Como, just below Entrobbio in the bed of the Pioverna. The species is evidently very local and scarce. I too only found one male, just emerged, and an exhaustive search for more, carried on for some days, was fruitless. Its features are exactly those of the II. generation of Dalmatia, like Geyer's original figures. The dark spots, however, are light gray, instead of blackish, as they are in most individuals from that region.

P. rapae race *rapae*, L.: Oulx and Cesana. I. gen. *metra*, Steph. (a few very old individuals still on the wing at the end of June, mixed with the following); II. gen. *secunda*, Vrty. (end of June to about July 20th, but a few laggard sporadic individuals emerge till the end of the month, at the same time as the early ones of the following); III. gen. *rapae*, L. (sudden abundant emergence on July 25th, which continues till mid-August). At Oulx, as everywhere, the generations differ from each other quite obviously, when sufficiently large series are compared and individual exceptions are neglected. The II. generation's features are its large size, broad wings and pale straw-yellow underside; I have series from Northern Sweden and Leningrad to southern Italy and Spain, and these characters hold good throughout; in dry localities, however, the upperside spots tend in most individuals to be gray, instead of black, and not as sharp in outline as in the III. and IV., whilst such is not the case in damper ones; Oulx is the latter. The III. generation of Oulx exhibits the features, which seem to prevail in it usually in Central and Northern Europe, as regards size, black suffusion at base on both surfaces and rather warm tinge of yellow on the underside, but they are rather exceptional in that the spotting of the upperside is not as black and sharp in outline as in most localities, including Alpine ones, such as Vanzone in the Anzasca Valley. In warm localities of South Tyrol I have found individuals exactly similar to form *tertia*, Vrty., which constitutes the III. generation of the end of July and August in Peninsular Italy (small size; very sharp jet-black spotting; no gray suffusion at base above and none or nearly none on the underside, where the ground-colour often is of a slightly warmer and richer yellow than in *secunda*; abdomen light in colour and very naked), when nymotypical *rapae*, as described above, constitutes the IV. generation of September. In the "List of *Grypocera* and *Rhopalocera* of Peninsular Italy" [*Ent. Rec.*, 1923, p. (20)] I used the name of *secunda* for the race of that region and other southern ones such as Spain, taken as a whole, but I have since realised the right one would be *tertia* in some localities and *phaiosoma*, Vrty., in others, because these two forms of the III. generation are the characteristic ones of it, whereas *secunda* is broadspread also further north, as noted above. Not having worked out the generations of *rapae* continuously in South Tyrol, it still remains unknown, whether *tertia* spreads as far north, as a race or only as an extreme individual form.

*Mancipium** *brassicae* race *brassicae*, L.; Oulx. I. gen. *chariclea*, Steph. (June); II. gen. *brassicae*, L. (July 31st-Aug. 10th).

Aporia crataegi race *basanius*, Frhst.: Oulx (mid-June to mid-July) and Cesana, in enormous numbers. Rather small, on an average, in size, this race agrees, on the whole, with Frühstorfer's description: black streaks usually very limited in male; females rather abundantly powdered with white scales so that the transparent area is nearly abolished.

Parnassius phoebus (*delius*) race *serenus*, Frhst.: Sestrières and seen also at Clavières. Described from Courmayeur and Pralognan.

P. apollo race *substitutus*, Rothsch.: Sestrières, on peat-bog, in company with *P. phoebus*, and probably Clavières. It agrees perfectly with my specimens from La Grave and with the "typical" pair figured in *Rhop. Pal.*, pl. LVII., figs. 13 and 14: small size; very large black spots, especially precostal; ocelli small, very intensely coloured and broadly edged with black. Race *piedemontanus*, Frhst.: Cesana, in glades of larch-wood, growing in the stony bed of the stream. Seems to answer Frühstorfer's description drawn from specimens of the Dora Baltea springs. My Cesana ones are intermediate between *substitutus* and the following race, from which they differ by their smaller size, larger black spots, especially precostal, broad and very transparent marginal area, small, but intensely coloured ocelli. Race **oulxensis**, mihi: Oulx, on hot, and barren, rocky, mountain-side (gradual emergence from end of June to Aug. 10th). Remarkably different from *valdieriensis*, Vrty., of Maritime Alps, with which it may be said to have nothing in common. It can, on the contrary, be compared with *valesiacus*, Frhst., of the Upper Valais, and with *caloriferus*, Frhst., of the southern watershed of the Simplon. From these also, however, it differs by its smaller size, by the lesser extent of precostal and of premarginal markings, by its smaller ocelli, more thinly edged with black and with white pupils smaller even in proportion to their lesser size. All these features apply to both sexes. The females, besides, are never veiled with black on forewing and the premarginal transparent area is considerably lesser in extent than in the races just mentioned, so that this sex has, on the whole, a whiter appearance. The existence of three very distinct races within a distance of scarcely ten miles, but in totally different surroundings, shows how sensitive the species is to variations of the latter.

Papilio machaon race *bigenerata*, Vrty.: Oulx I. gen. *bigenerata*, Vrty. (beginning of June); II. gen. *aestivoides*, Vrty. (July 12th-Aug. 15th). The only specimen I have of the I. generation resembles *emisphyrus*, Vrty., more than the form characteristic of *bigenerata* in Central Europe, my "type" of which is from Chantonney, in Vendée. I observe, however, that also at Geneva the two forms occur together and I feel sure that at Oulx, as in the latter locality, the name which suits best on the whole, is *bigenerata*. In its well characterised form it is of larger size than *emisphyrus*, the wings are more elongated and pointed, the outermargin being straighter, the neuration is much less broadly edged with black on disc and the transverse bands are less broad and with a straighter outline. In the II. gen. some individuals

* Is it decided that *brassicae* and *rapae* are not congeneric? If so *Mancipium* is certainly correct and not *Ganoris* as they call it in Oxford.—G.W.

exhibit the features of *aestivoides* to their highest degree (very pale yellow and thin black pattern), others point to *sphyroides*, Vrty.

Iphiclides podalirius race *valesiaca*, Vrty.: Oulx I. gen. **plenissima,** mihi (beginning of June); II. gen. *valesiaca*, Vrty. (beginning of Aug.). The specimens I have of the I. generation agree with those of Martigny, in the Valais, and of Merano, in S. Tyrol. It is the largest and most gaudy race. In the I. generation it differs strikingly from the nymotypical one, described from Leghorn, in Tuscany, by its much larger size, on an average, by the bright yellow ground-colour of many individuals and by the broader black stripes, with a more shaded outline. I name it **plenissima,** taking a series from Merano as typical. My examples from Martigny are not quite as large and yellow and the Oulx ones are still less yellow. One of April from Chantonney, in Vendée, near the extreme north limit of this species, would seem to indicate that *plenissima* is the race there; its II. gen. of August is my "typical" *zanclaeides*, probably similar to *aestiva*, Fuchs. (*Nass. Ver. Nat.*, 1899, p. 118), which, however, would, anyhow, be a *nomen praeocc.* in *machaon*. At Oulx the II. gen. was extremely scarce, and I can only assume it was *valesiaca*, but I have had no specimen in hand. It is worth noting that in the Anzasca Valley, at Vanzone, m. 700, under Mt. Rosa, instead of the latter race, I found in mid-July a large and highly characterised *zanclaeus*, Z., indistinguishable from that of Sicily and Tuscany; I have not in this case seen its I. generation.

Coenonympha pamphilus race **postaustralis,** mihi: Oulx, Cesana and Clavières. At Oulx: I. gen. *australis*, Vrty. from June to mid-July, when the species disappeared entirely; II. gen. *postaustralis*, Vrty., made its appearance with one female on July 28th, but the mass of males only emerged on Aug. 11th, and the two sexes then became abundant till I left on the 17th. At Cesana and Clavières *australis* was still emerging at the end of July. The II. generation *postaustralis* chiefly differs from the I. by its androconial scales, as described by Ball in *Soc. Ent. Belgique*, 1914, p. 8; to the naked eye it is nearly identical, except for a very slight touch of fulvous on the underside in most individuals of both sexes, a little more extent of the white spaces and the slightly more pronounced dark bands and ocelli. It thus only points distantly to the much more striking features of *aestivalis*, Rocci, described from Turin and found in the lower altitudes of the Po Basin and in those damp localities of Peninsular Italy, where the still further grade *emilyllus*, Vrty., does not occur, or later in the season than the latter, where it does occur.

(To be continued.)

Diacrisia mendica, Clk., race and var. rustica, Hb., in Ireland.

By THOMAS GREER.

For many years I have been interested in the variation of this species as observed in this country. At the outset, I would like to state two facts, that are perhaps not generally known, with regard to the species in Ireland; the first is:—that as far as I am aware, no male has been taken (or bred) as dark as the darkest typical form occurring in Great Britain; the second is:—that the var. *rustica* as figured by Hübner, of a *milky white*, or of the same colour of the typical female, is of comparatively rare occurrence; eighty per cent. of the pale forms of

the male being tinged with some shade of cream, pale yellow, or grey. In the past all these colour forms have been lumped, more or less, as var. *rustica*.

Many of the male forms, which are found here in a wild state, are undistinguishable from those which have been obtained by crossing the female of *D. mendica* with the male var. *rustica*, such as *standfussi*, *mus*, *clara*, etc.

Dr. E. A. Cockayne in his masterly way states; "The name *rustica* is unfortunate in that it covers a number of forms bearing different factors for colour and not a genetically homogeneous race, but since we cannot distinguish these different forms by their superficial appearance, it is convenient to retain it for the pale Irish and Eastern geographical races."

NOTES ON COLLECTING, etc.

Prolonged period of emergence of Abrostola urticae, Hb.—A number of nearly full-grown larvae of *A. urticae* were taken in August, 1925, in E. Aberdeenshire and all pupated within ten days of one another. The cocoons were left undisturbed in one box in an unheated room. The first imago emerged on April 13th, 1926, and others on the 15th, 16th, 24th and 28th. They continued to emerge at fairly regular intervals in May, June, July, August and September, and the last appeared on October 2nd, nearly six months after the first. I believe that, although this was exceptionally long, prolonged periods of emergence are not uncommon and that the later specimens are often wrongly recorded as examples of second or even third broods.—E. A. Cockayne (M.A., D.M.), 116, Westbourne Terrace, W.2.

Colias croceus (edusa) at Chichester.—A male *Colias croceus* (*edusa*) was seen flying in a garden here one day during the spell of warm and sunny weather in September.—Joseph Anderson, *Chichester*.

CURRENT NOTES AND SHORT NOTICES.

The following extracts (of interest to Entomologists) are taken from a review of the latest edition of the *Encyclopedia Britannica*—"The New Britannica" in the *Saturday Review* for October 23rd, 1926—by the brilliant pen of C. K. Ogden.

"While it is gratifying to have Dr. John B. Watson's crystallization of Behaviorism, it is disappointing to find no mention of so profound and influential a thinker as Professor W. M. Wheeler, America's leading entomologist and perhaps her leading sociologist as well.

"Sir Richard Burbidge secures a handsome tribute, but Major Darwin's life-service to Eugenics evokes no echo.

"Fabre is in, but Donisthorpe, Bugnion, Emery and Escherich, no less than Mr. Ernest Thompson Seton, have naturalized in vain; and Father Wasmann is apparently for myrmecophilous even to be entered as a symposiast in the Animal Intelligence controversy.

"As for other dominant figures in the record of the last fifteen years, it would be hard to find more startling omissions than Auguste Forel, Léon Duguit, and Vilfredo Pareto."—H.St.J.D.

Professor W. M. Wheeler has just published a charming book, *The Natural History of Ants from an unpublished Manuscript in the Archives of the Academy of Sciences of Paris, by René Antoine Ferchault de Réaumur.* In it he gives an account of the life and works of Réaumur, the original French of the manuscript, an English translation of the same, 42 pages of Annotations (of great scientific value), and a full list of the writings and works of the illustrous Réaumur. This is a book which should be in the hands of every entomologist.—H.St.J.D.

The following is the list of Members recommended by the Council of the South London Entomological and Natural History Society to be appointed Officers and Council of the Society for the Session, 1927-1928 :—*President:* E. A. Cockayne, D.M., A.M., F.E.S. *Vice-Presidents*: H. W. Andrews, F.E.S., T. H. L. Grosvenor, F.E.S. *Treasurer:* A. E. Tonge, F.E.S. *Librarian*: E. E. Syms, F.E.S. *Curator:* S. R. Ashby, F.E.S. *Hon. Editor of Proceedings*: H. J. Turner, F.E.S. *Hon. Secretaries*: Stanley Edwards, F.L.S., etc. (*Corresponding*): Hy. J. Turner, F.E.S. *Hon. Lanternist*: J. H. Adkin. *Council:* C. Craufurd, A. W. Dods, O. R. Goodman, F.Z.S., F.E.S., E. Step, F.L.S., W. H. T. Tams, F.E.S., H. Worsley-Wood, F.E.S., C. N. Hawkins, S. B. Hodgson, W. Rait-Smith, F.Z.S., F.E.S.

The following Fellows have been nominated by the Council of the Entomological Society of London as Officers and Council for the Session 1927-1928 :—*President:* J. E. Collin, F.Z.S. *Treasurer:* W. G. Sheldon, F.Z.S. *Secretaries:* S. A. Neave, M.A., D.Sc., F.Z.S. N. D. Riley, F.Z.S. *Librarian:* H. J. Turner. *Other Members of Council:* R. Adkin, Prof. W. A. F. Balfour-Browne, M.A., F.Z.S., F.R.S.E., P. A. Buxton, E. A. Cockayne, A.M., D.M., F.R.C.P., H. M. Edelsten, J. C. F. Fryer, M.A., Prof. Sir. T. Hudson Beare, B.Sc., F.R.S.E., J. W. Munro, D.Sc., Prof. E. B. Poulton, M.A., D.Sc., F.R.S., H. Scott, M.A., Sc.D., W. H. T. Tams, A. E. Tonge.

As we go to press we are much grieved to hear of the sudden death at the early age of 28, of the brilliant entomologist Dr. C. L. Withycombe, who only recently took up his appointment as Demonstrator in Entomology at Cambridge University. Less than a week ago he was present at the meeting of the Entomological Society of London and joined in the debates.

Correction.—p. 156, Footnote, third line, "*margaritosa*, Hb." should be "Hw."—J.H.D.

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ab. nigra, *Rbl.*
r. chapmani, *Prout.*

PACHYCNEMIA, *Steph.*

HIPPOCASTENARIA, *Hb.* 383. 271. 318.

GNOPHOS, *Tr.* [Dasydia, *Gn.*: Pseudopanthera, *Hb.*]

OBSCURATA, *Schiff.* 386. 270. 319.
ab. anthracinaria, *Esp.*
ab. tristaria, *Culot.*
ab. quadripustulata, *Don.*
ab. pallidemarginata, *Obthr.*
ab. fasciata, *Prout.*
ab. bellieri, *Obthr.*
ab. uniformata, *Prout.*
ab. mundata, *Prout.*
ab. woodiata, *Prout.*
ab. mardinaria, *Stdgr.*
ab. bivinctata, *Fuchs.*
r. obscurioriata, *Prout.* [saturata, *Prout.*]
r. calceata, *Stdgr.* [serotinaria, *Haw.*]
r. argillacearia, *Stdgr.* [pullata, *Dup.*]
r. lafauryata, *Obthr.*
r. zeitunaria, *Stdgr.*
r. pullaria, *Haw.*

MYRTILLATA, *Thnbg.* 392. 271. 320.
ab. anastomosis, *Strand.*
r. obfuscaria, *Hb.*
r. nivea, *Schwrd.*

PSODOS, *Tr.*

CORACINA, *Esp.* [trepidata, *Dup.*] 395. 274. 321.
ab. wahlbergi, *Lampa.*
r. rectilineata, *Wehr.*
r. transiens, *Wehr.*
r. lappona, *Wehr.*

ISTURGIA, *Hb.* [Fidonia, *Tr.*: Bupalus, *Leach.*]

CARBONARIA, *Clrck.* 397. 266. 322.
ab. roseidaria, Hb.

LIMBARIA, *Fb.* [conspicuata, *Schiff.*] 398. 266. 323.
ab. quadripunctaria, *Fuchs.*
ab. infuscata, *Th.-Mg.*
ab. nigricaria, *Bubac.*
ab. fumata, *Math.*
r. delimbaria, *Stdgr.*
r. pedemontaria, *Stdgr.*
r. anzascaria, *Stdgr.*
r. rablensis, *Zell.*
r. styriaca, *Schwing.*

EMATURGA, *Led.* [Bupalus, *Leach.*]

ATOMARIA, *L.* 399. 265. 324.
♂ ab. ochrearia, *Rbl.*
ab. minuta, *Staud.*
♂ ab. ustaria, *Fuchs.*
♂ ab. unicoloraria, *Stdgr.*
ab. obsoletaria, *Zett.*
♀ ab. virilis, *Staud.*

ab. anomalaria, *Vorbrdt.*
ab. caloraria, *Staud.*
ab. dentaria, *Staud.*
♂ ab. fallax, *Staud.*
ab. melanostigma, *Staud.*
ab. ophthalmaria, *Staud.*
ab. felicis, *Krausse.*
♀ ab. pseudoglarearia, *Staud.*
r. alpicolorarja, *Vorbt.*
r. orientaria, *Stdgr.*
r. krassnojarscensis, *Fuchs.*
r. meinhardi, *Krulik.*
r. iliaria, *Alph.*

BUPALUS, *Leach.*

PINIARIA, *L.* 400. 265. 325.
♂ ab. albidaria, *Dziurz.*
♂ ab. kollari, *Dziurz.*
♂ ab. anomalarius, *Huene.*
♂ ab. tristis, *Dziurz.*
♂ ab. flavescens, *B. White.*
♂ ab. dziurzynskii, *Koll.*
♂ ab. hirschkei, *Dziurz.*
♂ ab. nigricarius, *Bachh.*
♀ ab. fuscantaria, *Krulik.*
♀ ab. unicolora, *Strand.*
♀ ab. strigata, *Dziurz.*
♀ ab. fulvaria, *Dziurz.*
♂ ab. nana, *Dziurz.*
♂ ab. nigricans, *Dziurz.*
♂ ab. albopuncta, *Dziurz.*
♂ ab. albomacula, *Dziurz.*
♂ ab. mughusaria, *Gmpbg.*
♂ ab. flavomughusaria, *Dziurz.*
♂ ab. nivalis, *Dziurz.*
♂ ab. immaculata, *Dziurz.*
ab. flavomaculata, *Hann.*

SELIDOSEMA, *Hb.*

PLUMARIA, *Schiff.* [ericetaria, *Vill.*] 400. 363. 325.
ab. fumosa, *Greer.*
ab. intermedia-fumosa, *H.J.T.*
ab. depuncta, *Nitsche.*
r. pyrenaearia, *Bdv.*
r. pallidaria, *Stdgr.*
r. syriacaria, *Stdgr.*
r. scandinaviaria, *Stdgr.*
r. oelandica, *Wallgrn.*
r. oliveirata, *Mab.*
r. granataria, *Rmbr.*

ITAME, *Hb.* [Thamnonoma, *Led.*: Halia, *Dup.*]

WAUARIA, *L.* 401. 259. 326.
ab. v-nigraria, *Hatcht.*
ab. alba, *Prout.*
r. halituaria, *Gn.*

FULVARIA, *Vill.* [brunneata, *Thnbg.*: pinetaria, *Hb.*] 402. 258. 327.
ab. unicinctata, *Strand.*
♀ ab. flava, *Hann.*
r. sordida, *Btlr.*

LITHINA, *Hb.* [Panagra, *Gn.*: Phasiane, *Stdgr.*: Lozogramma, *Steph.*: Pseudopanthera, *Hb.*]

CHLOROSATA, *Scop.* [petraria, *Hb.*] 403. 271. 327.

