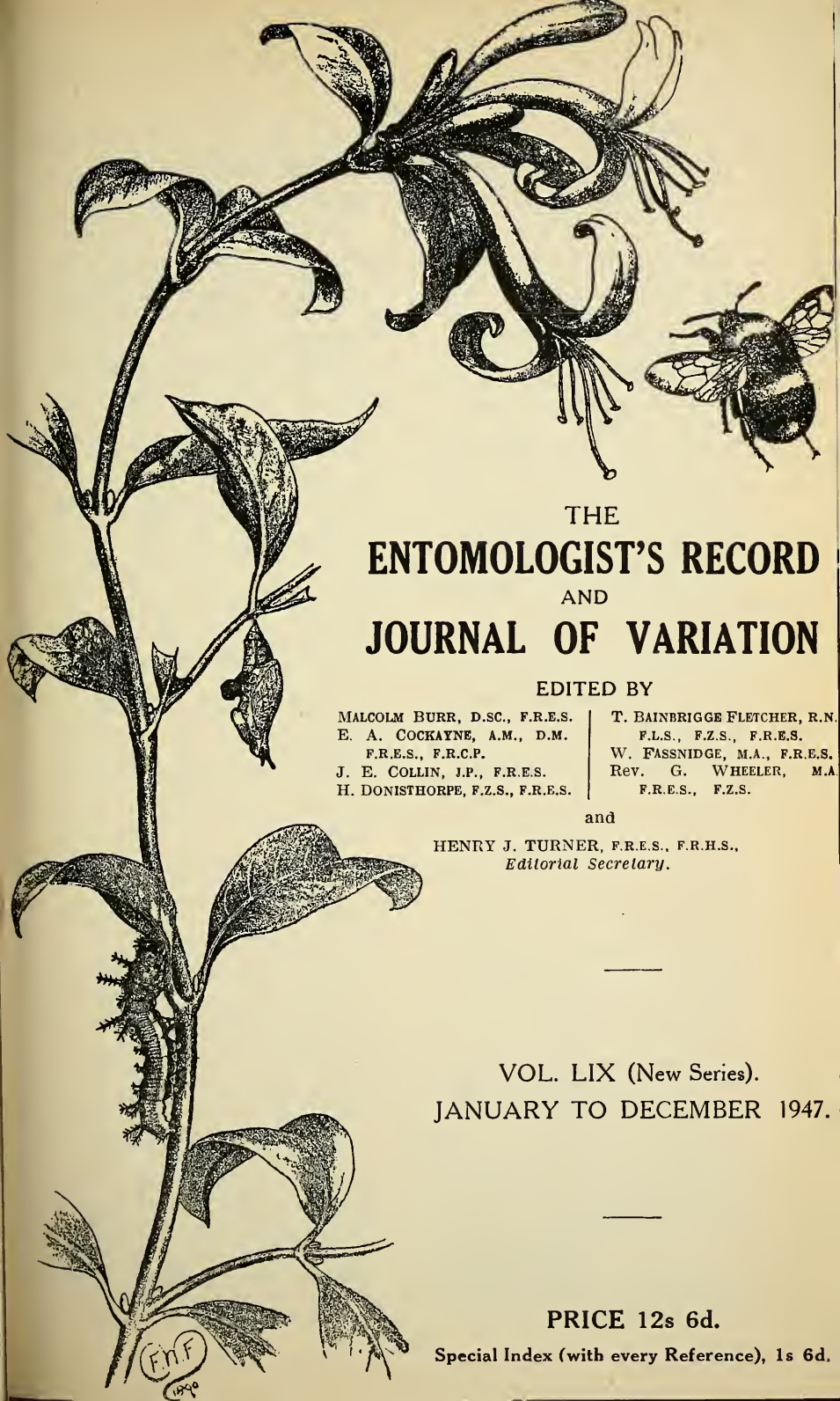

THE

# ENTOMOLOGIST'S RECORD

AND

# JOURNAL OF VARIATION

EDITED BY



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VOL. LIX (New Series).

JANUARY TO DECEMBER 1947.


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By HY. J. TURNER, F.R.E.S., F.R.H.S.

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As we are going to press we regret to announce the death of Rev. G. Wheeler, who would have been *Editor Emeritus* in 1948.

Vol. LIX.

No. 1

JANUARY 1947

# ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION



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# The Entomologist's Record
AND
# Journal of Variation

VOL. LIX. 15TH JANUARY 1947. No. 1.


## TRIGONOPHORA FLAMMEA (EMPYREA) IN DEVON.

By Frank H. Lees.

A notable addition to my list of moths captured at Maidencombe was made on 2nd October last. Migrants rare and otherwise are to be expected in late autumn on the S. Devon coast, but never had I imagined that I should see *Trigonophora flammea* (*empyrea*) fly into my moth trap as I did that night. It was a male in very good condition. After so long a lapse in British records of the species we must regard it (Dr Cockayne tells me) as a migrant. It is not uncommon, I understand, across the Channel, so that if mine was but one of several that were urged to travel Devonwards this autumn, let us at least cherish the hope that a colony may have been founded (as presumably was the case in Sussex in the middle of last century) that will restore a truly fine insect to the British list. I know very little myself either of Sussex or of the far-off days when *T. flammea* was regarded by all as an indigenous species, but Mr A. J. Wightman from his knowledge of the old Sussex collectors and localities has been able to give me the following information to help us in bridging the long gap in published records. " According to the old Lewes collector, Mr J. E. R. Jenner, the last year in which *T. flammea* occurred in any numbers was 1879. From then until 1892 there were hopes, if not expectations, that it would be found again and it was several times said to have been found oddly, but by that year the fact that it was gone was generally accepted." Mr Wightman tried all the Lewes spots himself 40 years ago and during these 40 years has tried likely places as well as the historic places and has never seen it or met anyone who had personally done so, but from time to time has been told that it has been taken ever since 1900.

Mr Wightman's personal opinion is that " *T. flammea* appeared as a result of immigration in 1855 " (Stainton's *Entomologist's Annual* for 1856, p. 30, claims it as a " New British species of 1855 "). " In the following years the species gradually spread; then after 1879 lost ground and died out long before 1892. It had been fairly plentiful and no one was prepared to say positively at the time Tutt, for instance, was compiling his " Hints " that the species was gone and so old records were used as if current."

" Some of the supposed captures since may, of course, be correct and be immigrants, but it is to be feared that many old-taken *flammea*, which lacked labels (usual), were provided with data and the dates guessed."

" To sum up " (Mr Wightman says) " I do not think that *flammea* (*empyrea*) has been an inhabitant of Sussex for 60 years."

There is a record of breeding *T. flammea* by a Devonshire correspondent of the *Entomologist's Record* in 1906 (Vol. 18, p. 136); data as to the origin of the ova are lacking, which is a pity, but if they had been laid by a Devon capture one cannot imagine even the least data-minded collector omitting to state the fact. The only other reference I can find since then is on p. 19 of Vol. 54 of *The Entomologist*—an account of a dead specimen found in a spider's web at Chailey in 1921, to which Dr Cockayne directed my attention. More than one explanation of its presence there has been offered me, but having some respect myself for spiders' webs and bats' midden heaps as " signposts " I think it was probably just another but less well-directed " migrant " than the one whose advent I am recording.

## THE RATE OF PROGRESSION IN ANTS.

By Fergus J. O'Rourke, M.Sc., F.R.E.S.

As Mr Pickles has recently (1946) pointed out some interesting facts in regard to the speed of ants, it may be of value to record some further observations on the question. In 1942 I obtained some specimens of the ant *Tetramorium caespitum* at Ballyteige, Co. Wexford. Since this ant is rather rare in this country, I made some observations on the speed at which it travelled with a view to comparing its speed with that of the more common Irish species. Unfortunately, I have not since had the opportunity of doing these further experiments so that it is worth using this occasion to publish the figures for *Tetramorium*. The observations recorded in the table herewith were made on 10th July 1942 at 16.00 Irish Summer Time and at a temperature of 20° C. Two winged females and ten workers were used. The method was to introduce the ants into a narrow bore glass tube about 60 cms. long and to time the speed of the ant over the middle 50 cms. of this tube. It was, however, found that while the females walked the entire length of the tube that the workers, owing to the relatively large bore of the tube, tended to turn back after a short distance. It was therefore decided to time the workers over the length of their first run, provided that this was not less than 10 cms. The time which would be taken to cover 50 cms. was then calculated and is shown in the third column of the table below; in brackets after that figure is given the distance covered by the ant in question.

TABLE SHOWING THE TIME TAKEN TO COVER 50 CMS.

| Expt. | Female A. | Female B. | Workers. |
|---|---|---|---|
| 1. | 37.3 secs. | 46.6 secs. | 122 secs. (120 mm.). |
| 2. | 28.8 secs. | 27.1 secs. | 111 secs. (110 mm.). |
| 3. | 28.7 secs. | 33.4 secs. | 147 secs. (130 mm.). |
| 4. | 27.6 secs. | 24.9 secs. | 167 secs. (150 mm.). |
| 5. | 27.6 secs. | 26.4 secs. | 187 secs. (220 mm.). |
| 6. | 25.9 secs. | 25.5 secs. | 135 secs. (500 mm.). |
| 7. | 29.8 secs. | 35.6 secs. | 158 secs. (200 mm.). |
| 8. | 31.8 secs. | 31.9 secs. | 110 secs. (300 mm.). |
| 9. | 32.5 secs. | 35.5 secs. | 124 secs. (200 mm.). |
| 10. | 29.3 secs. | 28.2 secs. | 188 secs. (100 mm.). |

*Average time taken to cover 50 cms.*:

Female A:—29.9 secs., i.e., 103 cms. per min. or 41.2 ins. per min.
Female B:—31.5 secs., i.e., 95.2 cms. per min. or 38.1 ins. per min.
Workers:—144 secs., i.e., 20 cms. per min. or 8 ins. per min.

Several remarks may be made on the times recorded above: first, it may be noted that the speed of the two females did not differ appreciably between the two specimens and from one trial to another; secondly, there is considerable variation between the speeds of the workers, the speed of the fastest (No. 10) being almost twice as fast as the slowest (No. 8). Further, the speed of the females was nearly five times that of the average of the workers. It may be of interest to record that the female of this species is just twice the length of the workers. In all cases it may be noted that the speeds are considerably greater than those recorded by Pickles.

Pickles (*loc. cit.*) has drawn attention to many of the factors involved in determining the speed of ants. Two further factors may be considered here. Temperature is an exceedingly important factor in determining the speed at which the ants travel. J. Huxley (1928) quotes the case of an ant which, at 50° F. moved at 52 feet per hour, moved at 780 feet per hour at 100° F. (I have been unable to trace the original reference.) The second factor is what may be called the metabolic state of the ant. S. C. Chen (1937) showed that ants could be divided into two groups which he called leaders and followers respectively. In any nest one could find these groups and as the leaders showed a higher metabolic rate (being more easily affected by anaesthetics, desiccation, and starvation) they would travel at a greater speed. In a further paper Chen showed that if a follower were placed with a group of ants it was stimulated to a greater extent than was a leader. Pickles (*loc. cit.*) says " a small ant may travel quicker than a larger one over a given distance because it is carrying nothing and the larger one may possibly be carrying a load, or there may possibly be no such cause—the individual ant may be more ' interested ' in its immediate surroundings than its fellows and will therefore travel more slowly on that account." It may be suggested that an explanation based on Chen's work may be more likely, although undoubtedly an ant out foraging would be very interested in its surroundings and would probably travel more slowly on that account.—Department of Zoology, University College, Dublin, 18th November 1946.

---

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## TUKDAH DIARY, SEPTEMBER-NOVEMBER 1945.

By D. G. Sevastopulo, F.R.E.S.

(*Continued from p. 154.*)

21st September.—A fine sunny morning and numbers of *Y. sakra*, *L. daraxa*, *Z. flegyas*, and *D. adonira* were settled on the damp road, the only other butterflies seen were two male *Neptis ananta*, Moore, *ochracea*, Evans, a male *Hestina nama*, Dbl., and a male *Pseudergolis wedah*, Koll., all on the road, and a female *Euploea mulciber*, Cr., *mulciber* and a *Danaus aglea*, Cr., *melanoides*, Moore, flying. A black and blue *Papilio*, probably *P. arcturus*, Westw., and two of the green *Euthalia* flashed past but were not caught. A single *Eressa* (*Syntomis*) *multigutta*, Wlk., was settled on a leaf, and a number of small Geometers, all previously recorded, were disturbed by beating. Nothing new in the way of larvae. The Lasiocampid mentioned twice previously is a catholic feeder; examples were found on Ginger, Nettle, an unidentified creeper, an unidentified shrub and a coarse grass. The afternoon and evening were misty, beating undergrowth produced a number of the common, small Geometers, the only one hitherto unrecorded being *Scopula* (*Craspedia*) *remotata*, Guen., and a single *Filodes fulvidorsalis*, Hbn. A single *Baoris eltola*, Hew., was taken at flowers. Light again a complete failure.

22nd September.—A walk along a path on the open hillside in mist broken by sunny spells, *Y. sakra* and *Z. flegyas* common, also a few *Eurema* (*Terias*) *blanda*, Bsd., *silhetana*, Wall., *Ypthima nareda*, Koll., *newara*, Moore, *Y. baldus*, *Argynnis hyperbius*, L., *hyperbius* and *Baoris bevani*, Moore, *bevani*. A number of small larvae of *P. helenus*, *M. troglodytus* and *Cosmophila mesogona*, Wlk., and a pupa of *C. correspondens* were found. A neighbour sent me a number of larvae of *Phytometra tarassota*, Hamps., and *P. orichalcea* off Geraniums from his garden and one of *Boarmia acaciaria*, Bsd. off Rose. A rainy afternoon, but a walk through the lower forest produced a male *Orinoma damaris*, Gray, and a single ovum each of *P. metallica* and an unknown Sphingid off Arum (the larva from this second ovum died in its first instar, but it was probably either *Pergesa elpenor*, L., *macromera*, Btlr., or *Rhyncholaba acteus*, Cr.). A visit to a friend's garden in the evening produced a single *Eurema hecabe*, L., *contubernalis*, Moore, and larvae of *P. helenus* off orange, *R. albomarginatus* off Hydrangea and an unknown Arctiid (which failed to emerge) off Cosmos. A full moon, but before it rose a single male each of *L. chalybeata* and *E. multistrigaria* came to the light.

23rd September.—A misty morning again with bursts of sunshine. A walk through the forest produced nothing new but a male *Krananda semihyalina*, Moore, spread out on a large leaf and looking exactly like a skeleton leaf itself. On the way home a male *Papilio rhetenor*, Westw., *rhetenor* was seen but not caught. A wet afternoon, but a search over a small vine growing up the side of the house produced three 2nd instar larvae of *Theretra alecto*, L., *alecto* and one of *Dasychira feminula*, Hamps. (this determination is not absolutely certain, the imago being a female). A dull evening devoted to larva hunting, more *L. katinka* and what is probably an Agaristid (it subsequently died

as a pupa) off Virginia Creeper. Light rather more productive, several *Miltochista phaeodonta*, Hamps., *A. strigipennis*, and *E. reticulata* and a single *Euplexia auroviridis*, Moore.

24th September.—Another dull, misty morning with very few butterflies about, a female *Pantoporia cama*, Moore, was found hanging to its empty pupa-case and a male *N. feisthamelii* was caught. A dark Zygaenid (described as a *Pidorus*, probably new, by the Forest Entomologist) was found hanging to a leaf. Several larvae of *Cidaria delecta*, Btlr., and of an unknown *Cidaria* (the Forest Entomologist determined it as being near *cinerea*, Moore) were found and no fewer than thirteen larvae of *E. repleta* were found on a single frond of bracken. Several more of the Lasiocampid larvae were found and all were, as usual, infested with red mite. A wet afternoon and a misty evening, the only thing found of interest being three larvae of *P. metallica* on an isolated Arum, what they would have done when they had eaten it bare I don't know, there were no other Arums anywhere near. In spite of a downpour, light was more successful, and a male *B. bevani* and specimens of at least twenty-three species of moths were attracted.

25th September.—Another dull morning with spells of watery sunshine, and again very few butterflies flying—species not encountered previously were *Argynnis childreni*, Gray, *childreni*, *Cethosia biblis*, Drury, *tisamena*, Fruhs., and *Zizeeria gaika*, Trim. A number of larvae of *P. metallica* off Arum (Bell and Scott write " appears to be rare " regarding this species), more of the unknown *Cidaria* and two of a Hemitheid (still unidentified). A female *Scopula* (*Craspedia*) *walkeri*, Btlr., was found settled on a bank. A drizzling afternoon and evening, but a walk after tea produced a pair of *E. pulchella in cop.* and a female of *T. crocoptera* settled on the underside of a large leaf. Larvae of *N. feisthamelii* were found on Ginger and of a Drepanid on oak (these latter all died, but appeared to be identical, without comparing them side by side, with larvae of *Albara argenticeps*, Warr., found subsequently on *Rubus*). In spite of incessant, torrential rain, some ten species of moths came to light.

26th September.—A wet morning and a drizzly afternoon. A fine spell at mid-day enabled me to go for a short outing, which produced a male *Heliophorus androcles*, Hew., *moorei*, Hew., and four species of larva—a new Lasiocampid, *Parallelia* (*Ophiusa*) *maturata*, Wlk., *Garaeus specularis*, Moore, and an unidentified Geometer. (The Lasiocampid and the unknown Geometer both failed to emerge, the former was a very beautiful creature, with a series of pointed dorsal tufts of canary yellow hair, which could be opened out, when the larva was alarmed, into rosettes with their centres filled with sharp brown bristles.) I have now forty-five receptacles containing larvae, tins of all sizes and small glass jars, and I have already described forty-five species of larva that I have not met with before (unfortunately the pupae from a number of these died in Calcutta, so these descriptions were wasted). A fine evening but the only things caught were an *O. damaris* and a *T. crocoptera*, and a cocoon very like that of the English *Hylophilina bicolorana*, Fuessl., was found (this produced an ichneumon, so could not be identified, but it was probably a *Tyana*). Light disappointing, no rain but only single examples of six species.

27th September.—A dull, sunless morning. A walk along the road on the open hillside produced nothing new except a single *Lethe rohria*, F., *rohria*, butterflies are very scarce, and an *Eterusia tricolor*, Hope, settled on a leaf. A number of larvae of *Brithys crini*, F. (*Glottula dominica*, Cr.) were found feeding on a species of Amaryllaceae, and one of *Sypna curvilinea*, Btlr., on *Rubus*. A wet afternoon. The evening was fine, and an attempt was made to take a series of the wet form of *M. francisca* in a small patch of forest where the dry form had been abundant in May and June 1944, only two were seen, but single specimens of the following moths were disturbed from the undergrowth: *Callidula erycinoides*, Wlk., *Heteromiza argentilinea*, Moore, and *P. decussata*. A clear, moonless night, but light a complete failure.

28th September.—A fine sunny morning and a walk along the forest road produced numbers of *Y. sakra*, *L. daraxa*, *Z. flegyas*, and *D. adonira*, with a few *P. wedah*, and *N. ananta*, settled on the road, *N. feisthamelii* in numbers were flying and settling on the flowers, and an *A. childreni*, an unidentified black and white *Pantoporia* and several *P. helenus* flew past but were not caught. *E. multigutta* was settled on the leaves in numbers and a pair of *Sewa* (*Macrocilix*) *orbiferata*, Wlk., were found resting side by side. A short walk in the afternoon produced another *M. francisca* and a *C. biblis*, and an unidentified *Euthalia* was seen but escaped. Mist came up in the evening, but a walk produced a number of *L. distorta* standing on their long legs and looking rather like small chips of wood. A set of wings of *Delias descombesi*, Bsd., *leucacantha*, Fruhs., was found on the path. Light again a complete failure.

29th September.—The day started well with a female *Boarmia* (still unidentified) and a male *Berta* (*Thalera*) *chrysolineata*, Wlk., at rest in the verandah. A drizzly morning, a *L. rohria* was beaten out of herbage and an *Abraxas sylvata*, Scop., was caught spread out on a leaf. A batch of larvae of a new Geometer (still unidentified) was found. An afternoon expedition after yesterday's *Euthalia* resulted in its capture, a very battered male of *Euthalia sahadeva*, Moore, *sahadeva*, this is probably the species that has been seen, but not caught, on previous occasions. A larva of *Fascellina plagiata*, Wlk., was also found. A drizzly evening, but, in spite of the weather, *A. fylla* was flying in the forest in numbers along with a few *O. damaris*. Searching and beating produced a single specimen each of *P. cama*, *E. lativitta* and *K. semihyalina*, as well as a larva of *Callimorpha plagiata*, Wlk. Single specimens of some half a dozen species of moths came to light.

30th September.—A pouring day, clearing up in the late afternoon. *Y. sakra* was flying in its usual numbers in the evening, and larvae of *Callidrepana obliquistriga*, Warr., and of *Cosmophila fulvida*, Guen., were found. Light attracted single specimens of some six species of moths.

1st October.—A misty morning with short spells of sunshine. The usual common things were flying on the road through the forest and the first specimens of *Lethe sidonis*, Hew., *sidonis* and of *Precis iphita*, Cr., *iphita* were seen. Numbers of *S. orbiferata* were settled on the upperside of leaves, and a female *Agylla* (*Sidyma*) *bipars*, Moore, was found. Larva hunting produced a batch of young larvae of *Argyda bheroba*, Moore, and larvae of *N. feisthamelii* and *Rhagastis aurifera*,

Btlr., *aurifera*. A misty afternoon, which I spent blowing larvae. In the evening a walk through the forest, searching and beating, produced examples of several previously noted moths as well as specimens of *Chionaema* (*Cyana*) *puer*, Elwes, *Botyodes caldusalis*, Wlk., and *Polythlipta cerealis*, Led., also a larva of *Macroglossum aquila*, Bsd. (Bell and Scott describe the larvae of 127 out of the 183 species of *Sphingidae* known from India. This is one of the 56 undescribed species.)

2nd October.—A drizzling morning, but, in spite of the rain, *Y. sakra* and *O. damaris* were both flying freely in the forest. Too wet to beat, so a search was made on the tree trunks, producing specimens of *Somera viridifusca*, Wlk., *E. bhurmitra*, and an unidentified Geometer. A number of ova of *M. troglodytus* were found on *Paederia* sp. The afternoon and evening far too wet to go out. A single *A. strigipennis* was attracted to light.

(*To be continued.*)

## COLLECTING NOTES.

Maidencombe Records.—On 18th October *Margaronia unionalis* was in my moth-trap; another came in on 21st October, on which date and again on 11th November *Diasemia ramburialis* was captured by the same means. At sugar I took *Leucania vitellina*, single specimens on 4th, 5th, 6th and 16th October. The last was perfectly fresh, but most autumnal species were later in appearing this year. Three larvae of *Aporophyla nigra* that pupated in the Spring within a few days of each other produced moths on 12th and 15th October and 3rd November.—Frank H. Lees, Maiden Coombe, S. Devon.

Colias croceus, Fourcroy.—In mid-September I netted, at Lewes, a couple of ♀ specimens, one rather worn and one quite fresh. These deposited a number of ova and ultimately about 120 pupae were obtained. From these some 100 imagines emerged, many of them being undersized. The majority of the ♀♀ are of the type in which the yellow markings on the marginal black band on the forewings are smaller than usual, and in several instances almost entirely missing—♀ ab. *obsoleta* (ab. *pseudomas*). The ♂♂ are of normal type but mostly of lighter ground colour, several being of pale yellow instead of the normal orange. A number of the undersides of both sexes are of the well-spotted form known as ab. *marginata*, Braun.

One of the ♀♀ has the right hindwing entirely of *helice* form with yellow spot (*pallida*) with similar colouring in the inner basal area of the left hindwing. The remaining forewings are normal. Two other ♀♀ show indications of similar variation in the basal area of the hindwings. Another ♀ has the hindwings of a dark shade.

In some 60 ♀ pupae 6 or 7 contained imagines of the *helice* form, but all these died and failed to produce insects.

The larvae were fed up in an unheated glass house, or out in the open in the sun.—S. G. Castle Russell, Stokesay, Bridge Road, Cranleigh, Surrey.

## CURRENT NOTES.

The Annual Report of the Entomological Society of Ontario for 1945, recently to hand, has an interesting and useful note on the "Larvae of *Spilonota ocellana* used to provision Nests of a Eumenid Wasp," by H. R. Boyce. Most of the other contents are purely economic in outlook.

The *Bull. and Ann. Soc. Ent. Belge.*, IX-X, contains an article worth study: "Intraspecific Taxonomy in its Application in Lepidoptera." A long discussion on the recognition of Variation, the Results and Suggestions summed up and strongly recommended by the author together with a useful List of Works cited. The author is S. G. Kiriakoff.

Society Report.—The South London Annual Exhibition took place on 26th of October last in the Rooms of the Royal Society. It was a most successful function. The exhibits were of a high order, the recorded attendance was 295, and the catering arrangements were praised by everyone. This year the Society had at its disposal not only the Library of the Royal Society but also that of the Royal Geological Society. As usual, Lepidoptera predominated among the exhibits, but there were important exhibits of other Orders of Insects, Lantern Slides, a Collection of Sketches and Photographs of flowers collected in the mountains of Basutoland, a very striking set of Drawings for an educational film, etc. Blown Larvae of Macro- and Micro-lepidoptera were well in evidence and there was a most instructive Collection of Coleopterous Larvae, some of them very little known.

But to my mind the feature of the afternoon was the number of *insects new to the British List*—no less than 5.

(1) *Cosymbia pupillaria*, Hb.. taken in the Isle of Wight, by Dr K. G. Blair.

(2) The dragonfly *Coenagrion scitulum*, Ramb., taken in S.E. Essex by E. B. Pinniger.

(3) *Eulia formosana*, Hb. (*Tortricidae*), taken by R. W. Parfitt, near Guildford.

(4) *Blastobasis decolorella*, Woll., taken at Herne Hill, by S. Wakely.

(5) *Laspeyresia* (*Enarmonia*) *zebeana*, Rz.—T. R. Eagles.

Frederick William Frohawk, born 16.vii.1861, died on 10.xii.1946 (Obituary Notice in *Times* of 14.xii.1946). He drew the design which used to be printed on our cover every month and which is still employed for the Title-page of the Annual Volume of the *Ent. Record.* — T. B.-F.

# EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr HY. J. TURNER, "Latemar," West Drive, Cheam.

*Wanted*—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Instituto Miguel Lillo, Calle Miguel Lillo 205, Tucuman, Republica Argentina.*

*Desiderata*—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—*H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.*

*Wanted.*—*Lycaena* (*Heodes*) *phlaeas* from all regions including British Isles. Also wanted other species of Chrysophanids from all areas. Exchange or purchase considered. *Duplicates.*—Foreign Lepidoptera, e.g., Satyrids, Charaxes, Papilios, and others; full lists sent.—*P. Siviter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.*

*Wanted* for cash or exchange many species of ova, larvae or pupae, especially local forms and *A. grossulariata* from different localities, also Seitz Vol. 1 and Supplements to Vols. 1-4. Offers also, Tutt's *Practical Hints*, Parts 1 and 2, Buckler's larvae, Vols. 1-6, and Tutt's *British Noctua*, Vols. 2, 3, and 4.—*Dr J. N. Pickard, F.R.S.E., 36 Storeys Way, Cambridge.*

*Wanted.*—Various monthly parts of *Entomologist's Record* for 1914, 1915, 1916, 1917, 1919, and 1920. Please report any odd monthly parts (in wrappers as issued) prior to these years.—*P. B. M. Allan, 4 Windhill, Bishop's Stortford, Herts.*

*Wanted.*—Males of *Morpha menelaus, M. didius, M. rhetenor* in papers.—*Leonard Tatchell, Rockleigh Cottage, Swanage, Dorset.*

*Wanted* urgently for experimental purposes, pupae of *betularia, porcellus elephanor.*—*Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.*

*Wanted*, set or in papers: *Apatura iris, Vanessa polychloros, Argynnis adippe* and *aglaia, Melitaea cinxia, Erebia epiphron* and *aethiops, Coenonympha tiphon, Thecla betulae, T. pruni* and *w-album, Lycaena astrarche* and *artaxerxes, Lyc. arion, Nemeobius lucina, Adopoea lineola* and *actaeon, Angiades comma, Cyclopides palaemon.* In exchange for other British and foreign species.—*Chas. B. Antram, "Rivermead," Keynsham, near Bristol, Glos.*

*Wanted*, British butterflies, set or in papers, in exchange for *Morpho papirius, Morpho didama*, and other Morphos.—*Chas. B. Antram, "Rivermead," Keynsham, near Bristol, Glos.*

*Exchange.*—I would like to get in touch with those interested in exchanging living ova and larvae of southern species of Lepidoptera for northern species and adults. Write stating wants and probable offers.—*J. K. Goody, Weldon, 26 Carr Wood Road, Bramhall, Cheshire.*

*Wanted.*—Buckler's *Larvae*, Vols. 8 and 9.—*C. Bignell Pratt, 1 West Ham Lane, Stratford, E.15.*

*Wanted.*—"Entomologist" Volumes, bound or unbound, for 1926 to 1932 inclusive, and 1935, 1939, 1940 to 1942.—*F. W. Smith, Boreland-of-Southwick, by Dumfries, Kirkcudbrightshire.*

*Wanted*, for experimental purposes, a few pupae of *Endromis versicolora*, purchase or exchange.—*R. W. Parfitt, 1 Dunsdon Avenue, Guildford, Surrey.*

*Wanted.*—Spuler's *Die Schmetterlinge Europas*, Vol. I. Various unbound parts containing pages 1-144, and I-XVI with plates as issued. *Exchange.*—Various numbers of the *Entomologist's Record* and *Entomologist.*—*S. Wakely, 36 Stradella Road, Herne Hill, London, S.E.24.*

*Wanted.*—Volume V (five) of Tutt's *British Lepidoptera.*—*T. R. Eagles, 32 Abbey Road, Enfield, Middlesex.*

## MEETINGS OF SOCIETIES.

*Royal Entomological Society of London*, 41 Queen's Gate, S.W.7: February 5th; at 5.30 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History Society*: Last Fridays in month, 7.0 p.m., at The Birmingham Chamber of Commerce.

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*Communications promised*:—H. Donisthorpe, A. H. Turner, the late Dr H. G. Harris, T. Bainbrigge Fletcher, Dr Malcolm Burr, Hy. J. Turner, H. A. Leeds, W. Fassnidge, S. G. Castle Russell, H. W. Andrews, J. E. Collin, Dr E. A. Cockayne, Rev. G. Wheeler, W. Pickles; A. J. Wightman, Lt. C. N. Collyer; M. Niblett; An Old Moth Hunter; C. N. Gummer.

All Communications should be addressed to the Acting Editor, Hy. J. TURNER, "Latemar," 25 West Drive, Cheam.

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# ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION



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## LEPIDOPTERA OF MIDLAND AND EASTERN DISTRICTS, 1946.

By G. Tozer.

Although the weather has been so cool, wet, and often with very little sunshine almost throughout the season, I found that many Lepidoptera were present in almost normal numbers and most species of butterflies I observed seemed to be holding their own pretty well.

A few, such as *Lycaenopsis argiolus*, *Pararge megera*, and *Heodes phlaeas* were in smaller numbers than usual in the second brood.

In the Midlands, at least, the migrants seemed almost absent except for *Vanessa cardui*, *V. atalanta* and *Plusia gamma*.

*Erannis leucophaearia* was noted in woods around Leicester on the 3rd February, and an *Aglais urticae* found resting on a road on this date.

In March *Achlya flavicornis* and *Xylocampa areola* were noted on the 24th in the local woodlands, and *Brephos parthenias* flying around birches in the sunshine.

The mild and sunny weather during April caused the usual hybernating butterflies to appear commonly early in the month, and on the 2nd I saw two *Pieris rapae* on the wing.

The 22nd was a fine sunny day and quite a number of *Lycaenopsis argiolus* and *Pararge aegeria* were noted flying around the borders of woods in the Peterborough district. The species of *Pieris* were also well out and I saw the first *Euchloe cardamines*—a male.

Many stems of Viburnum containing the earlier stages of *Aegeria andrenaeformis* were cut from bushes in the woods and taken home. The imagines emerged in June. Both species of Viburnum are attacked.

On the following day a single *Pyrgus malvae* was seen, also near Peterborough.

On the evening of the 27th larvae of *Atethmia xerampelina* were taken crawling up ash trunks at dusk on the outskirts of Leicester, and on two trees I took two dozen half-grown larvae of *Eilema lurideola*. Oddly enough, I could see nothing in the way of lichen on which these latter could feed, but I found they fed very readily on leaves of sallow and dock and on these they thrived. Nearly all produced imagos in June and were of normal size.

With the close of the month the weather changed, becoming very cold and dull and continuing into May.

However, on the 5th *E. cardamines* and *P. aegeria* were well out near Leicester, and on the 6th I noted a single male *Carterocephalus palaemon* on the wing in a Rutland wood—the earliest date I have for it.

On the 11th and 12th we had bright but cool weather, and at Monk's Wood in Hunts many butterflies were seen. *L. argiolus*, *Callophrys rubi*, *Argynnis euphrosyne*, *Erynnis tages* and *P. aegeria* were all common, and hybernated *rhamni* and *V. io*.

Beating was attempted, and produced larvae of *Strymon pruni* (in small numbers), *Thecla quercus*, *T. betulae* (very small), *Pseudoips bicolorana*, *Trichiura crataegi*, *Orthosia miniosa*, *Poecilocampa populi* and many more, while " nests " of small *Eriogaster lanestris* were seen

in the hedges. I had never previously seen this latter here, so it may be increasing in numbers.

I had the pleasure of seeing for the first time *Leptidea sinapis* in a wood near Northampton on the 25th. They were just appearing here—being very late owing to the cold weather, and were in fine condition.

Later on, I obtained a female for ova and reared a small number of larvae to the pupal stage on Yellow Pea (*L. pratensis*).

*Pararge megera* was first observed on this date.

At Wicken Fen on the 26th—a cool and dull day—no butterflies were observed apart from some *L. argiolus* which were found at rest on alder buckthorn. The Great-water-dock seemed to have almost disappeared and no larvae of the introduced Large Copper were seen.

Later in the season the butterflies did not appear and I heard of none being seen. It seems that its main breeding ground had been ploughed during the war, so it may now be extinct here.

Two almost fully-fed *Gastropacha quercifolia* larvae were seen on small alder buckthorn bushes.

They had nearly stripped the bushes and were plainly visible on the bare stems some yards distant. The foodplant is unusual since hawthorn and sloe are generally chosen.

The buckthorn also yielded many larvae of *Scotosia rhamnata* and of *S. vetulata*.

In early June I took *Hamearis lucina* and *C. palaemon* in some of the Northants woodlands and both were fairly abundant.

Near Wansford in Northants a colony of *Procris geryon* was discovered on a patch of rough uncultivated ground on the 10th, and in the same spot many larvae of *Polyommatus* (*Lysandra*) *coridon* were found in the moss and debris at the roots of its foodplant. They are very easily taken by this method.

A few very small larvae of *Saturnia pavonia* were seen, and late in the afternoon many male *Macrothylacia rubi* were dashing over the ground.

*Maniola jurtina*, *Polyommatus icarus*, and *Ochlodes venata* were well out on the 15th, and on the 30th I saw freshly-emerged males of *Argynnis paphia* in the woods near Peterborough, while *P. icarus* was abundant and a few male *Diacrisia sannio* were disturbed from low herbage on a piece of heathland.

Some *L. argiolus* larvae were noticed feeding on berries of dogwood.

As late as the 5th July *L. sinapis* was still about in the Northants woodlands, but mostly in very worn condition. However, I was surprised to find a pair " *in côp* "—the female fresh but the male very worn, and here I saw the first *Vanessa atalanta* of the season.

A female *Angerona prunaria* captured near Northampton laid me a whole batch of fertile ova.

In the Peterborough district *Satyrus galathea*, *Maniola tithonus*, *Coenonympha pamphilus*, *A. paphia*, *A. cydippe*, *Adopea sylvestris*, *A. lineola* and *Zygaena loniceraе* were all locally abundant on the 21st, and in one wood *Aegeria vespiformis* was observed flying around and settling on stumps of freshly-felled oaks.

A freshly-emerged *Polygonia c-album* was seen on the 27th.

*P. (L.) coridon* was well on the wing by the 28th and a friend secured *Lygephila (Taxocampa) pastinum* on the same ground. This is an interesting find, since it is chiefly a more southern insect.

On the same date larvae of *Hemaris fuciformis* were taken from honeysuckle in a nearby wood, and they varied much in size.

August 4th was a very warm sunny day, and at Wicken Fen the second brood of *L. argiolus* was in profusion. *Gonepteryx rhamni*, too, was abundant and we noticed several late *A. lineola*.

No imagines of *Papilio machaon* were noted, but the larvae were seen, and in all sizes. A specimen each of *Eustrotia olivana* and *Epione apiciaria* were disturbed and captured, and the latter laid me a few ova before dying.

At Monk's Wood (in Hunts) on the 7th I saw a *Macroglossum stellatarum* flying very wildly and rapidly along the main riding. This was the first time I had ever seen this supposedly common moth alive and under natural conditions.

A pair of *Phragmatobia fuliginosa* was taken " *in côp* " and a large batch of ova afterwards laid. Not far from here some *Eremobia ochroleuca* were found resting on flowers of Knapweed.

*Vanessa io, G. rhamni* and the genus *Pieris* were abundant in clover fields in parts of Northants and Hunts later in the month, and *Aricia agestis* (second brood) was locally common. A fair number of *Vanessa cardui* were seen, and *Plusia gamma* was plentiful. *Colias croceus* seemed entirely absent this year.

Near Leicester I took larvae of *Deuteronomus fuscantaria* on ash saplings, and from 28th August-4th September I obtained a long series of *Atethmia xerampelina* by looking for the newly-emerged moths low down on the trunks of ash and on vegetation around their bases late in the afternoon. Sometimes as many as ten could be found under one tree.

During September larva beating gave poor results, but the following were met with in Northants woodlands:—*Clostera curtula, Phaeosia tremula, Notodonta ziczac, Lophopteryx capucina, Demas coryli, Plagodis dolabraria* and *Apoda avellana*. The curious larva of this last species is more easily taken by searching oak leaves than by beating, since it clings so tightly.

An imago of *Tiliacea aurago* was shaken from maple near Wakerly.

Several days spent in the Broads district of Norfolk at about the middle of the month was not too productive owing to the weather and the very wet condition of the marshes, but a fair lot of young *P. machaon* larvae were seen, and even unhatched ova. There must have been a good emergence of the butterflies in August.

Numbers of these small late larvae must surely perish as the foodplant was dying down and could not last much longer.

Other larvae taken by beating Sallows were:—*Orgyia recens (gonostigma), G. quercifolia, Smerinthus ocellatus* and *S. populi, N. ziczac, Dasychira pudibunda, Mysticoptera sexalata* and *Earias clorana*. Several late *Sphinx ligustri* were taken feeding on privet in a Stalham garden.

But few moths were met with at night, but on the 18th a specimen each of *Miltochrista miniata* and *Epione apiciaria* (in quite fresh condition) were attracted by light and some very late and worn *Deutero-*

*nomus alinaria* also turned up among other things. Ripe or rotting blackberries were well attended by the " sallows." *Citvia lutea* and *Cirrhia ictevitia* were in numbers, and three of the all-yellow form of this latter were taken, also two or three *C. gilvago*, and *Phlogaphora meticulosa* abundantly.

In September butterflies became scarce much earlier than usual and the " whites " were soon absent, but plenty of *V. io* and *U. urticae* were seen at times, and this latter was abundant.

No " sugaring " was tried in the autumn, but my bloom in mid-September near Leicester produced only *Agrochola macilenta, Eupsilia transversa (satellitia), Conistra vaccinii* and *Phlogophora meticulosa.*

In October a few *Colotois pennaria* and *Oporinia dilutata* were noted resting on trees, etc., and on the 28th I saw a fresh *P. c-album* at rest on a road in Leicester. This is only the second specimen I have seen in the county this year.

This butterfly and also *Lymenitis camilla* seem to have become much less common during the last two or three years and of the latter I have not seen even one during this season anywhere in the Midlands.—98 Copdale Road, Leicester, 20/12/46.

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## NOCTUAE NOTES IN 1946.

By A. J. Wightman, F.R.E.S.

The season 1946 was a very poor one with me in regard to breeding forms new to me among the Noctuae except in the case of *Atethmia xerampelina*, with which I had a most satisfactory experience.

*Calymnia trapezina* produced among many of the forms described by Tutt and none of which are scarce, two forms I have not bred before.

One has the ground colour almost white with the tranverse lines and central shade in blackish grey.

The other is ab. *ochrea*, Tutt, but with the hindwings bright fulvous yellow without any trace of the usual blackish suffusing.

In this it agrees with ab. *lutescens*, Wehrli., *Drdt. Seitz Pal. Noct.*, 189 (1935).

*Atethmia xerampelina*, Esper

In spite of hard work and a super abundance of the larvae, I found it impossible to breed as large a batch of this species this year as usual.

Late frosts killed the ash buds and flowers, the only food these larvae thrive on. I tried newly-expanded leaves, then the ravages of the frost had passed, but as in previous years the larvae merely nibbled these and almost at once diarrhoea appeared, as is always the case.

Fortunately this year's moths made up in quality for lack of quantity, rather more than one per cent. being extreme abs. and three per cent. were selected for cabinet purposes, the other ninety-seven per cent being released.

I had previously bred unicolorous red and unicolorous yellow abs. in addition to the almost unicolorous highly suffused form which is generally treated as *unicolor*, Stgr., but it is in my opinion not the right red to be called carnation-red. Barrett's fig. 3e, plate 229, represents it well in its darkest form and his fig. 3c represents it in a less heavily suffused form, except that the hindwings are far too heavily red in both figures.

This year I failed to obtain any of the unicolorous bright red abs., but a good number of the above-mentioned form appeared, the bulk nearer 3c than 3e.

Several of the unicolorous yellow forms appeared almost at the end of the emergence followed by three forms new to me and a number of fine high colour banded forms. The most beautiful of the new forms I should describe as being apricot colour, unicolorous and even in tone, with the hindwings tinted apricot. Almost equally beautiful is a unicolorous yellowish deep tone orange example with pale orange tinted hindwings. I obtained but one example of each of these forms, both very large ♀s.

The third form is buff yellow and of this form a number emerged. Two are quite unicolorous, but others have traces of the reniform stigma and the outer band and two have both bands present but much reduced in area.

Some of these forms were on the small side and several had some defect due to the pupae having got too dry I think, and these I put down on selected ashes.

Another form which I have had in other years, but which has been, until this year, very scarce, also appeared in better numbers.

This, no doubt, is intermediate between *centrago*, Haw., and *lutea*, Bromb.

The ground colour is as in *centrago* orange tinted yellow; the bands also are as in *centrago*, Haw., deep red, but instead of being definite bands they are a mere group of deep red marks.

Some are far more extreme than others and ♂s are more numerous than ♀s.

These red marks consist of the reniform; 3 fine red lines (veins) just below and a small patch just above the hind margin (suffused veins).

The outer band is nearly normal in area, but broken up by wedges of ground colour in regular fashion, and it is separated from the orange-red cilia by a yellow line.

There is another intermediate between *centrago* and *lutea* in which instead of the red bands being broken up and strong in colour, the bands are normal in area, but so pale in colour and diffused in appearance as to be almost lost in ground colour.

The best of the banded forms this year are two with saffron-yellow ground colour, purplish-slate bands and a good deal of suffusion with band colour scales of the outer area of the wing, but I also got a very fine example of *nigro-picta*, Schwd., in which the ground colour is intense yellow and the bands purplish-slate, the reniform and dot in basal area being black.

As it is evident that in spite of the numbers bred I have, as yet, by no means exhausted the possibilities of this species in Sussex, I propose to continue breeding for at least another season before attempt-

ing to give a detailed summary of all the forms obtained and I hope then to have a coloured plate.

In the meantime I shall be most grateful to anyone who can tell me where, in this country, I can see extreme abs. of this species, especially of the subsp. *pallida*, Stdgr., and some of the original Manx *unicolor*.

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## ABROSTOLA TRIPARTITA, HUFN., AND ITS FORMS IN BRITAIN.

By E. A. Cockayne, D.M., F.R.C.P.

The fact that there are three closely allied species of *Abrostola*, *tripartita*, Hufn., *triplasia*, L., and *asclepiadis*, Schiff., in Europe has led to considerable confusion in the past. Esper (1791), Tab. 169, *Noct.* 90, gives three figures of *Abrostola*, fig. 1, *triplasia*, L., which is correctly named, and fig. 4, foem., fig. 5, *maris*, var. *asclepiadea*, both of which are unicolorous forms of *tripartita*, Hufn. In his text, vol. 4, p. 612, he calls them *asclepiadis*. There are specimens from Predota and Herkulesbad in the Tring Museum, which agree perfectly with Esper's var. *asclepiadis*, but since Schiffermüller had named another species *asclepiadis* in 1775 or 1776, Esper's name cannot be used for a form of *tripartita*. Hübner's *urticae* No. 625 has the whitish markings well developed, and, as most authors have agreed, is a synonym of *tripartita*. His *asclepiadis* Nos. 268 and 627 are probably true *asclepiadis*, Schiff. His *triplasia* No. 269 is a *tripartita*, darker than usual and with the pale markings reduced in extent.

Tutt in his *British Noctuae and their Varieties* (1891), vol. 4, pp. 16, 17, writing about *tripartita*, says: " Mr Findlay of Morpeth has sent me a specimen with the pale markings entirely obsolete, exactly copying a *triplasia*, although the specimen is certainly *tripartita* . . . Hübner's *triplasia*, fig. 269, is this species with the normally pale markings clearly shown. The same author's *urticae*, fig. 625, is also this species, but represents that form, in which the whitish or ochreous markings are absent as in the Morpeth specimen to which I have previously referred. There is, however, apart from entire absence, considerable variation in the quantity of pale markings; those with the greater amount of pale markings were known to our old British authors as *urticae*, those with a less quantity were known as *asclepiadis*. The latter is, therefore, a form intermediate between typical *tripartita* and the obsoletely marked form *urticae*, Hb." He then gives a description of Hübner's *urticae*, fig. 625, and ends by saying, " Altogether this is a most unicolorous form."

Tutt accepts the existence of three forms in Britain, taking *tripartita*, Hufn., as the form with pale markings well expressed, *asclepiadis* (no author) as the intermediate, and *urticae*, Hb., as the unicolorous form. As I have shown *asclepiadis* cannot be used for the intermediate form, and *urticae* is not a unicolorous form, so that neither has a valid name. There appears to me to be no clear division between specimens with the maximum and those with the minimum amount of pale marking, for all gradations between them are found. There is, however, a very distinct melanic form, which may have greatly reduced pale

markings in the basal and submarginal areas or be unicolorous, and as the division between them is not a sharp one I think one name will suffice.

Ab. **plumbea**, ab. nov.

Forewing.—Unicolorous dark leaden grey without any pale markings, but with the usual dark markings visible; fringes considerably darker than usual.

Hindwing.—Basal area nearly as dark as the marginal area. Thorax dark leaden grey with no pale scales, but with the usual rust-coloured scales present. Spectacle mark present. Abdomen dark grey with the hairs at the base leaden grey instead of pale. Some specimens show a variable but restricted amount of pale marking in the basal and submarginal areas and in these the fringes, base of the abdomen, and basal area of the hindwing are not quite as dark as in the unicolorous ones.

Type, ♂, Sunderland, bred 1930, Corder; allotype, ♀, same data. Paratypes, 14 ♂♂, 4 ♀♀, Sunderland, bred 1930, Corder; 1 ♂, Burnley, 1907, W. G. Clutten. Of these 4 ♂♂ and 3 ♀♀ from Sunderland and the ♂ from Burnley are unicolorous.

This melanic form is considerably darker than the unicolorous Hungarian specimens in the Tring Museum, which agree closely with Esper's var. *asclepiadis* (*asclepiadea*), and I have seen no continental specimens as melanic as ab. *plumbea*.

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## NOTES ON THE HELOMYZIDAE [DIPTERA].

By L. Parmenter, F.R.E.S.

Mr Collin's excellent paper on the British Species of *Helomyzidae* has enabled dipterists to revise their collections of this family. Mr Andrews' notes proved that their life-history is still to be elucidated and that several species can be found in the neighbourhood of London in Kent.

I find that Surrey is inhabited by many species and as Mr Collin has rarely mentioned dates I have ventured to list my own specimens. Although I have not paid particular attention to the family when collecting perhaps my notes may encourage others to add to our knowledge of the distribution, ecology and habits of members of the family.

The species of *Helomyza* seem to be definitely attracted to fungi, noted by Andrews, Seguy, etc. Only this autumn I found *Helomyza affinis, bicolor, variegata* and *notata*, var. *hilaris*, all attracted to a pile of fungi within 15 minutes after it had been discarded, just a few feet from the edge of the woodland, by members of the British Mycological Society during a fungus foray at Bookham Common. Scent must be the attraction and it would be interesting to know to what distance the odour is effective on the various species. Certainly some species of fungi are more attractive than others. A comparison might be made between the *Helomyzidae* and the other fungus haunting Diptera such as the *Mycetophilidae, Calliphoridae, Muscidae* and *Sphaecroceridae* on their response to the various species of fungi.

On 7th November 1937 on a fungus identified by my friend Mr J. E. Lousley at Limpsfield Common as *Clithocybe maxima*, Quel., I found a male *Allophyla atricornis* with males of *Helomyza bicolor*, *Stratiobor-borus roserii*, Rond., and *S. fimetarius*, Mg. On the same day on another part of the common on a Stinkhorn fungus, *Phallus impudicus*, Pers., there were gathered males of *Helomyza notata*, var. *hilaris*, *H. humilis*, *H. affinis*, *Dryomyza flaveola*, F., var. *zawadskii*, Schum., and a female *Phaonia variegata*, Mg. Since then I have noted at other times males of several species of *Helomyza* gathering together on fungi. Although I have no proof, yet it appears possible that this congregation of males is not solely for feeding purposes, but due to mating activities. Male dung flies foregather on cow-pats awaiting females with whom to mate and I suggest that male *Helomyza* may congregate on fungi for the same purpose. That more than one species should occur together so frequently makes one wonder how the species refrain from inter-breeding; how the female of each species is recognized—by vision or by scent. It must be borne in mind that flies have poor sight compared with human beings and that mating generally takes place so quickly that immediate recognition is implied. There seems to be plenty of scope for study for those willing to watch flies.

*Helomyza variegata*, Lw. 15th May-8th November from Cornwall, Herts. and Surrey.

*H. notata*, Mg., var. *hilaris*, Zett. 25th May-30th July, 29th September-10th November from Cornwall and many localities in Surrey.

*H. humilis*, Mg. From Studland Heath, Dorset, and Bookham, Caterham, and Limpsfield, Surrey, in June, September, to 7th November.

*H. affinis*, Mg. 22nd May-29th September from Cornwall and several localities in Surrey.

*H. flava*, Mg. A ♂, Limpsfield Common, 7th July 1940, and a ♀, Ashtead Common, Surrey, 9th October 1946.

*H. pallida*, Fln. Under trees, 14th June-7th July at Limpsfield Common and Oxshott, Surrey.

*H. flavifrons*, Zett. 2 ♂♂, Wooler, Northumberland, 9th April 1943.

*H. ustulata*, Mg. A ♀ in the "Nut Grove," a wood on the cliff at Carbis Bay, Cornwall, 8th August 1941.

*H. bicolor*, Zett. June, 29th September-7th November from New Forest, Hants., and several localities in Surrey.

*H. fuscicornis*, Zett. 3 ♂♂, Limpsfield Common, 25th June 1939, and a ♀, Oxshott, Surrey, 14th June 1941.

*H. dumicola*, Collin. A ♂, Byfleet, Surrey, 9th July 1941.

*Allophyla atricornis*, Mg. June and 7th November at Limpsfield Common, Surrey.

*Heteromyza rotundicornis*, Zett. ♂♂ found flying to and fro under the edge of the canopy of a conifer thicket in Worth Forest, Sussex, 11th April 1937. ♀♀ on gorse, Limpsfield Common, Surrey, 5th December 1937, and Wooler, Northumberland, 12th May 1943.

*Tephrochlamys tarsalis*, Zett. Taken on a window, Thornton Heath, Surrey, 9th December 1940, and on a window at Fetcham, Surrey, by Mr H. J. Burkill in October 1940 and 1941.

*T. flavipes*, Zett. A ♀ bred by Mr G. Waller from the nest of a dormouse from Keston, Kent, emerged 14th May 1940.

*T. rufiventris*, Mg. February-June and December from Essex, Norfolk, Kent, Northumberland and Surrey. On 14th February 1937 some were taken on jetsam at the high tide line on the sea wall at High Halstow, Kent. In early spring the species was found on the window of the huts of several camps during my Army service.

*Tephrochlaena oraria*, Collin. A ♀, Studland Heath, Dorset, 6th June 1938.

*Neoleria inscripta*, Mg. June, Norfolk. On two occasions I have found the species on a dead rabbit; Keston Common, Kent, 17th May 1936, with *Lucilia caesar*, L., *L. sericata*, Mg., *Hydrotaea dentipes*, F., and *Piophila nigriceps*, Mg., and at Bookham Common, Surrey, 14th May 1942, with *Lucilia caesar*, L., *L. sericata*, Mg., *Hydrotaea dentipes*, F., *Pseudomorellia albolineata*, Fln., and *Calliphora erythrocephala*, Mg.

*Oecothea fenestralis*, Fln. 23rd March-28th April, Northumberland and Surrey.

*O. praecox*, Lw. 2nd-12th May 1943, Wooler, Northumberland. This species followed after *fenestralis* had disappeared from my hut window [28th April].

*Eccoptomera longiseta*, Mg. A ♀, Beddington sewage farm, Surrey, 2nd June 1935.

*Leria serrata*, L. March-June from Hants, Northumberland and Surrey.

*L. modesta*, Mg., subsp. *czernyi*, Collart. March-May, from Northumberland and Sussex.

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—— 1945. N. Kent Records of *Helomyza*, Fln. (*sensu stricto*). *Ent. Record*, LVII: 33.

Collin, J. E. 1943. The British species of *Helomyzidae* (Dipt.). *Ent. mon. Mag.*, LXXIX: 234-251.

—94 Fairlands Avenue, Thornton Heath, Surrey, 15th December 1946.

## COLLECTING NOTE.

Honey-Dew and Larvae.—Some breeders of Lepidoptera hold that honey-dew is harmful, indeed often fatal, to the larvae of certain species. In a letter to me a year or so ago Fleet-Paymaster T. Bainbrigge Fletcher, R.N., suggested that in all probability the harmful effect of honey-dew was owing not to the aphidal secretion itself but to the moulds which are known to grow in this medium. A book of great interest to the entomologist, which deals with this subject, has just been published and amply bears out the above suggestion. It is *Insect Microbiology* by Edward A. Steinhaus, Assistant Professor of Bacteriology at the University of California (published by the Comstock Publishing Com-

pany at New York, 1946; price 46s 6d). This voluminous work (there are 595 pages of text, 89 of bibliography, and 71 of index), well illustrated, deals with the bacteria, yeasts, fungi, viruses, spirochetes and protozoan parasites of insects. Those who are interested in the subject will find it most valuable.—P. B. M. ALLAN.

## CURRENT NOTES.

THE New York Entomological Society has recently issued a reprint of Albert Zerkovitz *Lepidoptera of Portugal*, which had appeared in their Journal early in 1946. It consists of 262 pp. and a locality map of the country. The first 80 pp. consists of a general Introduction to the area comprised in relation to the adjacent geographical characters and their influence on the Lepidopterous Fauna—the Atlantic Ocean, the Mediterranean Sea, the Spanish flora and fauna, and the North African fauna and flora. Records of both Macro- and Micro-Lepidoptera are given, and some 1216 species are detailed, many with useful notes. There is a very full and useful Bibliography.—H. J. T.

1946 was the Centenary of that famous American Institution, the well-known Smithsonian, and there has just come to hand a most striking volume, well-illustrated memorial, of some 70 large pages. There are 41 plates, most of them having more than one illustration. The matter is given in a dozen chapters: the unusual and curious origin of the project; a life of Smithson, an Englishman with but little, if any, contact with or even knowledge of America; the carrying out of the project years after Smithson's death in 1822. Other chapters deal with the aim of the Institution as the National Treasure House; another deals with the objects acquired, and finally the use to be made of the facilities by the diffusion of knowledge for the advancement of the human race.

## SOCIETY.

A meeting of the London Natural History Society on 19th November 1946 was held at the Hall of the Art Workers' Guild, Queen Square, W.C.1. The President, Mr L. G. Payne, in the Chair. Among the exhibits Mr L. Parmenter showed seventeen species of *Asilidae* taken in Britain, including a pair of *Laphria gilva*, L., taken *in côp* at Oxshott, also a case containing forty species of Diptera taken as prey by *Machimus atricapillus*, Fallen, and on behalf of Mr H. Oldroyd a further five species of *Asilidae* from the National Collection, together with a rare Corsican species with its pupa and photos of its habitat.

Mr P. W. E. Currie showed *Melisandra cinereipes*, Klug, *Selandria serva*, Fab., *Tenthredopsis nassata*, L., and *Euura atra*, Jur., as prey of *Dioctria rufipes*, De Geer., *Tenthredopsis litterata*, Geoff., and *Tenthredo ferruginea*, Schrank, as prey of *Dioctria oelandica*, L., and

*Melisandra morio*, Fab., as prey of *Laphria flava*, L. Mr R. M. Payne showed *Chorthippus bicolor*, Charp., and *Ch. parallelus*, Zett., *Onocestus viridulus*, L., *Myrmeleotettix maculatus*, Thun., and *Coenagrion pulchellum*, van de Linden, as prey of *Asilidae*. Mr Parmenter gave an illustrated paper on " The Habits of the *Asilidae*."—J. Burkill, Minuting Secretary.

## REVIEW.

*Proceedings and Transactions of the S. London Entomological and Natural History Society for the Year 1945-(6).*

We again have an outstanding publication from this well-known notable association of active and real lovers of nature. The Society is still located in the palatial rooms of the Royal Society, who have not only given them shelter with all their valuable possessions of books and insects but have assisted them financially in the efforts to carry on.

The record is a very full one with evening meetings, field meetings, and the wonderful Annual Exhibition, to which members and friends from all parts of the country look forward as the Entomological Event of the Season.

The Rule that a President should not be eligible to sit for a second year was suspended in the case of Capt. Jackson, and has proved, as it did " in the old days," a happy act of the Council. One experience which a one-year President gains is thrown away if he has not the opportunity of using it for the benefit of the Society. In the difficulties caused by the war and the removal to temporary and unfamiliar circumstances which needed unbroken supervision, the Council were wise in their irregular and fair action.

The Publication was late in appearing, but this is made up by the quality of its contents and the excellence of the 11 plates, of which one is coloured.

The initial plate is a capital photo. of Mr F. D. Coote, who passed away during 1945. He had been for many years one of that band of members who do all they can to organise and foreward the objects and aims of the Society. He was a personal friend of all of us, and was rarely absent from meetings, indoors or in the field, which last he took the greatest interest in arranging.