CHIASMIA, *Hb.* [Strenia, *Dup*: Opisthograptis, *Hb.*]

CLATHRATA, *L.* 404. 257. 328.
ab. cingularia, *Hb.*
ab. cancellaria, *Hb.* [radiata, *Haw.*]
ab. fasciata, *Prout.*
ab. flaveola, *Staud.*
ab. ornataria, *Krulik.*
ab. schawerdae, *Staud.*
ab. aethiopissa, *Meves.*
ab. nocturnata, *Fuchs.*
r. retata, *Haw.*
r. aurata, *Trti.*
r. chretieni, *Th.-Mg.*
r. punctata, *B.-Hs.*
r. centralasiae, *Krulik.*
r. niveata, *Rocci.*

DYSCIA, *Hb.* [Scodiona, *Bdv.*: Crocota, *Hb.*]

FAGARIA, *Thnbg.* [belgiaria, *Hb.*] 408. 272. 329.

ab. fleischmanni, *Rbl.*
r. alvarensis, *Whlgrn.*
r. favillacearia, *Hb.*
r. psoricaria, *Evers.*
r. albidaria, *Stdgr.*

SIONA, *Dup.* [Scoria, *Steph.*; Pseudopanthera, *Hb.*]

LINEATA, *Scop.* [dealbata, *L.*] 409. 272. 330.
ab. obsoleta, *Stephan.*
r. oenotriensis, *Staud.*

ASPITATES, *Tr.* [Crocota, *Hb.*]

GILVARIA, *Schiff.* 411. 273. 330.
ab. sublataria, *Fuchs.*
ab. conspersaria, *Stdgr.*
ab. nigricans, *Jourdh.*
r. orientaria, *Alph.*
r. insignis, *Alph.*

OCHREARIA, *Rossi.* [citraria, *Hb.*] 412. 273. 331.
ab. alba, *Krausse.*
ab. unicolorata, *Seeb.*
g.a. aestiva, *Schawerd.*

PERCONIA, *Hb.* [Aspitates, *Tr.*: Crocota, *Hb.*]
STRIGILLARIA, *Hb.* 412. 272. 332.
ab. herpeticaria, *Rmbr.*
ab. fuscata, *Hann.*
r. grisearia, *Stdgr.*
r. cretaria, *Evers.*

Addenda.

To parthenias,	1,	add	ab. flava, *Wors.-Wd.*
„ aestivaria,	23,	„	? r. sachalinensis, *Mats.*
„ prunata,	211,	„	r. estonica, *Schawrd.*
„ testata,	211,	„	r. karafutonis, *Mats.*
„ truncata,	221,	„	? r. nyiwonis, *Mats.*
„ citrata,	221,	„	? r. alexandrowskana, *Mats.*
„ unangulata,	247,	„	? r. tonnaichana, *Mats.*
„ hastata,	254,	„	r. rikovokensis, *Mats.*
„ galiata,	257,	„	ab. brunneata, *Kitt.*
„ alternata,	257,	„	ab. pseudorivata, *Wagn.*
„ vonosata,	279,	„	ab. circumfluxa, *Kitt.*
„ extensaria,	293,	„	? r. ichinosawana, *Mats.*
„ prunaria,	334,	„	ab. infuscata, *Mats.*, and ab. unicolor, *Mats.*
„ aurantiaria,	352,	„	(ab. fusca, *Porritt.*) = ab. fumipennaria, *Hollweg.*

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of their leaves. I have only found the brown form of the larva in the winter, but it is not at all uncommon then. The moth varies little except as stated above, and I have secured no aberrations from some 2000 specimens that I have bred. One however is of a somewhat greyish green, and has the appearance of a very faded specimen that has been exposed to strong light for a considerable time. A slight difference occurs at times in the coloration of the underside, some specimens, especially amongst the winter broods, having a considerable amount of ochreous brown showing.

Genus XXXVIII., *Celerio*, Oken.

C. livornica, Esp.—Common from February till August. I have taken it frequently during the remaining part of the year. My specimens vary only in size, ranging from 46 mm. to 92 mm. The usual size is about 85 mm.

C. celerio, L.—Never taken alive, but in Februaay, 1920, whilst examining wings and elytra dropped by bats, I found two sets of wings probably some months old. Expecting to meet with the moth itself later I unfortunately threw them away.

Genus XXXVI., *Macroglossum*, Scop.

M. stellatarum, L.—Rare at Aswan. I have only seen it as follows: —Two specimens flying together on November 3rd, 1919, at dusk, one specimen on August 26th, 1920 (and another reported to me a day or two previously), and a specimen in November, 1921.

Very common at Maadi, and at Alexandria.

III. A note on the Noctuidae of the Aswan district of Egypt.

By KENNETH J. HAYWARD, F.E.S.

The following list of Noctuids comprises those taken between September, 1919, and March, 1922.

The locality is, as will be seen, far from rich in this group, only 23 species being recorded. Possibly others may turn up, especially in Aswan itself and the cultivation immediately North. Of the species taken, nearly all are common and widely distributed species of little interest. Only one species is new *Cryptotidia maculata*, Tams. For describing this I have to thank Mr. Tams.

A note on the locality in which these moths were taken has appeared previously under my note on the butterflies of Aswan. (page 1.)

Section III., *Noctuiformes*. Family 2, *Noctuidae*.

Sub-family 3, *Euxoinae*.

Genus XX., *Euxoa*, Hbn.

E. segetum, Schiff.—All the year. Common from March till July, and in October. The ground colour varies slightly as elsewhere.

E. spinifera, Hbn.—Common all the year. I have only one aberration; the ground colour very light, claviform and orbicular stigmata distinct, pale ochreous edged with black, reniform fuscous. The darker portion of the subterminal line pronounced and wedge-shaped.

Genus XXI., *Rhyacia*, Hbn.

R. ypsilon, Rott.—Common from February till June, and in October and November. Occasionally at other times.

Sub-family 4, *Hadeninae*.

Genus XL., *Hyphilare*, Hbn.

H. loreyi, Dup.—Late February till November, occasionally in early December. Common.

Sub-family 6, *Amphipyrinae*.

Genus LXVIII., *Prodenia*, Guen.

P. litura, F.—Taken from February till November, possibly also occurs in the other two months. Fairly common. Larva feeds also on cabbage from which I have bred it. (The "cotton worm." Arabic. Dud el qutn,)

Genus LXX., *Laphigma*, Guen.

L. exigua, Hb.—Abundant all the year. Varies considerably, the markings sometimes being pronounced, at others the wings are suffused with the ground colour to a considerable extent. The ab. *pygmaea*, Rmb. occurs rarely.

(The small green leaf worm. Arabic. Dud el akhdar el soghair.)

Genus LXXXVIII., *Catemecia*, Stgr.

C. minima, Swin.—One specimen at Maadi in November, 1920.

Genus CXIII., *Nonagria*, Tr.

N. maritima, Tausch.—Common, March till November. Ab. *bipunctata*, Haw. Not uncommon amongst typical specimens from March till June. This aberration varies very much in size, ranging from 17mm. to 34mm.

Genus CXVI., *Sesamia*, Guen.

S. cretica, Led.—All the year. Fairly common from late February till June.

Staudinger and Rebel.—*Catalog der Lep. des Pal. Faun.* Theil.1. 1901, gives *nonagrioides*, Lef. (=*vuteria*, Stoll.) as occurring in Egypt, and not *cretica*, Lef. My specimens were identified by the Entomological Section. Ministry of Agriculture, Cairo, as *cretica*, and verified at South Kensington.

Sub-family 7, *Melicliptriinae*.

Genus 2, *Chloridea*, Westwd.

C. peltigera, Schiff.—Taken all the year. Quite common from late February till July. I have one aberration in which the ground colour of the forewing is white, the usual markings showing but faintly, except the brown points on the outer margin, which are dark as usual. The shading on the hindwing is also light, and the hairs on the head and thorax are silvery.

C. nubigera, H.-S.—April till June and occasionally in the autumn. Not at all common.

Sub-family 9, *Erastriinae*.

Genus VIII., *Coccidiphaga*, Spul.

C. scitula, Ramb.—Somewhat rare, March till June, and in November. The basal area is sometimes white and in others the leaden-grey shading extends right over this area.

Genus X., *Porphyrinia*, Hbn.

P. parva, Hbn.—Taken all the year. Common from March till July. Specimens referable to ab. *griseata*, Warren. Occur frequently.

P. ostrina, Hbn.—One specimen on May 1st, 1921. It appears very rare.

Genus XI., *Autoba*, Walk.

A. gayneri, Rott.—March till November. Common. An occasional specimen in December, January and February. Seitz gives "Assouan Egypt" as its habitat. I took one specimen of which the colouring was approaching orange, but the ubiquitous ant got at it whilst it was still setting, and made short work of it.

Sub-family 13, *Acontiinae*.

Genus VI., *Earias*, Hbn.

E. insulana, Bsd.—Common at Aswan from March till November, and occasionally from December till February. Never becomes abundant as elsewhere in Egypt, probably because little cotton is grown in the neighbourhood.

ab. *anthrophilana*, Snell, is nearly as common as the type.

ab. *ochreimargo*, Warren, is quite common.

ab. *semifascia*, Warren, is uncommon. I have six specimens, (one from Maadi). Five have green forewings, four with the space between the outer and median lines rufous of different shades, the fifth has this space purplish. The sixth specimen has the rufous patch on the ochreous forewing of ab. *anthrophilana*.

Sub-family 14, *Catocalinae*.

Genus II., *Cryptotidia*.

C. maculata, sp. n. (Tams.).—Head, thorax, and abdomen, ochreous, frons lighter. Forewing, above, ground colour very pale ochreous approaching whiteness, shaded with ochreous, the costal area darker ochreous, inner line white, median line brown edged outwardly with pale ochreous, outcurved beyond the cell, outer line pale ochreous, outcurved to veins 4 and 6, the area between the outer and median lines dark brown shading lighter towards the base, the subterminal area dark brown shading lighter towards the outer line, the veins terminated on the outer margin by small ochreous points inwardly edged with dark brown, reniform stigma alone plain, ochreous edged with brown, indistinct on some specimens, a large brown circular mark resting on the inner margin and extending laterally from the inner to the median line, and upwards to the cell. Fringe alternating brown and white the brown being at the veins. Hindwings above, white, shaded with brown at the outer margin, fringe white slightly shaded with brown at the outer angle.

Beneath the ground colour of the wings white, the apical area of the forewings brown shading towards the inner margin and darker within the area of the outer line which is but faintly defined and has a small white spot without it at the costa; the outer angle of the hindwings dark brown, this colour being sharply cut off at vein 6, the median line dark brown and running about half way across the wing, the costal area speckled finely with brown, fringes of both wings as above but that of the forewing somewhat lighter.

Three specimens at Aswan in May and June, 1920.

Presented to B.M.

C. mesosema, *Hmpson*.—Very rare. I have two specimens taken in April and May, 1920, and a third in March, 1922.

Genus XXI., *Autophila*, Hb.

A. dilucida, Hb. (?)—Unidentified for a time but subsequently acertained to be this species by Mr. W. H. T. Tams. Taken at Reservoir, February 26th, 1920. A somewhat worn specimen. Fore-wing light ochreous when fresh, outer line faintly defined by slightly heavier scaling of the same colour. Possibly an aberration. Different from any other species taken.

Very similar to the above but lacking the large brown circular spot on the inner margin.

Specimen presented to the B.M.

[Originally described from a specimen taken at Khartoum by Longstaff.—Tams.].

Genus XXI., *Ophiusa*, Ochs.

O. algira, L.—Rare. I have only four records.

Taken on July 7th, 1920, and August 20th, 1920.

Seen and identified on July 6th, 1920, and June 2nd, 1921.

It probably occurs here in June, July, and early August. Perhaps also in May.

Sub-family 15, *Phytometrinae.*

Genus III., *Syngrapha*, Hbn.

S. circumflexa, L.—Common all the year and abundant in March, June, and November.

Genus IV., *Phytometra*, Haw.

P. ni, Hbn.—Common all the year.

Sub-family 16, *Ophiderinae.*

Genus XIII., *Pandesma*, Guen.

P. anysa, Guen.—March till November. Never really common.

The ground colour varies from pale grey to a dark brownish grey, the markings showing up well on the lighter specimens, in which the shading of the hindwings is also fainter than in the dark specimens.

Genus XXII., *Tathorhynchus*, Hamps.

T. exsiccata, Warren.—Fairly common all the year. In some specimens the black dash separating the reniform and orbicular stigmata is brown, little darker than the ground colour.

[I also took the following Noctuids in Egypt, at Maadi, near Cairo, and add them for the sake of the record.

Euxoa segetum, Schiff.—I took ab. *pallida*, Stgr., at Maadi, fairly common.

Euxoa puta, Hbn.—I took one specimen of the form *radius*, Haw., at Maadi in November, 1920.

Polia consanguis, Gn.—One specimen at Maadi, November, 1920.

Athetis atriluna, Gn.—One specimen at Maadi, November, 1920.

Athetis clavipalpis, Scop.—A specimen at Maadi, November, 1920.

Athetis aspersa, Rmb.—One specimen at Maadi, November, 1920.

Catamecia minima, Swin.—One specimen at Maadi, November, 1920.

Anua tirrhaca, Cr.—One specimen from Maadi, April 7th, 1921. The black bar on the hindwing is very much reduced.

Phytometra chalcites, Esp.—Alexandria and Maadi. I have not seen it at Aswan.

Phytometra gamma, L.—One specimen at Maadi, November, 1920.

Phytometra daubei, Bdv.—Two specimens at Maadi, November, 1920.

Rivula sericealis, Scop.—One specimen from Maadi in November, 1920.

Hypena eremialis, Swin.—One specimen from Maadi in November, 1920.]

IV. Notes on the Geometrae of the Aswan District of Egypt.

By K. J. HAYWARD, F.E.S.

Only ten species aspear to occur at or near Aswan. *Gymnoscelis pumilata*, Hb., is added to the list for the record. I took it at Alexandria, and at Maadi near Cairo, but not at Aswan.

Chlorissa pulmentaria, Gn., was taken for the first time in Egypt.

Rhodometra sacraria, L., is very small and lightly marked, having a washed out appearance even when fresh. The period during which my collection was formed was from September, 1919, till March, 1922.

Section IV., *Geometridae.*

Sub-family 3, *Hemitheinae.*

Genus XXIV., *Chlorissa*, Guen.

C. pulmentaria, Guen.—Not uncommon from March till November.

C. faustinata, Mill.—Always common. Specimens in which the colour is greenish-ochreous (perhaps faded specimens) are sometimes taken.

Genus XXXVIII., *Xenochlorodes*, Wrrn.

X. beryllaria, Mann.—March till June and in November. Fairly common especially in the earlier months. Here again (vide *faustinata* above) an ochreous coloured specimen has turned up.

Sub-family 4, *Acidaliinae.*

Genus XII., *Acidalia*, Tr.

A. ochroleucata, H.-S.—Fairly common from February till November. Moderately variable. One specimen I have has a brownish ground colour with dark brown markings. Specimens somewhat darker than type are not uncommon.

Genus XX., *Ptychopoda*, Curt.

P. fractilineata, Z.—Common always. Varies only in depth of the colouring of the markings.

P. microptera, Warren.—The ab. *granulosa*, Warren, is occasionally taken from April till November.

Sub-family 5, *Larentiinae.*

Genus II., *Rhodometra*, Meyer.

R. sacraria, L.—Rare in May and June. I have only seen it about half-a-dozen times.

I took one specimen of ab. *labda*, Crm. Common in lower Egypt.

Genus LIX., *Cidaria*, Tr.

C. obstipata, F.—Occasionally all the year but especially from April till June. Not common.

Genus LXXIV., *Gymnoscelis*, Mab.

G. pumilata, Hbn.—I have taken it at Alexandria in June, and at Maadi in April, May, October, and November.

A List of Egyptian Microlepidoptera collected in the Aswan District.

By KENNETH J. HAYWARD, F.E.S.

The insects enumerated in the following list were taken (unless otherwise stated) at Reservoir, six miles south of Aswan between October, 1919, and March, 1922. The majority were captured by the aid of a moth trap, which was run nightly. A note on the locale appears in my "Notes on Egyptian Rhopalocera from the Aswan district."

The occurrence of *Nepticula pomella*, Vaugh., is interesting since only three small apple trees exist within several hundred miles, these having been imported from England.

My thanks are due to Mr. Meyrick for his great kindness in identifying these micros, and for describing certain new species.