The " Transactions," i.e., the Papers presented to the Society during the 1945 Session, were eleven, besides the President's Address. Mr H. W. Andrews, F.R.E.S., " Some External Aspects of the Bodies of Diptera," struck a new line of observation of this Order, of which, no doubt, other students will take advantage. Mr W. H. Spreadbury in " Nature Rambles with a Camera," and his fine plates appended, recall the days of our dear comrade, the late E. Step. Mr H. E. Hulls in " The Louse in Literature " recalls to us Shakespeare's " Familiar Beast to Man." Mr J. K. Matthew, M.A., goes farther afield for the S. London Society in his " Lepidoptera of the Coastal Sandhills of Lancashire," not only in locality but in locale. Mr K. G. Blair, D.Sc., F.R.E.S., " On the Economy of the Oak Marble Gall, *Cynips kollari*,"

shows the work of an eminent combination, an excellent field naturalist and an excellent museum worker.

Mr T. R. Eagles, F.R.E.S., in the " Physiology of Insects," sums up a side of Entomological Studies which so many of us are prone to overlook. Commander G. W. Harper, R.N., in " A War-time Visit to W. Africa," gives a unique experience to most of our members in this description of his experiences; a List of Lepidoptera of Freetown will interest some of us whose minds often wander from our Island. Mr E. J. Bunnett, M.A., a long-ago President, renews his re-appearance in " Some Notes on the Hemipteron, *Pentatoma rufipes*," with a number of figures of details on 3 plates. Mr L. T. Ford, a veteran Micro-lepidopterist, gives us " The Psychidae," which deals with the " 17 or 18 " well-established British Species. This work is illustrated by a very excellent coloured plate by another micro worker, " S. N. A. Jacobs *del*," from material in his own collection. Mr E. W. Classey, F.R.E.S., in " British Mosquitoes," gives an Introduction to the study of their ova and life-history.

Mr H. R. Last, in " Collecting Notes on the British Staphylinidae," gives the " how and where " of the obtaining of the minute specimens of this large group of the smallest of our British Coleoptera. His Bibliography is useful. It is a real pleasure to go through a set of papers more or less of practical nature lovers' work which do not microscope about with the genitalia, which excites but the slightest interest to real nature lovers.

These " Transactions " are a great credit to the Editor and his colleagues, to the firm (S.-S.) who make the plates, and to the Printers. The Society must be proud of their officers.—Hy. J. T.

P.S.—Will our subscribers excuse any delay that may arise from the present circumstance of fuel and weather.

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Special Note.—Mr H. W. Andrews' *New Address*: " The Wigwam," Aldwick Avenue, West Bognor Regis, Sussex.

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Corrections.

1946. p. 151. line 5 from the bottom replace " *Butterflies of India* " by " *Identification of Indian Butterflies*."

1947. p. 6. line 6 from the top for " Butlr." put " Moore."

# EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr Hy. J. Turner, "Latemar," West Drive, Cheam.

*Wanted*—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Instituto Miguel Lillo, Calle Miguel Lillo 205, Tucuman, Republica Argentina.*

*Desiderata*—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—*H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.*

*Wanted.*—*Lycaena* (*Heodes*) *phlaeas* from all regions including British Isles. Also wanted other species of Chrysophanids from all areas. Exchange or purchase considered. *Duplicates.*—Foreign Lepidoptera, e.g., Satyrids, Charaxes, Papilios, and others; full lists sent.—*P. Siviter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.*

*Wanted* for cash or exchange many species of ova, larvae or pupae, especially local forms and *A. grossulariata* from different localities, also Seitz Vol. 1 and Supplements to Vols. 1-4. Offers also, Tutt's *Practical Hints*, Parts 1 and 2, Buckler's larvae, Vols. 1-6, and Tutt's *British Noctua*, Vols. 2, 3, and 4.—*Dr J. N. Pickard, F.R.S.E., 36 Storeys Way, Cambridge.*

*Wanted.*—Various monthly parts of *Entomologist's Record* for 1914, 1915, 1916, 1917, 1919, and 1920. Please report any odd monthly parts (in wrappers as issued) prior to these years.—*P. B. M. Allan, 4 Windhill, Bishop's Stortford, Herts.*

*Wanted.*—Males of *Morpha menelaus, M. didius, M. rhetenor* in papers.—*Leonard Tatchell, Rockleigh Cottage, Swanage, Dorset.*

*Wanted* urgently for experimental purposes, pupae of *betularia, porcellus elephanor.*—*Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.*

*Wanted*, set or in papers: *Apatura iris, Vanessa polychloros, Argynnis adippe* and *aglaia, Melitaea cinxia, Erebia epiphron* and *aethiops, Coenonympha tiphon, Thecla betulae, T. pruni* and *w-album, Lycaena astrarche* and *artaxerxes, Lyc. arion, Nemeobius lucina, Adopoea lineola* and *actaeon, Angiades comma, Cyclopides palaemon.* In exchange for other British and foreign species.—*Chas. B. Antram, "Rivermead," Keynsham, near Bristol, Glos.*

*Wanted*, British butterflies, set or in papers, in exchange for *Morpho papirius, Morpho didama*, and other Morphos.—*Chas. B. Antram, "Rivermead," Keynsham, near Bristol, Glos.*

*Exchange.*—I would like to get in touch with those interested in exchanging living ova and larvae of southern species of Lepidoptera for northern species and adults. Write stating wants and probable offers.—*J. K. Goody, Weldon, 26 Carr Wood Road, Bramhall, Cheshire.*

*Wanted.*—"Entomologist" Volumes, bound or unbound, for 1926 to 1932 inclusive, and 1935, 1939, 1940 to 1942.—*F. W. Smith, Boreland-of-Southwick, by Dumfries, Kirkcudbrightshire.*

*Wanted*, for experimental purposes, a few pupae of *Endromis versicolora*, purchase or exchange.—*R. W. Parfitt, 1 Dunsdon Avenue, Guildford, Surrey.*

*Wanted.*—Spuler's *Die Schmetterlinge Europas*, Vol. I. Various unbound parts containing pages 1-144, and I-XVI with plates as issued. *Exchange.*—Various numbers of the *Entomologist's Record* and *Entomologist.*—*S. Wakely, 36 Stradella Road, Herne Hill, London, S.E.24.*

*Wanted.*—Volume V (five) of Tutt's *British Lepidoptera.*—*T. R. Eagles, 32 Abbey Road, Enfield, Middlesex.*

## MEETINGS OF SOCIETIES.

*Royal Entomological Society of London*, 41 Queen's Gate, S.W.7 : March 5th and 19th; at 5.30 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society* : Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History Society* : Last Fridays in month, 7.0 p.m., at The Birmingham Chamber of Commerce.

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# LEPIDOPTERA OF WEST SUSSEX AND EAST HAMPSHIRE, 1946.

By Commander G. W. Harper, R.N., F.R.E.S.

Prophecy is always a risky undertaking; but it is probable that the year 1946 will be recalled for a long time to come as one of unusually prolonged bad weather in the summer and autumn. The effect of this was to limit the numbers of individuals in the late summer and autumn broods in most cases. This was particularly noticeable with *Colias croceus*, Fourcr., and *Plusia gamma*, both of which were present in good numbers early in the summer. Other migrants do not seem to have been well represented.

January.—The first and last weeks were mild; *Erannis leucophaearia* was seen flying on the 31st, but was probably out earlier.

February.—Mild weather with an occasional sunny day persisted until the 20th; *Theria rupicapraria* and *Phigalia pedaria* were common at light by the 7th, and were joined by *Erannis marginaria* on the 12th. This insect became particularly active on the wing about midnight. Severe wintry weather supervened on 26th, though the amount of snow on the South Coast was slight.

March.—Wintry weather with East winds and snow blizzards continued until the 18th, doing considerable damage to the local sallow blossom, which was on the point of flowering. On the 19th fine mild weather set in, and already *Achlya flavicornis*, *Earophila badiata*, and *Orthosia stabilis* were on the wing. The undamaged sallows flowered quickly, and by the 24th all the Common Taeniocampids were feasting; I was delighted to find also that the lovely *Orthosia miniosa* was not uncommon among them, and also at light. The latter also attracted large numbers of ♂♂ *Alsophila aescularia*, which were also to be found commonly sitting on the birch twigs in woods, *Tephrosia bistortata*, and an occasional *Biston strataria*. An interesting customer at an illuminated road sign at this time was a female newt; although appearing to gaze with fascination at the light, I suspect her of being in reality more interested in the flying and settled insects. The 26th was a glorious sunny day, when I saw the first butterfly of the year; this was a lovely *Nymphalis antiopa* observed from the train quite clearly flying alongside the line in Balcombe forest. If I had had a net, the temptation to pull the communication cord might have been considerable! *Gonepteryx rhamni* ♂♂ were also on the wing this day, and on the 28th *Nymphalis io*, together with *Brephos parthenias* and *Nothopteryx carpinata* on the birches. The month went out in a blaze of warm weather; attempts were made to rediscover *Endromis versicolora* in its old Sussex haunts with the aid of a virgin ♀ bred from Scottish stock, but without success.

April.—Continued warm weather brought *Pieris brassicae* and *P. napi* out in some numbers by the 2nd, *Celastrina argiolus* by the 4th, and at light on this day an unusual visitor was a rather worn *Spilosoma lubricipeda*, the larvae of which are to be found commonly in the autumn feeding at night on ivy. The warm spell brought the cuckoo early, being heard on the 2nd, and Cowslips were flowering in sheltered spots. From 5th to 12th cold North-Easterly winds occurred,

synchronizing with a fine show of Blackthorn blossom. On the 7th *Nothopteryx polycommata* was found not uncommonly on privet near Worthing. On the 13th *Pararge aegeria* was well out, followed on the 14th by *Euchloë cardamines*, and the first tentative song of nightingales, while swallows and house-martins were flying. On the 19th *Ligdia adustata* was flying at dusk over the Spindle bushes.

On 23rd a fortnight's leave was taken at Aviemore, and a short digression on conditions there may be of interest. The weather was mostly fine but with cold N.E. winds. Immediately on arrival *Endromis versicolora* was found in large numbers sitting on the fences and large birch trunks, as well as on twigs and heather. Perhaps owing to the small amount of sun, however, not one male was seen on the wing by day, though a male came to the lamp at midnight on the 30th! A single specimen of *Isturgia carbonaria* was seen at 700 feet altitude on the 24th, but this species was not fully out until the first week in May. By the end of the month *Saturnia pavonia* (*carpini*) was well out, the males flying in the sunshine, females sitting on heather, while the earlier spring species, *N. carpinata*, *Lycia hirtaria*, and *A. fiavicornis*, were still to be seen on fences and tree trunks, together with *Selenia tetralunaria*, which was emerging.

May.—By the 2nd, *Pieris napi* was flying freely on the low ground, while *I. carbonaria* and *Anarta cordigera* were well out on the lower hillsides, the latter sitting singly and *in cop.* on the rocks in the late afternoon. In company with Baron de Worms, visits to the high ground were paid on 4th and 8th, a number of full-fed larvae of *Amathes alpicola* and a pupa of *Psodos coracina* being found under crowberry on the hilltops at 2400 feet.

On 8th also, *Anarta melanopa* was emerging, and much healthy exercise was had in procuring them. So procryptic is their colouration and fast their flight that in was often found easier to chase their shadows on the hilltop moss in the bright sunlight. From the 12th to the 18th duty took me to Kyle of Loch Alsh; here I found *Thecla rubi* and *Argynnis euphrosyne* flying in company with numerous *P. napi*. *Apatele menyanthidis* and *A. euphorbiae* var. *myricae* were emerging; larvae of *Arctia caja* were numerous.

Returning to Sussex on the 18th the season appeared to be a few days later than normal; *A. euphrosyne* was fully out but by no means common, whilst on the 25th in Hampshire *Euphydryas aurinia* ♀♀ were just emerging, a beautiful sight. A very few ♂♂ *Acosmetia caliginosa* were obtained, whilst the usual common moths of early May were found in fresh condition. Larvae of *Thecla betulae* and *Nola cucullatella* were very immature, second instar, even in sheltered places; on the other hand a nearly mature larva of *Apatura iris* was found on the 29th, pupating on 5th June. *Plusia gamma* was very fresh and abundant everywhere by the end of May.

June.—May went out and June came in with cold, wet and windy weather, continuing with only occasional bright intervals all the month. *Dasychira pudibunda* and *Rivula sericealis* were unusually abundant at light during the month, but otherwise night work was very unproductive, due probably to the low temperatures. Butterflies were equally little in evidence, *A. selene* not being met with until 22nd, still fresh.

Larvae were developing very slowly, for on 7th June two more *A. iris* were found, which did not pupate until the third week of the month, while *T. betulae* larvae were abundant, most being in the 2nd and 3rd instars only. Oak trees were notably free of larvae, very few being found. Temperatures continued so low that the three *A. iris*, although kept indoors, remained in pupa for 27, 23, and 22 days respectively. A large colony of larvae of *Eriogaster lanestris* was found on 15th; they were mostly in the third instar, fed up slowly and all had pupated successfully by the end of July. *Sphinx ligustri* flew round a street lamp at midnight on 22nd.

On 25th *Melitaea athalia* ♂♂ were emerging, the day being comparatively warm and fine, whilst a few *Cupido minimus* were flying on the Downs. *Proeris globulariae*, however, was not yet out; in 1945 it was nearly over by this date.

JULY.—The only prolonged sunny and warm period of the summer occurred from 1st to the 13th; even this was punctuated by some thunderstorms. *Argynnis paphia* was emerging, both sexes on the 3rd, but numbers remained comparatively few in its usual Sussex woods; with *Limenitis camilla* it was not fully out here until 9th, the latter also being less numerous than usual. *Argynnis cydippe* was actually rare in its usual haunts where it is normally abundant. On the other hand, *Argynnis aglaia*, *Vanessa atalanta* and *Vanessa cardui* were common and fresh at this time, as also was *Colias croceus* in the lucerne fields, including the usual proportion of var. *helice*; *Colias hyale* was not seen. *Aphantopus hyperantus* was fully out, but also below usual numbers, by the 12th; *Melanargia galathea* was, however, plentiful on the Downs on 12th, on which date *Plebejus argus* ♂♂ were freshly out in Balcombe and Ashdown forests, and *Polyommatus* (*Lysandra*) *coridon* ♂♂ on the Downs; the latter as usual remained in small numbers until August.

All three *A. iris* had emerged in my cages by 12th, and on 14th fresh males were not uncommon over birch trees as well as oak in West Sussex. Quite short birches were tantalizingly popular! Cool, stormy weather supervened now until the end of the month. On the 17th, during a brief sunny period, it was pleasant to find *Adopoea actaeon* abundant on the Dorset coast, and *Eumenis semele* was flying in some numbers. Probably due to the continued bad weather moths were only found in small numbers during the rest of the month, the most interesting being single examples of *Stauropus fagi*, *Notodonta dromedarius*, *Abrostola tripartita*, and *Apatele tridens* coming to light on different nights. Sugar substitute, malted cod liver oil, and beer, which has previously been proved effective, produced practically nothing at this time, only a few rather worn *Mythimna turca*. The Catocalas were conspicuous by their absence, and I believe emerged late in August this year.

The month ended with a cold night on 31st, which unexpectedly provided good results with the lamp, specimens of *Nola albula*, *Miltochrista miniata*, *Eilema complana*, *Eilema lurideola*, *Lymantria monacha*, *Lophopteryx capucina*, *Habrosyne derasa*, *Cilix glaucata*, *Lasiocampa quercus* ♀, *Philudoria potatoria*, *Thalpophila matura*, and many Geometers being taken.

AUGUST.—Gales and rain characterized most of this month, with a few sunny days here and there. *Apatura iris* was still flying on the 5th, as was the second brood of *Leptidea sinapis* in fair numbers. I was delighted to watch the courtship on grass stems of two pairs of this attractive insect. *Gonepteryx rhamni* was flying in large numbers at this time.

Hunting for *Nonagria* pupae in the aquatic reeds produced a fair number of *N. typhae*, with a sprinkling of *N. cannae* (*algae*) and *N. sparganii*. A noticeable feature was the unusually large number of casualties due to Moorhens and Coots, perhaps caused by the high water level of this wet summer. On the Downs, *Nymphalis io* was common on the 15th, and *Anaitis efformata* was flushed from the undergrowth in some numbers. *Nonagria typhae* was flying well to the lamp by the 18th, and continued to emerge right up to the end of September in the reed beds; here also a pleasant surprise was the discovery of *Simyra albovenosa* on 21st and 1st September. The common moths appeared thinly at light whenever the weather allowed, the most interesting to be found being second brood *Pheosia tremula* and *P. gnoma*, and an occasional *Cryphia muralis* at rest on stones.

SEPTEMBER.—The same dismal weather—rain, wind and cloud continued almost unbrokenly until the 23rd, when a few days of warm, sunny weather made a belated appearance. On the 1st, dusking in the reed-beds discovered *Comacla senex*, possibly a second brood, together with large numbers of *Tholera popularis* and *Orthoneura lignata*. A single example of *Arenostola pygmina* also came to the lamp, with large numbers of *N. typhae*.

A single larva of *Plusia festucae* fed up and developed a male moth in October, while on the Downs near Arundel beating maples provided a fine young larva of *Lophopteryx cucullina*.

On 9th a rare sunny day occurred; a few *Colias croceus* were flying, including two on waste ground in the middle of Portsmouth, but the numbers were sadly reduced by the wet weather.

On 19th the " early " autumn moths were appearing; *Omphaloscelis lunosa* was at light and ivy blossom in large numbers, followed on 21st by *Cirrhia gilvago*, and a few *C. icteritia* and *C. lutea*, the latter mostly at remnants of Ragwort blossom in the woods. On 23rd the lamp attracted large numbers of *Asphalia diluta* and *Dysstroma truncata* with melanic examples of the latter predominating.

The 25th was marked by a large rise in temperature, accompanied by light rain. That night and on seven successive nights a very considerable number of the splendid Geometrid Moth, *Ennomos autumnaria*, appeared at street lamps and illuminated road signs. Both sexes were present in fresh condition and ova were obtained. For this reason I think they were probably locally bred and not immigrants. Several *Polia flavicincta* were obtained resting on street lamps at this time, and a few *Gortyna flavago* (*ochracea*).

OCTOBER.—Mild weather continued for the first week, and ivy blossom was well patronized by *Agrochola circellaris* with a few *Eupsilia transversa* and *Agrotis ypsilon*; these three species also condescended to come to the sugar substitute patch. Rather cold fine weather followed,

and by the 18th *Agrochola lychnidis* and *colotois pennaria* appeared in rather small numbers compared with 1945; the remaining autumn moths were also less common than usual, *Oporinia dilutata*, *Erannis defoliaria*, *E. aurantiaria*, *Meganephria oxyacanthae*, *Episema caeruleocephala* all appearing occasionally at light during the last week.

November.—This month also opened with a fine sunny week, which was devoted largely to pupa digging. Results bore out the impression gathered earlier in the year that Oak trees were deficient in numbers of insects; Elm was the most productive, fair numbers of *Mimas tiliae*, various Taeniocampids and Geometers being obtained. Among them a pupa of *Agrotis saucia* produced a moth on 22nd, and another came to light on 23rd. *Poecilocampa populi* has hardly been seen, in contrast to 1945 when it was abundant.

In conclusion, I realize how dangerous and unscientific it is to generalize as to cause and effect when considering a group of animals so large and varied in its ecological requirements as are the Lepidoptera. I must content myself, therefore, with observing that the Sussex butterflies continued on the whole to decline in numbers in this second wet and cold summer running; many moths also, among them the most usually common, failed to appear in any quantity; but many others showed sturdy resilience, amounting almost to defiance, of our English weather.

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## LEPIDOPTERA AND " HONEY-DEW."

By Bryan P. Beirne.

In an interesting article in the *Entomologist's Record* for September, 1945 (vol. LVII: 93) Mr P. B. M. Allan discusses the possibility of larvae being killed by feeding on leaves coated with the aphid excretion known as honey-dew. This prompted me to analyse a number of notes on the seasonal abundance of Lepidoptera and of aphids, which I had compiled from the entomological periodicals.

Aphids (or honey-dew) are recorded as having been exceptionally abundant in many parts of England in at least five and probably in a further three of the past sixty years. Judging from the published records none of these seem to have been a " good " year for Lepidoptera, several of them having been very " bad." In estimating the seasonal abundance of these insects the fact that scarcities of Noctuids may have been only apparent has been taken into account. Apparent scarcities of Noctuae often are due to their forsaking sugar for the counter-attraction of honey-dew.

1889 was a year of aphid abundance (see, e.g., Stott, *Entom.*, XXII: 262; Still, *Ibid.*, XXIII: 14; Young, *Ibid.*, XXIII: 69) and seems not to have been a " good " year for Lepidoptera. The relative scarcity of most species of Lepidoptera may have been due to the preceding winter having been comparatively mild and dry and thus favourable for the activities of natural enemies of these insects.

In the following summer, 1890, aphids again seem to have been exceptionally abundant (see, e.g., Walker, *Ent. Rec.*, I: 156; Fenn, *Ibid.*, I: 158; Newstead, *Entom.*, XXIV: 20). There seems to have been no particular scarcity of Lepidoptera in the spring but later they became scarce and from July onwards 1890 was a very " bad " year for most Lepidoptera. This scarcity, however, could be attributed to weather conditions. There were high winds and heavy rains in the spring and summer of that year. The winds must have battered many adults and larvae to death and greatly restricted the flight and egg-laying activities of those which survived, while the damp was favourable for the spread of larval disease.

1893 in particular was a year in which aphids were excessively abundant (see, e.g., South, *Entom.*, XXVI: 274; Atmore, *Ent. Rec.*, IV: 175; Mason, *Ibid.*, IV: 176; Battley, *Ibid.*, IV: 226; Bazett, *Ibid.*, IV: 226; Riding, *Ibid.*, IV: 344). Again, Lepidoptera seem to have been in their normal numbers in the spring but there was a relative scarcity of most species during the summer. There is no good evidence that the abundance of honey-dew was the primary cause of this. The scarcity probably was due to the long and severe droughts of that summer, which must have caused the deaths of large numbers of larvae and pupae from lack of moisture and, more importantly, caused the increased activities of birds, parasitic and predatory Hymenoptera and other diurnal and sun-loving natural enemies of the Lepidoptera.

The next years of recorded aphid abundance were 1898 and 1911 (see, e.g., Ridley, *Ent. Rec.*, X: 262; Greer, *Ibid.*, X: 309; Ormerod, *Entom.*, XXXII: 143; and Theobald, *Entom.*, XLIV: 252; Whittle, *Ibid.*, XLIV: 368; Mathew, *Ibid.*, XLV: 155). Neither seems to have been a " good " year for Lepidoptera, probably because of unfavourable weather. In both summers the rainfalls were below and the temperatures above the average so that the relative scarcities of the Lepidoptera may have been due to the same causes as in 1893. In 1911 the cold winds in the spring also must have been detrimental. Incidentally, most butterflies were exceptionally abundant in the hot summer of that year.

There are some indications that aphids may have been abundant in 1907 (Mosely, *Entom.*, XLI: 209), 1929 (Barnes, *Ent. Mon. Mag.*, LXVII: 55) and 1944 (Allan, *loc. cit.*). None of these was a " good " year for Lepidoptera, but in 1907 the relative scarcity of these insects may have been due to the cold, wet and sunless summer, in 1929 to the preceding long succession of " bad " and " average " seasons (see Beirne, *Entom.*, LXXX: in the press) and in 1944 to the cold and windy summer weather.

Although it may be significant that the seasons of aphid abundance all seem to have been seasons of relative scarcity of the Lepidoptera as a whole, the scarcities can be explained more readily and with a greater degree of probability by factors other than the excess of honey-dew. While it seems probable that honey-dew is detrimental to some larvae (see, e.g., Rogers, *Ent. Rec.*, XXI: 233), probably by favouring the spread of or by reducing the resistance of the larvae to disease, there is at present no good evidence that it is important in causing seasonal scarcities of the Lepidoptera as a whole, whatever the case may be with individual species.

## VARIATION OF EREMOBIA OCHROLEUCA.

By A. J. Wightman, F.R.E.S.

This species is generally considered to be very constant in markings and colour in this country and apparently on the continent also.

Nevertheless, when large numbers are bred a fair number of minor variations in the markings are met with and the colour range is fairly wide.

As regards the markings, the two large dark blotches across the centres of the forewings are usually divided by the crescent shaped white edging of the lower one, but occasionally this white line is absent and the insect has an unbroken, dark, waisted band.

Again the lower blotch may be subdivided into two distinct dark spots. The reniform which being white with a mere dark line in its centre is normally hardly to be traced, is sometimes edged by a brown line and then becomes quite conspicuous. In the very pale forms the submarginal area and apical patch are almost wholly free from markings, while in the darkest forms those areas may be wholly brown.

I have in the course of years and by reason of breeding large numbers obtained three forms which are very different from the type in appearance.

(1) Ground colour pale greenish grey, cilia white with dark bars obsolete except in the extreme outer edge, where these appear as blackish dots.

Submarginal area white with the faintest of greenish grey dusting, apical patch extended in area and white.

The pale area outwards from the upper dark blotch is almost wholly white, and the two dark blotches widely separated by white, and light grey in colour.

This is a scarce form, but I have bred it in both sexes. I call it ab. *pallida*.

(2) Ground colour pale rosy pink; the darker markings apart from the red-brown blotches are red.

The usual white markings, including the apical patch, are flesh-colour, but there are a few white lines around the blotches.

This is also a scarce form, especially in the ♀. I call it ab. *rufescens*.

Both the above forms are much paler than the ordinary typical form.

(3) Ground colour brown; dark blotches and band between outer line and submarginal are deep chocolate.

The submarginal area and apical patch are pale brown, while the usual pale area outwards from the upper dark blotch is so marked with brown reticulation as to be lost in the general brown of the wing.

The reniform is clearly seen, being the palest part of the wing. White edged in brown and with a brown centre, the orbicular is also clearly marked white, round, edged with brown and with a brown dot in centre. I have only bred this in the ♂. I call it ab. *brunnea*.

All three forms from Sussex larvae.

## A LIST OF TRYPETIDAE (DIPTERA) FROM NORTH-EAST SURREY.

By M. Niblett.

The following List of *Trypetidae* comprises the species I have either bred or captured from an area bounded on the North by Norwood, Mitcham and Esher; on the South by Clandon, Kingswood and Boxhill; on the East by Addington, Chelsham and Woldingham; on the West by Albury, Ockham and Wisley. The area contains a portion of the North Downs with their characteristic Chalk flora, and also in addition a number of low-lying Commons with a very different assortment of plants. To some portions I have only paid occasional visits; others have been visited much more frequently; weather was very variable, making sweeping at times impossible. I have found collecting the larvae and breeding the flies from them much more profitable than trying to capture the adult insects, besides giving in addition an insight into their biology; also the number of species discovered by searching for the larvae was much in excess of those swept.

The nomenclature of the *Trypetidae* appears to be still in the melting pot so I have retained that used by me previously (1); the botanical nomenclature follows *The London Catalogue of British Plants*, eleventh edition. There are undoubtedly other species likely to be found in the area under consideration, but they have not appeared to me.

*Euribia cardui*, L.—This species is widely spread over the whole area but appears to favour the more low-lying districts, where the conspicuous galls upon the stems of the thistle, *Cnicus arvensis*, L., are frequently to be met with. The fly emerges in June and July and, considering how plentiful the galls are, it is rather surprising how few of the insects come to the net.

*E. jaceana*, Her.—The host plant, *Centaurea nigra*, L., may be found usually quite plentifully almost everywhere; it is rare to find a clump of *C. nigra* in the autumn without at least a few of the heads having the hard gall containing the larvae of this species in them. The flies emerge from May to August and may usually be swept from their food-plant, or other plants growing in the vicinity, in some numbers in July.

*E. quadrifasciata*, Mg.—This species is also associated with *C. nigra*, the larvae feeding in the seeds. I have found it well distributed and by no means scarce; on one occasion at Epsom Common, in July, it was the most plentiful Trypetid on the wing. There are two broods, one emerging in May and June, the other in July and August.

*E. stylata*, Fab.—This is a species whose galls in the flower-heads of *Cnicus lanceolatus*, Willd., may be found plentifully all over the area; where *Carduus nutans*, L., occurs, it is also usually attacked; more rarely the flower-heads of *Cnicus palustris*, Willd., and *C. arvensis*, Hoffm., are also galled. The flies emerge in June and July and sweeping the thistles from June to August will usually produce a number of specimens.

*Myopites blotii*, Bréb.—With this species the larvae cause the formation of hard galls in the flower-heads of Fleabane, *Pulicaria dysenterica*, L.; it is usually confined to coastal districts. I have met with it on both Epsom and Ashtead Commons, not in any great numbers and widely

scattered. The flies emerge in July and August, having a long larval period. Fleabane is not uncommon in many low-lying parts of the area and a more intensive search than I have made might reveal the presence of this species in other localities.

*Rhagoletis alternata*, Fall.—I think this species is more frequently seen in the larval stage, the larvae being found in the fruits of various species of wild-roses in the autumn. It appears to be much more widely distributed than one would judge from the small number of imagines seen, which emerge during May and June.

*Trypeta zoe*, Mg.—I have never taken this species on the wing, the larvae are to be found in mines in the leaves of Ragwort, Chrysanthemum, etc.; in my garden at Wallington the leaves of cultivated forms of the latter are often heavily attacked, the larvae are as a rule heavily parasitized by Chalcids but they have survived these attacks for the last fifteen years. It is a hibernating species, the flies emerging from the end of June to the end of July.

*Gonioglossum wiedemanni*, Lw.—This is another species I have only obtained by breeding from the larva, these live in the berries of *Bryonia dioica*, Jacq., the White Bryony; it is I think rather local, its host-plant is widely distributed but examination of it in many areas failed to disclose any larvae; one stretch of hedge at Banstead, some years ago, had a very high percentage of the Bryony fruits decorating it with larvae in them. The flies emerge in June.

*Phagocarpus permundus*, Har.—The larvae of this species are also berry-feeders, being found in the fruits of Hawthorn; it is I am inclined to believe rather local, but judging by the number of larvae found in various localities, should be locally plentiful. The fly emerges in May and June and should be found in the latter month in localities it favours.

*Acidia cognata*, Wied.—The larvae of this species live in mines in the leaves of Butterbur and Coltsfoot; I have only found them in those of the latter plant in the area under discussion. Coltsfoot is to be found well distributed but I have found the larvae in a small number of places. The fly emerges in June so patches of the plant might well be profitably swept during that month and July.

*Philophylla heraclei*, L.—The larvae mining the leaves of cultivated Parsnips and Celery are undoubtedly a pest to cultivators; the leaves of various species of Umbelliferous plants are often heavily attacked, particularly Hogweed and Wild Parsnip. The fly may usually be found in all districts where the plants occur. The flies emerge in June, July and August; it has been stated that there are two broods in a year; this may well be so, I have had flies emerge at the end of June from larvae found early in the month, from other larvae found in July the flies emerged in August.

*Ceriocera ceratocera*, Hend.—This species is found sparingly in such localities as the food-plant of its larvae, the Great Knapweed, occurs; this is chiefly on the North Downs area. The fly emerges from early June to early July and sweeping in July and August should prove most profitable.

*C. microceras*, Her.—The larvae of this little known species live in the stems of the Great Knapweed, *Centaurea scabiosa*, L., and emerge

during June and July; I have never taken the insect, but have bred it from stems of its food-plant collected at Epsom Downs, Banstead Downs, Banstead Wood and Woodmansterne; the latter locality is now under cultivation.

*Chaetorellia jaceae*, R.D.—My only record of this species is of a few flies bred from flower-heads of *C. nigra* growing in my garden.

*Chaetostomella onotrophes*, Lw.—This species is well distributed over the whole area; I have swept it from various Composites in July and August and bred it from *C. nigra*, *Serratula tinctoria*, L., and *Cnicus palustris*. My observations lead me to believe that this species is at times, if not always, double-brooded.

*Terellia serratulae*, L.—Swept sparingly from Thistles in July and bred in fair numbers from heads of *Carduus nutans* collected at Walton Heath and Banstead Downs; also from heads of *C. lanceolatus* taken at Epsom Common, Banstead Downs, Boxhill, Riddlesdown, Mitcham Common and Epsom Downs; the majority of the flies emerged in June.

*Orellia colon*, Mg.—This species is generally distributed all along the North Downs, where its food-plant, *Centaurea scabiosa*, occurs. Bred specimens have emerged in August of the first year and June of the second, others have been swept in July.

*O. falcata*, Scop.—I have only one record of this species, nine flies were bred from the root-stocks of several plants of *Tragopogon pratense*, L., collected at Riddlesdown, from which they emerged in May and June.

*O. ruficauda*, Fab.—This species has been swept from *C. palustris* and *C. arvensis* in numerous localities, and bred from the flower-heads of these Thistles in some numbers. Judging by the larvae obtained *palustris* appears to be the more favoured food-plant. All the flies captured by sweeping were taken in July; of those bred the majority emerged in June, a very few coming out in early July.

*O. tussilaginis*, Fab.—Bred and swept from very few localities, it is probably much more widely distributed than my records show; captured insects were taken in August while those bred emerged in June and July; it appears to have a long larval period; from several heads of Burdock collected in mid-July with larvae in the seeds, the flies did not emerge until the latter half of the following June.

*O. winthemi*, Mg.—Since I added this species to the British List in 1934 (2) I have found the larvae in the flower-heads of its food-plant, *Carduus crispus*, L., in considerable numbers, in nearly all of the many localities in the area where *crispus* occurs. Although I have not captured any of the flies it should be possible to net them in some numbers after mid-June, as they emerge freely from then until early July.

*Xyphosia miliaria*, Schr.—Here we have another species whose larvae feed in flower-heads of Thistles, rather favouring *arvensis*, I think; I have bred from *arvensis* more *miliaria* than I have from *palustris*, and in selective sweeping the same thing has occurred. There are apparently at times two broods, flower-heads collected in mid-July yielding flies in August while those taken at the end of July or later did not give the flies until the following June; those swept were taken in July and August. I found this species well distributed over the area.

*Oxyna flavipennis*, Lw.—I have never taken or bred this insect but have found the characteristic galls on the roots of *Achillea millefolium*, L., at Epsom Common, Fetcham, Bookham Common and Worms Heath, between 4th August and 28th March, in each case they had emergence holes in them and contained empty puparia; this rather points to a rapid development of the gall in the early summer, and an equally quick development of the larva. The flying time is stated to be between May and September, this requires confirmation; I think there may well be a break in this period; further investigation is obviously needed here.

*Sphenella marginata*, Fall.—The larvae of this species are to be found in the flower-heads of various species of *Senecio*, where they pupate, the majority of the flies emerging in August; it is generally distributed over the whole of the area and is not uncommon. There is one point in connection with this species which I should like to know more about: it is whether insects whose larvae have fed up on one species of *Senecio* will oviposit in the flowers of another. Some years ago I found in an uncultivated field near Burford Bridge a big crop of Groundsel, the flowers of which contained numerous larvae of *marginata*; on visiting the field two years later I found that practically all the Groundsel had disappeared, its place being taken by an equally abundant growth of Ragwort; examination of well over a hundred flowers of this plant in various parts of the field failed to disclose a single *marginata* larva; this might be an interesting point to follow up, there had obviously been no cultivation of the field during the intervening period.

*Ensina sonchi*, L.—This small species is usually plentiful over the whole area, the larvae affecting a number of species of the Compositae, *Sonchus arvensis*, L., being I think the most favoured; there is more than one brood in a year judging from my breeding investigations, although I have only captured the insect in July.

*Tephritis bardanae*, Schr.—This species is not uncommon in areas where its food-plant, Burdock, occurs; it emerges from the seed-heads in August and September; if it is proposed to obtain the flies by breeding the heads should for preference be collected in early August as the flies frequently emerge before the end of the month. It is a hibernating species.

*T. conjuncta*, Lw.—I have records of this species from Ranmore Common, Epsom Downs, Chipstead and Walton Heath only; it is, however, in all probability to be found in many other localities where the food-plant of its larva occurs. The larvae may be found in the flower-heads of the Ox-eye Daisy, *Chrysanthemum leucanthemum*, L., from the latter part of June to the end of July, the flies emerging in July and August, which are the best months to sweep for it.

*T. hyoscyami*, L.—This species is to be found on the North Downs and adjacent areas where its food-plant, *Carduus crispus*, grows; if it is proposed to breed the fly the flower-heads should not be gathered later than the beginning of August, otherwise they may be found to contain empty puparia only. The flies emerge in July and August when they may be swept, also hibernated specimens may be found in spring and early summer.

*T. vespertina*, Lw.—This is another species where the adult fly hibernates; it emerges from June to August but does not appear to be double brooded, the larvae are to be found in the flower-heads of *Hypo-*

*choeris radicata*, L., but rarely after the end of July. It appears to be widely distributed, favouring rather the higher ground perhaps; sweeping its food-plant in July and August will usually produce specimens, but they are more easily obtained by breeding from the flower-heads collected in the summer.

*Trypanea stellata*, Fuess.—Only once have I found this species, a few larvae being found in flower-heads of Ragwort collected at Riddlesdown in August; the flies emerged at the end of that month and early in September. I cannot believe it to be so scarce and probably by sweeping some of its many reputed host-plants in September, further records might be obtained.

*Noeëta pupillata*, Fall.—This species is well distributed over the whole area and is to be found wherever the food-plant of the larva occurs; these may be found in the swollen flowers of the shrubby Hawkweeds. They have a long emergence period and it is rather surprising more are not found in the net; May and June, and again in August, are likely to prove the most profitable times for sweeping for the fly. They are, however, easy to breed, and flowers with larvae in them in the late summer will as a rule yield a series of flies a little later, or in the following May.

The number of species recorded, 32, compares favourably with other local and county lists that have been published, but I feel that more intensive work in the area should produce a number of additional species.

REFERENCES.

(1) Niblett, M. 1939. *Entomologist's Record*, 15.v.
(2) Niblett, M. 1934. *Entomologist's Record*, 15.iii.

## TUKDAH DIARY, SEPTEMBER-NOVEMBER 1945.

By D. G. Sevastopulo, F.R.E.S.

(*Continued from p. 7.*)

3rd October.—Another wet day, but a specimen of *L. rohria*, in addition to the other common Satyrids, was flying in the forest. A search of the tree trunks produced a single *Plexiphlebs (Euplexia) stellifera*, Moore, well hidden against a background of moss. A walk in the evening produced *Lymantria concolor*, Wlk., and *Urapteryx sciticaudaria*, Wlk., off tree trunks, and another large Geometer was seen settled too high up to be caught or identified. A single *Sylepta deficiens*, Moore, at light.

4th October.—A misty morning with short spells of sunshine, but not enough to tempt the sun lovers, the shade butterflies were flying in numbers and *L. verma* is becoming more common. A number of *U. primularis* were beaten out and specimens of *Elphos hymenaria*, Guen., were taken settled on tree trunks. Larvae of *T. batis* were very common on *Rubus*. In the afternoon a walk in the forest produced specimens of *Ariolica pulchella*, Elwes, and *Erebomorpha fulgurita*, Wlk., both disturbed from the branches of pine trees. In the evening a

*Sirinopteryx rufivinctata*, Wlk., and a *L. obliquata* were caught. Light attracted two *A. strigipennis* and a few small Geometers.

5th October.—A fine morning without much sun, most of the common butterflies flying. *L. sidonis* is now becoming common. A single *Celaenorrhinus pyrrha*, de N., was caught. *U. primularis* was common, no fewer than four being settled under the large leaves of one small tree. A misty afternoon and evening, the only things of interest found being a larva of *Pantana bicolor*, Wlk., and a dead female *Zeuzera multistrigata*, Moore. A good evening with light, some twenty or more species, mainly Lithosiids.

6th October.—A fine morning, but without much sun. *Melanitis leda*, L., *ismene*, Cr., was flying fairly commonly among the undergrowth in the forest. A female *Carige cruciplaga*, Wlk., and a male *Boarmia* (still unidentified) were found settled on tree trunks. A misty afternoon spent blowing caterpillars. A clear evening and a walk through the forest produced a female *E. sahadeva*, larvae of *Locastra cristalis*, Hamps., and, in addition to previously recorded species, specimens of *Euproctis inconcisa*, Wlk., and *Chlorodontopera discopilata*, Moore. Some half a dozen moths only attracted to light.

7th October.—A fairly sunny morning, and went down through the tea to see if any butterflies or tea-feeding Zygaenids were flying. Very little about, apart from the ubiquitious *L. sakra* the only things met with being a very few *Danaus tytia*, Gray, *tytia*, *L. daraxa*, *C. biblis* and *Y. nareda*, and single specimens of *Cepora nerissa*, F., *nerissa*, *Y. baldus*, *Symbrenthia* ssp. *hippoclus*, Cr., *khasiana*, Moore, *N. radha*, *P. bicolor*, *R. vinacearia* and *Erythrolophus hyriarius*, Wlk., whilst a tailless *Papilio* and a *Jamides* were seen but not identified. A walk through the forest in the afternoon produced the usual things, and, in addition, an example of *Dodona dipoea*, Hew., *dipoea*. *L. sidonis* is getting still commoner. A male *Dalima schistacearia*, Moore, was found settled on a leaf. Light a complete failure.

8th October.—A dull and unproductive morning. A late afternoon walk produced a specimen of *Melanitis phedima*, Cr., *bela*, Moore; nothing else new all day. A clear, moonless night, but nothing attracted to light.

9th October.—The weather is settling, the morning was cloudy at first, clearing later. A walk along the forest road produced nothing new except a female of *Ixias pyrene*, L., *familiaris*, Btlr. Larvae of a *Stauropus* (which died), *E. bhurmitra* and another Boarmiid (still unidentified) were found. A fine, sunny afternoon, the first so far. A walk through the tea produced, in addition to the usual common things, a few *D. aglea*, *D. tytia*, *Y. nareda* and *C. biblis*, a black and orange *Neptis* and a *Lycaenopsis* were seen but not identified, and single specimens of *E. blanda*, *N. hylas* and *Tagiades menaka*, Moore, were caught. A male *Gnophus licheneus*, Oberth., was found settled on a stone boundary post and one of *E. hymenaria* on a tree trunk. An Asilid was seen to make an unsuccessful attack on a female *E. mulciber*. Light a complete failure.

10th October.—Heavy showers all the morning, making collecting impossible. It cleared in the afternoon and a walk through the forest produced, among other things, *T. plagiata* and a Boarmiid (still unidentified, I have twelve species of this Sub-family still unidentified alto-

gether) on tree trunks and *Bomolocha* (*Hypena*) *divisalis*, Moore, out of herbage. A number of *L. verma* were noticed resting head downwards on tree trunks. In the evening the sun came out and *Vanessa indica*, Herbst., *indica* and *Vanessa cardui*, L., were basking on marigolds. Light again a complete failure.

11th October.—A fine, sunny morning and a walk along the forest road produced, in addition to the usual common things, a pair of *Danaus melaneus*, Cr., *plataniston*, Fruhs., a *P. wedah*, a *Symbrenthia hypselis*, Godt., *cotanda*, Moore, and two *D. dipoea*. *A. childreni* was flying quite commonly, but not a single *Neptis* was seen. On the way home, an *Abraxas martaria*, Guen., was found resting on a leaf. In the afternoon a walk through the tea produced the first *Vanessa cashmirensis*, Koll., ssp. *aesis*, Fruhs.; it seems strange that in a place where one would expect bright colours, *aesis* should be a dull edition of *urticae* and *indica* of *atalanta*. Single specimens of *Eurema laeta*, Bsd., *sikkima*, Moore, *P. cama* and *Ceryx* (*Syntomoides*) *imaon*, Cr., were also caught, as well as a number of larvae of *C. fulvida*. Light again a failure.

12th October.—A beautiful sunny morning, but completely ruined from the point of view of collecting by a severe cold in the head, which left me with barely enough energy to crawl about the garden. One cannot be short of breath and tramp these hills. It has suddenly struck me that the swarms of *S. taprobanis* have been missing from the verandah for about a week. Light a complete failure.

13th October.—Again nice and sunny, plenty of butterflies were flying down among the tea, but nothing worth recording. A large orange and brown wasp with dark blue wings was seen dragging a paralysed spider almost the size of a baby mouse; these spiders are presumably quite common, although I have seen none, as the wasp is flying in numbers. In the afternoon an Asilid was seen to attack and kill a *Y. sakra*. A female *Caberodes dentisignata*, Moore, was taken at rest, and larvae of *Rhagastis confusa*, Roths. & Jord., *Lymantria bivittata*, Moore, and *Dindica* (*Pseudoterpna*) *polyphaenaria*, Guen., were found. Light again a failure.

(*To be continued.*)

## COLLECTING NOTES.

NOTE ON ORTHOPELMA LUTEOLATA, GRAV. (HYM. ICH.).—Several of the familiar pincushion galls caused by *Rhodites rosae* were collected near Ravensborough Castle (ancient earthworks) on the Barton Hills (Beds.) and were stored (28.1.42). A large number of the ichneumon *Orthopelma luteolata* emerged during the period 11th-16th May 1942. Fifteen of these were preserved at the time, being collected at random and since only four of these are ♀♀ it would appear ♂♂ preponderated amongst the emerging ichneumons.—B. VERDCOURT.

A VERY RARE ABERRATION OF HEODES PHLAEAS.—On 10th May 1946, near Soothern, Lincolnshire, I was fortunate enough to capture an example of the rare and beautiful ab. *alba*, Tutt. It was taken at rest on a knapweed head at dusk.—J. SIDNEY ASH.

## CURRENT NOTES.

The *Ent. News* (Am.), July 1946, records that the " well-known and active " Museum of the Federated Malay States at Kutala Lumpur was totally destroyed by bombing, but the private collection of one of the staff was found intact. Another of the staff, Mr H. M. Pendlebury, who was author of " The Butterflies of the Malay Peninsula," who took part in exploration in Borneo, has died after three years in a concentration camp from " malnutrition and starvation."

An extremely fine and perfect local collection of Lepidoptera from S. Mexico has been acquired by the American Museum of Natural History. It was made by Caros C. Hoffmann during 30 years' residence in S. Mexico.

The current part of the Spanish *Eos*, Vol. xxii, pts. 1-2, pp. 31-45 (1946), contains an article on the French race (subsp.?) of the very remarkable Saturniid, *Graëlbsia isabelae*, of Spain. It is written in French by H. Elen, who adds to his own observations a summary of what has been said by various authors of the alpine form of this very fine insect.

Two more contributions to the records of the Hesperidae of S. America have been received from K. T. Hayward: (1) The species which occur in the Parana area of S. Brazil; and (2) Those of the S. Paulo district.

The *Ent. News* for October records two new genitalic species of Skipper, *Hesperiidae*, from Central America and Mexico. No figures of the perfect insects are given.

Some time ago our correspondent Kenneth J. Hayward was appointed to a post in the Institute Miguel Lillo in Tucuman, an Argentine provincial city at the N. Western foot of the Andes. We have just received from him an illustrated pamphlet describing in detail the method of collecting and preserving in the field as well as despatching insects of all Orders. From his own experience in his native S.W. England, from the desert country around the Aswan (Nile Reservoir) desert country, from the lovely island of Cyprus, and the years he has spent about the great river areas of the Argentine, Hayward's practical advice and instructions must be quite adequate for his task.

Obituary.—Another of the older generation of enthusiastic naturalists has passed away by the death of the Rev. Alfred Thornley at the age of 91. He was born at Preston and became a student at Merton College, Oxford, and subsequently he took up duty in Nottinghamshire and took a general interest in Botany, Zoology and Geology. His persistent advocacy of the introduction of Natural History in the curriculum of all schools and eventually his view was adopted by the Educational Department. He was a genial man and liked by all who knew him. He spent his latter years in Cornwall, where he did a great deal in recording the Fauna and Flora of the Country.

## AN EARNEST APPEAL.

Now that war-time restrictions on access to the Isle of Wight have been removed, the *Sub-Committee for the Protection of British Insects*, set up by the Royal Entomological Society of London, desires to draw attention to the necessity for the protection of *Melitea cinxia on the island*.

The habitat of the insect in this country is on the extreme northern limit of its range in Europe, and it only exists in restricted areas on our South coast.

The collection of larvae of this species, though easy, is a source of extreme danger to the continued existence of the insect in these islands, since larvae if taken small are difficult to rear and, in any case, the perfect insects not required cannot reproduce their kind unless liberated in their chosen localities.

It is most desirable, therefore, that if entomologists are desirous of breeding the insect in large numbers they should arrange for this to be carried out in the Isle of Wight, so that the perfect insects not required may be liberated on their breeding grounds.

The rearing of large numbers of insects and their subsequent liberation in this way, would go far to increase the numbers of *Melitea cinxia*, since the larvae would be protected from their enemies during a critical stage in their lifetime.

The Committee for Protection of British Insects earnestly desires that the practice of collecting and of removing larvae of this species in numbers to distant parts of the country may be discontinued.

N. D. Riley, Honorary Secretary.

## CORRECTIONS.

### THE BRITISH GENERA OF TRYPETIDAE (DIPTERA).

It is unfortunately necessary to call attention to a number of mistakes in the printing of this paper, including the omission of a whole line after the proof was corrected:—

p. 4, line 19 from above, transfer the word " mining " to line 20 between the words " as " and " the."
p. 9, line 7 from above, for " *heliantii* " read " *helianthi.*"
p. 10, line 5 from below, insert " therefore " after " *cornuta.*"
p. 11, line 21 from below, should read " Caractères de la Sitarée; mais les bords latéraux," etc., etc.
p. 11, line 19 from below, for " arrondé " read " arrondi."
p. 11, line 8 from below, for " *Myiopardalic* " read " *Myiopardalis.*"
p. 12, line 3 from above, after " *Euribia* " insert the following line:— " Latr., 1802, in place of *Urophora*, Dsv., 1830, but this of course."
p. 12, line 5 from below, instead of " *guttularis*, Mg., species " read " of these three species (*guttularis*, Mg.)."
p. 13, line 16 from below, for " gläenzend " read " glänzend."
p. 14, line 16 from below, instead of " as " read " very."
p. 14, line 13 from below, after "ciliation" add "in these specimens."

## EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr Hy. J. Turner, "Latemar," West Drive, Cheam.

*Wanted*—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Instituto Miguel Lillo, Calle Miguel Lillo 205, Tucuman, Republica Argentina.*

*Desiderata*—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—*H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.*

*Wanted.*—*Lycaena* (*Heodes*) *phlaeas* from all regions including British Isles. Also wanted other species of Chrysophanids from all areas. Exchange or purchase considered. *Duplicates.*—Foreign Lepidoptera, e.g., Satyrids, Charaxes, Papilios, and others; full lists sent.—*P. Siviter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.*

*Wanted* for cash or exchange many species of ova, larvae or pupae, especially local forms and *A. grossulariata* from different localities, also Seitz Vol. 1 and Supplements to Vols. 1-4. Offers also, Tutt's *Practical Hints*, Parts 1 and 2, Buckler's larvae, Vols. 1-6, and Tutt's *British Noctua*, Vols. 2, 3, and 4.—*Dr J. N. Pickard, F.R.S.E., 36 Storeys Way, Cambridge.*

*Wanted.*—Various monthly parts of *Entomologist's Record* for 1914, 1915, 1916, 1917, 1919, and 1920. Please report any odd monthly parts (in wrappers as issued) prior to these years.—*P. B. M. Allan, 4 Windhill, Bishop's Stortford, Herts.*

*Wanted.*—Males of *Morpha menelaus, M. didius, M. rhetenor* in papers.—*Leonard Tatchell, Rockleigh Cottage, Swanage, Dorset.*

*Wanted* urgently for experimental purposes, pupae of *betularia, porcellus elephanor.—Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.*

*Wanted*, set or in papers: *Apatura iris, Vanessa polychloros, Argynnis adippe* and *aglaia, Melitaea cinxia, Erebia epiphron* and *aethiops, Coenonympha tiphon, Thecla betulae, T. pruni* and *w-album, Lycaena astrarche* and *artaxerxes, Lyc. arion, Nemeobius lucina, Adopoea lineola* and *actaeon, Angiades comma, Cyclopides palaemon.* In exchange for other British and foreign species.—*Chas. B. Antram, "Rivermead," Keynsham, near Bristol, Glos.*

*Wanted*, British butterflies, set or in papers, in exchange for *Morpho papirius, Morpho didama*, and other Morphos.—*Chas. B. Antram, "Rivermead," Keynsham, near Bristol, Glos.*

*Exchange.*—I would like to get in touch with those interested in exchanging living ova and larvae of southern species of Lepidoptera for northern species and adults. Write stating wants and probable offers.—*J. K. Goody, Weldon, 26 Carr Wood Road, Bramhall, Cheshire.*

*Wanted.*—"Entomologist" Volumes, bound or unbound, for 1926 to 1932 inclusive, and 1935, 1939, 1940 to 1942.—*F. W. Smith, Boreland-of-Southwick, by Dumfries, Kirkcudbrightshire.*

*Wanted*, for experimental purposes, a few pupae of *Endromis versicolora*, purchase or exchange.—*R. W. Parfitt, 1 Dunsdon Avenue, Guildford, Surrey.*

*Wanted.*—Spuler's *Die Schmetterlinge Europas*, Vol. I. Various unbound parts containing pages 1-144, and I-XVI with plates as issued. *Exchange.*—Various numbers of the *Entomologist's Record* and *Entomologist.—S. Wakely, 36 Stradella Road, Herne Hill, London, S.E.24.*

*Wanted.*—Volume V (five) of Tutt's *British Lepidoptera.—T. R. Eagles, 32 Abbey Road, Enfield, Middlesex.*

## MEETINGS OF SOCIETIES.

*Royal Entomological Society of London*, 41 Queen's Gate, S.W.7: March 19th and April 2nd; at 5.30 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History Society*: Last Fridays in month, 7.0 p.m., at The Birmingham Chamber of Commerce.

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# ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION



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## THE EFFECTS OF HUMAN ACTIVITIES ON THE DISTRIBUTION AND ABUNDANCE OF THE LEPIDOPTERA.

By Bryan P. Beirne, Ph.D., M.R.I.A., F.R.E.S.

As with most aspects of the study of the ecology of the British Lepidoptera, comparatively little has been published on the effects of human activities on the distribution and abundance. The following brief summary of the available information may be of value in drawing attention to points on which further information is desirable; most of the examples quoted are the only records of their type.

In the British Isles human activities have been detrimental to a very large number of Lepidoptera and beneficial only to a minority. The species which have been most seriously affected are those characteristic of woodlands. In prehistoric times the British Isles were covered with dense forests from sea-level up to as high as 2000 feet on the hills, while at the present day less than 5% of the country is wooded and only a small proportion of this is the remnants of the native forests.

Some examples of local extinctions due to the destruction of woodlands are on record. For instance, James (*Ent. Rec.*, XXXV: 161) states that the cutting of Chattenden Woods, Kent, resulted in the extinction in that area of such species as *Melanargia galathea*, *Strymonidia w-album*, *Diacrisia sannio*, *Lygephila pastinum*, and *Siona lineata*. A larger number of extinctions, although not recorded as such, may be inferred from the old records for species from woodlands which no longer exist. There is little recorded information on the effects of the extensive clearance of woodlands which was carried out during the recent war.

There is no definite record of any species having become wholly extinct in the British Isles as a result of the cutting of the woodlands, but there is a possibility that this may have happened to *Notodonta tritophus*, *N. torva*, *Cryphia algae*, *Synvaleria oleagina* or *Meyenaphria bimaculosa*.

The thinning of the trees in a woodland is detrimental to the tree-feeding species and the haulage of the logs through the undergrowth must destroy many ova, larvae and pupae of species which feed on the smaller woodland plants. Generally speaking, however, the thinning of the trees is beneficial to the latter species as it permits more light to reach the undergrowth which may increase in consequence. For example, it is recorded (James, *Entom.*, LVII: 285) that the thinning of a wood in Essex resulted in the disappearance of the tree-feeding *Comibaena pustulata* and *Boarmia roboraria* but the resultant increase of scrub Birch was followed by an increase of *Parastichtis suspecta*. Local increases of such species as *Cucullia asteris*, *Eulype hastata* and *Ecliptopera silaceata* have been attributed to their foodplants becoming abundant in the newly-cleared parts of woods and it is well known that *Melitaea athalia* prefers one-year-old clearings.

The clearing of the undergrowth in woods is detrimental to species which, like *Apatura iris* and *Limenitis camilla*, are associated with the shrub layer but is beneficial to the herb-feeders. Scarcities of the latter may result if the undergrowth is allowed to grow unchecked (Eastwood, *Entom.*, LVIII: 104; Conquest, *Ibid.*, XXX: 102; Castle Russell, *Trans. S. Lond. ent. nat. Hist. Soc.*, 1941-2: 40).

All or most of the Lepidoptera characteristic of swamps, marshes, fens, bogs and damp grasslands have undergone numerous local extinctions as a result of reclamations of their habitats. In most cases these situations have been drained as a preliminary to cultivation but in the case of the bogs which cover large areas of Ireland the purpose has been to permit the cutting of the peat for fuel. I am indebted to Mr T. Greer for a description of the changes which took place over a period of 40 years in the large area of bogland south and east of Lough Neagh as a result of this. In parts of this bogland there were extensive areas of Birch and Oak which were felled ruthlessly with the result that such species as *Pheosia gnoma, Tethea duplaris, Achyla flavicornis, Drepana falcataria, Diarsia dahlii* and *Parastichtis suspecta* became rare. Local extinctions of *Apatele menyanthidis, Amathes agathina, A. glareosa, Dasychira fascelina, Scopula inornata, Dyscia fagaria, Selidosema plumaria, Perconia strigillaria, Callophrys rubi* and other species followed when the remaining vegetation was burnt off. *Coenonympha tullia* is the first species to disappear when a bog is drained and is now almost extinct in the area, although formerly common. When the bogs had been exhausted of the peat suitable for fuel the drains and pools became colonised by various freshwater plants with the result that such Lepidoptera as *Apamea unanimis, A. ophiogramma, Celaena leucostigma, Hydraecia crinanensis, Nonagria typhae* and *Eustrotia uncula* became abundant.

The initial operations necessary for the reclamation of a marsh or fen are similar: the vegetation is burnt off and the area is drained, with the result that the marsh plants, and their associated Lepidoptera, disappear. The most marked recorded effects of this took place when the East Anglian Fenlands were drained about the middle of the 19th century. This was primarily responsible for the extinction as British species of *Lycaena dispar, Lymantria dispar, Caenophila subrosea, Laelia coenosa* and *Euphyia polygrammata* and for a large number of local extinctions of other species in the area. Similar local extinctions resulted from the reclamation of the Thames marshes in the London area, judging from the older records.

The areas reclaimed from heath and moorland have been small in comparison with the areas that remain. There is no definite evidence that any species has become wholly extinct as an inhabitant of the British Isles as a result of such reclamations. Local extinctions, although numerous, have been less important than with the woodland and fen species. Again, the initial clearance operation is the burning-off of the vegetation and it is recorded that local extinctions of *Epicnaptera ilicifolia* and *Coscinia cribraria* and local scarcities of *Nonagria neurica, Sterrha eburnata* and *Isturgia limbaria* have resulted from this (Freer, *Ent. Rec.*, VI: 238; Capper, *Ibid.*, XV: 122; Mera, *Ibid.*, XIX: 122; James, *Ibid.*, XXXIV: 170; Wightman, *Ibid.*, XLI: 85).