The types are in his collection, the remainder are now in the British Museum, Natural History, South Kensington.

Family 2, *Pterophoridae*.

Agdistis tamaricis, Z.—Rare in January and November. Also at Maadi in November.

Trichoptilus congrualis, Walk.—April, May, October, and November. The commonest of the *Pterophoridae* in this district.

Stenoptilia zophodactyla, Dup.—A single specimen in November which Meyrick thinks is referable to this species.

Family 3, *Orneodidae*.

Orneodes hexadactyla, L.—A single specimen from Maadi in May.

Family 4, *Tortricidae*.

Sub-family "C" *Olethreutinae*.

Bactria lanceolana, Hbn.—Abundant always. The colour of this species varies considerably.

Laspeyresia planifrontana, Rbl.—A single specimen in March, 1920.

Laspeyresia renigrescens, Meyr.—Common from March till June. Described by Meyrick from specimens taken by me at Aswan. Type in his collection. Specimens in coll. Ent. Sect. Mus. Agric. Cairo are numbered 1919.

Family 7, *Plutellidae*.

Sub-family "A," *Plutellinae*.

Plutella maculipennis, Curt.—Abundant all the year. The larvae feed on cabbage amongst other things. This moth sometimes emerges in thousands. In November, 1921, on a very warm night there was a big hatch and my light trap was simply smothered in them, and they were lying on the bottom of it on the following morning to an average depth of just over two centimetres.

They vary slightly in colouring and the intensity of the markings.

Family 8, *Gelechiidae*.

Sub-family "A," *Gelechiinae*.

Platyedra gossypiella, Saund.—A single specimen in November, 1920.

Hypersymmoca psammocryptis, Meyr.—Common, March till June and in Nov. Described by Meyrick from my specimens. Type in his collection. Specimens sent to Ent. Sect. M. of A., Cairo, and numbered 1794 and 1927.

Dichomeris ianthes, Meyr.—Specimens in June and November. Rare.

Phthorimaea crocoleuca, Meyr.—October. Fairly common. Described by Meyrick from my specimens. Type in his collection.

Phthorimaea sp. near *obsoletella*, F.—A single specimen in May.

Phthorimaea extorris, Meyr.—Common March till November. Described by Meyrick from specimens taken by me at Aswan. Type in his collection. Specimens in the collection of the Ent. Sect. Min. of Agric., Cairo, from same source are numbered 2749.

Anacampsis anthyllidella, Hb.—Common February till November. Occasionally from December till February. Also at Maadi. (Numbered 1724. Coll. Ent. Sect. M. of A., Cairo.)

Apatetris albiramis, Meyr.—Described by Meyrick from a single specimen taken at Aswan in April. Type in his collection.

? *Apatetris* sp.—Two specimens taken at Aswan in April. Not unlike, but distinct from, *albiramis*. Too worn for determination.

Stomopteryx polychromella, Reb.—Very common all the year.

Anarsia acaciae, Wlsm.—Rare. April.

Family, *Elachistidae*.

Group, *Scythridinae*.

Scythros blandella, Chret.—Rare. April.

Scythros nipholecta, Meyr.—Fairly common in March and April. Described by Meyrick from my specimens from Aswan. Type in his collection. (Numbered 1391 in Coll. Ent. Sect. M. of A., Cairo).

Scythros glyphidota, Meyr.—A single specimen on April 15th, 1920. Aswan.

Scythros lychnitos, Meyr.— A single specimen Feb. 19th, 1920.

Scythros chelota, Meyr.—Not uncommon in April. Liable to be at first mistaken for *Ephysteris chersaea*, Meyr.

Scythros, sp.—March. Rare. My specimens too worn for certain determination.

Group, *Momphinae.*

Cosmopteryx mimetis, Meyr.—Common all the year. Also at Maadi. (Numbered 791 in Coll. Ent. Sect. M. of A., Cairo.)

Cosmopteryx bactrophora, Meyr.—April. Rare. Mr. Meyrick thinks my specimens, which are worn, are of this species.

Batrachedra amydraula, Meyr.—Common in March, April and May.

Stathmopoda auriferella, Walk.—Common from February till November. Also at Maadi. (No. 377 Coll. Ent. Sect. M. of A., Cairo.)

Limnaecia leucomelanella, Reb.—Common April till June, and November, and occurs also in January and late March. Numbered 792 in Coll. Ent. Sect. M. of A., Cairo.

Ascalenia sclerodes, Meyr.—Occasionally in February, March and April.

Ascalenia subcrocea, Meyr.—A single specimen in March, from which Meyrick described the species. Type in his collection.

Group *Coleophorinae.*

Coleophora aularia, Meyr.—Common in November. Described by Meyrick from my specimens. Type in his collection. (Numbered 1056 in Coll. Ent. Sect. M. of A., Cairo.)

Family, *Gracilariidae.*

Group, *Lithocolletinae.*

Bedellia somnulentella, Z.—March. Probably at other times when I may have mistaken it for *Stomopteryx anthyllidella*, Hb.

Family, *Nepticula.*

Nepticula pomella, Vaugh.—A single specimen in February.

Nepticula, sp.—A single specimen (worn) in April.

Family, *Tineidae.*

Group, *Tineinae.*

Tinea pellionella, L.—A single specimen. April 1920.

Appendix.

Hieroxestis divulsa, Meyr.—Fairly common. March to May. Described by Meyrick from my specimens. Type in his collection.

Ephysteris chersaea, Meyr.—March and April. Rare.

Isorrhoa charadritis, Meyr.—May. Appears to be rare. Described by Meyrick from my specimens. Type in his collection.

Errata.

Page (15) line 28. (*N. undata*, Klug.) for "11mm. × 6mm." read "1·1mm. × ·6mm."

Bibliography. (Addenda).

The following references of Egyptian Government publications having bearing on the Lepidoptera of Egypt are added, mainly in view of the very full bibliographies contained in some of them on the following species of moths.—*Gelechia gossypiella*, *Earias insulana*, *Prodenia litura*, and *Rhyacia ypsilon*. Unless otherwise stated they are published by the Egyptian Government Press, Cairo.

Technical and Scientific Bulletins :—

No. 2.—The nature of the damage done by the pink boll-worm. (*Gelechia gossypiella*, Saund.). Lewis Gough, Ph.D., B.A., F.E.S.

No. 4.—Life history of *Gelechia gossypiella* from the time of cotton harvest to the time of cotton sowing. Lewis Gough, Ph.D., B.A., etc.

No. 5.—List of Egyptian insects in the collection of the Ministry of Agriculture, Cairo, G. Storey, F.E.S., 1916.

No. 6.—Notes on a machine to kill *Gelechia* larvae by hot air, and the effects of heat on *Gelechia* larvae and cotton seed, Lewis Gough, Ph.D., B.A., F.E.S.

1907.—Notes on injurious scale insects and mealy bugs of Egypt together with other insect pests and fungi, Walter Draper, F.L.S., (National printing Dept., Cairo.)

1912.—*Agricultural Journal of Egypt*. Vol. II., Pt. 2., pp. 45-48, and plate. (On *Gelechia gossypiella*). G. C. Dudgeon, F.E.S.

?1920.—*Agricultural Journal of Egypt*, pp. 49-107. On the effects produced by the attacks of the pink boll-worm on the yield of cotton seed and lint in Egypt, L. Gough, Ph.D., etc. (I cannot be sure of the date of this Journal since my copy lacks the covers and early pages, but it quotes 1919 references and omits any reference to Ballou's 1920 publication on *Gelechia gossypiella*. The paper contains a bibliography of the latter insect on pages 102-106).

1920.—*The Pink Boll-Worm*—H. A. Ballou. (A bibliography of *Gelechia gossypiella* up to the end of 1917 appears in this work).

1921.—*First Annual Report of the Cotton Research Board*. (Waterlow and Sons, Ldn.), pp. 34-41. Breeding experiments on the pink boll-worm. In appendix 4, p. 113 et seq, this report gives a bibliographical note on the following lepidopteaous insects with the number of references cited. *Gelechia gossypiella* (Cites Ballou's 1920 work). *Earias insulana* (42 references). *Prodenia litura* (69 references). *Rhyacia ypsilon* (53 references).—[K.J.H.]

F. J. KILLINGTON, A.C.P., F.E.S.

List of the Paraneuroptera (Odonata) of Hampshire and the Isle of Wight.

[Reprinted from *The Entomologist's Record*, Vol. XXXVIII.]

List of the Paraneuroptera (Odonata) of Hampshire and the Isle of Wight.

Compiled by FREDK. J. KILLINGTON, A.C.P., F.E.S.,

FOR

The Entomological Society of Hampshire and the Isle of Wight.

Of the forty-two British dragonflies thirty-four appear in the following list, and it is unlikely that more than two others—*Sympetrum vulgatum*, Linn., and *Lestes dryas*, Kirby—will appear in subsequent lists. The former has possibly been overlooked on account of its strong resemblance to the very common *S. striolatum*, Charp.; it has been taken on at least three occasions south of the Thames, on Bookham Common, in Richmond Park and at Torquay—while F.W. and H. Campion took a specimen in Epping Forest in 1906 (*Entom.*, Dec., 1906). It should be looked for from July to September. A table giving the main points of difference between *S. striolatum* and *S. vulgatum* is given by W. J. Lucas in his *British Dragonflies*, 1900, p. 73. But while the number of species given as occurring in Hampshire is unlikely to be increased to any extent, the distribution of these species still needs much working out. From amongst others I would pick out particularly the case of *Sympetrum sanguineum*, Müll., which has, so far as I am aware, been recorded only from one locality, in the Isle of Wight, and which will almost certainly be found to occur on the mainland. The only districts in Hampshire, where the dragonfly fauna is well-known, are Bournemouth, the New Forest, Southampton, Eastleigh and Alton; the north-west and south-east portions of the county have, apparently, been almost completely neglected.

My thanks are due to those friends who have sent me records. All the literature available to me has been searched; in particular the annual notes of W. J. Lucas in the *Entomologist* have been found of great use.

The following abbreviations have been made use of:

Brit. Drag. = *British Dragonflies*, by W. J. Lucas, 1900.
Vict. Hist. = *The Victoria History of Hampshire*, 1900.
Dale Coll. = "Notes on the British Dragonflies of the Dale Collection," by W. J. Lucas (*Entomologist's Monthly Magazine*, 1908-09).
Nat. Hist., I. of W. = *A Guide to the Natural History of the Isle of Wight*, 1909.
Ent. Mo. Mag. = *The Entomologist's Monthly Magazine.*
Entom. = *The Entomologist.*

Suborder ANISOPTERA.

Gomphus vulgatissimus, Linn.—A rare dragonfly only recorded, so far, from the south-west of the county, but quite likely to occur elsewhere. May-June.

Parley Heath* (Dale Coll); rather common near Rhinefield in 1922 (H. P. Jones); one specimen near Lyndhurst Road Station (A. J. G. Harris); W. J. Lucas has given a number of records for the New Forest, *e.g.*, Oberwater (*Entom.*, LVI., p. 132), Blackwater (*Entom.*, XXXVI., p. 220), Boldre River (*Entom.*, XLIX., p. 205).

Cordulegaster annulatus, Latreille.—A fairly common insect, May-August.

Usually in good numbers along streams in the New Forest, at ponds and streams around Eastleigh, Southampton and Winchester (F. J. Killington); Bournemouth (*Brit. Drag.*). Widely distributed, often abundant in the New Forest (*Vict. Hist.*).

I. of Wight: Parkhurst Forest (*Nat. Hist. I. of W.*).

Brachytron hafniense, Müll. (= *B. pratense*, Müll.).—A local species, April-July.

Parley Heath (Dale Coll.); recorded from a number of localities in the New Forest—neighbourhood of Beaulieu Road (*Entom.*, XXXIII., p. 228), Hatchet Pond (*Entom.*, XXXIV., p. 67), Marlborough Deeps (*Entom.*, LVII., p. 121), common at Royden in May (H. P. Jones); in fair numbers at Fisher's Pond, Eastleigh (F. J. Killington). No doubt widely distributed in early summer (*Vict. Hist.*).

I. of Wight: Sandown Marshes, common on May 18th, 1912 (*Entom.*, XLVI., p. 181).

Aeschna grandis, Linn.—Although reported to be generally distributed and common in late summer and autumn (*Vict. Hist.*), the records I have been able to collect do not bear this out; it would certainly seem to be very uncommon in the southern half of the county, and is not included in the list given in *Nat. Hist. I. of W.* July-September.

Parley Heath and Christchurch, two specimens in the Dale Collection (Dale Coll.); Bournemouth (*Brit. Drag.*); Beaulieu Road, one specimen seen on September 12th, 1923; Eastleigh, rarely met with (F. J. Killington); Alice Holt, Alton, not found until 1924 (E. A. C. Stowell); common at Mytchett Lake, Farnborough, 1923 (*Entom.*, LVII., p. 124).

Ae. juncea, Linn.—There are few records for this dragonfly, which is probably often passed over as the common *Ae. cyanea*, Müll. W. J. Lucas (*Brit. Drag.*, p. 195) thinks that it may be found to have a preference for fir-woods. June-September.

Near Bournemouth (*Brit. Drag.*); it has been taken in the New Forest at Knaves Ash (*Entom.*, LVII., p. 121), Wood Fidley (*Entom.*, XLVII., p. 78) and Beaulieu Heath (F. J. Killington); Hurn Common (*Brit. Drag.*); Woolmer Forest (Dale Coll.).

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* May mean Dorsetshire.

Ae. mixta, Latreille.—Usually a rare insect, but in some years it is more plentiful than in others. In favourable years it is likely that we get visitors from the continent, and in this connection it is to be noted that the species is restricted to the south and south-eastern portions of this country. August-November.

Bournemouth (*Brit. Drag.*) ; taken in several localities in the New Forest in August, 1901, viz., Rhinefield, Denny Bog, Lady Cross, and Beaulieu Gate (*Entom.*, XXXV., p. 36) ; near the R. Test (*Entom.*, L., p. 203) ; Southampton and Eastleigh, one specimen taken in each case, in November, 1922 (F. J. Killington).

I. of Wight : Freshwater (*Entom.*, XXXVII., p. 103) ; Yarmouth (E. A. C. Stowell) ; a female in 1903, and a male in 1904 at Shanklin ; Bembridge, 1905 ; Borthwood, a male 1907 (*Nat. Hist. I. of Wight*).

Ae. cyanea, Müller.—This is the most common species of this genus in Hampshire, and undoubtedly occurs all over the county. July-October.

Bournemouth (*Brit. Drag.*) ; New Forest, very common (H. P. Jones) ; Milton (*Entom.*, XXXVIII., p. 179) ; Southampton, Eastleigh and Winchester, fairly common at most of the ponds in the neighbourhood of these places (F. J. Killington) ; Alton, common (E. A. C. Stowell) ; Fareham (J. E. Tarbat).

I. of Wight : Yarmouth (*Entom.*, XXXVII., p. 104) ; Ryde, St. Catherine's Point, Parkhurst Forest, Shanklin, and Hyde near Shanklin (*Nat. Hist. I. of Wight*).

Anax imperator, Leach.—According to the *Vict. Hist.*, this fine species occurs at ponds, especially in woods, throughout the county. May-August.

Parley Heath, a specimen in the Dale Collection dated 1819 (Dale Coll.) ; near Mudeford (*Entom.*, LIII., p. 206) ; New Forest, common (H. P. Jones) ; Fisher's Pond, Eastleigh (F. J. Killington) ; Alton (E. A. C. Stowell) ; Yateley, plentiful in June, 1919 (*Entom.*, LIII., p. 206).

I. of Wight : Parkhurst Forest ; Hyde, near Shanklin (*Nat. Hist. I. of Wight*).

Oxygastra curtisii, Dale.—This very rare dragonfly was first discovered in the British Isles on Parley Heath, in Hampshire, on June 29th, 1820, by J. C. Dale, and was described by him in *Loudon's Magazine of Natural History*, Vol. VII., p. 60, 1834. The county records up to 1899 are given by W. J. Lucas (*Brit. Drag.*) as follows : "On June 8th, 1831, Mr. Curtis captured a specimen on the side of Ramsdown, near Heron Court, Hampshire . . . . . From this time the insect was lost sight of till 1878, when on July 1st, Mr. H. Goss took six specimens (two males and four females) on a heath to the north of Pokesdown, near Christchurch, in Hants. Four years later, in 1882, Mr. Goss again visited the locality, and on July 11th took four males." Since that date the late Major Robertson has taken the species in its old locality ; in July, 1901 (*Entom.*, XXXIV., p. 230) ; in fair numbers June 27th-July 24th, 1902 (*Entom.*, XXXVII., p. 31) ; finally, the late H. Campion informed me some years ago that he had received one male and two females taken by Major Robertson in 1905. Brockenhurst (*Vict. Hist.*).

Cordulia aenea, Linn.—Although generally considered somewhat rare, this insect seems to be by no means uncommon on the mainland of Hampshire. It appears to favour ponds in woods. May-July.

It occurs in the New Forest where I have seen it in fair numbers near Minstead; Royden (H. P. Jones); found flying commonly close to Brockenhurst (*Entom.*, XXXVII., p. 103); Botley (B. Hobby); Baddesley, near Southampton (W. Fassnidge); usually in fair numbers at Fisher's Pond and North Stoneham Park, near Eastleigh (F. J. Killington); Alice Holt, Alton (E. A. C. Stowell); Woolmer Forest and Hartley Wintley (W. H. Bath, *Naturalist's Gazette*, 1891). Stated to be locally distributed, and common at a pond to the west of Ringwood (*Vict. Hist.*).

Somatochlora metallica, Vanderlinder.—A very rare species. July-August.

Three specimens taken in north-east Hants (Mrs. T. D. Arter, *Entom.*, LII., p. 116).

Libellula quadrimaculata, Linn.—A common species that undoubtedly occurs throughout the county. April-August.

Christchurch (A. Druitt); common in the New Forest and around Southampton, Eastleigh and Winchester (F. J. Killington); Alton (E. A. C. Stowell).

Var. *praenubila*, Newman.—Many Hampshire specimens approach this beautiful form, although I have not yet encountered the extreme form. In the *Vict. Hist.* the variety is said to be occasionally met with.