Fire appears to cause great destruction and its effects on different species require investigation, as there is some indication that different species may be affected to different degrees. Thus, Perkins (*Entom.*, XVI: 249) states that many species became scarce locally as a result of fire on dry hillsides but *Macrothylacia rubi, Procris statices* and the Crambidae were unaffected. Probably the importance of fire depends on whether a species feed high up or low down on the vegetation. Many

of the local extinctions of *Maculinea arion* have been attributed, at least partially, to fire (Bignell, *Entom.*, XX: 234; Conquest, *Ibid.*, XXX: 102; Oliver, *Ibid.*, LIII: 279; Milman, *Ibid.*, LVIII: 144; Goss, *Ent. mon. Mag.*, XXVII: 58). An interesting effect is described by Blair (*Proc. S. Lond. ent. nat. Hist. Soc.*, 1928: 62) who states that the firing of the Scottish grouse moors in strips influences the occurrence of *Anarta cordigera*, as its foodplant, Bearberry, is slow to recover.

The replacement of the natural vegetation by grassland or cultivated land over the greater part of the British Isles must have resulted in great increases in the Lepidoptera characteristic of these types of habitat. Such species originally must have inhabited the margins and glades of the native forests. According as each region was cleared of its trees it was colonised by these species, which have replaced the woodland Lepidoptera as the dominant species in most areas. However not all the grassland species have expanded their distributions. Some, such as *Maculinea arion*, *Pachetra sagittigera* and *Scopula marginepunctata*, probably have not spread from the regions they inhabited at the time the native forests existed.

The cleared and reclaimed areas were divided and sub-divided into fields which in most cases are separated from each other by hedges. Consequently those Lepidoptera which feed on hedgerow shrubs and herbs must now be far more abundant and more widely distributed than they were when they inhabited the margins of the native forests. Large quantities of Hawthorn and other plants have been imported from abroad for hedging purposes but there is no evidence that any species of Lepidoptera has been added to the British fauna in this way.

The effects of normal farming operations on the Lepidoptera would make an interesting study but at present apart from scattered notes little information on this is available. Some examples of the recorded effects may be noted. The ploughing-up of previously uncultivated areas has resulted in local extinctions of such species as *Coscinia cribraria*, *Epirrhoe galiata*, *Melanargia galathea*, *Coenonympha tullia*, *Melitaea athalia*, *Maculinea arion*, *Strymonidia w-album*, *Pieris napi*, *Hesperia comma* and *Erynnis tages* (Clarke, *Entom.*, XXII: 47; Arkle, *Ibid.*, L: 92; Harrison, *Ibid.*, VII: 51; Walsh, *Ent. mon. Mag.*, LI: 225). Local scarcities of *Cupido minimus* and *Cyaniris semiargus* have been attributed to hay-making (Jones, *Entom.*, LI: 100; Dale, *Ent. mon. Mag.*, XXXVIII: 76). Barrett mentions a local extinction of *Phothedes captiuncula* which took place when a field in which it occurred was mowed earlier than usual. Hutchinson (*Entom.*, XIV: 250) suggested that the collecting and burning of the Hop plants after the crop had been gathered may have contributed to a scarcity of *Polygonia c-album*. Wild Barberry is destroyed by farmers in wheat-growing districts as it acts as an alternative host for the Wheat-Blight Fungus and this, according to Barrett, has resulted in the extinction of *Coenotephria berberata* in many localities. A local decrease in the abundance of some butterflies was attributed by Marshall (*Entom.*, XXXIV: 58) partly to the destruction of ova, larvae and pupae when the hedges and herbage on the field margins were cut and the cuttings destroyed. *Caradrina clavipalpis*, unlike other grassland species, often is benefited by haymaking as the plants on which the eggs are laid may be incorporated

in haystacks or brought into barns where the larvae often are found in great numbers.

The increase of buildings and communications doubtless has caused many local extinctions but again comparatively few have been recorded. Apart from the actual destruction caused by the building operations the Lepidoptera are affected by the pollution of the atmosphere and foliage with smoke, fumes and sooty deposits. Results of this are on record (see, e.g., Rendall, *Entom.*, XX: 198; Meldola, *Ibid.*, XX: 235; Biggs, *Ibid.*, XX: 234; Fenn, *Ent. Rec.*, VI: 228; Walsh, *Ent. mon. Mag.*, LI: 225). Bond (*Entom.*, LVII: 207) and Oldaker (*Ibid.*, LXII: 20) suggest that many Lepidoptera may be killed by the fumes and specks of the tar used in road-making.

An incidental effect of the increase of communications is that it has resulted in the opening-up of formerly remote regions to cultivation and building and in the great increase of visitors to formerly unfrequented localities, with a consequent trampling of the vegetation and larvae. A further incidental effect has been the great increase in street-lighting. It is difficult to assess the effects of this on the Lepidoptera. Boursin (quoted by Wiltshire, *Ent. Rec.*, L: 84) suggests that the lights result in the surrounding country gradually becoming relatively depopulated of its lepidopterous fauna. The cumulative effect of the moths being attracted away from their foodplants year after year before they have had time to breed and lay their eggs must be of some importance but it would be difficult to obtain definite information.

Certain species tend to be especially common in urban districts. These must be species which are unaffected by pollution of the atmosphere and foliage but their abundance in some cases is due primarily to the abundance of their foodplants in gardens, in others probably to the relative scarcity of their natural enemies, chiefly birds, in towns.

The sea-coast species, which normally are unaffected by other types of human activities, have undergone some local extinctions as a result of the growth of seaside resorts. Thus, *Celama aerugula* and *Sterrha ochrata* formerly occurred commonly at Deal, Kent, but became very scarce there when a golf course and holiday camp were constructed on the sandhills (Tutt, *Ent. Rec.*, I. 129; Bull, *Ibid.*, IX: 273; James, *Ibid.*, XXXV: 161; Adkin, *Trans. S. Lond. Ent. Nat. Hist. Soc.*, 1927-8: 45). Local scarcities of such species as *Hadena caesia*, *Antitype xanthomista* and *Eustroma reticulata* have been attributed to the destruction of their foodplants by road-making (Clarke, *Ent. Rec.*, IV: 205; Booth, *Ibid.*, VI: 158; Nurse, *Entom.*, LI: 33). The construction of the golf course on the sandhills at Ballycastle, Co. Antrim, apparently has wiped out the colony of *Nyssia zonaria* which occurred there.

Large quantities of trees and shrubs have been imported into the British Isles from abroad and several species of Lepidoptera probably have been added to the British fauna in this way. Likely examples are *Eucymatoge pini* (*togata*) and *E. lariciata* and the Microlepidoptera *Leucoptera laburnella*, *Argyresthia laevigatella* and *Gracilaria azaleella*. The most important of these accidental importations have been of the conifer-feeding species. Many of these, in addition to the two just mentioned, may not have been indigenous species. All must have been artificially spread over the greater part of their ranges in the British Isles. All must have been artificially introduced into Ireland, as there is no

evidence that Pine, Spruce or Larch survive in that country as native trees. Some of the following may be wholly artificial introductions and all certainly have been artificially introduced into many parts of the British Isles: the conifer-feeding *Hyloicus pinastri*, *Panolis griseovariegata*, *Thera obeliscata*, *T. firmata*, *Semiothisa liturata*, *Eupithecia indigata*, *Ellopia prosapiaria*, *Cleora ribeata*, *Bupalus piniaria* and conifer-feeding Microlepidoptera, and also the following, which feed on Currant and Gooseberry: *Lygris mellinata*, *L. prunaria*, *Eupithecia assimilata*, *Itame wauaria* and *Aegeria tipuliformis*. *Cosymbia trilinearia*, *Hemistola chrysoprasaria*, *Eupithecia isogrammaria*, *Peronea sparsana* (*sponsana*) and *Lithocolletis faginella* must have been artificially introduced into Ireland as their foodplants are not natives of that country.

The destruction of the native forests has affected the Lepidoptera during the past 2000 years, the reclamation of the marshes, fens, heaths and moorlands mainly during the past 1000, and the increase of towns and communications chiefly during the past 200. Factors which have operated only within the past century are the increase of public lighting, mentioned above, and the effects of the intensive study of natural history.

One of the most important effects of the interest taken in natural history is that there has been a great increase in the abundance of insectivorous birds within the past 100 years, due partly to the increased use and availability of firearms, which has resulted in the increased destruction of hawks and other birds of prey, but primarily to the birds being protected from destruction by law. As birds are amongst the most important of the natural enemies of the Lepidoptera their increase must have had important results. Judging from the records in the entomological periodicals there seems to have been a gradual decrease in the abundance of the Lepidoptera as a whole during the past century and several writers (e.g., Frohawk, *Entom.*, XVII: 37; Meldola, *Ibid.*, XX: 225; Castle Russell, *Ibid.*, LVIII: 100, and *Trans. S. Lond. Ent. Nat. Hist. Soc.*, 1941-2: 40) have attributed this to the increase in bird-life. This seems to be a reasonable conclusion.

The protection of game birds, however, has been more beneficial than detrimental to most Lepidoptera, as it has resulted in the preservation of woodlands which otherwise might have been cut and their lepidopterous faunas destroyed. It has been detrimental in that the larvae and pupae of some of the species which feed on the smaller woodland plants may be destroyed in large numbers by game birds. Thus, it has been suggested that the exceptional abundance of *Argynnis euphrosyne*, *A. selene*, *Euphydryas aurinia* and other fritillaries in 1917-9 was due to a temporary decrease in the numbers of Pheasants and other game birds during the 1914-8 war (Castle Russell, *loc. cit.*). It is more probable that weather conditions were responsible for these increases.

The interest taken in the Lepidoptera has resulted in some species being deliberately established in localities in which they did not occur as natives and in some species being exterminated by over-collecting. I am in agreement with Dr E. B. Ford (*Butterflies*, p. 142) that the danger of over-collecting often has been unduly stressed. Over-collecting probably is rarely the primary cause of local extinctions but produces its effects in conjunction with other detrimental factors. Ex-

cept in a few well-known cases, e.g., *Lycaena dispar*, *Maculinea arion* and *Zygaena meliloti*, its importance in producing local extinctions is negligible in comparison with the importance of other factors.

To summarise the probable effects human activities have had on the British Macrolepidoptera. The destruction of the native woodlands has resulted in the total extinction as inhabitants of the British Isles of an unknown number of species. About 64% of the total number of surviving species have been affected by the destruction of the woodlands, this figure being made up as follows: about 31% have undergone numerous local extinctions and few or no expansions of their distributions, about 26% have undergone numerous local extinctions and probably some local expansions of their distributions, and about 7% probably are more abundant than in prehistoric times. About 2% of the total have been artificially spread over the greater part of their present ranges in the British Isles as a result of the planting of trees and shrubs, perhaps half of them being wholly artificial introductions. About 22% of the total, comprising chiefly species characteristic of grasslands or cultivated land, probably are more abundant and widely distributed than they were in prehistoric times. Most of them now occur in areas covering perhaps twenty times the areas of their former distributions while most of the woodland species have had their distributions correspondingly reduced. Incidentally there is no definite evidence that more than a negligible number have expanded their ranges in the British Isles, i.e., the total area of country within which they occur, as a result of the increase of their habitats. About 12% of the total number of species probably have not had their distributions or abundance changed to any important extent. Of these nearly half (5%)—mostly inhabitants of the mountains or the sea-coasts —probably have hardly been affected at all. The great majority of the total have been affected detrimentally to some extent by the increase of bird-life and other controlling factors which have become important within the past 100 years.

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## COLLECTING AT HOME: RECORDS OF A RAINY SEASON AT CLEVEDON.

By J. F. Bird, F.R.E.S.

Due, principally, to the Clerk of the Weather, our opportunities for collecting far afield were few; therefore our entomological activities, during 1946, were mainly conducted within the limits of our garden walls. Nevertheless, within that restricted area, and chiefly by the attraction of light, we were not altogether unsuccessful.

During a brief period of fine weather at the end of March and the beginning of April, we noticed, for the first time in this locality, a fair number of *Brephos parthenias*; a few, even, flying erratically past our windows. One surprised us, on 1st April, by alighting on a concrete path by the side of the house where it, a female, was eventually netted by my youngest son; a most unexpected capture in one's garden. Another unusual find in the garden was a larva of *Lasiocampa quercus*, discovered by my wife on a gooseberry-bush, from which I reared a male

on 27th July. My wife also brought me a pupa she had found in the greenhouse on 9th April, from which a beautiful suffused example of *Phlogophora meticulosa* emerged the following day. In this specimen there is a conspicuously bright elongate patch between the upper portion of the triangular central band and the marginal markings; otherwise, the forewings are darkly suffused, as are also the hindwings, except for a small lighter area towards the outer angle.

It was rather interesting to observe the effect of unfavourable weather conditions on *Cucullia verbasci*. Towards the end of April I again searched the *Verbascum* in the garden for the ova, and on the 30th found 40 or 50 on one of the plants, mostly laid by the side of prominent veins on the undersurface of the leaves, as I have previously described (*Ent. Rec.*, LVII, 51); but a very few, four or five, were also discovered on the upperside; in this position deposited in the furrows above the veins. More eggs were found than in the previous year and as many as fifteen noticed scattered on a single leaf. A portion of one of the leaves, with about half-a-dozen ova, was torn off and taken indoors for observation. These hatched out on 9th May. With the coming of May the weather rapidly became extremely wet and cold, and during this deterioration it was noticed that the eggs left on the plant gradually disappeared, but no newly-hatched larvae were observed until 20th May, and then only a very few. These also disappeared and I imagined they, as well as the ova, had been soaked, or washed off to perish by the combined action of drenching rain and a low temperature. The plant, thereby, escaped the ravages of the larvae, and I may add that only two fully-grown larvae were subsequently found, in July. They were on another plant, some three yards distance away, upon which I had failed to discover any ova. Probably many other species must have been adversely affected by the deplorable weather, but in the case of *C. verbasci*, no doubt its capability of sometimes remaining two, three, or more years in the pupal state serves it well under similar, or other unfavourable circumstances, which preserves this insect from extinction, or even becoming scarce.

As might have been expected, in such a cold and wet year, the number of Lepidoptera attracted by light was far less than in 1945. Unfortunately, the rainy season favoured an increased productiveness of the Culicidae and other kindred tribes. Consequently, myriads of mosquitoes and midges of all sizes swarmed to the lights, and so plagued us with their unwelcome attentions that we were frequently obliged to close the windows and retreat from the room; deferring the slaughter of these sanguinivorous pests until the morning. During January the only moth attracted was *Operophtera brumata* which persisted until the 26th. February proved a blank period, and no further moths were attracted until 11th March, when the first *Erannis progemmaria* appeared on the window. Then followed *Alsophila aescularia* on the 23rd, and *Xylocampa areola*, *Orthosia incerta*, *O. stabilis*, *O. gothica*, *Earophila badiata*, *Theria rupicapraria*, *Selenia bilunaria*, and *Oidaematophorus monodactylus* on the 27th. The season had now definitely started. During the year my son, H. W. Bird, was fortunate enough to take our most interesting captures at light; all but one in the small hours of the morning after I had retired to rest. These were: *Mythimna turca*, 9.vii, presumably a record for the county as it is not included in A. E.

Hudd's List in the *Victoria County History of Somerset*, nor in his, or A. R. Hayward's supplements; *Cucullia absinthii*, 23.vii, previously recorded only from the west of the county, at Minehead, where the larvae were found by Hudd; *Laphygma exigua*, 23.vii and 6.viii, two specimens of this very casual migrant; and *Hydraecia paludis*, 23.viii, hitherto only recorded in Somerset from " a salt marsh near Withycombe," where it was taken by the late H. Slater, in 1912. Amongst other visitants to the lights were: *Eilema complana*, 25.vii. *Miltochrista miniata*, 3.vii-23.viii. *Nudaria mundana*, 23.vii. *Hypocrita jacobaeae*, 15.v-8.vii, not attracted in 1945. *Spilosoma lutea*, 11.vi-18.viii, only mentioned because I kept two of the larvae hatched from ova laid on curtains, etc., by attracted ♀'s; from which I bred two examples of a second generation, the first emerging on 6th November, and the second a few days later. *Arctia caja*, 23.vii-4.viii, several; one ♂ rather a nice aberration, similar to the example figured at the top of Plate 84, in the 1st Series of South's *Moths of the British Isles*, but with less whitish-cream markings on the primaries, and the spots larger and slightly coalescent on the hindwings. *Colocasia coryli*, 1st gen., 1.v; 2nd gen., 11.viii. *Cryphia muralis*, 4.viii. *Ochria ochracea*, 26.ix-9.x. *Rusina umbratica*, 2.vii-22.vii. *Rhizedra lutosa*, 28.ix. *Lycophotia porphyrea* (*strigula*), 23.vii, rather a surprise since there is hardly any *Calluna* in the district. *Lampra fimbriata*, 4.viii. *Cerastis rubricosa*, 1.iv. *Charaeas graminis*, 1.viii, ♂, and 3.viii, ♀. *Tholera popularis*, 29.viii, one ♀ and no ♂'s! the only specimen we have seen here of this common species. *Polia nebulosa*, 22.vii-3.viii. *Laspeyria flexula*, 4.viii. *Dasychira pudibunda*, 24.v-4.vi, ♂'s only, one with all the wings greyish suffused. *Cosymbia annulata*, 2nd gen., 23.viii. *Geometra papilionaria*, 23.vii, two ♂'s. *Eupithecia absinthiata*, 21.vii-3.viii. *E. albipunctata* (*tripunctaria*), 17.viii. *E. pulchellata*, 1.v, an early date. *E. isogrammata* (*haworthiata*), 8.viii-24.viii. *E. abbreviata*, 2.iv. *Horisme vitalbata*, 1st gen., 1.v-25.v; 2nd gen., 5.viii-23.viii. *H. tersata*, 2.vii. *Calocalpe cervinalis* (*certata*), 26.v. *Lygris prunata*, 25.vii. *Epirrhoë galiata*, 25.vii. *E. rivata*, 1.vii. *E. alternata*, 4.viii, an interesting aberration in which the central band on the forewings, and the basal striae of the secondaries, are only faintly indicated, although the discal spot and the marginal markings are more or less normal. *Dysstroma truncata*, 1st gen., 23.v-21.vi; 2nd gen., 23.viii-3.xi; an extreme form of var. *perfuscata*, uniformly blackish, with smoky hindwings, taken on 27th September. *Perizoma bifaciata*, 23.viii. *P. alchemillata*, 23.vii-3.viii. *P. albulata*, 2nd gen., 11.viii. *Pelurga comitata*, 1.viii. *Operophtera fagata*, 11.xi-16.xi. *Larentia cervinata* (*clavaria*), 15.ix-28.ix, only the ♂'s at light; the larvae have become common in the garden since we grew *Malva moschata*, upon which they play havoc. *Chiasmia clathrata*, 2nd gen., 5.viii. *Ectropis bistortata*, 1st gen., 1.iv; 2nd gen., 12.vii-3.viii; 3rd gen., 2.x; the second generation the most plentiful; melanic examples fairly common. *Biston strataria*, 2.iv. *B. betularia*, 20.vii-4.viii. *Abraxas grossulariata*, a rather small example of a partial second generation on 30th September. *Selenia tetralunaria*, 2nd gen., 25.vii. *Colotois pennaria*, 16.x-24.xi; an uncommon and handsome ♂ aberration was taken on 4th November, in which the wings, including the secondaries, are entirely suffused with dark purple. *Deuteronomos*

*alniaria*, 1.ix-28.ix. *D. fuscantaria*, 28.ix, two ♂'s. *Thyatira batis*, 3.viii. *Sphinx ligustri*, 23.vii. *Notodonta dromedarius*, 23.v. *Pheosia gnoma*, 6.viii. *P. tremula*, 23.vii-24.viii. *Lophopteryx capucina*, 1st gen., 20.iv, surely a very early date! 2nd gen., 4.viii-14.viii. *Drepana falcataria*, 23.v. *Pempelia dilutella*, 23.vii. *Homoeosoma binaevella*, 3.viii. *Euzophera pinguis*, 5.viii. *Chilo phragmitellus*, 9.vii-22.vii, ♂ and ♀. *Schoenobius forficellus*, 23.vii, ♂ and ♀. *Phlyctaenia crocealis*, 23.vii. *P. lutealis*, 2.ix. *P. ferrugalis*, 12.vii-22.x, abundant. *Nomophila noctuella*, 9.vii-23.x, not early, but continued later than usual. *Pyrausta aurata*, 4.viii. *P. cespitalis*, 4.viii. *Loxostege verticalis* (*cinctalis*), 25.vii. *Scoparia angustea*, 15.ix-14.xi. *Malacosoma neustria*, 1.vii-4.viii, more variable than usual. *Philudoria potatoria*, 9.vii-1.viii. *Gastropacha quercifolia*, 5.viii.

In conclusion, it may be interesting to mention that of the 317 species of " Macro-Lepidoptera " recorded in my garden during the last eight years, no less than 258 have been noted at light during the last two years. Actually, the total at light amounts to 302, including 44 of the Pyraloidea attracted during the same period.

It will be interesting to observe what effect last year's appalling weather, followed, as it has been, by a long and severe winter, will have on the insect life of the British Isles during 1947.

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## FURTHER NOTES ON THE HELOMYZIDAE (DIPTERA).

By C. H. Wallace Pugh, F.R.E.S.

The following records based on my own observations are intended to supplement Mr Parmenter's Notes on this interesting family (1947: *Ent. Rec.*, **59**, 15).

### HELOMYZINAE.

Distribution: The species of *Helomyza*, Fln., appear to be widely distributed. I have taken all the British species in Shropshire and/or North Wales, except *dumicola*, Coll., *infera*, Coll., and *oxyphora*, Mik., the last two of which are only recorded by Mr Collin from Scotland. The same remarks apply to *Allophyla atricornis*, Mg.

*H. variegata*, Lw., hibernates as an imago, and may be taken on mild days throughout the winter by sweeping or beating suitable undergrowth. I suspect that *H. ustulata*, Mg., does the same, as I have taken it on 14.2.37.

### LERIINAE.

*Heteromyza*, Fln. I have noted that the males of *H. commixta*, Coll., which is the most common species around here, have the same habit of patrolling a " beat " near coniferous trees at a height of about 10 feet as described by Mr Parmenter in the case of *H. rotundicornis*, Ztt. The other two species also occur here sparingly. I have bred *H. occulta*, Fln., from an unidentified tree fungus.

*Tephrochlamys*, Lw. I have bred *T. flavipes*, Ztt., from a thrush's nest and also from a wasp's nest. *T. rufiventris*, Mg., which is commonly found on windows throughout the winter months, I have bred from a rook's nest and from a hotbed, and Mr H. Donisthorpe gave me one bred from a heron's nest.

*Neoleria*, Mall. *N. inscripta*, Mg., is definitely associated with carrion and may easily be trapped by hanging up a dead bird or a meat bone. *N. ruficauda*, Ztt., is recorded by Collin from carrion, but I have chiefly taken it, and also *N. ruficeps*, Ztt., on fungi.

*Oecothea*, Hal. *O. praecox* I took in numbers on 25.7.35 just inside the entrance to rabbits' burrows on the sandy " morfa " between Criccieth and Borth-y-gest, Carnarvonshire, and again in similar circumstances at Talybont, Merionethshire on 24.7.37.

*Eccoptomera*, Lw. *E. microps* I have bred in numbers on several occasions from moles' nests, the flies emerging February to May. One male of *E. pallescens*, Mg., taken near Oswestry, 16.6.33.

*Scoliocentra*, Lw.:—*S. amplicornis*, Cz. I have not bred this species, but have taken the male at the entrance to a rabbit burrow and the female on a manure heap. *S. villosa*, Mg. One female taken in woods on 6.3.38. All in Shropshire.

*Leria*, R.-D. *L. brachypterna*, Lw. Bred in some numbers from rooks' nests near Oswestry, June 1937. Mr Collin also records it from nests of owls and crows (1939: 79 *E.M.M.*, 148). *L. modesta*, Mg., var. *czernyi*, Collart, one pair, and *L. dupliciseta*, Stein., one male, both in April. All in Shropshire.

*Morpholeria* Garrett: *M. ruficornis* Mg. Montgomeryshire, September.

TRICHOSCELINAE.

*Trichoscelis*, Cz. *T. obscurella*, Fln. Fairly common in June on sandy " morfas " at Criccieth and Talybont, North Wales. *T. frontalis*, Fln. One male bred from thrush's nest, Oswestry, emerging 27.4.35.

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## NEWS ON LYSANDRA OF THE CORIDON GROUP OF SPECIES (LEP. LYCAENIDAE).

By Orazio Querci.

Vindicio. Formia (Prov. Latina). Italy.

The object of this paper is to indicate in a correct manner the places where we collected some *Lysandra* of the *coridon*, Poda, group of species, recording when they emerged, the feature and climate of the surroundings in which they lived, and to whom those butterflies were sent.

*Italy.*—We have taken many *coridon*, always in summer and on chalky grounds, in any locality of the Apennines of Central Italy (Sibyllini, Gran Sasso, Sirente, Majella, Meta) where we collected. Rarely we met with that species above 5000 ft. We have also found plenty of them on Apuane Alps, above Caregine, on the slopes of Mt. Sumbra, 3000 ft. (Garfagnana); in the Fegana valley, below Montefegatesi, 1500 ft. (Lucca); on Mt. Pratofiorito, 5000 ft. (Lucca); on Mt. Fanna at 2000 ft. near Fiesole (Florence); on Mt. Conca, 1200 ft., near Fontebuona (Florence); and above the locality Le Sterpete near Foligno (Umbria).

The other allied species, that looks like Herrich-Schäffer's figure of *hispana*, was taken by us only at Pian di Mugnone, 400 ft. (Florence) and on Mt. Fanna where both *coridon* and *hispana* were flying together

in August 1915. *L. hispana* emerge in the Spring and, after a pause, also in summer.

Large series of those butterflies were sent to British entomologists (Lord Rothschild, Mr Bethune-Baker, Mr Pether, Mr Turner, and others). Many specimens were shipped to America (Mr Williams of Philadelphia, Pa., Mr Weeks of Boston, Mass., Mr Mengel of Reading, Pa., Mr Winn of Montreal, Canada). Other specimens were sent to Germany, Austria, Belgium, Switzerland, France, Hungary. Dr Verity of Florence has the largest set of *Lysandra* taken by us in Italy.

The specimens that Verity refers to *Lysandra syriaca*, Tutt, and that he figures at Pl. 16, nos. 56-58, in his grand work, " Le Farfalle Diurne d'Italia," 1943, Florence, were taken by us near the small group of trees, just above, 4300 ft., the upper buildings of Casteldelmonte (Aquila) in Gran Sasso mass, above the path towards Mt. Capodiserre, at the beginning of July 1939. Another male (55) and one female (59) were taken by my wife on Colle Alto, 3600 ft., above Settefrati (Latium) in Mt. Meta mass, in summer 1940.

The specimens that Verity figures (Pl. 16, nos. 47, 48) with the name of *polonus* Zeller, which might be hybrids between *Lysandra coridon* and *bellargus*, were taken by myself on Mt. Sumbra (Garfagnana), 4000 ft., at mid-June 1920. Another *polonus* (49) was found by my wife, by the end of June 1941, along the path, 4300 ft., in front of Roccadimezzo (Aquila), which climbs to Fontana delle Macchie, below Mt. Monterotondo, in Sirente mass.

The striking specimen, figured by Verity with the name *glaucargester* (Pl. 15, no. 26), which according to that author might be a hybrid between *argester*, Bgstr. = *hylas*, Esp. and *syriaca*, Tutt, was taken by Lycaena Romei, my granddaughter, on 28th July 1939, at the same place above Casteldelmonte where in June a few *syriaca* were flying. All the strange *Lysandra*, that I have recorded now, are in Verity's collection.

*Spain.*—In 1924 we collected on Sierra de Albarracin in Aragon. Both in June and at the beginning of July the whitish *Lysandra*, similar to Herrich-Schäffer's figure of *albicans* emerged in the valley Valdevecar, 3300 ft., about two miles from Albarracin towards Teruel. My wife, with our daughter Erilda, took many of them, among which we noted a few specimens looking like Herrich-Schäffer's figure of *hispana*. While *albicans* ceased to be on the wing in mid-July, a few *hispana* were taken by us until September.

In July, Dr Enzo Romei and I made some trips to the high mountain towards Orihuela del Tremedal above Albarracin. In a field near Tramacastilla, 3600 ft., we took some *coridon* that were flying together with some *albicans*. Those two species might be distinguished at first glance: *albicans* on the wing looked as white as a *Pieris*, *coridon* was shining metallic blue. In alpine surroundings we did not see any *coridon*-like butterfly.

At the beginning of August we went by a car to that mountain. My granddaughter, now Dr Lycaena Romei, but then only two years old, was with us. She played with a net in a meadow, at about 4000 ft., above the village of Noguera (between Tramacastilla and Orihuela), and thus she took, by a chance, a magnificent blue female of the species that Zapater, Korb, Sagarra and I named by mistake *corydonius*, H.-S.,

that Verity named *caelestissima*, but which now he refers to *caucasica*, Lederer. Having discovered the small locality, where those nice *Lysandra* live, we took many of them.

Afterwards, Dr Romei went and collected at Puerto de Pajares, about 4000 ft., on Cantabrian Mts. (Asturias), taking a series of bright blue *Lysandra* that both Sagarra (*Bull. Inst. catal. Hist. nat.*, (**2**), **9**: 202, 1924) and I referred at first to *caelestissima*, Vrty. (that is *caucasica*, Led.). We were misled by the big number of blue females (resembling that taken at Noguera) among the *Lysandra* of Pajares. Now, I believe that they are nothing else than *coridon* modified in tinge by the great humidity of that ground, where it had always rained until mid-August.

In 1925 and 1929 we collected in Catalonia. *Lysandra hispana* were plentiful at S. Pere de Vilamajor and Llinas, 1800 ft., at the base of Mt. Montseny near Barcelona. They emerged, like near Florence, both in the Spring, and after a pause, in August-September. On Mt. Montseny, 3300 ft., and on Catalan Pyrenees (Puigmal and Taga) we found only the single-brooded *coridon* in August.

At the beginning of June 1926 my wife and I, together with Prof. Bolivar of Madrid, and again at mid-June 1933, with Mr René Oberthur of Rennes, took many *albicans* in the gypseous and bare moor of Montarco, 2000 ft., near Madrid. They were smaller and still whiter than those from Aragon. We have never collected in summer near Madrid, however the entomologists of that city told us that the *albicans* of Montarco emerge there only by the end of the spring, and no specimen of that kind had ever been taken later.

On 10th June 1926 we went and collected at Ugna. (in Spanish maps it is written " Uña " with a " cedilla " on " n ") on Serrania de Cuenca, 3600 ft., in New Castile, where we remained until the frost. That season was very dry as it never rained from April to October. Many *albicans* (like those from Albarracin, Tramacastilla and Montarco) emerged from mid-June to mid-July in a meadow of Rincon de la Laguna, 3600 ft., in front of the village of Ugna, on the opposite side of the lake. Some *coridon* emerged later, always at Rincon de la Laguna, along the path that rises to El Escaleron on the way to Tragacete. *Lysandra caucasica*, widespread all over Rincon del Juez, on the way to Ciudad Incandata, was on the wing in August. In 1928, and again in 1933, we remained at Ugna from May to the end of October. In those years it rained almost always in the afternoon and the emergence of *albicans* was delayed by the cold weather that continued until the beginning of June. *Lysandra albicans*, *coridon* and *caucasica* emerged at the same time, but in three different places, near Ugna, from mid-July to the beginning of September.

Besides the Lepidopterist, to whom I had sent the Italian specimens, those taken in Spain were also sent to Mr Hemming of London, and Mr René Oberthur of Rennes. Large collections were also deposited in the museums of Natural History of Barcelona, Lisbon and Madrid. However, the greater number and the most interesting specimens should now have been assembled in the British Museum both at London and Tring.

While living at Barcelona from November 1923 to October 1929 I wrote some notes, concerning the Rhopalocera of the Iberian Peninsula

that were printed in " Treballs del Museu de Ciències Naturals de Barcelona," 1932, vol. xiv. I also made some tables, showing the sequence of broods for the 126 species of Diurnal Lepidoptera taken by us at Ugna in 1928, but I made the mistake to record by figures only the set specimens, which were before my eyes, not considering many others that had remained in paper, and not remembering the large number of those which, of course, we were unable to take in the field. From those extensive tables, I am now copying the data for the *Lysandra* of the *coridon* group and a few other species, recording in a general manner the probable frequency in the field of recently emerged specimens. I do this in order to show that, in spite of the altitude of about 4000 ft., the butterfly emerges at Ugna from early May to the end of October as it occurs in most lowlands of Southern Europe. *The country around Ugna is not an alpine locality.* It is a beautiful valley sheltered from winds by high mountain covered with beech and pine woods and *there the Lepidoptera emerge quite in the same manner as at Pian di Mugnone, 400 ft., near Florence,* and in the neighbourhood of Barcelona.

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## GYMNETRON MELAS, BOHEMAN, IN SCHOENHERR [GEN. ET SPEC. CURCULIONIDUM 4 1246 (1838)], A WEEVIL NEW TO THE BRITISH LIST.

By Horace Donisthorpe, F.Z.S., F.R.E.S., etc.

3. *G. Melus*, Schh.

" *Ellipticus, subdepressus, niger, cinereo-pubescens, antennis brevibus concoloribus, rostro lineari, modice arcuato; thorace latiore punctulato; elytris amplis, profunde punctato-striatis; femoribus obsoleto dentatis. Patria*: *Gallia ad Paris. Ex Musaeo Dom. Aubé ad describendum amice missus.*

Statura *Gymnetron stimulosi*, nonnihil tamen major, magis depressus, thorace latiore, colore antennarum elytrorumque alio, ab illo distinctus. Caput breve, latum, supra modice convexum, punctulatum, nigrum, parce cinereo-pubescens; oculi laterales, ovati, modice prominuli, nigro-brunaei; rostrum vix longitudine thoracis, lineare, minus tenue, modice arcuatum, punctulatum, nigrum, nitidum. Antennae vix longitudine capitis cum rostro, crassiusculae, nigrae, clava magna, ovata, sub-obtusa, cinereo-pubescente. Thorax brevis, transversus, antice augustior, apice truncatus et juxta apicem striga transversa impressus, lateribus versus basin sensim ampliatus, basi sub-rotundatus, supra paulo convexus, confertim punctulatus, niger, pube depressa, cinerea, sat dense obsitus, scutellum parvum, rotundatum, nigrum, cinereo-pubescens. Elytra antiae conjunctim leviter emarginata, thoracis basi latiora, humeris fere rectangulatis, antrorsum nonnihil prominulis; lateribus non ampliata, apice conjunctim obtuse rotundata, thorace triplo longiora, supra minus convexa, sat profunde punctato-striata, interstitiis sub-convexis; tota nigra, pilis rigidis, cinereis, sub-seriatis, adspersa. Corpus subtus punctulatum, nigrum, parce cinereo-pubescens. Pedes mediocres, nigri, cinereo-pubescentes; femoribus modice clavatis, subtus dente obsoleto armatis; tibiis teretibus, rectis.—Bhn."

When collecting at Lampton, Middlesex, on 23rd June 1946, I swept off general herbage a small black *Gymnetron* which, when set, I found to be unlike any of our known British species.

My friend, Sir Guy K. Marshall, has very kindly worked it out, and by the tables it runs down to *G. melas*, Boh. We have been unable to compare it with any other specimen, as neither he nor the British Museum collections possess this species. It, however, agrees very well with the original description given above, and I am adding the species to the British list with very little hesitation. The entirely black tarsi are very distinct.

British Museum (Nat. Hist.) Entomological Department.
15th January 1947.

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## BUTTERFLY COLLECTING IN WOOD WALTON, HUNTS., AREA, THE CHILTERN HILLS, AND ROYSTON, HERTS., DURING 1946.

By H. A. Leeds.

In 1946 some species of butterflies emerged early, as from 22nd March until 16th April nearly every day was cloudless, sunny and warm; but was followed by abnormal rainfall, which rarely, in most of England, permitted collecting for two consecutive days, whilst several wet days in succession were not uncommon and caused great damage to the much-needed corn crops. The bread loaf was reduced in the Spring from 2 lbs. to 28 ozs., and on 21st July this was followed by rationing of bread and flour. Harvesting commenced in mid-July, but was so hindered by rain that carting of wheat and oats was only finished during six fine, but entirely sunless, days, 12th-17th October, with a loss of about one-third. The destruction of barley was much worse as the grain fell out and made rapid growth; many crops of it were entirely ruined and useless for cutting, including 30 acres of barley on the two clearings in Monk's Wood.

Regarding the preliminary weather, the last two months of 1945 were consistently mild and that year ended with an all-day dense fog.

1946 commenced with frost 1st-4th January, recurrent 13th-24th, providing some skating; then frosty on 27th. Strong winds and heavy showers followed until 12th February. A mild period then ensued and the buds on trees enlarged until 22nd, when seven days were frosty; this was followed by snow-storms, 1st-3rd March, when the ground was covered by about 2½ inches. Apart from a few flakes no other snow fell during winter; it, however, was slow in melting as frost occurred nearly daily up to and including 10th March. Slight morning frost was registered afterwards but was not detrimental except on 19th April and 15th May with ice half-an-inch thick, which damaged fruit trees, but not so seriously as in May 1945.

Some plum trees were in full bloom on 24th March, and by the 31st blackthorns were flowering and whitethorns leafing; then progress was slow and the latter was not in fair blossom until 6th May; preceded by Horse-chestnut trees on 2nd May, 19 days later than in 1945.

No hibernating species were seen, in 1946, until 25th March, when a solitary *N. io* visited hyacinth flowers, followed by two *A. urticae* the next day. Both these species as well as *G. rhamni* were flying in Monk's Wood on 27th March, and soon afterwards more *io* than *urticae* occurred.

On 12th April it was hazy but warm and after touring Monk's Wood in the afternoon I was returning down a cross-riding when the sun broke through; almost directly a large butterfly flew over the trees and then settled, high up, on a bare branch of an oak skirting the riding; before I reached the tree it took off for another high flight, then just as I arrived at the tree it settled, right in front of me, on the trunk and after raising and opening its wings a few times; fully expanded them to the bright sun and remained quiescent for a few minutes before flying away. It was a fine untorn female of *N. polychloros*. I had not previously met with this species in Hunts., but later on, in June, a boy from St Neots took one and saw another in Monk's Wood. Some years ago I obtained many larvae of this species from an elm tree at St Lawrence, Isle of Wight, and imagines duly resulted. They used to be plentiful at Horning, Norfolk, in some seasons, especially favouring flights along the Neatishead Road, but I do not know if it still occurs there.

*P. c-album* was scarce—one was seen on 9th May, and another 11th; afterwards two of the first emergence on 9th and 10th July respectively in Hunts., and only two of the late brood there, one of them being a female var. *hutchinsoni*, Robsn. In Bucks. I saw one at Askett on 27th July, and on 31st one at Pulpit Hill.

6th July, a very faded *V. cardui*; 11th, three more perfect specimens were settled near each other on a road, whilst during my walk that day —and afterwards—several pairs were apparently engaged in courting flights.

A very ragged *V. atalanta* on 8th July was the only one seen of that species prior to 7th September, and from then they increased quickly, gradually getting less in October and finally two of them and one *A. urticae* were seen outdoors on 13th November; from that date much rain fell until the month ended.

The fine weather extending over nearly the first month of Spring enabled visits, almost daily to the woods in the warm sunshine, and then and whenever fine intervals permitted, during 1946, the following first emergence dates and notes were collated:—

26th March, *P. rapae*, moderate in quantity throughout; 31st, *P. napi*, a large female: seen in fair numbers during the first half of April and this early commencement, despite the cool and wet months which followed, enabled them to produce a third brood in October.

14th April, *C. argiolus*, soon became common and continued for some weeks; this followed the abundance of the second brood in 1945, but in 1946 the later brood was much reduced; throughout these emergences I found no appreciable variation; 19th, *P. brassicae*, uncommon in Spring, which was rather surprising after the abnormal quantities in 1945; they somewhat increased later in 1946 and their larvae spoiled the cabbages in mixed flower and vegetable gardens, but on allotments, devoid

of flowers for the butterflies' sustenance, no harm was occasioned; 16th, *P. aegeria*, others seen oddly at various times; 20th, *E. cardamines* and *C. rubi*, only one of the latter then and another on 26th; 30th, *A. euphrosyne* and *P. malvae*.

2nd May, *E. tages*; 4th, *C. pamphilus*; 9th, *P. megera*, very scarce in both broods; 23rd, *P. icarus* and *A. agestis*; these were much restricted in numbers and places owing to complete burning of vegetation on the railway embankment and partially in the cuttings during early April.

5th June, *O. venata* (*sylvanus*) and *Heodes* (*L.*) *phlaeas*, the only one seen in first brood; of the second brood ten were noticed, viz., 2 Oxon., 1 Bucks. and 7 in Hunts., no third brood appeared; 21st, *A. urticae*, one *S. pruni* reported seen, but rain and mud kept me out of Monk's Wood until 7th July, when during hot sunshine I toured the wood, but looked in vain for this species. Dr J. L. Newton obtained one larva only when beating. 25th, *M. jurtina*, fairly plentiful, but bleached forms poor and scarce.

2nd July, *M. galathea*, soon plentiful on grassy verges of roads, their variation was slight; 5th, *S. w-album*, a few at an elm plantation; 6th, *A. aglaia* female, very worn and no others seen; 7th, *A. hyperantus*, *T. quercus* and *T. sylvestris*; 9th, *P. c-album*; 11th, *T. lineola*, and a very fresh *Macroglossum stellatarum*; no others of this Humming-bird Hawk moth appeared; 14th, *M. tithonus*, some later on had additional spots; 21st, *L. coridon* (at Kop Hill, Bucks.), 3 males, 22nd 18, and many more there on 23rd.

16th August, *N. io*; and a worn male—the only one seen—of *T. betulae*, two collectors beat about a dozen larvae of this in the spring.

(*To be concluded.*)

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## CURRENT NOTES.

Current Notes would be very welcome from any subscriber, aught that affects collecting, collectors and collections would be interesting. What about prospects in the New Forest, Rannoch, and other famous grounds? Deal used to be a good outing about Easter. What portion of the Natural History Museum is now available for study? We have had reports from quite new areas lately. Ashdown Forest is said to have been partly devastated. Has it?

We hope our active entomologists will give us Notes of the effects of the long protracted dreadful weather upon the usual appearances of varying species; whether abundant or scarce, and also observations on the pests, both terrestrial and arborial.

We should like to call the attention of Dipterists that the comprehensive and detailed articles on the Trypetidae recently published as a Supplement to this Magazine can be obtained from Mr H. W. Andrews for half-a-crown a copy.

## EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr Hy. J. Turner, "Latemar," West Drive, Cheam.

*Wanted*—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Instituto Miguel Lillo, Calle Miguel Lillo 205, Tucuman, Republica Argentina.*

*Desiderata*—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—*H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.*

*Wanted.—Lycaena (Heodes) phlaeas* from all regions including British Isles. Also wanted other species of Chrysophanids from all areas. Exchange or purchase considered. *Duplicates.*—Foreign Lepidoptera, e.g., Satyrids, Charaxes, Papilios, and others; full lists sent.—*P. Siviter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.*

*Wanted* for cash or exchange many species of ova, larvae or pupae, especially local forms and *A. grossulariata* from different localities, also Seitz Vol. 1 and Supplements to Vols. 1-4. Offers also, Tutt's *Practical Hints*, Parts 1 and 2, Buckler's larvae, Vols. 1-6, and Tutt's *British Noctua*, Vols. 2, 3, and 4.—*Dr J. N. Pickard, F.R.S.E., 36 Storeys Way, Cambridge.*

*Wanted.*—Various monthly parts of *Entomologist's Record* for 1914, 1915, 1916, 1917, 1919, and 1920. Please report any odd monthly parts (in wrappers as issued) prior to these years.—*P. B. M. Allan, 4 Windhill, Bishop's Stortford, Herts.*

*Wanted.*—Males of *Morpha menelaus, M. didius, M. rhetenor* in papers.—*Leonard Tatchell, Rockleigh Cottage, Swanage, Dorset.*

*Wanted* urgently for experimental purposes, pupae of *betularia, porcellus elephanor.—Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.*

*Wanted*, set or in papers: *Apatura iris, Vanessa polychloros, Argynnis adippe* and *aglaia, Melitaea cinxia, Erebia epiphron* and *aethiops, Coenonympha tiphon, Thecla betulae, T. pruni* and *w-album, Lycaena astrarche* and *artaxerxes, Lyc. arion, Nemeobius lucina, Adopoea lineola* and *actaeon, Angiades comma, Cyclopides palaemon.* In exchange for other British and foreign species.—*Chas. B. Antram, Clay Copse, Sway, Lymington, Hants.*

*Wanted*, British butterflies, set or in papers, in exchange for *Morpho papirius, Morpho didama, and other Morphos.—Chas. B. Antram, Clay Copse, Sway, Lymington, Hants.*

*Wanted.*—Various Books on Lepidoptera. Please send lists and price. Also wanted, Live Exotic and English Lepidopterous Material for cash or exchange for similar material or Set English Imagines.—*J. K. Goody, "Weldon," 26 Carr Wood Road, Bramhall, Ches.*

*Wanted.*—"Entomologist" Volumes, bound or unbound, for 1926 to 1932 inclusive, and 1935, 1939, 1940 to 1942.—*F. W. Smith, Boreland-of-Southwick, by Dumfries, Kirkcudbrightshire.*

*Wanted*, for experimental purposes, a few pupae of *Endromis versicolora*, purchase or exchange.—*R. W. Parfitt, 1 Dunsdon Avenue, Guildford, Surrey.*

*Wanted.*—Spuler's *Die Schmetterlinge Europas*, Vol. I. Various unbound parts containing pages 1-144, and I-XVI with plates as issued. *Exchange.*—Various numbers of the *Entomologist's Record* and *Entomologist.—S. Wakely, 36 Stradella Road, Herne Hill, London, S.E.24.*

*Wanted.*—Volume V (five) of Tutt's *British Lepidoptera.—T. R. Eagles, 32 Abbey Road, Enfield, Middlesex.*

## MEETINGS OF SOCIETIES.

*Royal Entomological Society of London*, 41 Queen's Gate, S.W.7: May 7th and June 4th, at 5.40 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section*: Last Fridays in month, at 7 p.m., at the Birmingham Museum and Art Gallery. Particulars from the Hon. Secretary, G. B. Manly, 72 Tenbury Road, King's Heath, Birmingham, 14.

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## TO OUR READERS.

**Short Collecting Notes and Current Notes. Please, Early.—Eds.**

All MS. and EDITORIAL MATTER should be sent and all PROOFS returned to HY. J. TURNER, "Latemar," 25 West Drive, Cheam.

We must earnestly request our correspondents NOT TO SEND US COMMUNICATIONS IDENTICAL with those they are sending to other magazines.

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Articles that require ILLUSTRATIONS are inserted on condition that the AUTHOR DEFRAYS THE COST of the illustrations.

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*Communications promised*:—H. Donisthorpe, A. H. Turner, the late Dr H. G. Harris, T. Bainbrigge Fletcher, Dr Malcolm Burr, Hy. J. Turner, H. A. Leeds, S. G. Castle Russell, H. W. Andrews, Dr E. A. Cockayne, Rev. G. Wheeler, W. Pickles, A. J. Wightman, Lt. C. N. Collyer, M. Niblett, An Old Moth Hunter, O. Querci, B. P. Beirne.

All Communications should be addressed to the Acting Editor, HY. J. TURNER, "Latemar," 25 West Drive, Cheam.

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# ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION





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## COLLECTING NOTES FOR 1946.

By Surg.-Lieut. H. M. Darlow, R.N., F.R.E.S.

Having spent most of the last five years collecting in various parts of the tropics, sometimes in places in which the native lepidoptera are comparatively little known, I returned to England in May with a changed outlook upon and almost as a stranger to our own native species. Absence has made the heart grow fonder, though as a scientist I may not wax lyric. I can at least share my jottings with others.

Things started badly. I returned from West Africa with a large brood of larvae of an unknown lycaenid, complete with their attendant ants, but, unfortunately, though every larva pupated, all produced dipterous parasites, and the English weather killed off these in the pupal state. Finally, I dropped all the ants on the hearth rug, so that was the end of an interesting problem. I was always under the impression that attendant ants played some part in the protection of the larvae with which they associate, though they do not seem to have been a success in this case.

After this tragedy followed the dreadful winter of last summer. It was not an " edusa year," but some of my migration records may be of interest.

*Colias croceus*.—First seen on 12th September when a worn female was taken flying at random at mid-day in a garden in Gosport. The weather was sunny with a light westerly wind. A second specimen was seen under similar circumstances on 16th September. No more were seen until 29th September, when a very worn var. *helice* was taken flying N.-W. along the sea shore at Lee-on-Solent at about 1 p.m. The wind was strong and easterly. On 6th October two moderately fresh specimens, a male and a female, were taken in still weather on the cliffs at Sandown, I.O.W., and four other specimens were seen on the same day at Sandown, Ryde, Bembridge, and Brading. All were flying at random and were seen between mid-day and 3 p.m.

*Vanessa cardui*.—This species was fairly plentiful in Hants and the Isle of Wight in 1946. The first recorded was a very worn specimen flying in from the sea at 2 p.m. at Alverstoke on 11th July, the wind being light and easterly. Later in July fresh specimens started to occur in numbers and they were observed on the wing whenever weather permitted until last seen on 8th October at Gosport.

*Vanessa atalanta*.—Very common in Hants this year. First recorded on 6th July when a worn specimen was seen flying at random at 3 p.m., the wind being light and easterly. Thereafter it became common everywhere. Twenty-eight were counted at mid-day on 3rd October flying on a single flower bed, but the number rapidly declined after that and the last record was on 12th October.

*Pieris brassicae*.—On 23rd August this species was extremely common at Gosport, though I was unable to make observations as to direction of flight. It seemed clear that a migratory swarm was in transit. Two days later, at Highcliff-on-Sea, at least six specimens were seen to fly in from the sea between 4 and 7 p.m., the wind being light and south-westerly. The last record of the year was 6th October, when two specimens were seen at the eastern end of the Isle of Wight.

*Plusia gamma* was very common indeed and numbers were seen flying around the last of the Michaelmas daisies in glorious sunshine as late as 4th November. *Macroglossum stellatarum*, on the other hand, seems to have been rare, at least in Hampshire. I only recorded one specimen, and that was taken indoors in fine still weather at mid-day on 10th July.

A special study was made of a colony of *Zygaena filipendulae* which inhabited a tract of rough country near Alverstoke. I first visited it on 22nd July, when a few fresh specimens were on the wing and fully fed larvae and numerous pupae were observed. There were no signs of any other Zygaenid species. 164 cocoons were collected. Of these only 74 (45%) produced imagines (all perfect). Of the fifty-five per cent. mortality, thirty-nine deaths were due to parasitisation by a single species of Ichneumon, so far unidentified, as it appears to spend the winter hibernating in the larval stage within the Zygaenid cocoon, reinforced by a papery product of its own. Twenty deaths were due to three species of Tachinid, the larvae of which escaped from the cocoons before the Zygaenid larvae had pupated, whilst the Ichneumon larvae did not leave their hosts until the latter had actually pupated. The remainder all died in the pupal stage from unestablished causes.

Variation in the colony was disappointingly rare. A total of 500 imagines was examined and only three varieties of note found:—(1) an ab. *conjuncta*, Tutt; (2) a partial ab. *aurantia*, Tutt, with an orange right hindwing and some orange suffusion on the underside of the right forewing; (3) a semi-transparent specimen, the black being replaced by metallic blue-grey and the red by pink. The antennae were ashen and tipped with yellow. This insect was bred, and so was in perfect condition. I once bred a similar variety from a batch of larvae taken in a field near Bedford. I do not think that it has ever received a name, but it seems to be analogous to ab. *eboraceae*, Prest., of *Zygaena lonicerae*.

Whether a five-spot species occurs in the same locality I do not know, but on examining a short series of males it was found that a reduced sixth spot was associated with an uncus which was either shorter, straighter or less hairy than a normal uncus. In these specimens the reduced sixth spot was always bisected by a band of black scales along the vein, and the black border of the hindwing was always twice as wide at the apex of the wing as in the normal six-spotted form. Of course, it cannot possibly be claimed that these specimens are hybrids, but it is tempting to speculate. The five-spot species emerge earlier in the year than *Z. filipendulae*. Hybrids might be expected to have an intermediate emergence time, the more five-spotted forms of hybrid emerging earlier and the more *filipendulae*-like forms emerging nearer the true *filipendulae* emergence date. I have kept no dates, but this year I shall find a colony of mixed species and plot uncus length against emergence date.

In spite of, or perhaps because of, the miserable weather conditions, many species remained on the wing until much later than is usual, or in some cases appear to have emerged later owing to retarded metamorphosis. Worn females of *Agriades* (*L.*) *bellargus* were taken flying with fresh males of *A.* (*L.*) *coridon* at Bembridge, I.O.W., on 25th July, and with both sexes of the latter species on 7th August. *Pararge aegeria* was taken

at Bembridge on 6th October and *Maniola jurtina* was taken in various localities round Portsmouth until 22nd October, when a female was taken in Gosport, the last butterfly of any species seen that year. *Gonepteryx rhamni* remained on the wing until the second week in September, the females remaining on the wing later than the males. A fresh, living pupa of *Abraxas grossulariata* was found spun up on a shoot of *Euonymus japonicus* on 4th November. It had certainly not been there the previous week.

## COSYMBIA PUPILLARIA, HUEBNER, IN THE SCILLY ISLES.

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

I have in my collection two specimens of *Cosymbia pupillaria*, Hb., ab. *badiaria*, Stdgr., a male and female, both rather tattered. They are labelled "Scilly Isles. F. D. Wheeler Coll.," and were in Sir Vauncey Harpur Crewe's collection at the bottom of a row of *C. porata* with a label below them in his handwriting "*porata* abs." When his collection was sold at Stevens's Auction Rooms on 20th October 1925 they were in lot 34, catalogued as "*porata*, two unicolorous reddish vars., Scilly Isles, 1882, F. D. Wheeler," and were purchased by me for 7/-. When the Rev. F. D. Wheeler's collection was sold at Stevens's on 10th July 1895 they were in lot 118, catalogued as "*porata* 12, two fine unicolorous varieties from Scilly Isles," and were bought by Janson for 14/-. As Janson often bought on commission for Sir Vauncey Harpur Crewe, and at the same sale bought the *Minucia lunaris* taken by Wheeler at Stratton Strawless for him, it is probable that the "*porata*" were also bought for Sir Vauncey. I turned them out of my collection, when I recognized them as *porata* and had had the identification confirmed by Prout, but decided to reinstate them, when I learnt that Dr K. G. Blair had captured a fertile female *pupillaria* in perfect condition at Freshwater, Isle of Wight, on 2nd October 1946, a capture which he recorded later (*Ent. mo. Mag.*, 1947, **83**, 29). My specimens were in store when they were mentioned at the time Dr Blair's specimen was exhibited at a meeting of the Royal Entomological Society (*Proc. R. ent. Soc. Lond.* (C), 1946, **11**, 38), and I could not remember what was on the labels. It is certain that they are not the same as Norgate's, as Dr Blair suggested, unless Norgate gave them to Wheeler.

The Rev. F. D. Wheeler of Norwich was a member of the Norfolk and Norwich Naturalists' Society from 1872 to 1923, and was President in 1891-1892. He wrote a few articles in the Transactions of this society, but I can find no account of a visit to the Scilly Isles, and the articles he contributed to *The Entomologist* in 1870 and 1879 are about fen insects.

In the list of moths taken by him in the Scilly Isles, F. Norgate records two *Ephyra porata* from Tresco, August 1878 (*Ent. mo. Mag.*, 1880, **16**, 183). Dr Blair says that this is the only record of *porata* from Scilly, and that it does not appear to occur on the mainland of Cornwall. It is therefore probable that Norgate's specimens were *pupillaria* and not *porata*. Norgate's collection was sold at Stevens's on 20th May 1919, sale no. 13053, and his *Cosymbias* were in lot 162,

but I have been unable to find out who bought them. I shall be much obliged if anyone can help me to trace them. If they were really *pupillaria*, it is probable that the moth was breeding there for several years, but Mr B. W. Adkin, who did a good deal of collecting there from 1889 onwards, took neither *porata* nor *pupillaria*, and it may have died out before that date. It is not unlikely that *pupillaria* was introduced with some South European shrub into the garden at Tresco, where the climate is so mild that many sub-tropical plants and shrubs grow luxuriantly. On the other hand, if the Isle of Wight specimen was an immigrant or descended from an immigrant, as seems probable, the Scilly specimens may also have resulted from an immigration.

## TUKDAH DIARY, SEPTEMBER-NOVEMBER 1945.

By D. G. Sevastopulo, F.R.E.S.

(*Continued from p. 34.*)

14th October.—A showery night and a cloudy morning with short spells of sunshine. A walk along the forest road produced a female *Callidrepana patrana*, Moore, ova of *P. helenus* and larvae of *R. confusa*, *C. nitida* and *S. curvilinea*. Few butterflies were about, mostly *Y. sakra* and *D. adonira* (incidentally, Evans describes this latter species as rare). A showery afternoon, a walk along the open hillside where the three *Ypthima* and *Z. flegyas* were all flying commonly and a few *N. hylas* were seen; this is usually one of the commonest butterflies of these parts, this year it is one of the rarest. A fair number of larvae of *M. troglodytus* were found and *R. vinacearia* was beaten out in dozens. A single male *Ocinara signifera*, Wlk., was found settled on a leaf. A thundery evening, but nothing attracted to light.

15th October.—A fine sunny morning, a walk along the forest road produced all the usual things, *L. daraxa* is less common than it was and *L. sidonis* is rivalling *Y. sakra* in numbers. A female *Dodona ouida*, Moore, *ouida* was caught resting under a leaf and examples of *Leucoma* (*Caviria*) *sericea*, Moore, *Myrteta simpliciata*, Moore, and the first female *U. primularis* were taken. Larvae of *P. helenus* and of an unknown Notodontid (which subsequently died) were found. A showery afternoon clearing up late and allowing time for a short walk only, which produced a male *Erebomorpha compositata*, Guen., and larvae of *A. fylla* and a Zygaenid (this pupated, but failed to emerge). The moon is now well in its second quarter and light was a failure again.

16th October.—A fine sunny morning but nothing out of the ordinary flying on the forest road, a *P. helenus* was seen and missed. Larvae of *S. hypselis*, *R. aurifera*, *A. argenticeps* and *E. repleta* were found. A late afternoon walk down through the forest produced some half dozen species of moths, including a *Sideridis*, a *Boarmia* (both still unidentified) and a *Cambogia pulchella*, Hamps. Larvae included *L. verma* and a batch of *Samia cynthia*, Drury. Light attracted a single female *Chionaema detrita*, Wlk.

17th October.—A fine sunny morning, a walk along the open hill road produced *Y. sakra* and *Z. flegyas* in numbers, a few *D. aglea*, *N. hylas*, *L. daraxa* and *A. hyperbius*, and single examples of *L. rohria*

and *D. melaneus*. Larvae of a Limacodid and a *Risoba* (both of which died) and of *P. spurcataria* were found. In the afternoon more larvae, the yellow tufted Lasiocampid, a batch of young larvae of a Eupterotid (which died), *E. pulchella* and *C. delecta*. Light a failure.