L. fulva, Müller.—A rare species, of which but few records can be given. May-August.

Ringwood, a male, 1897 (*Brit. Drag.*); a female at Hurn, 19.V. 1919, and a male from the same place, 5.VII.1837 (*Ent. Mo Mag.*, XLIV., p. 199). H. Campion informed me that he possessed a teneral male from Ringwood (1905) given him by Major Robertson, who was in the habit of getting the species between Bournemouth and the New Forest. "Is recorded from Parley Heath and elsewhere" (*Vict. Hist.*).

L. depressa, Linn.—A very common species to be found in the neighbourhood of most ponds. April-August.

Mudeford, on the shore (*Entom.*, LV., p. 4); Lymington (H. P. Jones); common in the New Forest, around Southampton, and at Eastleigh and Winchester (F. J. Killington); Alton (E. A. C. Stowell); Pamber, near Basingstoke (*Brit. Drag.*).

I. of Wight: Parkhurst Forest and America Woods (*Nat. Hist. I. of W.*).

Orthetrum coerulescens, Fabricius.—This species is said to be common and generally distributed (*Vict. Hist.*), but the records do not bear this out. It would be more correct to describe the insect as common in certain localities. June-September.

Abundant on the marshes bordering the Lymington River south of Boldre (H. P. Jones); Bourne Valley, near Bournemouth (*Entom.*,

LVII., p. 122); a female from Boscombe Chine is in the Dale Collection (*Dale Coll.*); Hengistbury Head, near Christchurch, one (*Brit. Drag.*, p. 331); common in parts of the New Forest, *e.g.*, by Oberwater, Brockenhurst, and at Beaulieu Road (F. J. Killington).

I. of Wight: Blackgang Chine (*Brit. Drag.*).

O. cancellatum, Linn.—A careful look-out should be kept for this insect of which we have but few records. It bears a great resemblance when in flight to the common *L. depressa*, and may be overlooked at times in consequence of this. In the *Vict. Hist.* it is given as found locally about ponds and brick pits. May-July.

A specimen was taken by W. J. Lucas at pools on the shore near Mudeford; Apsley Passage, Oberwater, and Dames Slough Inclosure in the New Forest (W. J. Lucas); Alton, at a pond in Alice Holt, July 8th, 1923 (E. A. C. Stowell).

I. of Wight: Parkhurst, a female in 1906 (*Nat. Hist. I. of W.*).

Sympetrum striolatum, Charpentier.—An abundant species. June-November.

Pokesdown (*Entom.*, XXXV., p. 33); Christchurch, New Forest, Sowley and Woolmer Forest (*Brit. Drag.*); Mudeford (*Entom.*, LIII., p. 207); very common in the New Forest, and around Southampton, Eastleigh and Winchester (F. J. Killington); Alton, common at heath ponds (E. A. C. Stowell); Fareham (J. E. Tarbat); Mytchett Lake, Farnborough (*Entom.*, LVII., p. 124).

I. of Wight; Shanklin and Ventnor (*Brit. Drag.*); Ryde, Parkhurst Forest, Borthwood, Totland Bay, Brading Marshes (*Nat. Hist. I. of W.*).

S. fonscolombei, Selys.—A very rare dragonfly. May-June.

W. J. Lucas met with it in the New Forest, both in 1911 and 1912 (*Entom.*, XLV., p. 143, and XLVI., p. 183). On the first occasion the species was quite abundant at a pond on Beaulieu Heath, and no doubt the specimens then found formed part of the general immigration into this country which took place in 1911. In 1912 nothing beyond a single female was obtained on the way to the pond.

S. flaveolum, Linn.—Like the last this is a rare British insect, and visits us from the continent. August-September.

A male was taken at Denny Bog, in the New Forest, in 1900, by Major Robertson (*Entom.*, XXXIV., p. 66). Has occurred sporadically (*Vict. Hist.*)

I. of Wight: One female in a very much damaged condition—probably from Parkhurst Forest (*Nat. Hist. I. of W.*).

S. sanguineum, Müller.—This is a local species for which I can find no records for the county with the exception of one from the I. of Wight. It might possibly be confused wilh *S. striolatum*. July—October.

I. of Wight: Near Yarmouth (*Nat. Hist. I. of Wight.*).

S. danae, Sülzer (*S. scoticum*, Don.)—A somewhat local species, but common where it occurs. June-October.

Bournemouth (*Brit. Drag.*); on Beaulieu Heath and at other

places in the New Forest (F. J. Killington); Pokesdown (*Entom.*, XXXV., p. 33); Alton, common at heath ponds (E. A. C. Stowell).

I. of Wight; Freshwater (*Entom.*, XXXVII., p. 103); Bembridge (*Nat. Hist. I. of W.*)

Suborder ZYGOPTERA.

Calopteryx virgo, Linn.—This beautiful insect is common along streams fringed with trees and bushes. May-August.

Along streams in the New Forest, and at Baddesley near Southampton (F. J. Killington); Southampton (E. Hayward); Alton, much commoner than *C. splendens*, Harris (E. A. C. Stowell); Pamber Forest near Basingstoke (*Brit. Drag.*).

var. *anceps*, Stephens.—In numbers near Lymington River (H. P. Jones.)

C. splendens, Harris.—Like its congener it is common by streams, but the two insects rarely seem to be found on the same stretch of water. The present species appears to prefer less shaded streams than the last. May-August.

Abundant by the River Itchen from Southampton to Winchester (F. J. Killington); Romsey (*Entom.*, (XXXVI., p. 245); Alton, less common than *C. virgo* (E.A.C. Stowell).

I. of Wight: Black Pan near Sandown, 1905 (*Nat. Hist. I. of W.*).

Lestes sponsa, Hanseman.—Common in heathy districts (*Vict. Hist.*). June-September.

Bournemouth, and near Lymington (*Brit. Drag.*); New Forest, common (H. P. Jones); found at a brick-clay pit near Eastleigh (F. J. Killington); near Alton (E. A. C. Stowell)

Platycnemis pennipes, Pallas.—Abundant in certain localities in the New Forest. June-August.

Oberwater, Brockenhurst, common (F. J. Killington); New Forest, common (H. P. Jones); Parley Heath (*Dale Coll.*); occurs in New Forest and elsewhere (*Vict. Hist.*).

I. of Wight: Two males—probably from Parkhurst (*Nat. Hist. I. of W.*).

Var. *lactea*, Charp.—Occurs in New Forest (*Entom.*, LV., p. 9); Oberwater, Brockenhurst (F. J. Killington).

Var. *bilineata*, Selys.—Oberwater, Brockenhurst (F. J. Killington).

Ischnura elegans, Vanderlinden.—A very common insect where it occurs. May-September.

Bourne Valley, near Bournemouth (*Entom.*, LVII., p. 123); coast near Sowley and Hengistbury Head, one (*Brit. Drag.*); New Forest, several localities (H. P. Jones); Brockenhurst, Beaulieu Road, Southampton, ponds and river at Eastleigh, River Itchen at Winchester, (F. J. Killington); Romsey (*Entom.*, XXXVI., p. 246); near Hythe (*Entom.*, LV., p. 9); Alton (E. A. C. Stowell).

I. of Wight: "Evidently common. It has been noticed at Alverstone (H. F. Poole); Sandown (S. A. Blenkarn); Parkhurst (F. Morey); at margin of Yar, Brading Marshes (F. Morey); Ryde, salt

marshes (A. H. Hamm); St. Helens (A. H. Hamm); Brading (A. H. Hamm)" (*Nat. Hist. I. of W.*).

♀ Var. *rufescens*, Stephens.—New Forest (H. P. Jones); fairly common and found with type at Southampton, Eastleigh and Winchester (F. J. Killington).

I of Wight: Brading (*Nat. Hist. I. of W.*).

♀ Var. *infuscans*, Campion.—Not uncommon at Swaythling near Southampton, at North Stoneham and Fisher's Pond near Eastleigh, and by the R. Itchen from Southampton to Winchester (F. J. Killington).

♀ var. *infuscans-obsoleta*, Killington.—Occurs fairly commonly with the type by the R. Itchen, and at ponds around Eastleigh (F. J. Killington).

I. pumilio, Charpentier.—No recent records can be given for this dragonfly. Although it seems to have been not uncommon in the south-west of Hampshire at one time, it disappeared in a mysterious way, and diligent searching in its old haunts has failed to re-discover it. It does not seem possible that it can have become completely extinct, and paraneuropterists in the New Forest should keep a look-out for it. It might easily be passed over as the common and larger *I. elegans*. June-September.

Parley Heath, not uncommon (W. H. Bath: *Handbook*, p. 79, 1890); sparingly in August, 1890, at a pool near Bournemouth (W. H. Bath: *Naturalist's Gazette*, p. 50, 1891); male, July 3rd, 1844, New Forest (*Dale Coll.*); near Lyndhurst, August, 1820, and on Parley Heath, June 18th, 1824 (*Entom.*, XXXIV., p. 53).

Apparently extinct (*Vict. Hist.*, 1900); "on various occasions and in a number of its known haunts in the New Forest, *I. pumilio*, Charp., was sought for in 1920, but without success, and it seems certain that this little dragonfly has disappeared, at any rate for the time being" (W. J. Lucas: *Entom.*, LV., p. 9).

Var. *aurantiaca*, Selys.—New Forest (*Dale Coll.*).

Agrion pulchellum, Vanderlinden.—A local species very similar to *A. puella* in appearance. April-August.

New Forest, common (H. P. Jones); Eastleigh, occurred until recently at a small pond in Hiltingbury Woods, Chandler's Ford, but I have not seen it there the last year or two (F. J. Killington); Alton, at a small pond in Alice Holt (E. A. C. Stowell).

A. mercuriale, Charpentier.—A very local species. W. J. Lucas states (*Brit. Drag.*, 1900): "The only known habitat of this species in the British Isles is the New Forest . . . . in two or three centres connected with the Lymington River. . . . Mr. C. W. Dale has in his collection specimens from Glanvilles Wootton, in Dorset, and from Winchester, but the locality at the former place has now been drained, and that at the latter is no longer known." It has since been discovered elsewhere, whilst I came across the species by the R. Itchen between Eastleigh and Winchester, in June, 1920; and it is quite likely that a careful search would lead to its discovery in other Hampshire localities. May-August.

Locally common at drainage ditches, etc., in several places in the

New Forest, such as near New Park Inclosure, and at Emery Down (*Vict. Hist.*); New Forest at Royden, and many other places, generally overlooked (H. P. Jones); Oberwater, Brockenhurst (F. J. Killington); R. Itchen, at Brambridge (F. J. Killington).

A. puella, Linn.—A common insect, no doubt well distributed all over the county. May-August.

New Forest (*Brit. Drag.*); in many parts of the New Forest, plentiful at ponds around Southampton, Eastleigh and Winchester, and by the R. Itchen (F. J. Killington); Alton, common (E. A. C. Stowell); Romsey (*Entom.*, XXXVI., p. 246; abundant everywhere (*Vict. Hist.*).

I. of W.; Parkhurst, Heytesbury Farm, Newport, Alverstone, Ryde Salt Marshes (*Nat. Hist. I. of W.*).

Erythromma naias, Hansemann.—A very local species. May-July.

Brockenhurst (*Entom.*, XLVII., p. 64); Fisher's Pond, near Eastleigh, in fair numbers (F. J. Killington); Alton, in Alice Holt (E. A. C. Stowell).

Pyrrhosoma nymphula, Sülzer.—Probably the commonest of our Zygopterid dragon-flies. April-August.

Abundant in many places in the New Forest, and around Southampton, Eastleigh and Winchester (F. J. Killington); Romsey (*Entom.*, XXXVI., p. 246); Alton (E. A. C. Stowell); Portsmouth (A. H. Sperring); Fareham (J. E. Tarbat).

I. of Wight; Sandown Marshes, Alverstone, Parkhurst (*Nat. Hist. I. of W.*).

♀ var. *melanotum*, De Selys (=*aeneatum*, Lucas).—A variety of the female that may occasionally be taken with the type.

New Forest, and at Eastleigh (F. J. Killington).

♀ var. *fulvipes*, Stephens.—A not uncommon form of the female by the R. Itchen (F. J. Killington).

P. tenellum, de Villers.—Common in many localities, but not nearly so widely distributed as its congener. June-September.

Bournemouth (*Brit. Drag.*); Bourne Valley, near Bournemouth (*Entom.*, LVII., p. 123); in a number of parts of the New Forest (F. J. Killington); Cranmer Bolton, Alton (E. A. C. Stowell).

♀ var. *erythrogastrum*, Selys (=*rubratum*, Lucas).—Occurs with the type in the New Forest (F. J. Killington).

♀ var. *melanogastrum*, De Selys (=*aeneatum*, Lucas).—Occurs with the type the New Forest (F. J. Killington).

Enallagma cyathigerum, Charpentier.—A common insect. April-September.

New Forest, common (H. P. Jones); abundant at ponds on Southampton Common, by the canal at Swaythling, Fisher's Pond near Eastleigh (F. J. Killington); Fareham (J. E. Tarbat); Alton, the commonest species (E. A. C. Stowell); very common west of Ringwood, widely distributed (*Vict. Hist.*).

The writer will be very pleased to receive any notes on Hampshire

dragonflies that will help to make the foregoing list more complete, as he hopes to be able, later on, to publish a supplementary list.

"The British Noctuae and their Varieties." (J. W. Tutt.)

Supplementary Notes.

By Hy. J. TURNER, F.E.S.

Note:—The order and Nomenclature in *The British Noctuae and their Varieties*, are used in these notes as a necessary reference to that work. Changes in Nomenclature and Systematics where revision has taken place will be stated.

Where the spelling of names has been corrected, the correction has been adopted, *e.g.*, *Acronicta*, Ochs., for *Acronycta*, Auct.

The original name of species or variety will also be indicated in brackets, *e.g.*, *orion*, Esp., 1787 (*alpium*, Osbeck., 1778.)

The various genera under which the species have been cited will also be included.

The following works, dealing more or less directly with Systematics of the *Noctuidae*, have been published since the issue of the late J. W. Tutt's "British Noctuae and their Varieties" in 1891-2.

1888-91. Aurivillius, C., "Handbuch Nordens Fjärilar." (Sweden, Norway, etc.).

1893. Smith, J. B., "Catalogue of the Lepidopterous superfamily Noctuidae found in Boreal America."

1893. Chapman, Dr. T. A., "The genus Acronicta and its Allies."

1892-5. Hampson, G. F., "The Fauna of British India. Moths." Vols. I-III.

1892. Kirby, W. F., "A Synonymic Catalogue of Lepidoptera Heterocera."

1894. Hofmann, E., "Die Gross-Schmetterlinge Europas." Ed. 2.

1895. Meyrick, E., "A Handbook of British Lepidoptera."

1896-1900. Barrett, C. G., "The Lepidoptera of the British Islands." Vols. III.-VI.

1897. Kirby, W. F., "A Handbook to the Order Lepidoptera." Vol. V.

1901. Staudinger, O., "Catalog der Lepidopteren des Palaearctischen Faunengebietes."

1902. Dyar, H. G., "A List of North American Lepidoptera."

1903. Holland, Dr. W. J., "The Moth Book."

1903-1915. Hampson, Sir. G. F., "Catalogue of the Lepidoptera Phalaenae in the British Museum."

1903. Lambillion, L.-J., "Catalogue des Lépidoptères de Belgique."

1903-8. Spuler, A., "Die Schmetterlinge Europas."

15.IV.1926.

1907. South, R., "Moths of the British Isles." Vol. I.-II.
1907-1914. Warren, W., (Seitz) "Macro-lepidoptera of the World." Vol. II. Bombyces, III. Noctuae.
1909-1915. Culot, J., "Noctuelles et Géomètres d' Europe." Vols. I. and II.
1911. Vorbrodt, K., "Die Schmetterlinge der Schweiz." Vol. I.

The following is a list of the Genera and Species, the position of which has always been a debateable matter since they all have both Bombycid and Noctuid characters and affinities. By some authors they have been considered in the latter and styled (Noctuid) Bombyciformes, by other they have been distributed as portions of the heterogeneous Bombyces (sens. lat.).

Family *Cymatophoridae*, H.-S. = *Noctuo-Bombycidae*, Gn.
Genus *Gonophora*, Brnd., *derasa*, L.
,, *Thyatira*, Och., *batis*, L.
,, *Cymatophora*, Tr., *ocularis*, L., *or*, F., *duplaris*, L., *fluctuosa*, Hb.
,, *Asphalia*, Hb., *diluta*, F., *flavicornis*, L., *ridens*, Fb.
Family *Bombycoidae*, Bdv.
Genus *Diloba*, Steph., *caeruleocephala*, L.
,, *Demas*, Steph., *coryli*, L.

As Tutt included these species in the Noctuae and we have to deal with them it would perhaps be interesting to see what each of the above subsequent authors have to say.

In 1888-91 C. Aurivillius produced his *Hand. Nord. Fjärilar.* There he placed the *Cymatophoridae* as the Xth family of the Bombyces followed by the XIth family the *Arctiidae*. The 7th sub-family of this was the *Dilobinae* which included *C. coryli*, *S. albovenosa* and *D. caeruleocephala*. The 8th sub-family of the *Arctiidae* was the *Acronictinae*, which included the species of the genera *Acronicta*, *Craniophora*, Snell. and *Bryophila*. The group Noctuae followed this with the *Agrotiinae*.

J. B. Smith, in his *Cat. Lep. superfam. Noctuidae Bor. Am.* includes. in his superfamily (= Tutt's *Noctuae*) the families *Thyatiridae*, *Noctuidae* and *Brephidae*, as of equal value. In the first he places the genera *Thyatira*, *Bombycia* (*Cymatophora*) and a few others. Early in the *Noctuidae* one finds *Demas*, *Moma*, *Arsilonche* and *Acronicta*. Thus Smith quite independently had come to the same conclusion as to their position as did Tutt.

In 1893 Dr. T. A. Chapman, *The Genus Acronicta and its allies*, says p. 111. "In *Diloba caeruleocephala*, we have a species that is very difficult to locate, but I can see very little affinity to *Acronicta* in any of its stages. The egg has a similar form, but the sculpturing is very different; the larva has no *Acronicta* characters; the pupa . . is more Bombycid than Noctuid. The imago has a very different facies and has quite a different proboscis; the cocoon, and in some degree the moth, are more suggestive of *Cerura* than of Noctua. I do not know on what characters it is placed among the Noctuae, or near the *Acronicta*." This was the only one of the debatable species the doctor dealt with.

In 1892-4 G. F. Hampson, was publishing vols. I.-II. of *Moths*

of *The Fauna of British India* and he there placed the *Cymatophoridae* directly after the *Notodontidae* and adds the footnote, (Vol. I. p. 177). "After the *Cymatophoridae* would follow the *Notodontidae*, if the Heterocera could be arranged in a linear series." In his suggested genetic tree of the families of the Lepidoptera (Vol. I., p. 8) he derives the *Cymatophoridae* and the *Agaristidae* as offshoots from the *Noctuidae-Trifidae*, the *Notodontidae* being the direct derivative. The *Cymatophoridae* are treated as a separate family co-equal with the *Noctuidae* and not a part of that family. This author followed out this plan in his subsequent work (1903 etc.), *Catalogue of the Lepidoptera Phalaenae in the British Museum*, and omitted all these species from his section dealing with the *Noctuidae*.

In 1892 W. F. Kirby, *A Synonymic Catalogue of Lepidoptera Heterocera*, places the genus *Colocasia*, Ochs.* = *Demas*, Steph. in the *Liparidae* and *Heteromorpha caeruleocephala* close to *Cerura*. This volume only deals with the Sphingids and Bombycids; the genus *Cymatophora* is not included; presumably he intended it to be considered as Noctuid, which his later remark in his *Handbook* 1897 would seem to confirm.

Ernst Hofmann in 1894, *Die Gross-schmetterlinge Europas*, 2nd ed., treats the *Cymatophoridae* as belonging to the Bombyces, placing it last in order, next to the commencement of the Division Noctuae, but he places both *Diloba caeruleocephala*, L., and *Demas coryli*, L., in the *Bombycoidae* at the commencement of the Noctuae. In this family (*Bombycoidae*) he also includes *Arsilonche albovenosa*. This is nothing more than the arrangement of Staudinger's *Catalog* of 1871.

Edward Meyrick in 1895, *A Handbook of British Lepidoptera*, based his classification on venation as a leading and preponderant character. He discarded the family name *Cymatophoridae* and substituted *Polyplocidae* for all the same species, and at the same time the generic names of *Habrosyne*, Hb. (1822-3) for *Gonophora*, Brnd. (1845); *Palimpsestis*, Hb. (1822-3) for *Cymatophora*, Tr. (1825); and *Polyploca*, Hb. (1822-3) for *Asphalia*, Hb. (1822-3 later in *Verz.*). The family is placed (forced) between the *Selidosemidae*, (which all authors look upon as Geometrid) and the *Sphingidae*, both of which families the author places in his Notodontina, *Diloba caeruleocephala*, is placed in the Poliades subfamily of the *Caradrinidae*, which contains most of the *Noctuidae* species. The genus name *Colocasia*, Ochs. is substituted for *Demas*, Steph. as being prior, and *C. coryli* is placed in the *Ocneria(i)dae* between *Dasychira pudibunda* and *Porthesia similis* (*auriflua*, Fb.).

In 1896-1900, C. G. Barrett published vols. III.-IV. of *The Lepidoptera of the British Islands*. He places the *Cymatophoridae* at the head of his Noctuina and goes into considerable detail as to his reasons for so doing (vol. III., p. 181 *et seq.*), relying on Hampson, *Moths* (ante) for structural characters and "the structure and usefulness of the tongue, their love of sweet substances as food, their crepuscular flight are characters so diametrically opposite to those of the *Notodontidae*, and so entirely in accord with those of the *Noctuae*, that I feel it necessary to follow Stainton (*Manual*) in including them in the latter, and in placing them at the head of the family, as a stepping-stone

* *Colocasia*, Ochs. 1816, Hb. 1822?

from the Bombycina, to which they, undoubtedly, are in some respects allied." Barrett placed *Diloba caeruleocephala* at the end of the *Notodontidae* next before the *Cymatophoridae*, and *Demas coryli* in the *Liparidae* = *Ocneriidae*, Meyr.

W. F. Kirby in 1897, *Handbook to the Order Lepidoptera*, vol. V., placed the *Thyatiridae* = *Cymatophoridae* at the head of the Group Noctuae, noting that "This family is now classed by many authors with the Bombyces." He uses *Habrosyne*, Hb., for *Gonophora*, Bruand (1845); and *Bombycia*, Hb. (*Tent.* 1806) for *Cymatophora*, Treit., plus *Palimpsestis*, Hb., *Heteromorpha*, Hb. (*Tent.*) = *Diloba*, Bdv. = *Episema*, Ochs., while *caeruleocephala* he has placed near *Cerura* (vol. III., p. 241) as suggested by Chapman; and *Demas coryli* near *Dasychira*, Hb. (*Tent.*) *pudibunda*. He now discards the genus *Colocasia*, Ochs. (Hb.) as "properly rejected by Stephens on account of its having been previously used in Botany." (Vol. III., 205).

In 1901 Ed. III., of Otto Staudinger's *Catalog der Lepidopteren des Palaearctischen Faunengebietes*, was published. The *Cymatophoridae* were treated as a family co-equal with the *Noctuidae*, but, strange to say, placed after the latter between the *Agaristidae* and the *Brephidae*, which immediately precede the Geometers. *Demas coryli* is placed in the subfamily *Acronictinae*, before the genus *Acronicta*; *Diloba caeruleocephala* is put in the middle of the *Noctuidae*, not far removed from *Bryophila* and *Apamea*. Upon what bases these revolutionary changes of relative position were made, there is no indication. In the Ed. II., of the *Catalog* 1871, the *Cymatophoridae* were placed at the end of the Bombyces, immediately preceding the Noctuae, which commenced with *Diloba caeruleocephala*, and *Demas coryli* came next before *Acronicta*, which latter arrangement was identical with that used in his *Cat.* Ed. I., 1861.

In 1902 H. G. Dyar, in *A List of North American Lepidoptera*, placed the genus *Demas*, Steph. as the second genus of his *Noctuidae*, and only separated by two small genera, from the genus *Apatela*, Hb. = *Acronicta*, Ochs. The genus name *Cymatophora*, Hb., he used in the Geometers as used by Hübner in the *Tentamen* with type *roboraria*. He used the family name *Thyatiridae*, for the species allied to those in our European *Cymatophoridae*, and placed in the genus *Habrosyne*, Hb., *Pseudothyatira*, Grote., *Thyatira*, Hb., *Euthyatira*, Smth., and *Bombycia*, Hb. This family (*Cymatophoridae*) he placed between his *Notodontidae* (*Cerura*, etc.), and *Liparidae* (*Notolophus* = *Orgyia*), sections of the Bombyces, the whole with *Hypena*, etc., coming between the Noctuae and the Geometers.

In *The Moth Book*, Dr. W. Holland, 1903, follows Dyar exactly.

A. Spuler, *Die Schmetterlinge Europas*, vol. I., 1903-8, follows Staudinger, *Cat.* 1901.

In the same year M. L. J. Lambillion published his *Catalogue des Lépidoptères de Belgique*, in which he placed *Demas* with *coryli* as the second genus of the *Noctuidae*, after *Diphtera* (*Moma*) with *alpium* (*orion*). The *Cymatophoridae* were placed after the *Noctuidae* and before the *Brephidae* and *Geometridae*, the *Hypeninae* being considered a subfamily of the *Noctuidae*. The genus *Diloba* (*caeruleocephala*) is placed between the genera *Bryophila* and *Apamea* in the middle of the *Noctuidae*. Apparently Lambillion was largely influenced by Staudinger's *Catalog*, 1901.

Vols. I.-II. of *The Moths of the British Isles* were published by R. South in 1907. The *Cymatophoridae*, which he calls *Thyatiridae*, was placed between the *Notodontidae* and the *Lymantriidae* in the Bombyces. *Demas* and *Diphthera* precede the *Acronicta* at the commencement of the *Noctuidae*, and *Diloba caeruleocephala* is placed in the middle of the *Noctuidae* next to *Hyppa rectilinea*.

In Seitz *Macrolepidoptera of the Palaearctic Fauna*, vol. II. 1912 W. Warren placed the *Cymatophoridae* in the Bombyces, between the *Notodontidae* and the *Megalopygidae* followed by the *Limacodidae* and included with it as one of the species *Diloba caeruleocephala*. In the *Noctuidae*, vol. III., Warren placed *Colocasia coryli* in the *Acronictinae* shortly before the typical genus.

J. Culot, *Noctuelles et Géomètres d'Europe*, 1909-1913, omits the *Cymatophoridae* and places *Diloba caeruleocephala* between the *Bryophila* and *Apamea*. *Diphthera alpium* (*orion*) and *Demas coryli* immediately precede the *Acronicta*.

In *Die Schmetterlinge der Schweiz*, 1911, the author K. Vorbrodt puts the *Cymatophoridae* next after the Hypenmae (*Tholomiges turfosalis*) section of the *Noctuidae* and follows it by the *Brephidae*. *Diloba caeruleocephala* he classifies as does Culot, and *Colocasia coryli* is put immediately preceding the *Acronicta* in the *Noctuinae*.

In summing up these opinions we find the whole of the authorities mentioned give the *Cymatophoridae* species Family rank co-equal to the whole of the rest of the *Noctuidae*.

Only 4 out of the 12 authors cited (omitting 3 who simply followed a predecessor) placed the family within the Noctuae as did Tutt, 8 and one follower placed it among the Bombyces, while Staudinger, who had two followers, placed it between Noctuae and Geometers. Of 14 authors cited, 10 and Tutt put *Diloba caeruleocephala* in the *Noctuidae*, 4 only placing it in the Bombyces. *Demas coryli* was placed in the *Noctuidae* by 12 of the authors, the remaining 4 placed it in the Bombyces as did Tutt (*British Moths*, 1896, p. 94).

Since Tutt included the *Cymatophoridae* in his Noctuae he will be followed, but regarding *Demas coryli*, that will be added in as the consensus of opinion is that it is essentially Noctuid. *Diloba caeruleocephala* will be dealt with in its place.

Class :—NOCTUAE, Linn.

I. Sub-Class :—Bombyciformes.

1. Family :—*Cymatophoridae*, H.-S. = *Noctuo-Bombycidae*, Gn. = *Polyplocidae*, Meyr. = *Thyatiridae*, Smith.

1. Genus :—*Gonophora*, Bruand (1846) = *Habrosyne*, Hb. (1822 ?) = *Thyatira*, Ochs. (1816-25).

Gonophora derasa, L.

Orig. Descrip.—Linn. *Sys. Nat. Ed.* XII. p. 851 (1767).

Tutt. *Brit. Noct.* I. 1 (1891), IV. 82 (1892) : Barrett. *Lep. Br. Isles.* III. 186. pl. 116 (1896) : Stdgr. *Cat.* ed. 3. no. 2834 (1901) : Splr. *Sch. Eur.* I. 333. pl. 78 (1903) : South. *Moths Br. Is.* I. 85. plt. 36 (1907) : Warr. (Seitz.) *Mac.-lep. Pal. Bomb.* II. 322. pl. 49. (1912).

May 15th, 1926.

Tutt gives only two forms, var. *intermedia*, Brem., and var. *derasoides*, Dobrée. The first named is probably a race of *derasa* of which Grote says "not to be distinguished from *derasa*." The habitat Armenia is probably erroneous, it should be Amur only. The authority for the second named is Butler, not Dobrée, *Ann. Mag. N.H.* (1878).

The following is a list of the aberrations, local races, derivative forms or species, and representative species of *derasa*. They all have that peculiar and novel plan of marking, differing inter se but slightly in general coloration, in definition of marking, in slight variation of relative position of markings and in other minor details, so that all of them at first glance would be, and have been, attributed to the one species *derasa*.

race *scripta*, Gosse. *Canadian Naturalist.* 249 (1840). Canada and N. America.

(*abrasa*, Gn. *Hist. Nat. Noct.* V. 12. pl. 3 (1852). New York. Is *scripta*, Gosse. teste Grote, Smith, Dyar, etc.)

ab. *gloriosa*, Gn. *Hist. Nat. Noct.* V. 12 (1852). Caucasus.

race *intermedia*, Brem. *Lep. Ost. Sib.* 46 (1864). Amur district.

race *indica*, Moore. *Pr. Zool. S.* 44 (1867). Kashmir. N. India.

race *derasoides*, Butlr. *An. Mag. N.H.* I(5). 77 (1878): *Ill. Het. B.M.* III. 12. pl. 44. Japan.

ab. or race *pterographa*, Pouj. *Bull. S. ent. Fr.* 135 (1887). W. China. Thibet.

race *fraterna*, Moore. *Pr. Zool. S.* 406 (1888). Dharmsala. Kangra.

race *conscripta*, Warr. (Seitz.) *Mac-lep. Pal. Bomb.* II. 322. pl. 49. (1912). W. China. Thibet.

(race *aurorina*, Btlr. *Trans. Ent. Soc. Lond.* (1881) 171. Japan.)

race *scripta*, Gosse. *Can. Nat.* (1840) 249.

Habitat.—Canada and North Atlantic States.

Figures.—Seitz. *l.c.* plt. 49. Holland. *Moth Book.* plt. XL. Guenée. plt. 3. (as *abrasa*).

Original Description.—The original description (sic) occurs in a small book, *The Canadian Naturalist*, p. 249, by P. H. Gosse, in 1840, written in the style of a dialogue. There is a very good illustration (woodcut). Giving his friend an account of an evening collecting, he says, "A Noctua, the Pink Arches (*Thyatira scripta*) is one of the most delicately beautiful of the small moths that I have ever seen." This, with the figure, constitutes the original description.

Walker, *Cat. Lep. Het. B.M.* IX. 6 (1856), describes it "Cervina, subtus albida; caput albidum, thorax albido fasciatus; abdomen pallidissime fuscescens; alae anticae cinerae, cervino variae, fasciis tribus obliquis, costa media, ocellis duobus strigisque lanceolatis discalibus albis: posticae subcinereae, albido marginatae et subfasciatae." He says it is the same as *abrasa*, Gn.

Thyatria abrasa, Gn. *Noctuël.* I.(V). 12 (1852).

Original Descrip.—"It is extremely near *derasa*, from which it differs by more vivid colours, and more rosy than ferruginous. The large basal spot which rests on the inner margin is wider at its upper

portion. The terminal space is deeply and irregularly toothed at its junction with the white subterminal line. The fringe is not divided between the teeth of the festooned line which separate it by a lighter mark. The median lines are expressed in black at the spot on the costa where they originate. The prothorax is of a rose white."

For a long time *scripta* (*abrasa*) was considered to be the *derasa* of Europe, but Grote's opinion gradually found favour. He wrote, *Proc. Ent. Soc. Phil.* II. 58 (1863), "M. Guenée's figure of this species is approximately correct, there is however no indication of the spur at the internal angle of the anterior wing, which is sufficiently prominent in an individual I have before me. This species is the representative on this continent of the European *G. derasa*, L., and resembles that species closely; the most observable differences consisting in the greater width of the greyish basal space at the tip, and in the more pinkish shade of the anterior wings, characters which appear to be specific and constant."

Apropos of this Spuler's remarks, *Schm. Eur.* I. 333 (1912), are interesting. "*Scripta*, Gosse, has narrower wings, and the white band before the outer margin is more concave outwardly and narrower, the waved lines go more closely down to the inner margin, the reniform stigma is narrower and is more oblique; the white oblique band towards the basal end discally is also more distinctly dark edged, which darkening stands out much darker towards the basal end than in *derasa*, the colour is brown-grey without orange tone: in N. India, East Asia and N. America; as the above remarks and the distribution shews, it is a true species standing in all respects most extraordinarily near *derasa*."

Warren in Seitz (*l.c.*) says that *intermedia*, Brem., is doubtfully distinct from it.

Barrett. *l.c.* III. 189 (1896) says of *scripta* "more of an olive-brown and very lovely, but apparently not distinct."

ab. *gloriosa*, Gn. *l.c.* (1852).

"It only differs absolutely from *abrasa* in that the extrabasal line forms, at the height of the median nervure, a much more marked elbow. All the other characters are the same as those of *abrasa*." Said to have come from the Caucasus, but Gn. considers it an *abrasa*, and only separates it on account of its locale.

race *intermedia*, Brem. *l.c.* (1864).

Tutt gives the original description in App. Vol. IV. 82. Grote says that this form is not to be distinguished from *derasa*.

Graeser. *Berl. Ent. Zeit.*, 1888, p. 148, says—"This form is not to be distinguished from *G. scripta*, Goss., from N. America and also has a great similarity with the *G. derasoides* described by Butler from Japan."

H. B. Browne, *Des. Cat. Dobrée Coll. Eur. Noct.*, 1909 says, "Slightly tending to var. *derasoides* in that the white markings are tinged with pink, but otherwise typical."

Finally Warren (Seitz) *l.c.* treats *intermedia* as a species. "Of the same size and shape as *derasa*, but in coloration and markings resembling *scripta*, from which it is doubtfully distinct; both are distinguished by the absence of ferruginous coloration, and the presence of a

white blotch in the angle between the subbasal and inner lines above the white part of the median vein."

race *indica*, Moore. *l.c.*

Orig. Descrip.—"Pale fawn colour: forewing with the base uniform pale fawn colour, bordered by an oblique silvery white line, and traversed by a white basal streak, which is crossed by a narrow line; middle of the costa white, beneath which the wing is pale ferruginous, with delicate undulating transverse striae, and a series of four narrow pale-bordered darker zigzag discal lines, bordered externally by a submarginal white band; a darker curved pale-inner-bordered streak before the apex; a marginal row of narrow pale lunules: hindwing darker fawn colour, palest on the disc. Head, thorax and abdomen pale ferruginous."

Habitat.—Dharmsala, Sikkim, Burma, Kashmir, N. India.

Figures.—Waterhouse. *Aid.* I. plt. 9: Hamps. *Fn. Ind.* fig. 111. (as a very large *derasa*): Seitz. *l.c.* plt. 55.