18th October.—The weather has now settled, fine and sunny from morning till evening, weather that we should have been having from the end of last month. A walk up the forest road showed the usual common things, to whose number *D. dipoea* must now be added, flying in abundance. A few *H. nama* were seen, as well as single specimens of *S. hypselis* and *D. ouida*, whilst the first *Pieris canidia*, Sparr., *indica*, Evans, was caught. In the afternoon a new, and very unproductive, part of the forest was searched, the only things obtained being single larvae of *E. pulchella* and *Dasychira mendosa*, Hbn., and a male *Andraca albilunata*, Hamps.; even *Y. sakra* and *L. verma* were scarce. Light again a failure.

19th October.—A walk along the forest road produced the usual common things, the only find of interest being two larvae of a Boarmiid (these were interesting in having the thoracic somites greatly swollen, they pupated but failed to emerge). The afternoon was devoted to larva-hunting, with a fair amount of success, *Papilio arcturus*, Westw., *arcturus*, *R. olivacea*, *E. repleta*, *S. curvilinea*, *C. fulvida*, *A. sylvata*, *Peratophyga aerata*, Moore, and *A. obrinaria* all being found, as well as a single male *Cambogia pictaria*, Hamps. Light again a failure.

20th October.—Completely hopeless from a collecting point of view because of heavy rain and a north wind all day, in spite of which a female *Tyana callichlora*, Wlk., came to light.

21st October.—Another blank day due to incessant, heavy rain. The papers report a cyclone on the Madras coast and our weather is probably the result of this. Not unexpectedly, nothing attracted to light.

22nd October.—A rainy morning, clearing up late in the afternoon, when a walk produced larvae of *Z. flegyas*, a Drepanid, a Geometer (both these latter two died), and *L. calcearia* (this is a long thin dark larva with recurved fleshy processes, and exactly resembles a dead leaf stalk of the Rubus, on which it feeds). In spite of more than forty-eight hours of very heavy rain, *Y. sakra* and *Z. flegyas* were both flying freely and a male *A. hyperbius* was found settled in a head of seeding grass. The usual number of small Geometers were disturbed by beating. Light a failure, and an attempt at assembling with two females of *D. feminula* equally so.

23rd October.—A dull, misty, drizzling morning. Larvae of *P. helenus*, *Z. flegyas*, two Notodontids, a Noctuid and two Geometers (these all pupated but the pupae of the last 5 failed to survive the transfer to Calcutta) were found by searching, and numbers of the common Geometers were settled on herbage. *Y. sakra* was flying in numbers. The afternoon produced a number of males of *Gnophos eolarius*, Guen., a *Boarmia* (still unidentified) and a *Myrteta planaria*, Wlk., at rest, larvae of *P. helenus*, *Papilio polyctor*, Bsd., *ganesa*, Moore, an Arctiid (ichneumoned), *Prodenia litura*, F. (*littoralis*, Bsd.), and *L. obliquata* and a pupa of *Z. flegyas*. A single *A. grisea* came to light.

24th October.—A sunny morning again and a walk along the forest road produced the usual things, a male *P. arcturus* being caught in

addition. More larvae of *P. helenus* were found as well as a batch of *D. ouida*. A female *P. bicolor* emerged in my cages and assembled successfully, swarms of males appearing until about noon. A cloudy afternoon, devoted to larvae, *Prismosticta fenestrata*, Btlr., two Notocampids, three Notodontids, a Noctuid and a Geometer (pupae of the last seven species failed to survive the change to Calcutta) being found, as well as ova of *R. aurifera*. An example of *T. crocoptera* was found settled under a large leaf; funny how these large Geometers give themselves away by leaving a corner of a wing sticking over the edge. Light produced a single male *A. pulchella*.

25th October.—A cloudy morning with intervals of sunshine, a walk along the forest road produced all the road haunters in their usual numbers, in spite of the heavy rain of the last few days; as nothing exciting was flying a check on the sex of the insects settled on the road was made, all being found to be males. A crushed example of a black and scarlet Zygaenid (see subsequent note) was picked up in the road, and a *Scopula moorei*, C. & S., was found settled. A larva of *Psiloreta* (*Oreta*) *obliquilinea*, Hamps., was found. The afternoon given up to social engagements. Light a failure.

26th October.—A fine sunny morning on the forest road produced a male *Lethe sura*, Dbl., and several *Lethe bhairava*, Moore, in addition to the usual common things. A pale yellow Pierid and a *Coladenia dan*, F., *fatih*, Koll., were seen but missed. A female *D. dipoea* was found settled on the damp road. The afternoon was cloudy and a walk along the hill road produced single specimens of *Euproctis subfasciata*, Wlk., and *Leucoma divisa*, Wlk., and larvae of *P. polyctor*, *M. troglodytus* and an Arctiid (which died). *M. troglodytus* is badly infested with ichneumons. I have found two full-grown larvae only, which have pupated successfully. All third and fourth instar larvae, a good number altogether, have been parasitised. Light a failure.

(*To be continued.*)

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## TWO UNRECORDED RARITIES: HADENA (DIANTHOECIA) COMPTA, F., AND LEUCANIA LOREYI, DUP.

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

*Hadena compta*, F.—This is labelled " W. Purdey. Leaden Spout, Folkestone, June 1877." It is a large female in perfect condition and has an unusually narrow white median band. Mr A. M. Morley says that it has not been recorded. W. Purdey, who lived at Folkestone, was a keen collector and very reliable. Leaden Spout is a misspelling of Lydden Spout, a rather inaccessible spot near the Warren, where it is believed that Purdey had a secret locality for *Hadena* (*Dianthoecia*) *albimacula*. The specimen was in the collections of Sir Beckwith Whitehouse and Mr B. Harold Smith.

*Leucania loreyi*, Dup.—This was taken by B. Harold Smith at the Lighthouse, The Lizard, Cornwall, in June 1919. It is a female in rather poor condition, lacking fringes and with a slit in the right forewing. It was in B. H. Smith's collection.

Both insects are now in my collection.

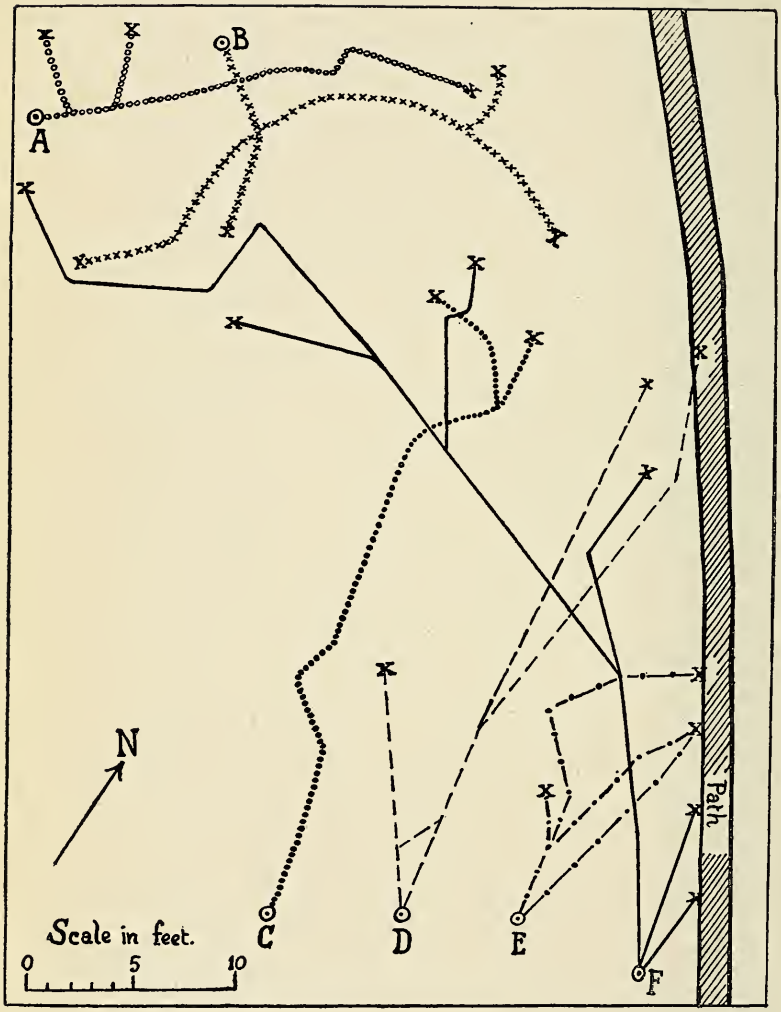


Fig. 1. Plan of the area of permanent trackways leading from six nest-mouths marked A to F: each of the separate tracks having the termination point marked X.

# A STUDY ON THE PERMANENT TRACKWAYS MADE BY THE ANT MESSOR BARBARUS, L., BARBARUS (HYM. FORMICIDAE) IN ALGERIA.

By W. Pickles, F.R.E.S.

Plates I, II.

## INTRODUCTION.

Whilst studying the ecology of ants on a hillside at Souk Ahras in Eastern Algeria during 1943 it was noticed that ants (*Messor barbarus*, L., *barbarus*) leaving the nests to go to the " harvesting areas " to collect the inflorescence of grasses, etc., actually wore away the grass near the nest and made a permanent trackway in one or more directions as the case might be. These are mentioned by Forel (1928).

At one particular spot on the hillside, where these observations were made, it was noticed that quite a maze of permanent trackways interlocking with each other, etc., had been formed during the Autumn months. Forel (1928) mentions that often these nests of the harvesting ants are of considerable area in extent and that the mouths may be several feet or yards away from each other. It is not, therefore, claimed that the mouth-openings marked A to F (Fig. 1) are those of different nests and that the trackways are from different nests; but that they represent the points of origin of different trackways which had their own particular ants running along them having their own individual scents (see later).

I wish to thank Mr S. Smith for the loan of his camera to take the photograph.

## DESCRIPTION OF THE TRACKWAY " MAZE."

This particular part of the hillside on which the " maze " of permanent trackways was situated measured 50 ft. by 30 ft. and was a rectangular area. To the north-east, south and west of this small area there were rocks with very little vegetation on them and the north-eastern side was bounded by a path (made by Arabs) running approximately north-west to south-east. Two of the nests were situated in the north-westerly part of the area, whilst the other four were practically arranged in a straight line along the south-easterly border. Between nests A and B and the other four nests C, D, E and F there was an expanse of grass which the ants from all these nests used as their harvesting area. Most of the permanent trackways led to it. On 12th July 1943 these permanent trackways were mapped out; they were in common use by the ants from these mouth-openings at the time, although they were not all used by the ants at the same time. These trackways, which are illustrated in Fig. 1 and which were clearly visible in the grass and were worn down to the ground (i.e., soil) level, were the permanent trackways only and those along which the ants would go towards their foraging areas before branching out to search for seeds when these latter areas were neared. It might appear from the diagram that the path made by the Arabs and running along the north-eastern part of the area acted as a boundary to the foraging activity but this was not the case and many a time ants were observed to pass

over this human path and make processions many yards beyond this path, but they were not permanent trackways.

The number of trackways varied with the nest (or mouth-opening) but only three of them had no branches; one of these was from nest E and the other two were from nest F, all the rest having a varying number of branches. The longest of these trackways was the one running in a northern and westerly direction from nest-mouth F; this was 57 feet long and stretched from its point of origin at F to near nest-mouth A at X. Trackways from nests C, D and E crossed this track at various points along its course and in the neighbourhood of F there was quite a " maze " of tracks running in different directions. Processions of ants along any one of these tracks kept rigidly to it and did not go off along a different track because that particular track crossed another one.

In order to show more clearly how these permanent trackways show up in the grass a photograph of the tracks leading from a nest of *M. b. barbarus* was taken. This is shown in the accompanying photograph (Fig. 2). This nest was situated some 30 yards or so to the north-west of the area described above. This particular nest was situated amongst the roots of a small spinous shrub about 2 ft. to 2 ft. 6 ins. in height. The trackways led chiefly in an easterly direction, the pathway in the photograph being a continuation of the pathway marked on Fig. 1. In this photograph three ant-trackways are plainly to be seen (marked A, B and C) as lighter coloured lines running from the nest towards the human pathway. Track C divided at the point C into two branches marked C1 and C2.

REFERENCE.

(1928) Forel, A. *The Social World of the Ants.* London.

## CHANGES IN THE DISTRIBUTION AND ABUNDANCE OF THE LEPIDOPTERA.

By Bryan P. Beirne, Ph.D., M.R.I.A., F.R.E.S.

One of the neglected aspects of the study of the Lepidoptera is the causes of changes in the distribution and abundance. Many such changes can be attributed, either directly or indirectly, to the weather or to human activities. Some other causes, all of which require further investigation, are discussed below.

Little is known of the causes of great outbreaks of larvae. While every species fluctuates in abundance from year to year, there are some whose larvae occur occasionally or regularly in vast numbers. There is one significant fact in connection with the majority of these species: their habits are such that there is normally a tendency for heavy concentrations of larvae to arise in limited areas. With some the females are incapable of flight so that each normally must lay all its eggs in a limited area on a single tree, examples being *Orgyia antiqua, Operophtera brumata, O. fagata, Phigalia pilosaria* (*pedaria*), *Erannis defoli-*

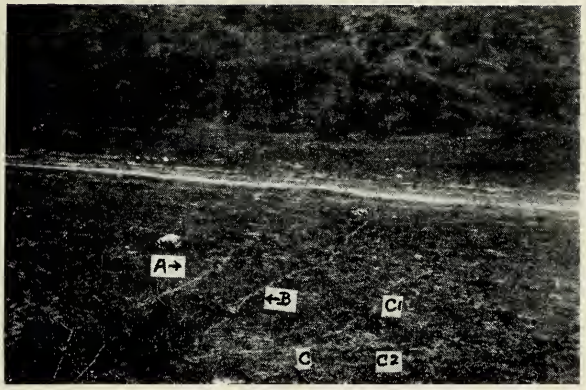


Fig. 2. Photograph of the permanent trackways leading from a nest of *M. b. barbarus*: these are marked A, B and C. C1 and C2 represent branches of the track C.

*aria*, *E. leucophearia*, *E. aurantiaria* and *Alsophila aescularia*. In other cases the eggs are laid in batches and the larvae live gregariously in large colonies, examples being *Euphydryas aurinia*, *Euproctis chrysorrhoea*, *Malacosoma neustria*, *Eriogaster lanestris* and the Hyponomeutidae. This tendency, however, does not appear to be present in other species amongst which great outbreaks occur, namely *Philudoria potatoria*, *Macrothylacia rubi* and *Charaeas graminis*.

A possible explanation for the outbreaks of species whose larvae tend to occur in heavy concentrations is that they are normally kept in check mainly by one particular type of natural enemy. Occasionally a colony of larvae escapes attack so that instead of only a small proportion reaching the adult stage the majority do so. The result is that in the following year the species becomes enormously abundant in that area.

In the case of the Hyponomeutidae there are indications that birds are the chief natural enemy. Normally an average of over 95% of the larvae appear to be eaten by birds but occasionally some colonies are overlooked so that instead of about 2% reaching maturity about 40% do so, the remaining 60% being destroyed by other natural enemies (Beirne, *Econ. Proc. R. Dublin Soc.*, III: 191). The result is that if only a single colony escapes attack the species is about twenty times more abundant in a limited area in the following year, while if several colonies escape this figure is multiplied proportionately.

Possibly birds are the chief natural enemies of *O. antiqua*, as outbreaks of this species seem to occur chiefly in towns where birds are relatively scarce; the ova, rather than the larvae, may be attacked. Parasitic Hymenoptera appear to be the chief enemies of *E. aurinia*. The chief enemies of the remaining species are not known and their identities require investigation. In all cases the enemy whose absence is responsible for the outbreaks probably is one which attacks the eggs or the larvae of those species which live gregariously or the females or eggs of those whose females are wingless. Climatic factors are doubtless of great importance in many cases and information is required on their identities, on whether they affect the species directly, i.e., by killing the females, ova or larvae, or indirectly, i.e., by influencing the degree of attack by the natural enemies.

It is difficult to suggest possible causes of outbreaks of larvae of *P. potatoria*, *M. rubi* and *C. graminis*. But it may not be coincidence that the two most severe outbreaks of *C. graminis* in the past century occurred in areas in which great vole outbreaks took place a few years previously. The two greatest vole outbreaks of recent times took place in the Southern Uplands of Scotland in 1875-6 and 1891-2 (Elton, *Voles, Mice and Lemmings*), while the outbreaks of *C. graminis* just mentioned took place in almost exactly the same areas in 1885 and 1894. However, Dr Elton informs me that there are no records of vole outbreaks preceding other recorded outbreaks of *C. graminis* larvae. Nevertheless, this is a point requiring investigation.

Possibly outbreaks of *P. potatoria*, *M. rubi* and *C. graminis* may be due to similar causes as judging from the published records they seem to occur mainly on heathy grasslands or hill pastures with all three species.

The excessive abundance of the larvae of any species usually is followed a year or two later by a scarcity, due to its being followed by an increase in the abundance of Ichneumons and other natural enemies and to conditions favouring the spread of disease. It is well known that when larvae are overcrowded disease spreads rapidly and causes great destruction. This is due to the fact that infection by most fungi, Protozoa, bacteria and viruses occurs mainly by the healthy larvae eating food which has been contaminated by diseased larvae. It may explain why " good " years for Lepidoptera always occur singly or in twos, there never being a longer succession as with " bad " or " average " seasons.

A further effect of the excessive abundance of the larvae of a particular species is that it may be indirectly responsible for the scarcity of that or of other species due to the larvae stripping the vegetation of its foliage before becoming full-grown, and as a result dying of starvation. For example, Turner (*Entom.*, LXIX: 254) records the occurrence of this with *Callimorpha jacobaeae* and Chapman (*Entom.*, XXVII: 217) with *Nonagria typhae*, while according to Jeddere-Fisher (*Entom.*, LVII: 285) a local defoliation of Oaks by *Tortrix viridana* resulted in the scarcity of other Oak-feeding species such as *Poecilocampa populi*, *Phigalia pilosaria* (*pedaria*) and *Apocheima hispidaria*.

Local scarcities or extinctions of Lepidoptera may result from the destruction of ova, larvae or pupae by herbivorous vertebrates. For example, local extinctions of *Lysandra coridon* have been attributed to grazing by cattle (Walker, *Ent. Mon. Mag.*, LVIII: 251; Oliver, *Entom.*, L: 286) and by rabbits (Robbins, *Lond. Nat.*, 1926: 37), the distribution of *Anepia irregularis* appears to be regulated largely by grazing animals as, according to Nurse (*Ent. Rec.*, XXIV: 260), the species does not occur where its foodplant is grazed in the flowering stage by sheep or cattle, and larvae of *Eupithecia pini* (*togata*) are said to be killed when the Spruce cones within which they feed are eaten by squirrels (Nix, *Entom.*, XXXVI: 291).

Different animals have different effects on the vegetation. For instance, sheep crop the herbage much closer than do cattle but cattle trample down the vegetation to a greater extent, Heather is kept down by sheep but can spread in cattle pastures, close grazing by sheep is favourable for the spread of Bracken, and Ragwort is not touched by rabbits and consequently may become abundant on coastal sandhills and in similar rabbit-infested situations. All such vegetational changes must affect the abundance of some species of Lepidoptera and information on this would be of interest; at present little information is on record.

Under natural conditions the vegetation of any area is in a condition of equilibrium known as a climax. The natural climax vegetation over most of the British Isles is deciduous forest. Through human agency most of this forest has disappeared but if left undisturbed the vegetation of a region tends to return to this climax. Changes in the abundance and distribution of the Lepidoptera must result from the ecological succession of vegetation but few are on record. However, an example is described by Clarke (*Ent. Rec.*, XIV: 24): such woodland species as *Argynnis paphia*, *A. euphrosyne* and *Aphantopus hyper-*

*anthus* inhabited a locality which was covered with trees and dense undergrowth but disappeared when the trees were cut and the locality converted into cornland. Later the area was left uncultivated for a long time and *Lysandra coridon*, *L. bellargus* and *Erynnis tages* made their appearance—presumably as a result of the appearance of the small plants on which they feed. The effects of the next stage in the succession are recorded by Simpson-Hayward (*Entom.*, LX: 30), Marsden (*Ent. Mon. Mag.*, XLI: 77) and Clarke (*Ent. Rec.*, XVIII: 23), who describe local extinctions of *Maculinea arion*, *L. coridon* and *L. bellargus* in other localities due to the choking-out of their foodplants by the spread of coarse grasses. An effect of the following stage—the spread of larger plants and of shrubs—is recorded by Bright (*Entom.*, LVIII: 273), who attributed an increasing scarcity of *M. arion* to an increase of Heather and Bramble which drove out its foodplant and the ants with which the larva is symbiotic.

Ecological succession of vegetation may result from causes other than the cessation of some limiting factor. For instance, the constant deposition of dead leaves and other vegetation may change the character of the soil of a locality, rendering it more suitable for the growth of some plants and less suitable for others. Corresponding changes in the abundance and distribution of some Lepidoptera must result, but again few such changes are on record. However, the increasing scarcity of some of the Fenland species has been attributed to the Fens gradually becoming dryer, with a consequent gradual change in the vegetation (Farren, in *The Natural History of Wicken Fen*; Wheeler, *Entom.*, XXII: 80).

Coast erosion and floods may result in local scarcities or extinctions. For instance, a local extinction of *Leucania pallens* ssp. *favicolor* was attributed to an invasion of the coastal marshes by the sea (Mathew, *Ent. Mon. Mag.*, XLI: 77), and the flooding of Horsey Mere and its neighbourhood by the sea in 1938 was disastrous to most Lepidoptera (Ellis, *Trans. Norf. Norwich Nat. Soc.*, XIV: 389). Incidentally, this flood was followed by a great increase of Orache (*Atriplex*), and as a result *Hadena trifolii* appeared in great abundance (*Op. cit.*). Flooded rivers must wash away great numbers of larvae and pupae, just as they do Coleoptera and other insects, but very little information is on record with the chief exception of instances of *Plusia festucae* being affected in this way (Collins, *Ent. Rec.*, II: 89; Arkle, *Entom.*, XXIX: 113).

A final neglected study is the effects on the abundance of the Lepidoptera when the development of the foodplants fails to coincide with that of the species. A few examples of this are that seasonal scarcities of such species as *Hadena caesia*, *H. conspersa* and *H. bicruris* have been attributed to scarcities of the seed-capsules of *Silene* within which they feed (Kane, *Entom.*, XVI: 52, and *Ent. Rec.*, VI: 210), the fall of the leaves in autumn is said often to overtake the larvae of such species as *Bena prasinana* and *Calocasia coryli* before they have become full-grown (Holland, *Ent. Mon. Mag.*, XXIX: 89), and a seasonal scarcity of *Lithostege griseata* was attributed to the species having produced an abnormal second brood in the previous year, the second-brood larvae failing to reach maturity before the foodplant died in the autumn (Edelsten, *Entom.*, XLVII: 71).

## CURRENT NOTES.

I HAVE heard from my old friend and colleague, Dr Freidrich Zacher, who writes that the late Dr Walter Horn's collections of insects are not destroyed, as had been previously reported. They, with the library, have been removed from Dahlem to the Vollrathsruge Castle in Mecklenburg, where they are under the care of Dr Sachtleben.

Dr Zacher himself has suffered the loss of the greatest part of his collection and most of his library; his Orthoptera collection was completely destroyed.—MALCOLM BURR.

DESPITE the severe winter the following appeared on 10th April:—6 *P. c-album*, 5 *A. urticae*, several *N. io*, 30-40 *G. rhamni* (both sexes). No fresh butterflies seen up to time of writing, 24th April. Vegetation then very backward and rain and gales still limiting the late sowing of corn and roots. The Nature Preserve and adjoining fen was flooded, but we are much higher situated.—H. A. LEEDS, Wood Walton, Hunts.

LATE APPEARANCE OF BUTTERFLIES IN THE NEW FOREST AREA, HANTS., UP TO 21ST APRIL 1947.—All lepidopterists must be wondering what effect last year's sunless and wet summer and autumn, followed by the long and extra severe winter, will have on the insect life of the British Isles in 1947. This year has started some three weeks to a month late and the early appearing butterflies, usually seen in March and April, have hardly put in an appearance in this area of the New Forest, at date of writing these preliminary notes. Weather conditions improved slightly by the 25th March and on that day of about 12 hours of sunshine the first male specimen of " The Brimstone " was observed and between that date and the 1st of April one or two very worn specimens of *Vanessa urticae* and *V. io*. While all three of the above-mentioned species have since been observed on bright days they have been in very small numbers indeed. On the 10th April one *Polygonia c-album* was taken but none seen since. *Cyaniris argiolus*, which sometimes appears in the last days of March, has not yet been seen, neither has *Euchloë cardamines* yet appeared.

This is a bad beginning and not a bright outlook for the future. The appalling winter, covering the most of our island from the South-East, Midlands and to Northward, to say nothing of the floods, must surely result in a bad season for at least some species. In Hants. and the South-West, adverse weather conditions have certainly not been so severe or prolonged and therefore we may not be so badly off in these parts.

These preliminary observations will be followed by further notes later on as to how the 1947 season has turned out, but in the meantime it would be very interesting to know what sort of a season followed a summer and winter such as we have just experienced, in times gone by, if someone will tell us what happened on the last or two last occasions. —CHAS. B. ANTRAM, 21st April 1947.

# EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr HY. J. TURNER, "Latemar," West Drive, Cheam.

*Wanted*—American Hesperilidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Instituto Miguel Lillo, Calle Miguel Lillo 205, Tucuman, Republica Argentina.*

*Desiderata*—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—*H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.*

*Wanted.*—*Lycaena* (*Heodes*) *phlaeas* from all regions including British Isles. Also wanted other species of Chrysophanids from all areas. Exchange or purchase considered. *Duplicates.*—Foreign Lepidoptera, e.g., Satyrids, Charaxes, Papilios, and others; full lists sent.—*P. Siviter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.*

*Wanted* for cash or exchange many species of ova, larvae or pupae, especially local forms and *A. grossulariata* from different localities, also Seitz Vol. 1 and Supplements to Vols. 1-4. Offers also, Tutt's *Practical Hints*, Parts 1 and 2, Buckler's larvae, Vols. 1-6, and Tutt's *British Noctua*, Vols. 2, 3, and 4.—*Dr J. N. Pickard, F.R.S.E., 36 Storeys Way, Cambridge.*

*Wanted.*—Various monthly parts of *Entomologist's Record* for 1914, 1915, 1916, 1917, 1919, and 1920. Please report any odd monthly parts (in wrappers as issued) prior to these years.—*P. B. M. Allan, 4 Windhill, Bishop's Stortford, Herts.*

*Wanted.*—Males of *Morpha menelaus, M. didius, M. rhetenor* in papers.—*Leonard Tatchell, Rockleigh Cottage, Swanage, Dorset.*

*Wanted* urgently for experimental purposes, pupae of *betularia, porcellus elephanor.*—*Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.*

*Wanted*, set or in papers: *Apatura iris, Vanessa polychloros, Argynnis adippe* and *aglaia, Melitaea cinxia, Erebia epiphron* and *aethiops, Coenonympha tiphon, Thecla betulae, T. pruni* and *w-album, Lycaena astrarche* and *artaxerxes, Lyc. arion, Nemeobius lucina, Adopoea lineola* and *actaeon, Angiades comma, Cyclopides palaemon.* In exchange for other British and foreign species.—*Chas. B. Antram, Clay Copse, Sway, Lymington, Hants.*

*Wanted*, British butterflies, set or in papers, in exchange for *Morpho papirius, Morpho didama, and other Morphos.*—*Chas. B. Antram, Clay Copse, Sway, Lymington, Hants.*

*Wanted.*—Various Books on Lepidoptera. Please send lists and price. Also wanted, Live Exotic and English Lepidopterous Material for cash or exchange for similar material or Set English Imagines.—*J. K. Goody, "Weldon," 26 Carr Wood Road, Bramhall, Ches.*

*Sale or Exchange—R.E.S. Trans. and Proceed.*; bound, 1911 to 1916, 1918 to 1919; unbound, 1921 to 1923, 1925; also 1917 and 1924 less part 5. New Series—*Trans.*, Vols. 1 and 2, Vol. 3, part 1. *Proceed.*, Vol. 1 and Vol. 2, part 3. *Trans. Suffolk Naturalist Society*, Vol. 3 and Vol. 4, part 1. *Wanted*, bound or unbound, *Entomologist*, Vols. 2 and 3, 1926 to 1930, 1940 to 1942. *Ent. Mont. Mag.*, 1922, and 1924 to 1942; also various volumes of *R.E.S. Trans.* List on application.—*F. W. Smith, Boreland of Southwick, by Dumfries.*

*Wanted*, for experimental purposes, a few pupae of *Endromis versicolora*, purchase or exchange.—*R. W. Parfitt, 1 Dunsdon Avenue, Guildford, Surrey.*

*Wanted.*—Spuler's *Die Schmetterlinge Europas*, Vol. I. Various unbound parts containing pages 1-144, and I-XVI with plates as issued. *Exchange.*—Various numbers of the *Entomologist's Record* and *Entomologist.*—*S. Wakely, 36 Stradella Road, Herne Hill, London, S.E.24.*

*Wanted.*—Volume V (five) of Tutt's *British Lepidoptera.*—*T. R. Eagles, 32 Abbey Road, Enfield, Middlesex.*

## MEETINGS OF SOCIETIES.

*Royal Entomological Society of London*, 41 Queen's Gate, S.W.7.: June 4th; Oct. 1st and 15th, at 5.40 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section*: Last Fridays in month, at 7 p.m., at the Birmingham Museum and Art Gallery. Particulars from the Hon. Secretary, G. B. Manly, 72 Tenbury Road, King's Heath, Birmingham, 14.