Hampson, *l.c.*, treats it as *derasa*, remarking that "the form *indica* from Sikkim is rather larger and brighter," I. p. 178. His figure is that of *indica* labellel *derasa*. Cotes and Swinhoe, *Cat. M. of Ind.* treat it as a species, but Elwes' note in his copy (which I have) is "=*derasa*, L."

Warren (Seitz) *l.c.* calls it a species. "Always larger and darker ferruginous than *derasa*; the termen more oblique and the apex more prominent; the upper part of the median area below the white costal patch much darker, extending thus to apex, the white subterminal stripe straighter, but curved into apex shortly before costa; hindwing always dark fuscous." "The larger Japanese specimens, generally referred to *derasa*, and those from Kashmir, are identical."

race *derasoides*, Butlr. (not Dobrée). *An. Mag. N.H.* 1878. I(5). 77.

Orig. Descrip.—"Nearly allied to *G. derasa*, but of a grayer tint; the markings (particularly on the white costal streak of primaries) less defined; the reniform and other discoidal spots narrower and more transverse; the area between the oblique white stripe and the zigzag lines pale stramineous, with darker and lunulated spots upon it, the zigzag lines wider apart, only three in number; the outer border white, the intersected semicircular marginal spots pale buff instead of ferruginous, the outer border of secondaries white, not yellowish. Hakodaté." Japan.

Figures.—Btlr. *Ill. Het. B.M.* III. pl. 44: Seitz. *l.c.* plts. 49 and 55.

Tutt gives only a few words from a letter of Dobrée, and apparently unaware of Butler's description. Brown, *l.c.* writes of four specimens from the Amur in the Dobrée collection. "A very fine variety, giving the impression of being a distinct species. With one exception all the white markings have become purplish-grey; the slope of first line altered, so that it meets the inner margin at its middle; the white stripe along the hind margin almost obsolete, and the white basal streak contracted into a conspicuous white spot."

Warren (Seitz) treats *derasoides* as a species. "Resembles *derasa* in colour and in shape of wings; distinguished by the presence of the white blotch in the angle above the white part of the median vein." He calls *fraterna*, Moore, as a *derasoides* and says that the larger Japanese specimens are identical with *indica*.

ab. (race) *pterographa*, Pouj. *l.c.*

Original Descrip.—"Generally more oblong than in *T. derasa* of Europe. General colour of the forewings similar, but much more dark; the large triangular blotch at the base is more rounded at its junction with the internal margin, where it reaches it about the middle; the white subterminal line is narrower; fringe not divided by white chequers as in *T. derasa*. Lower wings brown, deeper on the outer border; fringe yellow ochre at the base. Thorax and abdomen partaking of the colour of the upper and lower wings respectively. Tarsi relatively longer than in the species taken as type for comparison. This species is very near *G. abrasa*, Gn., of Western America." Thibet.

Warren (Seitz) says "The form *pterographa* is merely a darker, less ferruginous insect, found in W. China."

race *fraterna*, Moore. *l.c.*

Orig. Descrip.—"Paler than *derasa*. Differs on the forewing in the outwardly oblique sub-basal white band being more curved towards the base of the costal margin at its upper end, the white costal area being there also broader, the bordering ferruginous sinuous lines are narrower in extent, and the complex sinuous lines extending up the discal area are more distinctly defined, the white submarginal fascia is also somewhat more curved, and the marginal ferruginous lunules broader; both the orbicular and reniform spots are more constricted in their middle. This is quite distinct from *indica*, being distinguished from that species from its smaller size, wider space between the base of forewing and the outwardly oblique transverse line, the space within the base of the cell being pure white instead of ferruginous, as in *indica*." Dharmsala in the Punjab.

Figure.—Butlr. *Ill. Het. B.M.* VII. plt. 125.

Cotes and Swinhoe, *l.c.*, p. 744, say "Allied to *H. indica*." Hampson, *l.c.*, as a form of *derasa* (*indica*) from Dharmsala "slightly greyer than the European *derasa*." Warren (Seitz) treats it as *derasoides*, Btlr. Butler says "slightly darker and duller, stands between *derasoides* and *indica*, colour nearer the latter, not so in marking, the grey patch broad and prominent as in *scripta*."

race *conscripta*, Warr. (Seitz), *l.c.*, 1912 (treated as a species).

Orig. Descrip.—"As large as, and of the same shape as, the last species, *indica*, but in coloration agreeing with *intermedia*, Brem., and its American cousin *scripta*, Gosse, which it further resembles in having the white triangular patch above median vein between the sub-basal and inner lines." Ta-tsien-lu. Thibet.

(race *aurorina*, Btlr., *l.c.*)

Figure.—Seitz, *l.c.* 49.

"Allied to *scripta* of N. America, from which it differs in its smaller size, darker coloration, the distinct pink gloss on the upper surface of the primaries, the more contracted area of these wings, due to the inangulation of the inner white border of the central belt; the anal area is occupied by a large grey rounded spot, shading into rust-red along its inner border, which is bounded by a curved white stripe (the outer limit of the central belt); above this spot are the ordinary

black, crinkled, discal lines, which are four in number, parallel as usual, wider apart, much less deeply and less acutely zigzag or undated than in *scripta*, and terminate at the first median branch instead of running through the central belt to inner-margin; the abbreviated gravel-brown lines on the opposite side of the central belt are also wholly wanting in the Japanese species, but the costal border above the usual discoidal spot is much more obscured by transverse dusky stripes; the fringe of all the wings is golden brown tinged with white; the secondaries are shining fuliginous brown, with the external third dusky; below, the wings are similar in pattern to *scripta*, but the ground colour is shining greyish brown instead of sordid creamy whitish." Japan.

This is a curious form. At first glance it looks uncommonly *batis*-like, but when the markings are analysed and compared the *derasa*- or *scripta*-like affinity stands out plainly.

[This Japanese form also sent from Corea by Fixsen is not likely to be taken for *derasa* as are all the other above listed forms, and is probably quite a good species. Houlbert considers it to belong to a genus connecting *Gonophora* and *Thyatira*.]

race *thibetana*, Houlb. *Lép. Comp.* XVIII. (2), 81. fig. 19. (1921).

Habitat.—Eastern frontier of Thibet.

Orig. Descrip.—"Slightly larger than *fraterna*; distinguished from it by its general coloration of deeper and clearer brown chocolate. The apical end of the forewing is cut off obliquely and the outer margin is somewhat strongly curved. The costal margin is whitish with oblique brown spots; the white line which goes from the costa to the middle of the hind margin is well marked and more angularly broken up; the general direction of the line is more curved, and the area limited by it, towards the lower part of the base of the wings, is rounded at the outer margin in place of being sharply angled as in *derasa*; another oblique white line, from the middle of the base, runs to join this line near the costal margin and thrusts out two branches enclosing a small triangular brown space. The disc of the wing is chocolate velvety-brown, and on the outer side bordered by four or five sets of lines in zigzags with more rounded apices. The apical and external angles have each an ovoid brown spot, limited on the inner side by a whitish line. The outer margin has festoons formed by fine white lines.

"The lower wings are of a uniform brown without any spot. The fringe is of a reddish fawn."

The figure as well as the description show this form to be remarkably close to *derasa* and probably it will prove to be a local race as we have treated it. The markings and colour differ only in degree and that degree only slight in some characters.

It may be remarked that Houlbert considers all the forms we have dealt with as good species. He even goes so far as to place them in two genera; *pyritoides* (*derasa*), *derasoides* and *indica* in the genus *Habrosyne* and the rest in the genus *Gonophora*.

Looking over the series of the *derasa* group in the British Museum, and comparing them with *derasa*, *scripta* seemed more variegated

generally, darker, and the white line towards the outer margin more bowed; *intermedia* was the same size, darker generally, the space between the costal spot and the oblique second line was almost obsolete, the submarginal line was curved suddenly before the apex, and the white lines shewed up more against the darker ground; *indica* was much larger, the basal line almost obsolete, same chestnut suffusion as *derasa*, but not so bright, no white triangle at junction of the lines; *derasoides* (the type) almost identical with *derasa*, same chestnut colour, the zigzag lines very sharply angled, the transverse lines less definite in outline; *pterographa*, simply a dark form of *indica*, agreeing in all respects; *fraterna*, much larger, long-winged, large well developed white triangle at junction of the lines, lines tend to obsolescence in parts, paler generally, zigzag lines very faint, stigmata very faint, a dull form of *indica*; *conscripta*, still darker than *intermedia*, some of the zigzag lines were with very round turnings, subbasal line irregularly waved.

Hufnagel, *Berl. Mag.*, III. 400 (1767) called this species *pyritoides*, and Rottemberg points out, *Naturforscher*, IX. 133 (1776) that it was the *derasa* of Linn.

Note on the Synonymy of G. derasa.—The following facts are an illustration of how necessary it is in a revision to *take nothing for granted*, but to run every item to its origin. The name *derasa* was introduced by Linnaeus in the XIIth. edition of his *Sys. Nat.* in 1767. In the Volume III. of the *Berlin Magazine*, an obscure general periodical, is a very good and extended description of this insect, supported by a figure, which, although rude, is quite recognisable. This was by Pastor Hüfnagel and the title page of the volume is dated 1767 also. Although the identity of the descriptions had been recognised for much more than 100 years, it was not until 1921 that Houlbert (*Lép. Comp.* l.c.), in his revision of the *Cymatophoridae*, turned over the pages of the *Berl. Mag.*, and found that each of the six parts had separate, *dated* title-pages, and that part 6 in which the description occurred, was published in 1766!! Thus (unfortunately) the name *pyritoides* is clearly and undoubtedly prior, and must, by the law of priority, take the place of the name *derasa* in our list as Rottemberg pointed out in 1776.

2. Genus:—*Thyatira*, Ochs. (1816-25). Hb. (1823).

Thyatira batis, L.

Orig. Descrip.—Linn. *Sys. Nat.* ed. X. 509.

Tutt. *Br. Noct.* I. 2. 155 (1891); Barrett. *Lep. Br. Isles.* III. 190. pl. 116. (1896): Stdgr. *Cat.* ed. 3. no. 2836 (1901): Splr. *Sch. Eur.* I. 333. pl. 78 (1903); South. *Moths B.I.* I. 86. plt. 36 (1907): Warr. (Seitz). *Macro.-lep. Pal. Noct.* II. 323. plt. 49 (1912).

Tutt gives only two forms, var. *mexicana*, Hy. Edw., and var. *juncta*, Tutt, which latter he corrects to *confluens*, Reut. (1890), on p. 155, possibly in error (see below).

The following is a list of described forms, which do, or may, belong to this species, by reason of the peculiar character and arrangement of their pattern.

race *vicina*, Gn. *Noct.* I. (V.). 13 (1852). Java.
ab. *decorata*, Moore. *P.Z.S.* (1881) 328. plt. XXXVII. Darjiling.
race *mexicana*, H. Edw. *Pap.* IV. 16 (1884). Mexico.
race *hedemanni*, Christ. *Rom. Mem.* II. 24 (1885). Transcaucasia.
race (ab.) *cognata*, Moore. *P.Z.S.* (1888), 406. India.
ab. *confluens*, Reut. *Ent. Tidsk.* (1890), 201. fig.
ab. *juncta*, Tutt. *Noct.* I. 2 (1891).
race *superba*, Barnes. *Can. Ent.* XXXIII. 55 (1901) = *mexicana*, H. Edw.
ab. *albopuncta*, Spuler. *Schm. Eur.* I. 333 (1908).
ab. *confluens*, Marsch. *Berl. Ent. Zt.* LIII. 206 (1908). Silesia = ab. **variabilis**, mihi.
ab. *derosea*, Maürer. *Jahr. Wien. Ent. Ver.* XX. 41 (1909).
ab. *conflua*, Reb. *Berge. Schm.* ed. IX. 303 (1910) = ab. *variabilis*, mihi. (?)
race **indecorata** (Barrett *l.c.*), n. race. Ireland.
[race ? *violacea*, Fxsn. *Rom. Mem.* III. 352. plt XV. (1887). Korea, W. and Cent. China.]

In *Contributions*, I. pt. 4 (1912), Barnes figures *superba* (plt. XII., fig. 6.), and notes that it is "probably a syn. of *mexicana*." Locality Arizona.

Barrett (l. c.) remarks of *mexicana*, "very similar to our western variety."

Barrett (*l.c.*) states that the *batis* coming from the Western districts of the British Isles, S. Wales and N. of Ireland, "frequently have the pink colouring of the back of the thorax and of the large spots replaced by pale buff." This racial form might well be called **indecorata**, n. race.

Tutt refers (*l.c.* 2) to traces of an "obsolete series of dots," between the apical spot and the spot at the anal angle. There is frequently a single dot above the anal spot, and in line with it is a more or less produced projection from the apical spot. The small spot in the hind-margin above the anal angle blotch is the filling of one of the faint marginal crescents with the pink coloration. This coloration appears slightly in the next crescent above in some specimens and possibly may occur in a complete series in some examples. I have seen a figure in which these crescents all show white (Chenu), and also one without any of them being white, all, on the contrary, having a conspicuous emphasis of the black edging.

In an addendum to Vol. I. *Brit. Noct.*, p. 155, Tutt gives Reuter's description of ab. *confluens*, translated from *Ent. Tidskr.* (1890) 201. Reuter gives a figure of his aberration. This does not in any way represent Tutt's *juncta*, which "has all the characteristics of the type, but with the two rosy spots at the upper part of the wing towards the costa joined together" (l. 2). Therefore ab. *juncta*, Tutt, must remain.

race *vicina*, Gn. *Noct.* I. (v.) 13 (1852).
Original Description.—"It extremely resembles our *batis*. The

upper wings are a little longer, with the apex very slightly falcate. The spots are narrower and of a little different shape. The two apical ones are confluent. The lower wings are of a uniform burnt brown, with yellowish fringe and they have a slight sinus at the anal angle."

"Mr. Horsfield has told me that it occurs in Java. I thought it was American."

Barrett says of *vicina* (*l.c.*), "A browner form from Java appears to be doubtfully distinct."

The B.M. series of *vicina*, all very closely resemble the typical *batis*, but are generally browner. The inner marginal blotch is small, the hind marginal crescents small and darker, that is, not so distinct, the stigmata very faintly traceable.

P.S.—Barrett (*l.c.* p.193) says of *batis* "Also obtained from Java but called *victrix*." This name has not been traced in B.M. or in literature.

ab. *decorata*, Moore. *P.Z.S.* (1881), 328, pl. XXXVII.

Original Description.—"Fore-wing dark brown, with a peach-coloured basal tri-lobed spot, a large oval spot within the cell, a smaller spot at its end, an oblique irregularly shaped costal spot before and a similar spot at the apex, a large deep coloured spot at the posterior angle, and two small marginal spots above it, followed by lunules to the apical spot; an elongated spot on middle of hind-margin; some indistinct pale-bordered sinuous black-lines crossing the wing between the spots; hindwing pale brown, with a small marginal pale yellowish patch near the anal angle. Body pale ochreous-brown; palpi and legs with dark brown bands. Darjiling."

Hampson (*Fn. Br. Ind.*) says, "Extra pinkish spot in cell of FW.; a smaller one behind: and a more complete marginal series; palpi pink: probably a distinct species."

Seitz does not mention it; Cotes and Swinhoe treat it as a species.

In the B.M. series the reniform and orbicular stigmata seem to be quite traceable, the latter being very large, the former quite obsolete below. The dot above the anal angle blotch is absent, and two or three of the semi-circles on the margin above are filled in with the lighter colour.

race *hedemanni*, Christ. *Rom. Mem.* II. 24 (1885).

Figures.—Seitz. II. plt. 49d.

Original Description.—"Dr. Staudinger, to whom this moth was sent, called it a var. of *batis*. Although the resemblance is very great, yet I cannot accept this opinion, as the want of the blotch on the inner margin which M. Staudinger considers to be only accidental, does not form the only difference. True *batis* was taken in two places in Transcaucasia. Up to the present no one has found a single example which forms a transition to *batis*.

"The forewings are a little longer and larger than those of *batis*, and the costa is a little more arched. The clear basal spot is as that in *batis*. The two spots in the costal margin near the apical angle are much smaller and always joined, while in *batis* they are always separated by a brown black line of the ground colour. On the inner side they are insensibly lost in the ground, which is lighter in *hedemanni*. The anal spot is for the most part smaller than in *batis*, and its margins are less distinctly expressed on the clear brown. The

little spot beside that on the inner margin, which is found always in *batis*, is wanting. All these spots which are of a beautiful rose and white, with a brown cloud inside, are of a dirty rose in *hedemanni*. The ground is of a clearer brown, running sometimes more, sometimes less into a grey rose. A blackish line surrounds the basal spot, the ground between this line and that spot is a little darker than the rest of the ground. From the anterior spot on the costal margin, to the anal spot in a straight line runs a very distinct waved ray, which *batis* has 'tis true, but which is more oblique and directed towards the red spot near the outer margin."

In the B.M. collection *hedemanni* is somewhat smaller than *batis*, all the large features of the latter are present, but all lightly suffused with dark more or less; the marginal chevrons are suppressed, the inner marginal blotch ill-defined; but the development of an S-shaped narrow band of a dark and light shade between the middle of the top of the anal angle blotch and the inner corner of the apical blotch is very distinctive and almost destroys the *batis* look at the first glance. This band is continued around the anal blotch to the inner margin and around the second apical blotch to the costa.

Seitz treats it as a species.

ab. *cognata*, Moore. *P.Z.S.* (1888) 406.

FIGURES.—Seitz. II. plt. 49/e.

ORIGINAL DESCRIPTION.—"Differs from *T. batis* in the forewing being comparatively narrower and longer, the ground colour greyish brown, the peach-coloured patches are duller, but of a darker tint and the medial patch on the posterior border is absent, the basal patch is more angular, being almost pointed below the cell, the transverse black sinuous lines between the patches are mostly with greyish-white borders. Hindwings and abdomen also greyer brown."

Barrett says of *cognata* (*l.c.*) "ground colour more dull and leaden, and the spots less bright."

Hampson (*l.c.*) "no pink patch on inner margin of F.W.: has a waved marginal black line."

Warren (Seitz) (II. 323) "pale blotches dull blurred appearance: that on inner margin wholly absent: brown ground generally paler: transverse dark lines thus more in evidence: especially outer one bordered grey."

Butler says of var. *cognata* "duller than type, central dorsal spot obsolete, nearly like *vicina* (Java). The hindwing darker than the type." (*Ill. B.M.* VII. 48).

Elwes says "same as *batis*." (MS. notes in C. & S. Cat.)

The B.M. series show that *cognata* is almost identical with *batis*, but the wings appear somewhat narrower and longer, and the black margins of the blotches are emphasised.

ab. *albopunctata*, Splr. *Schm. Eur.* I. 333 (1908).

ORIGINAL DESCRIPTION.—"Whitish spots can be developed between the apical and inner angle spots on the wavy line. Ab., *albopunctata*.

ab. *derosea*, Maürer, *Jahr. Wien. Ent. Ver.* XX. 41 (1909).

ORIGINAL DESCRIPTION.—"It differs from the typical form by white and partly bone-yellow spots on the forewing instead of rose red.

Instead of being red-brown the ground colour is deep black ; the hind-wing up to the base of the wing is very darkly powdered, by which the insect has a peculiar appearance."

ab. *confluens*, Marschner, *Berl. Ent. Zeit.* LIII. 206 (1908).

Original Description.—" The three rosy spots at the wing base are merged into one which has only one diminutive dark centre. The small spot on the hind margin of the forewings, usually found between the basal spot and that on the distal angle of the hindmargin, is wholly wanting. The spots on the costa are bridged with the spot on the anal angle by a wide rosy union, so that the original dark grey ground colour of the wings appears transformed into a band." Silesia.

This is neither the *juncta*, Tutt, nor the *confluens*, Reut. and will, unfortunately, have to be rechristened. I call it ab. **variabilis,** n. ab.

ab. *conflua*, Reb. *Berge. Reb.* ed. IX. 303 (1910).

Original Description.—" Fore-wing with the basal spots run together and a bridgelike union of the costal spots with that on the inner margin. The small spot in the middle of innermargin is wanting."

Surely this can be nothing more than Marshner's *confluens = variabilis*, mihi. The description appears to be a summary of its characteristics. Possibly the name should have been spelt *conflu-ens*.

race *violacea*, Fxsn. *Rom. Mem.* III., 352, plt. XV (1887).

Figures.—*Rom. Mem.* l.c. : *Lép. Comp.* XVIII. fig. 28 : Seitz. II. plt. 49.

Original Description.—" Ground colour of a grey violet in the central portion of the disc with a lighter basal and marginal area and a very small portion along the costa similar. At the base, where as in *batis*, etc., the spot is extended, the ground is lighter than the general area of the wing and of a light blue grey. Externally this area, usually rounded, possesses two projecting points ; quite near the base there are sometimes also found two small silvery marks, between the median and dorsal nervures. The spot at the inner angle towards the inner side is of a reddish tint and there are externally some grey scales ; it is above scarcely separable from the ground colour and margined on the inner side with a very fine white line, it extends interiorly as a darkened division of the discal field to the costa : its continuation is of a dull brown. Disc without either ocelli or rays, such as occur in *derasoides* and *aurorina*. Along the margin not far from the top, there arises from the costa a short white line, lightly curved outwardly but not forming an apical spot. The margin is of a pale violet grey. Fringes chequered with brown white. Hindwings uniformly grey, of a brilliant satin."

The figures of this species do not agree. Two of them, *Rom. Mem.* III. plt. XV. and *Lép. Comp.* XVIII. fig. 28 are quite comparable as a form of *batis*, although not the same in the relative values of the shade of coloration, while the figure in Seitz II. plt. 49 looks very different, there being but little contrast of the light and dark coloration, but the markings are similarly positioned. It has been found in Korea.

Houlbert discusses the form, *Lép. Com. l.c.*, but he knows little of it, on account of its rarity in collections. He suggests that it may come in a genus between *Gonophora* and *Thyatira*, as it is more removed from *batis* and is near *aurorina*.

Warren (Seitz) notes, " the Chinese and Japanese specimens of *batis* are always larger than European.."

In the B.M. series of *batis* are several specimens of a somewhat larger insect from Guatemala, etc., practically indistinguishable from that species.

3. Genus :—*Cymatophora*, Treit. (1825) = *Palimpsestis*, Hb. (1822) = *Bombycia*, Hb. (1806) = *Cerotopacha*, Steph. (1829) = *Tethea*, Ochs. (1816) in part.

Cymatophora ocularis, L.

Orig. Descrip.—Linn. *Sys. Nat.* ed. XII. (1767) p. 837.

Tutt. *Brit. Noct.* I. 1. (1891) : Barrett. *Lep. Br. Isles.* III. 201. pl. 117 (1896) : Stdgr. *Cat.* ed. 3. no. 2844 (1901) : Spuler. *Schm. Eur.* I. 334. pl. 78 (1908) : South. *M.B.I.* II. 88. plt. 36 (1907) ; Warr. (Seitz.) *Mac.-Lep. Pal. Bomb.* II. 327. plts. 49. 56. (1912) : Houlbert. *Lep. Comp.* XVIII. (i.) 159. figs. 41-2. (1921).

Tutt considers three forms. (1) The ordinary form of our British race, which he recognised as the form described by Linneus, and for which he used the Linnean name *ocularis*. (2) The usual continental form with the 8 and 0, that is the stigmata separated by a dark shade or line, as figured by Hübner under the name *octogesima* (*octogena*, Esp.). 3. The richly suffused-red, occasional form, which he named *rosea*.

The following is a list of the aberrations, local races, &c. They all have the very distinctive combination of the reniform and orbicular stigmata to form the " 80 " on the fore-wing, more, rather than less, clearly marked.

race *octogesima*, Hb. *Samml.* fig. 209. (1802). Continental Europe.
race *alternata*, Moore. *P.Z.S.* 331. (1881). plt. 37. India.
ab. *rosea*, Tutt. *Br. Noct.* I. 6. (1891).
race *caucasica*, Krulik. *Rev. Russe. Ent.* I. 173 (1901). Caucasus.
hyb. *fletcheri*, Tutt. *Br. Lep.* V. 35. (1906).
ab. *interrupta*, Splr. *Schm. Eur.* I. 334. (1908).
race *sareptensis*, Splr. l.c. S. Russia.
race *amurensis*, (Bng-Hs). Warr. (Stz.) *Pal. Bomb.* II. 327. (1912). The Amur.

Ernst and Engramelle, *Pap. d'Eur.* (1792) VIII. plt. 308. figs. 533a and 533c have the "80" mark of *ocularis* and also the quadrupled lines of *or*. and thus would appear to represent the hybrid subsequently bred by W. H. B. Fletcher. These two figures have the two inner lines of each set with a space between them darkened into a well marked band ; 533a is a darker example generally, especially on the hindwings ; 533c is a lighter specimen. Werneberg calls the latter *or*, W.V. They are named *ruficollis*, W.V., which they are not. Fig. 533a is the form mixed grey in general colour. Fig. 533c is that of a reddish = rosy " rougeâtre " suffused example.

Esper's figure, *Schm. Abbld.* IV. plt. 128. 4, *octogena* is very poor and hard, while fig. 6 is not recognisable.

Stephen's figure, *Ill.* III. pl. 27. (1829) is of a very dark example:

all the characteristic markings are present but much too definitely expressed, hard, with the minor characteristics of each transverse line omitted, *e.g.*, irregularities, waving, etc., smoothed. Hindwing bands far too definite, with too great a contrast between light and dark portions. Somewhat larger than the average; a female apparently, more the size of *or*.

Curtis' figure, *Br. Ent.* 272 (1829) again, is one very like the hybrid of Fletcher in having both the quadruple lines and the "80" markings. He says it is very rare, and has never been figured in Britain before. The fig. is certainly not of a typical form.

Barrett *Lep. Br. Is.* III. 201 (1894) refers to W. H. B. Fletcher's hybrids and adds the additional remark that they had the two sets of quadrupled lines, which neither Fletcher originally nor Tutt subsequently mention.

South notes *M.B.I.* II. 88, that the lower portions of the figures in the 80 mark are often more or less obsolete.

The British examples in the B.M. show the paired lines much emphasised and heavy.

race *alternata*, Moore, *P.Z.S.* 331, pl. 37 (1881).

Orig. Descrip.—"Allied to *P. ocularis* of Europe. ♂ forewing pale metallic cupreous brown, crossed by a broad basal, a median, and two narrow, submarginal, greenish-grey, indistinct bands; some black basal spots, an ante- and post-median black sinuous line, black and white streaks externally along the veins; hindwing and abdomen pale cupreous brown. Thorax greenish-grey; collar, front of head, palpi, and legs rufous brown; legs with black bands. Darjiling."

Cotes and Swinhoe say, "Allied to *P. ocularis*." Warren (Seitz) omits it. (Pal. Bomby.)

race *caucasica*, Krulik, *Rev. Russe. Ent.* I. 173 (1901).

Orig. Descrip.—"Minor, maculis alarum anticarum, figurae 80 simillibus, fere vel plane deficientibus." Transcaucasia.

hybrid *fletcheri*, Tutt. *Brit. Lep.* V. 35 (1906): *Proc. Ent. Soc. Lond.* (1893), XXX. W. H. B. Fletcher. ♂ *ocularis* and ♀ *or*.

Figures.—Probably 533a and 533c, vol. VIII. of Ernst and Engram., *Pap. d'Europ.* 1792 are this form.

Orig. Descrip.—1893, *Proc. Ent. Soc. Lond.* "Resembled the female parent [*or*], except that both orbicular and reniform stigmata were very conspicuous, being pure white filled up slightly with black, whereas in *C. or* they are usually inconspicuous, and the orbicular is sometimes wanting. None of the *C. or* bred had the stigmata developed so fully as had the hybrids, which were most uniform in this respect. The tone, too, of the *C. or* shown was decidedly brown, while the others were grey."

These were subsequently named by Tutt hyb. *fletcheri*. *Br. Lep.* V. 35 (1906).

ab. *interrupta*, Splr., *Schm. Eur.* I. 334.

Orig. Descrip.—"Frequently the outer discal border of the orbicular is broken through, and in an example in the coll. of M. Daub, the inner border is also broken."

race *sareptensis*, Splr. *l.c.*

Habitat.—S. Russia.

Orig. Descrip.—"From Sarepta I saw a paler, less tinted, red-brown specimen; the stigmata at their margins were separate from one another."

race *amurensis*, (Bng.-Hs.) Warr. (Stz), *Pal. Bomby.* II. 327.

Orig. Descrip.—"Smooth whitish-grey: banded dark grey: lines limiting median area black and double, sometimes filled in with black: hindwings with pale outer curved band: forewing shows no trace of rosy or brown coloration."

The example of the race *amurensis* of *C. ocularis* in the B.M. is somewhat smaller, a very neat insect, with quite clearly cut distinct markings without trace of fuzziness, and more silvery looking than the average European *ocularis*.

Cymatophora or, Schiff.

Orig. Descrip.—Schiff. *Verz.* p. 87 (1776).

"Die Oberflugel grauliche. Albern Eulen Raupen (*Populus nigrum*)" *i.e.*, "the grayish winged Noctua of the poplar."

Tutt (*Br. Noct.*) cites Fabricius, *Mant.* II. 165 (1787) as the original describer, but in his supplementary notes (vol. IV. p. 82) states that Sven Lampa (*Ent. Tid.* 1885. p. 47) points out, that Goeze in his *Beitr.* III. (3), p. 253 (1781) names the species *ypsilon-graecum*; the suggestion being that the latter name should be substituted.

The tangle is really worse than this. It appears that De Geer (1771) *Mem.* II., p. 423, plt. 7, described and figured the species thus —"Phalene à antennes filiformes, à trompe, à ailes rabatues, d'un gris d' agathe, à nuances couler de lilas, et à rayes ondeés noirâtres, avec une tache couleur de souffre en γ." The figure leaves no doubt as to the identity of the species and the description, but no name was bestowed. Then Goeze (1778) in his *Ubersetz* of De Geer's work, II. (1), p. 307, translated the above into German, but did not name the species until he wrote his *Beitr.* III. (3), p. 253 (1781), when he called it *ypsilon-graecum*, no doubt quite in ignorance of what Schiffermüller had done in 1776. Retzius, *D.G. gen. et. sp.*, p. 47 (1783), gave it the name *gamma-graecum*. Then in 1787 Fabricius (*Mantissa*) returned to the original name *or*, without giving the authority for it, hence its being cited to him.

The species was still a considerable trouble to the older authors for De Villers (1789) in his edition of the *Entomologia*, called it *gamma-graecum*. Borkhausen (1790), in Scriba's *Beitr.* I., p. 66, plt. 6, described and figured it under the name *consobrina*. Esper (1791), in "*Abb. Schm.*," as *octogena* var., and Beckwith (1794), *Trans. Linn. S.* II., p. 4, plt. 1, followed by Donovan, X., plt. 347 (1801) as *gemina*. In the same year Fabricius, *Ent. Sys. emend.* III. (2), 86, continued the use of *or*.

It may be possible, of course, that Schiffermüller (1776) included both the poplar feeders in his *or* (even Esper took *ocularis* and *or* as two forms of one species), but the former species had already been fully diagnosed by Linnaeus (1767), and the name *or* was available for the other species of poplar feeder.

Note :—In 1888, Aurivillius (*Nord. Fjar.*) reasserted that Clerck's *flavicornis* (*Icones*, 1759, plt. 6, f. 9), was the prior name of this species. Werneburg (*Beitr. Schm.* I., 248), in 1864 had already discussed this question thoroughly, and pointed out, that although Clerck's figure was very similar to *or* in the forewing, the antennae, the salient feature of Linneus' *flavicornis*, were characteristically yellow and thick, and that the contrast of the basal colour of the fore- and hindwing was that of *flavicornis*, L., and not that of *or*. See Zell. *Stett. e. Z.* XIV. 409 (1853) ; Gn. *Noct.* I. (V). 18 (1852).

Tutt. *Brit. Noct.* I. 3 (1891) : Barrett *Lep. Br. Isles.* III. 198, plt. 117 (1896) : Stdgr. *Cat.* ed. 3, no. 2843 (1901) : Splr. *Schm. Eur.* I. 334, pl. 78, pl. 21 (*l*) (1908) : South *Moth. B.I.* II. 88, plt. 36 (1907) : Warr. (Seitz.) *Mac. Lep. Bomb.* II. 327, plts. 49, 56 (1912) : Houlbert. *Lep. Comp.* XVIII (1). 163 (1921).

Tutt names two British forms, race *scotica* and ab. *flavistigmata*.

The Scotch race is described as being paler, on the average, than British specimens, with costa strongly pink and markings more strongly emphasised, and the union of lines into bands more complete, while the stigmata are generally less distinct. The ab. *flavistigmata* is described by its name.

Spuler says, *l.c.*, " The stigmata are very variable in size and colour, but seldom appear quite pale green. Small examples may have quite obsolescent markings."

The British examples in the B.M. are more clearly marked than those in continental series and are quite comparable to the Amur form (*angustata*).

The following is a list of the forms, etc., to be considered :—

race *improvisa*, H. Edws. *Proc. Calif. Ac. Sci.* V. 189 (1873). California.

race *ampliata*, Btlr. *An. Mag. N.H.* (5) I. 78 (1878). Japan.

race *octogesima*, Btlr. *l.c.*

race *intensa*, Btlr. *An. Mag. N.H.* (5) VII. 234 (1881). Japan.

race *angustata*, Stdgr. *Rom. Mem.* III. 231, plt. 17 (1885). Amur.

ab. race *tearlii*, H. Edws. *Ent. Am.* II. 11 (1886). California.

race *scotica*, Tutt. *Ent.* XXI. 46 (1888). Scotland.

ab. *flavistigmata*, Tutt. *Ent.* XXI. 46 (1888).

ab. *unimaculata*, Auriv. *Nord. Fjaril.* 77 (1888).

race *terrosa*, Graes. *Berl. ent. Zeit.* 150 (1888). Amur.

race *orbicularis*, Moore. *Proc. Zool. Soc. Lond.* 407 (1888).

race *ornata*, Leech. *Proc. Zool. Soc. Lond.* 653 (1888). Japan.

ab. *unicolor*, Leech. *l.c.*

[ab. *fasciata*, (Teich.) *Stett. e. Zeit.* 356 (1892)] no name given.

race *gaelica*, Kane. *Ent.* XXVII. 125 (1894). Ireland.

ab. *fuscostigmata*, Strand. *Arch. Math. og. Nat. Christ.* XXV. 22 (1903).

ab. *unifasciata*, Spul. *Schm. Eur.* I. 334 (1908).

ab. *obscura*, Spul. *l.c.*

ab. *fasciata* (Teich.) Spul. *l.c.*

ab. *albingensis*, Warn. *Ent. Zeit.* XXII. 8. 126. fig. (1908).

race *fasciata*, Brns. and McD. *Jr. N. York Ent. Soc.* XVIII. 160 (1910). Vancouver Is.

ab. *undosa*, Wile. *Trans. Ent. S. Lond.* 282, plt. 30 (1911). Japan.

ab. *marginata*, Warn. *Int. Ent. Zeit.* V. 241 (1911).

ab. *albingoradiata*, Bunge. *Int. Ent. Zeit.* V. 287 (1911).

ab. *discolor*, Warr. (Seitz). *Gr.-Sch.* (*Pal.*) II. 327, plt. 56a (1912).

ab. *robertsi*, Ruhm. *Ent. Zeit.* XXVII. 83 (1912).

ab. *suffusa*, Warr. (Seitz.) *l.c.* 329 plt. 56a (1912).

ab. *angustimedia*, Warr. (Seitz). *l.c.* plt. 56b (1912).

ab. *albingosubcaeca*, Bunge. *Int. Ent. Zt.* VII. 85, 306, plt. 8 (1913).

ab. *permarginata*, Haseb. *l.c.* VIII. 53 (1914).

ab. *albingoflavimacula*, Haseb. *l.c.* X. 97 (1916).

ab. *costaenigrata*, Kujan. *l.c.* X. 141, 148 (1917).

ab. *confluens*, Closs. *l.c.* XI. 84. (1917).

race **hibernica**, Turner.

race *improvisa*, H. Edws., *Proc. Calif. Ac. Sci.* V. 189 (1873).

Orig. Descrip.—" Head grey with a rosy tinge, palpi short, dark brown, black at their tips. Antennae light chestnut brown whitish above. Tibiae and tarsi light brown, banded with black, with a rosy hue at their base. Thorax and prothorax velvety black, patagia grey. Abdomen olive grey above and below, tip rosy.

" Anterior wings rich olive brown, with a yellowish green blotch at base, and an oblong one at the apex, which latter rests on a narrow waved line of the same colour running to the interior margin. Central fascia smoky grey, broadest towards the costa and much notched anteriorly, the brown spaces on each side being traversed by several indistinct waved black lines. On the costa toward the apex are some minute rosy streaks directed toward the centre of the wing. Posterior margins with a row of velvety black, lunate marks. Fringes rosy grey. Posterior wings very glossy, with a rosy hue, and a row of indistinct lunate black marks along the margin. Fringes rosy grey. Underside dull smoky grey, darker towards the margins, with a waved brown line across the middle of the lower wings."

Figure.—Barnes and Mc.D. *Contrib.* I. IV., plt. XII., f. 4 (1912).

ab. form *tearlei*, H. Edws., *Ent. Am.* II. 11 (1886). California.

Orig. Descrip.—" Ashen grey crossed by two slightly waved lines of reddish brown, which are edged distinctly with black. The median space is a little lighter than the rest of the wing. Posterior margins slightly clouded with dusky. A narrow black marginal line. Lower wings dusky. Beneath, dusky without marks. Thorax reddish brown in front, grey on disk, as is also the abdomen." California.

Figure.—Holland, *Moth Bk.* 304, plt. XL. 27 (1903).

These two are considered together as Smith (Cat.), Dyar (List) and Holland (Moth Bk.) all treat them as identical.

Grote says of *improvisa*, *Bull. Buff. Soc. Nat. Sci.* III. 78 (1875).—" Recalls the European species *C. or* and *C. ocularis* in ornamentation. Eyes naked. The fringes beneath have a rosy hue, as also the apical marks of the primaries on the under surface."

Holland's figure (*l.c.*) supports this strongly.

Barnes and Mc.D. in *Contrib.* I. IV., say.—" *B. tearlei*, Edw. is of a dull grey colour and has a lack of contrasting markings."

The figure of *improvisa* is extremely like that of *or* in Barrett. Most of the markings and shades are practically identical.

My note on the B.M. specimens is, that the American *improvisa* have a striking appearance from the contrast of the light central band with the rest of the forewing. The very black margins to this band in the form *tearlii* are not emphasised in *improvisa* except that their inner sides have a slightly lighter, faint ribbon of the central band. The *tearlii* have jet black marginal lines to the central band, but its conspicuousness is much reduced by the shade of the generally dull suffusion with which the wings are covered. It appears from figures and descriptions in the absence of series of both, that the two names must stand as indicating differing forms of an insect very close to our British *C. or*.

race *ampliata*, Btlr., *Ann. Mag. N.H.* ser. 5, I. 78 (1878.)

Figures.—Btlr. *Ill. Het. B.M.* II., plt. 28 (1878) : Warr. (Seitz). *l.c.* II. 49g.

Orig. Descrip.—"Allied to C. *or*, but considerably larger, the primaries of a silvery grey instead of whity-brownish tint, the inner band darker, straighter, with more dentated limiting lines, the outer band with an additional angle towards the costa, and with the outer line more regularly undulated, blackish and parallel to the inner line, fringe darker, secondaries darker, thorax greyer, head, collar and antennae testaceous." Yokohama.

race *octogesima*, Btlr. *l.c.*

Figures.—Btlr., *Ill. l.c.*, plt. 28 : Warr. (Seitz.), *l.c.* II., plt. 49f (as *intensa*).

Orig. Descrip.—"Allied to *C. ocularis*, but much larger, of a dark silvery grey tint, with the transverse lines and margins of the 80-like reniform and orbicular spots deep black, the lines near the base more dentated, the central band wider and its external limiting line irregularly zigzag ; fringe of secondaries paler." Yokohama.

Between these two there seems no essential difference in the figures, and they probably represent more or less individual forms from the same restricted area, Yokohama.

The British Museum series gives one the idea that *C. ampliata* is a large edition of *C. or*, like many Japanese species which repeat our European forms enlarged. It contains all the characteristic markings, shades, emphasis, and suppression, with slightly more tendency to distinct banding on the hindwing. The reniform is filled in with jet black at the base in most examples. The orbicular is generally obsolescent as in *C. or*, and there is also the peculiar, curled hook-mark at the apex of the forewing as in that species.

race *intensa*, Btlr. *Ann. Mag. N.H.* ser. 5, VII. 234 (1881).

Figures.—Warr. (Seitz.) *l.c.* : Obthr. *Ét.* V., plt. 3.

Referring to *ampliata*, Obthr., *Ét.* V. 67 (1881). Butler says.—"It will perhaps be best to give the name of *C. intensa* to the Japanese species of this name, and thus save all confusion."

Oberthür gives no description, but figures an insect, which he believes to be *ampliata* of Btlr. Butler says it is not his *ampliata* and names it *intensa*. Oberthür's figure is not helpful.

race *angustata*, Stdgr., *Rom. Mem.* III. 231 (1885).

FIGURE.—Stdgr. *l.c.*, plt. 17.

ORIG. DESCRIP.—"The specimens vary somewhat in size from 43-45mm. *C. angustata* is coloured and marked quite like the well-known *C. or*, or even as *C. ampliata* from the Amur, but is distinguished by its far narrower wings, especially from *ampliata*, which also has a different coloured yellowish or brownish prothorax and head. In *angustata* the prothorax, as well as the thorax, is grey, somewhat mixed with whitish, with black streaks in the middle and at the end. Of the black transverse lines of the forewings, that before the two stigmata is most distinct, mostly also doubled and borders on a somewhat darker basal band-like portion. The two greenish white stigmata stand out very distinctly. The orbicular always has a black centre, and the reniform is in its lower portion always filled in with black, whereby all true *angustata* are distinguished from the other nearly related species. Also in *C. or* the orbicular is very rarely, never distinctly, black centred, and is very small in *ampliata*." Amur.

An examination of the B.M. series gives one the strong opinion that the sets labelled *C. angustata* and *C. intensa* are undoubtedly forms of *C. ampliata* and almost identical with that form in size, markings and emphasis of markings, even to the jet black base of the reniform.

Warren (Seitz) treats *octogesima*, Btlr., *intensa*, Btlr., and *angustata*, Stdgr., as scarcely separable from *ampliata*.

ab. *unimaculata*, (Meves) Auriv. *Hand. Nord. Fjär.* 77 (1888).

ORIG. DESCRIP.—"The inner or orbicular spot on the middle band of the forewing absent."

race *terrosa*, Graes. *Berl. ent. Zeit.* 150 (1888).

FIGURE.—Warr. (Seitz). *Pal. Gr.-Sch.* II., plt. 49h.

ORIG. DESCRIP.—"The numerous specimens collected by me have a strikingly different appearance from the European; since the larvae from which I bred the greater number of these specimens, belonged quite without doubt to *P. or*, I name it without hesitation, as a race of *P. or*. In *P. or*, the forewings have an ashy-grey colour, occasionally reddish suffused on the costa and slightly silky gloss; in var. *terrosa* this gloss is absent, the wings have a peculiarly earthy appearance and a whitish slaty grey colour, which usually almost wholly fills up the middle band; the remaining parts of the wing, especially on the costa are mostly also powdered with slaty-grey, so that of the ashy-grey colour of the typical form only a few longitudinal traces remain over in the middle of the wing. The hairing of the head and thorax are also very much mixed with slaty-grey. The outstanding character of *terrosa* is the want of the greenish white stigmata; the reniform is marked only by a small obsolescent dark streak, which sometimes has a yellowish tinge, while the orbicular is wholly absent." Wladivostock, etc.

Nicolajefsk, Chabarofka, Pokrofka, Wladivostock.

Spuler *l.c.*, sums this up, "With grey fore-wings and almost total obsolescence of the stigmata."

The B.M. *terrosa* is very plainly recognisable as an *or*, with the stigmata and the two sets of quadrate lines all very clear and typical.

race *orbicularis*, Moore. *Proc. Zool. S. Lond.* 407 (1888).

Figures.—Butlr. *Ill. Lep. Het. B.M.* VII., plt. 126, Warr. *l.c.*, plt. 49f.

Orig. Descrip.—" Dusky brownish grey. Forewing with a slender, distinct, black transverse antemedial, and a postmedial waved line; orbicular and reniform spot black-lined, the former with a whitish centre; between the antemedial line and the base are four or five transverse, indistinct, pale-bordered, blackish, sinuous lines, and beyond the postmedial line are two similar but wider separated discal lines, the outer lines being most distinct and ending at the apex; a less distinct line also contiguous to the postmedial line; along the extreme outer margin is a fine black lunular line. Hindwing greyish brown, indistinctly paler across the middle; cilia cinereous. Legs with black bands." Dharmsala. 41-42mm.

Of this form Butler remarks, *Ill. B.M.* VII. 48 (1889).—" Nearly allied to *P. flavicornis* of Europe, but much browner; the wings more seriaceous; the inner black line of the central belt of primaries more angular, the four lines across the basal area better defined and more irregular; the discoidal spots smaller and better defined; the secondaries darker and more uniformly coloured; the collar frequently reddish. Under surface darker and more uniformly coloured."

The figures of *orbicularis*, both in Butler. *Ill.* and in Seitz favour *or* much more than they do *flavicornis*, in size, trend of markings, the stigmata, and the positions of the general shades. Particularly the shape of the wings of Butler's figure are those of *or* and not of *flavicornis*.

race *ornata*, Leech. *Proc. Zool. S. Lond.* 653 (1888). Japan.

ab. *unicolor*, Leech. *l.c.*

Figures.—Warr. *l.c.*, plt. 49g (2).

Orig. Descrip.—" Primaries: ground colour greyish brown, browner along the base and costa; a series of dark wavy lines forming a broad band, the internal border of which is curved and sharply serrated, and the outer elbowed below the subcostal nervure, and indented above the inner margin; central fascia greyish white towards the inner margin, bordered externally by a blackish double line deeply angulated towards the outer margin, followed by a dark serrated line, and a fainter submarginal dentated line curving from the apex of the wings to the outer margin; a series of black linear marks along the outer margin; three tufts of raised black scales, one forming a basal dash, the second representing the orbicular stigma, and the third, which is edged with whitish, the reniform stigma. Secondaries fuscous brown, darker towards the margins." Japan and Corea.

ab. *unicolor*.—" Darker than the type and without any trace of the central fascia, the only markings noticeable being the basal dash and the submarginal bands. No greenish tinge."

The descriptions of these two forms do not speak of the shape of the forewing as being in anyway exceptional, but the figures in Seitz have extraordinarily pointed apices suggestive of malformation. The markings however are *or*-like.

ab. *fasciata*, Teich. *Stett. e. Zt.* 356 (1892), no name given with the description.

ab. *fasciata*, Spulr. *Schm. Eur.* I. 334 (1908).

Orig. Descrip.—I. "Of this species I bred on June 15th, 1892, two remarkable specimens. They are large and coarsely powdered like typical examples and the transverse lines of the forewing form dark bands, hence the specimens have an unusual appearance. The first transverse streak (or properly band) consists of three sharp dark lines, of which the middle one is very broad, and the two paler of which are included in the ground colour of the forewing. The outer cross-band consists of four lines of which the first (numbering from the base) is dark, the second pale, the third broad and dark, and the fourth sharp and pale. The stigmata are quite obsolescent not showing a trace of the white-yellow."

II. Spuler summarises the above and adds, "Dark specimens can have on the inside of the middle area three, and outside of it two, prominent, wide, and blackish transverse lines."

race *gaelica*, Kane. *Ent.* XXVII. 125 (1894), Ireland.

Orig. Descrip.—"♀ The ground colour is pearly white, almost obliterating all traces of the stigmata, and the fasciae are formed of very broad and almost black lines."

Two examples 1 Scotch, 1 Irish.

ab. *unifasciata*, Splr. *l.c.*

Orig. Descrip.—"In pale toned examples the outer transverse lines can be quite obsolescent, the inner transverse line-band standing out darker."

ab. *obscura*, Splr. *l.c.*—"The reniform stigmata are only just indicated, the examples I know of particularly have uniformly dark grey-toned ground of forewings with dark hindwings."

ab. *albingensis*, Warn. *Ent. Zeit.* XXII. 8, 126, fig. (1908).

Figures.—Warn. *Ent. Zeit.* XXII. 126, fig. (1908); *Int. Ent. Zeit.* V. 41, fig. (1911); *l.c.* VII., plt. VIII., fig. 2 (1914); *l.c.* X. 117, fig. (1917).

Orig. Descrip.—"The thorax, which in the normal form is coloured grey to greenish-grey, is of deep black, body and legs are more grey-black. The forewings are deep black like the hairing of the thorax up to the two whitish green characteristic spots, which are light in contrast with the dark surrounding. Towards the outer margin the black colour is somewhat paled and becomes in a few specimens a very dark grey. The dark bands and markings thus show through very weakly; they agree quite with the typical form. The hindwings are dark grey, as is the abdomen, but distinctly darker than in a normal specimen. The underside is of a similar dark green. Divergences among the forms are found only so far as that the forewings vary from pitch black to black-grey."

On the moors at Eppendorf, Borstel, and Eidelstedt near Hamburg, taken at light.

race *fasciata*, Barnes and McD. *Jr. N. York Ent. S.* XVIII., 160 (1910). Vancouver Is.

Figure.—Barnes and McD. Contrib. I., IV., plt. XII., f. 5 (1912).

The Entomologist's Record & Journal of Variation.

VOL. XXXVIII. (new series) (1926.)

SPECIAL INDEX.

By Hy. J. TURNER, F.E.S.

Coleoptera arranged in order of Genera. The other orders arranged by Species. Genera, Species, etc., new to Britain are marked with an asterisk, those new to Science with two asterisks.

ACARINA.

ARANEINA.

COLEOPTERA.

DIPTERA.

HYMENOPTERA.

LEPIDOPTERA.

ORTHOPTERA.

RHYNCHOTA.

MISCELLANEOUS.

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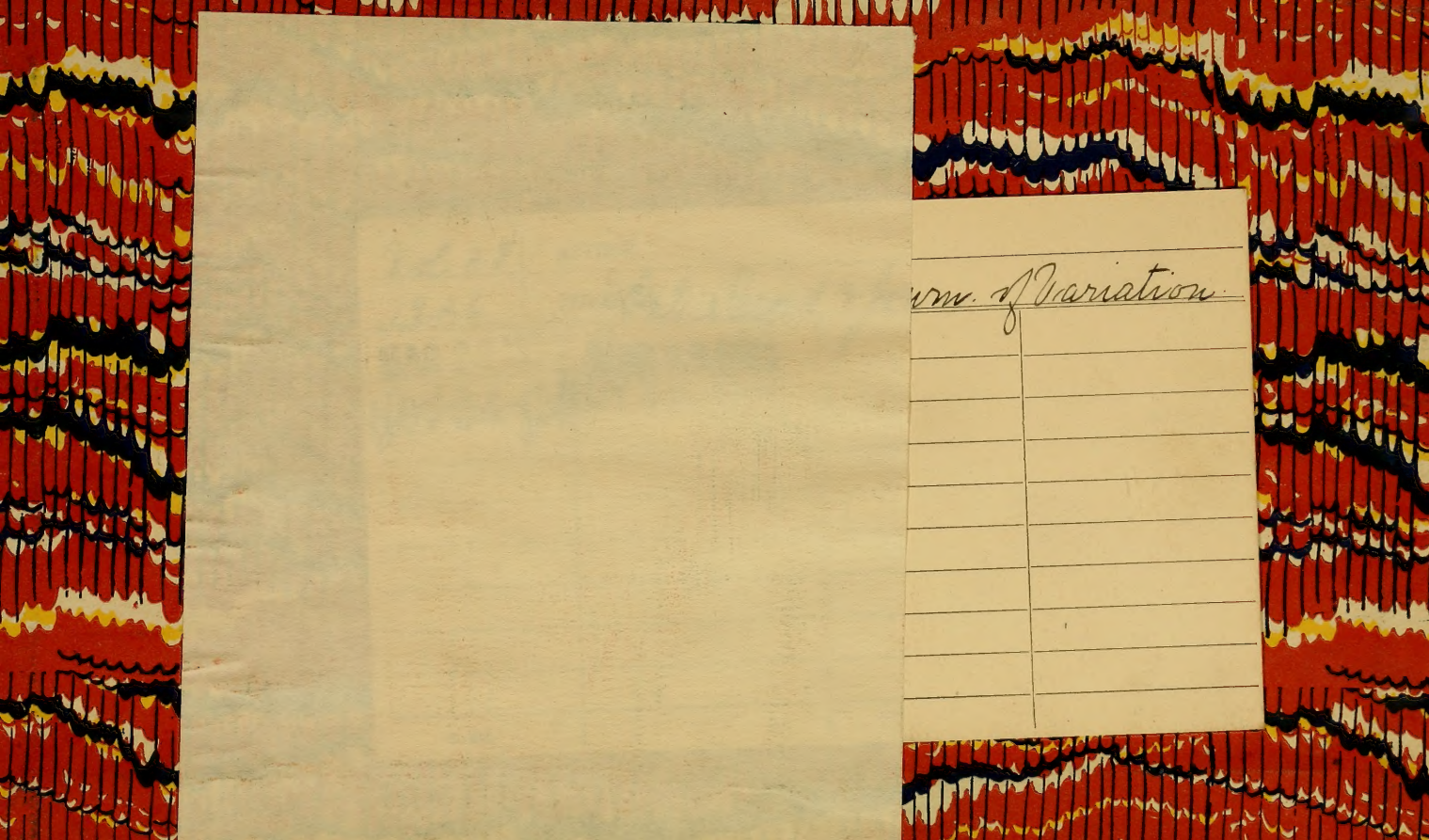
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