*Entomological Society of Düsseldorf, Rhineland, Germany.*—Saturday, May 17th, 1947, the opening of the Entomological Section of Löbbecke-Museum, Düsseldorf, Weseler-Street, will take place in connection with an exchange of insects, arranged by the Entomological Society of Düsseldorf. Beginning: 9 hrs. a.m. At the instigation of Mr Perry, Education Officer of the Military Government, Düsseldorf, the British Entomologists are kindly invited to visit this Insect-Exchange.

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*Communications promised*:—O. Querci, A. H. Turner, H. Donisthorpe, A. E. Wright, R. R. U. Kaufmann, B. Verdcourt, P. J. Lempke, E. Romei, B. P. Beirne, D. G. Sevastopulo, An Old Moth-Hunter, Major F. L. Johnson.

**All Communications should be addressed to the Acting Editor, HY. J. TURNER, "Latemar," 25 West Drive, Cheam.**

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## EFFECTS OF THE SEVERE WEATHER AT TAUNTON, WITH THE NORMAL SIMILAR PERIOD 1946.

By A. H. Turner.

After the severe conditions experienced during the past Winter, it may be of interest to see how the Lepidoptera compare with the same period during 1946 in this district, and the following schedule will give some idea of the effect:—

| | 1946. | Up to end of April 1947. |
|---|---|---|
| *Nymphalis io.* | First seen 6th Jan. 90 seen up to end of April. | First seen 10th April and only 17 to end of month. |
| *Aglais urticae.* | First seen 27th Jan. and 120 up to end of April. | First seen 16th Jan., but only 41 up to end of the month. |
| *Gonepteryx rhamni.* | First seen 23rd March and fairly common after. | First seen 9th April, but as frequent as in 1946. |
| *Polygonia c-album.* | Appeared 27th March, then common. | Appeared 10th April, but only once since. |
| *Celastrina argiotus.* | First seen 31st March and subsequently common. | One seen on 17th April and one since. |
| *Pararge aegeria.* | First seen 7th April. Afterwards abundant. | One on 26th and one on 27th April only. |
| *Euchloë cardamines.* | 11th April, and thereafter very common. | One only on 26th April. |
| *Pieris brassicae.* | One on 14th April, but not very frequent. | None seen. |
| *Pieris napi.* | One on 20th April, but not common. | None seen. |
| *Pieris rapae.* | One only on 30th April. | One on 28th and one 29th April. |
| *Xylocampa areola.* | First seen 27th March, afterwards very common. | None seen. |
| *Scoliopteryx libatrix.* | Seen on 15th Feb. and then frequently. | None seen. |
| *Orthosia gothica.* | Came to light 26th Feb. Abundant after 27th March. | None seen. |
| *Orthosia cruda.* | 27th March and subsequently. | None seen. |
| *Orthosia incerta.* | Common from 29th March. | None seen. |
| *Orthosia stabilis.* | Several from 2nd April onwards. | None seen. |
| *Orthosia miniosa.* | Once only on 3rd April. | One on 3rd and one 27th April. |
| *Earophila badiata.* | First seen 26th March, afterwards very common. | First seen 16th April, afterwards fairly common. |
| *Selenia bilunaria.* | Common after 27th March. | None seen. |
| *Biston strataria.* | Came to light 29th March, and frequently afterwards. | None seen. |
| *Oidaematophorus monodactylus.* | Fairly frequent after 6th January. | None seen. |
| *Orneodes hexadactyla.* | First seen 30th March, but uncommon afterwards. | First seen 12th April, but fairly common since. |

It will be seen that 1947 compares very unfavourably with 1946, practically all the usual early Spring species being either lacking altogether

or much below the average in numbers; the only thing I have seen at sallow was the *O. miniosa*.

There is always the exception and in this case it is *Depressaria arenella*, which in 1946 was only seen once, on 27th March, but this year it turned up on 14th January, and has been (intermittently) very common ever since.

I think it probable that the continuity of the February cold may have some bearing on the matter. Apart from a few hours on the 10th, the frost was continuous day and night from the 4th to the 23rd, and the mean shade temperature for the month was 27. It will be most interesting to hear the experiences of entomologists in the North, where the conditions have been much worse.

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## NEWS ON LYSANDRA OF THE CORIDON GROUP OF SPECIES (LEP. LYCAENIDAE).

By Orazio Querci.

Vindicio, Formia (Prov. Latina), Italy.

The object of this paper is to indicate in a correct manner the places where we collected some *Lysandra* of the *coridon*, Poda, group of species, recording when they emerged, the feature and climate of the surroundings in which they lived, and to whom those butterflies were sent.

*Italy*.—We have taken many *coridon*, always in summer and on chalky ground, in any locality of the Apennines of Central Italy (Sibyllini, Gran Sasso, Sirente, Majella, Meta), where we collected. Rarely we met with that species above 5000 ft. We have also found plenty of them on the Apuane Alps, above Caregine, on the slopes of Mt. Sumbra, 3000 ft. (Garfagnana); in the Fegana valley, below Montefegatesi, 1500 ft. (Lucca); on Mt. Pratofiorito, 5000 ft. (Lucca); on Mt. Fanna at 2000 ft. near Fiesole (Florence); on Mt. Conca, 1200 ft., near Fontebuona (Florence); and above the locality Le Sterpete near Foligno (Umbria).

The other allied species, that looks like Herrich-Schäffer's figure of *hispana*, was taken by us only at Pian di Mugnone, 400 ft. (Florence), and on Mt. Fanna, where both *coridon* and *hispana* were flying together in August 1915. *L. hispana* emerge in the spring and, after a pause, also in summer.

Large series of those butterflies were sent to British entomologists (Lord Rothschild, Mr Bethune-Baker, Mr Pether, Mr Turner, and others). Many specimens were shipped to America (Mr Williams of Philadelphia, Pa.; Mr Weeks of Boston, Mass.; Mr Mengel of Reading, Pa.; Mr Winn of Montreal, Canada). Other specimens were sent to Germany, Austria, Belgium, Switzerland, France, Hungary. Dr Verity of Florence has the largest set of *Lysandra* taken by us in Italy.

The specimens that Verity refers to, *Lysandra syriaca*, Tutt, and that he figures at Pl. 16, Nos. 56-58, in his grand work *Le Farfalle Diurne d'Italia*, 1943, Florence, were taken by us near the small group of trees, 4300 ft., just above the upper buildings of Casteldelmonte (Aquila) in the Gran Sasso mass, above the path towards Mt. Capodiserre, at the beginning of July 1939. Another male (55) and one female

(59) were taken by my wife on Colle Alto, 3600 ft., above Settefrati (Latium), in the Mt. Meta mass, in summer 1940.

The specimens that Verity figures (Pl. 16, Nos. 47, 48) with the name of *polonus* Zeller, which might be hybrids between *Lysandra coridon* and *bellargus*, were taken by myself on Mt. Sumbra (Garfagnana), 4000 ft., in mid-June 1920. Another *polonus* (49) was found by my wife, at the end of June 1941, along the path in front of Roccadimezzo (Aquila), which climbs to Fontana della Macchie, below Mt. Monterotondo, in Sirente mass, 4300 ft.

The striking specimen, figured by Verity with the name *glaucargyester* (Pl. 15, No. 26), which according to that author might be a hybrid between *argester*, Bgstr. = *hylas*, Esp., and *syriaca*, Tutt, was taken by Lycaena Romei, my granddaughter, on 28th July 1939, at the same place above Casteldelmonte where in June a few *syriaca* were flying. All the strange *Lysandra* that I have recorded now are in Verity's collection.

*Spain.*—In 1924 we collected on the Sierra de Albarracín in Aragón. Both in June and at the beginning of July the whitish *Lysandra*, similar to Herrich-Schäffer's figure of *albicans* emerged in the valley of Valdevecar, 3300 ft., about two miles from Albarracín towards Teruel. My wife, with our daughter Erilda, took many of them, among which we noted a few specimens looking like Herrich-Schäffer's figure of *hispana*. While *albicans* ceased to be on the wing in mid-July, a few *hispana* were taken by us in September.

In July, Dr Enzo Romei and I made some trips to the high mountain towards Orihuela del Tremedal above Albarracín. In a field near Tramacastilla, 3600 ft., we took some *coridon* that were flying together with some *albicans*. Those two species could be distinguished at first glance: *albicans* on the wing looked as white as a *Pieris*, *coridon* was shining metallic blue. In alpine surroundings we did not see any *coridon*-like butterfly.

At the beginning of August we went by car to that mountain. My granddaughter, now Dr Lycaena Romei, but then only two years old, was with us. She played with a net in a meadow, at about 4000 ft., above the village of Noguera (between Tramacastilla and Orihuela), and thus she took, by chance, a magnificent blue female of the species that Zapater, Korb, Sagarra and I named by mistake *corydonius*, H.S., that Verity named *caelestissima*, but which now he refers to *caucasica*, Lederer. Having discovered the small locality where those nice *Lysandra* live, we took many of them.

Afterwards, Dr Romei went to collect at Puerto de Pajares, about 4000 ft., on the Cantabrian Mts. (Asturias), taking a series of bright blue *Lysandra* that both Sagarra (*Butll. Inst. catal. Hist. nat.* (2) **9**: 202, 1924) and I referred at first to *caelestissima*, Vrty. (that is *caucasica*, Led.). We were misled by the large number of blue females (resembling that taken at Nognera) among the *Lysandra* of Pajares. Now, I believe that they are nothing else than *coridon* modified in tinge by the great humidity of that locality, where it had always rained until mid-August.

In 1925 and 1929 we collected in Catalonia. *Lysandra hispana* were plentiful at S. Pere de Vilamajor and Llinas, 1800 ft., at the base of Mt. Montseny near Barcelona. They emerged, as the species did near

Florence, both in the spring and, after a pause, in August-September. On Mt. Montseny, 3300 ft., and on the Catalan Pyrenees (Puigmal and Taga) we found only the single-brooded *coridon* in August.

At the beginning of June 1926 my wife and I, together with Prof. Bolívar of Madrid, and again in mid-June 1933 with Mr René Oberthur of Rennes, took many *albicans* on the gypseous and bare moor of Montarco, 2000 ft., near Madrid. They were smaller and yet whiter than those from Aragón. We have never collected in summer near Madrid; however, the entomologists of that city told us that the *albicans* of Montarco emerge there only at the end of the spring and that no specimen of that kind had ever been taken later.

On 10th June 1926 we went to collect at Uña on Serrania de Cuenca, 3600 ft., in New Castile, where we remained until the frost. That season was very dry as it never rained from April to October. Many *albicans* (like those from Albarracín, Tramacastilla and Montarco) emerged from mid-June to mid-July in a meadow of Rincón de la Laguna, 3600 ft., in front of the village of Uña, on the opposite side of the lake. Some *coridon* emerged later, still at Rincón de la Laguna, along the path that rises to El Escalerón on the way to Tragacete. *Lysandra caucasica*, widespread all over Rincón del Juez, on the way to Ciudad Incandata, was on the wing in August. In 1928, and again in 1933, we remained at Uña from May to the end of October. In that year it rained almost always in the afternoon and the emergence of *albicans* was delayed by the cold weather that continued until the beginning of June. *Lysandra albicans*, *coridon* and *caucasica* emerged at the same time, but in three different places, near Uña, from mid-July to the beginning of September.

Besides the Lepidopterists to whom I had sent the Italian specimens, those taken in Spain were also sent to Mr Hemming of London and Mr René Oberthur of Rennes. Large collections were also deposited in the museums of Natural History of Barcelona, Lisbon and Madrid. However, the greater number and the most interesting specimens should now be assembled in the British Museum at London and Tring.

While living at Barcelona from November 1928 to October 1929 I wrote some notes concerning the Rhopalocera of the Iberian Peninsula that were printed in *Treballs del Museu de Ciencies Naturals de Barcelona*, 1932, vol. xiv. I also made some tables, showing the sequence of broods for the 126 species of Diurnal Lepidoptera taken by us at Uña in 1928, but I made the mistake of recording by figures only the set specimens which were before my eyes, not considering many others that had remained in papers, and not remembering the large number of those which, of course, we were unable to take in the field. From those extensive tables I am now copying the data for the *Lysandra* of the *coridon* group and a few other species, recording in a general manner the probable frequency in the field of recently emerged specimens. I do this in order to show that, in spite of the altitude of about 4000 ft., the butterfly emerged at Uña from early May to the end of October, as it does in most lowlands of Southern Europe. *The country around Uña is not an alpine locality.* It is a beautiful valley sheltered from the winds by high mountains covered with beech and pine woods and *there the Lepidoptera emerge exactly in the same manner as at Pian di Mugnone, 400 ft., near Florence*, and in the neighbourhood of Barcelona.

## NOTE ON THE FOODPLANT OF PHALONIA LURIDANA, GREGSON.

By Albert E. Wright, F.R.E.S.

*Phalonia luridana* was originally described, as *Argyrolepia luridana*, by Gregson in *Entom.*, V, 80 (1870), from material obtained in 1869 from Witherslack, Westmorland, which is only about five miles from my home at Grange-over-Sands, Lancashire, so that for many years I have been on the look-out for this species at Witherslack, but hitherto without success there, although now I have better hopes of doing so since my discovery of its foodplant (Burdock), which is quite common there. Gregson's description was founded on " several specimens first taken by Mr Hodgkinson at Witherslack early in May and again when we were together on 18th May 1869 "; naturally, therefore, I have looked for the moth in May and early June, but without finding any, and I cannot understand Gregson's dates unless 1869 was an exceptionally early season, as they are far in advance of my experience of breeding the insect indoors. Otherwise, the only one that I have taken in the adult state was a fresh example, which came to my window light at Grange on 4.viii.1945, three months later than Gregson's dates. This moth has also been recorded from Norfolk, Surrey, Wilts, Dorset and Gloucestershire, and the dates given are end of June and in July.

My experience in breeding *P. luridana* is very limited. I find from my diary that I bred one on 7.vi.1939 from some flower-heads of Sea Chamomile, *Matricaria chamomilla*, Linn., which were gathered in September 1938 and were kept in a linen bag with the intention of breeding a series of *Homoeosoma saxicola*, Vol., which I had previously bred from this plant, which, when the larvae are present, has the inner yellow florets discoloured into dark brown patches. Several *H. saxicola* emerged in 1939 but only the one *P. luridana*, which I have not again been successful in breeding from Sea Chamomile.

In October 1945 I went into our Grange Woods and gathered a bag of the old flowers of Burdock, *Arctium lappa*, Linn., with the idea of breeding any Trypetid flies that might be present: I bred out many *Orellia tussilaginis*, Fb., in June and July 1946, and I saw on the plants a few *Tephritis bardanae*, Schrank, during a visit on 23rd July. There were only three Burdock plants in the Wood at Grange and from them I also bred out seven specimens of *Phalonia rubigana*, Treits. = *badiana* [nec Schiff.], Hb. Now that I know the likely date and foodplant of the larva, I shall hope to be successful in rediscovering *P. luridana* at Witherslack.

Barrett (*Lep. Brit. Isds.*, X, 295: 1905) refers to *P. luridana* as " a rare species in this country, and one of which little is known " . . . " in 1874 the species was found, not very rarely, by Mr E. Meyrick, about Hungerford, Wilts., . . . about dry places—in a wood-drive; on a common; about flowery banks, and at light at night—also noticed to rest upon *Centaurea*, though a subsequent search upon this plant revealed no trace of a larva." These habitats are similar to our Witherslack and Grange localities. It seems probable that *P. luridana* larvae may also be found in flowers of other Compositae.

I trust that my very limited experience may put observers in South and East England on to the track of finding the larva and thus of enabling them to publish the full life-history of this attractive insect.

" Brunleigh," Grange-over-Sands, 24.ii.1947.

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## SUPPLEMENTARY NOTES ON THE LONGICORN COLEOPTERA OF WALES.

By Raymond R. U. Kaufmann.

Since the publication of the collated list of the Welsh Longicorns (*antea* 105-8), a number of additional records, many of them new to the county lists, have been received; these are here brought forward, together with a few minor emendations and corrections to the original list.

An important paper on some Merionethshire beetles (Sharpe, J. S., 1946. A few Coleoptera of western Merionethshire. *Ent. mon. Mag.*, **82**: 203-5), considerably supplements what is already known of the Longicorns from that county, and is more particularly interesting in that it shows the spread in a westerly direction of the known whereabouts of the beautiful *Saperda scalaris*, L. Thanks are expressed to the following correspondents who have sent new details of captures in Wales:—S. E. W. Carlier, J. Cribb, F. H. Day, J. H. Flint, G. de C. Fraser (for some much-needed data from Flintshire), M. G. Fraser, E. F. Gilmour, H. M. Hallett, who has pointed out some spelling errors in place-names in the first list, and B. Verdcourt. Mr Hallett has suggested that the Longicornia of Monmouthshire should be included in a Welsh list for a variety of quite cogent reasons, but as this would entail the inclusion of the other march counties of Herefordshire and Shropshire on somewhat similar grounds, it has been decided to continue such omissions until some future occasion.

These errors occurred in the first paper:—Llandridnod Wells instead of Llandrindod Wells; Penullrgaer instead of Peullergaer; Caermarthen instead of Carmarthen; and the county symbol MN. was missed out in front of Llyn Cwmbychan for *Strangalia quadrifasciata*, L.

The revised analytical summary of county species now reads as under:—

| County Symbol | BR. | CD. | CM. | CR. | DB. | FT. | GM. | MG. | MN. | PB. | RA. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. of Species found | 1 | 6 | 1* | 8 | 11 | 4 | 28* | 4 | 19 | 7 | 9 |

Unclassified.
1*

*Including importations.

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### DISTRIBUTIONAL DATA

(New County Records are marked with a dagger (†)).

CERAMBYCIDAE.

*Tetropium gabrieli*, Weise—Merioneth (MN.): Dyffryn (Sharpe). An interesting addition to the Welsh list, and one which brings the total number of species recorded to 34.

*Rhagium bifasciatum*, F.—Flint (FT.)†: Cefn Bychan (near Mold), 29/3/46 (G. de C. Fraser), common. MN.: Cader Idris, 7/44 (B. Steel, *per* B. Verdcourt); Cwm-yr-afon (Sharpe); Dolgoth Falls, 11/8/46 (E. F. Gilmour).

*R. mordax* Degeer—FT.†: Cefn Bychan, 29/3/46 (G. de C. Fraser); 7/46 (M. G. Fraser), common, especially on dogroses. MN.: Cwm-yr-afon (Sharpe).

*Grammoptera ruficornis*, F.—FT.†: Cefn Bychan, 6/7/46 (G. de C. Fraser), common. MN.: Cwm-yr-afon (Sharpe).

*Alosterna tabacicolor*, Degeer—MN.: Cwm-yr-afon (Sharpe). Radnor (RA.)†: Knighton, 15/6/42 (S. E. W. Carlier), on *Torilis*.

*Judolia cerambyciformis*, Schrank—MN.: Cwm-yr-afon (Sharpe).

*Strangalia aurulenta*, F.—RA.†: Llandrindod Wells, 1931 (J. Cribb).

*S. quadrifasciata*, L.—MN.: Cwm-yr-afon (Sharpe).

*S. maculata*, Poda—Glamorgan (GM.): Cwrt-yr-ala (omitted from Tomlin's Glamorganshire list). MN.: Cwm-yr-afon (Sharpe); Rhydymain, 17/6/43 (G. de C. Fraser); Towyn, 6/46 (J. H. Flint).

*S. melanura*, L.—MN.: Dyffryn (Sharpe).

*Clytus arietis*, L.—Cardigan (CD.): Aberystwyth, examples in the Collins-Murgatroyd collection, now in G. de C. Fraser's possession. FT.†: Cefn Bychan, 4/5/44 (G. de C. Fraser); 7/46 (M. G. Fraser). GM.: Cardiff, Castell Coch; Swansea (omitted from Tomlin's Glamorganshire list). MN.: Cwm-yr-afon (Sharpe).

LAMIIDAE.

*Pogonocherus hispidulus*, Pill. & Mitt.—RA.†: Knighton, 5/4/44 (S. E. W. Carlier), by beating hazel in a mixed beech and oak wood.

*P. hispidus*, L.—RA.†: Builth Road, 9/46 (F. H. Day).

*Leiopus nebulosus*, L.—Caernarvon (CR.)†: Aber, 5/9/16 (S. E. W. Carlier), flying round oaks. MN.: Dyffryn (Sharpe). RA.†: Knighton, 26/6/45 (S. E. W. Carlier), by beating oaks.

*Saperda scalaris*, L.—MN.: near Llyn Cwmbychan (Sharpe).

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## THE OAK PROMINENTS.

By An Old Moth-Hunter.

Having spent the years 1941-1945 in a part of this island wherein the three oak-eating Prominents, *N. anceps*, *D. trimacula*, and *D. ruficornis*, were more plentiful than I have found them elsewhere, it has occurred to me that some of the observations which I made on these insects in the field may be of interest to beginners. For I found all three species in all four stages, and also reared broods of them in cages, from egg to imago. It must be borne in mind, however, that the idiosyncrasies of a moth in one part of the country are not always those which the same species exhibits elsewhere. *Autres champs, autres moeurs.* Yet on testing my experience one day in Essex last year I found that it held good for at least one of these species (*ruficornis*), and had I had the time and the opportunity to search for the other two it is at least possible that confirmation would have been forthcoming with regard to these as well.

Hitherto I had always regarded the Great Prominent as an " occasional " insect. Those who use petrol lamp and sheet sometimes have a tale to tell of a dozen or twenty males taken in a single night; but so far as the larva is concerned I had previously found only an occasional one, usually on some well-grown oak in a park or in the open parts of an extensive woodland. Such larvae were more often than not on a branch rather high up—about as high as one could reach with the beating-staff or pull down with the crook of one's walking-stick. And as the moth customarily lays her eggs in pairs it was rare for me to find more than a single larva at a time; in fact, most lepidopterists consider that one larva in a day is about as much as one has any right to expect. So, through the years, the impression grew in my mind that *anceps* was never a common insect and that the only way to obtain it in quantity was to assemble males to a virgin female which had resulted from a dug pupa—unless one was so fortunate as to find a fertile female at rest. This last achievement I never succeeded in effecting, because the odds against such an event are enormous: eclosion is at night and the moth habitually rests high up in an oak by day. Female moths found by day low down on a trunk or on a post or fence have presumably been disturbed, perhaps by birds, and have flown bemusedly downwards (away from the light) to the nearest convenient resting-place.

Incidentally, the flight of this moth when going about its lawful occasions and not stimulated by a powerful light is very slow and gentle, resembling that of *G. libatrix*, which most of us have often seen dawdling about a sugar-patch. Like a good many nocturnal moths of this size and larger (other than some of the hawkmoths) it does not fly " on a level keel " but with the body at an angle of about 30 degrees with the horizontal, the abdomen hanging down as with, for example, *S. ocellatus* and *A. populi*. On one occasion four males were flying close to my face round an assembling-cage containing a calling female, and as there was brilliant moonlight and a still air I was able to observe them for as long as I wanted. On another occasion I watched several males approach over the brow of a mound against a strong afterglow. I also watched liberated males at dusk flying about the branches of an oak; in all cases their flight was the same. The flight of a moth " under the influence " of a light (and the more powerful the light, the more intense the stimulus) is no criterion at all. In my experience moths behave in a markedly abnormal way when stimulated by light.

Once when the first male admitted to the assembling-cage declined to pair I removed him (he made no attempt to fly from my open hand) and held the door of the cage wide while another male buzzed slowly about my hands, quietly entered the cage, found the female, oriented himself, and paired. Indeed a cage is unnecessary when assembling with this species. Some of the larger moths, probably most, will pair if the female is sitting on one's jacket or sleeve, and one can then walk home with them so, transferring them to a cage by inducing the female to crawl on to the back of one's hand (by pressing the side of the hand gently but insistently under her head), which she will do without parting from the male if all one's movements are gentle and deliberate. But with species which copulate for only a few minutes (*e.g.* the Oak Eggar) the transference to a cage should be done as soon as possible: after ten minutes, or even less, they may separate if disturbed. With

*anceps* copulation lasts from conjugation until the beginning of flight-time the following night. They separate as soon as flight-time arrives, when both at once begin to warm up the flight muscles.

I found (as with all the other Prominents which I have observed) that copulation took place only once: the services of the first male were not required subsequently nor were those of other males of various ages (in relation to the female) placed *in a fresh cage* with the female on the nights succeeding copulation. In experiments to determine this matter it is important to put the female *in the morning* into a fresh cage placed up-wind of, and some distance away from, the cage used on the previous night; for the old cage retains the scent particles for at least twenty-four hours, and the behaviour of male moths in such an environment is invariably abnormal and can therefore be most misleading. In a contaminated cage male will often try to copulate with male. I have found that the most successful cage for pairing the Prominents is one constructed entirely of muslin (with a wooden base) not less than eighteen inches cube; it should be placed where the wind can blow right through it.

The female *anceps* busies herself with laying eggs each night until she dies, which I found was sometimes on the sixth, more usually on the seventh, afternoon after eclosion—provided of course that she was fertilized shortly after emergence: a virgin female has a considerably longer life than a fertilized one. On the last three nights of their lives my females laid only two or three eggs apiece. From about 300 to 320 eggs were laid by each of the females which I had under observation. The males seem to fly very little after copulation, and when kept alone in a large cage far removed from a female's scent their wings remained in "cabinet condition" for the few remaining nights of their lives. They became a little active at flight-time each evening, but only for about half-an-hour, and at whatever time I visited them throughout the night they were invariably at rest. Just before dawn they fluttered about again for a short time. They certainly made no attempt to find another female—though if they had crossed the line of a female's scent at flight-time it is likely (in view of previous experiments with other species of this Family) that they would have flown to her albeit unacceptable to her or unable to pair. Altogether this is a gentle amenable moth, and easier to pair in captivity than some others of the Family. In all the Prominents, of course, sexual selection obtains, though in some species (for example *C. furcula* and *C. hermelina*) I have found that it is more marked than in others. So much for the imago.

I suppose we have all found the eggs of the Great Prominent at times—on the trunk of an oak. These eggs, which are usually scattered in a small patch to the number of twenty or thirty, have been laid by crippled females. The normal female lays her eggs in pairs—occasionally a singleton, more rarely three—on the underside of an oak leaf growing either well inside the lowest overhanging branch or, if the oak is a young one, on a leaf borne by a short branch or shoot springing from the trunk two to five feet from the ground. I found eggs in both these positions repeatedly and reared moths therefrom. The larva certainly prefers a warm and sunny situation, though, like most caterpillars, it avoids the glare of the sun, and I do not remember finding one on a bough on the south side of an exposed tree. Practically every larva and

every egg that I found was in a sheltered spot: either on a tree in a glade, the bough facing east or west, or on trunk-shoots on young oaks fringing a woodland path and sheltered by a tall hazel or whitethorn hedge a few yards away, or on young oaks facing west and sheltered by birches or tall hazels. (By " young oaks " I mean trees less than a century old.) Only once did I find a larva on an isolated tree in a park —and that tree was just outside a wood and well sheltered from north, south and east. Indeed, I think I could now tell at a glance the kind of place where it might be profitable to look for *anceps* in June—at least in that part of our island!

What are the eggs like? Just like those of most of the other Prominents except the Pussmoth and Kittens, that is to say hemispherical, whitey-green, and perfectly smooth with a matt surface.

The infant larvae are easy to find, for their trade mark is unmistakable. They start to eat at the *edge* of the leaf and eat towards the midrib, but they eat *only the parenchyma*, eating right through the leaf and leaving the " veins " of the leaf intact; so that presently there is a little patch of network, about a quarter of an inch square in area, at the side of the leaf, which looks like a tiny sieve. So whenever you see this trade mark on the edge of a leaf during the last week of May or first week of June you may lawfully anticipate the presence of a baby *anceps*; for I know of no other larva which eats an oak leaf like this at that season. The trade mark may be at any place in the perimeter of the leaf.

When you come across this sign manual you must proceed extremely carefully. Scrutinize the underside of the leaf, if possible *without touching it*; then (if the larva is not there) the petiole, and then the twig. In his first instar the larva matches his background to perfection—but he doesn't always stay on the leaf: he is a restless little soul and likes to go for a walk along the twig now and then. I remember once finding a five-day-old larva close to his sign manual, and as the moth usually lays her eggs in pairs I started to look for his brother. Presently, a few inches away, I found another leaf bearing the registered trade mark. But no larva was to be seen and I was just about to give up the search when a tiny green larva was noticed perambulating the young green stalk of the shoot close to my finger and thumb. " Clumsy!" said I to myself; " You nearly squashed the baby! Look carefully in future before you take the twig in your fingers." So you see why I recommend you to scrutinize the leaf without touching it?

Was that the end of the matter? By no means. The place where these two young larvae were found was a woodland path facing west and nicely sheltered—just the very place *anceps* likes in that locality. So it did not require the perspicacity of a Sherlock Holmes to surmise that a female Great Prominent had flown along the path at the edge of that wood, laying a pair of eggs here and a pair of eggs there. With this in mind I returned to the spot next day and spent the afternoon searching those oaks. A fortnight later two of my larva-cages were " a source of infinite delight " to at least one moth-hunter . . . This larva needs special treatment if it is to be reared from the egg on a hundred per cent. basis; but that is outside the scope of this article.

Needless to say, it is infinitely preferable to search for *anceps* when he is young than when he is in the last or penultimate stadium. Apart

from the fact that the survival-average of a brood of larvae in the wild is only one per cent. and that therefore they diminish in number every day, the larva climbs higher as he increases in stature and then, of course, becomes more difficult to find. Never on any account attempt to obtain this larva by beating: it is extremely easy to find when young, and to use a beating-tray for *anceps* (and his two oak-eating congeners) is a confession that you are no great shakes as a field lepidopterist. Larvae of *anceps* that fall into the beating-tray are not usually reared: the larva is delicate and therefore easily injured; moreover, as a rule only parasitized larvae of this species remain within reach of the beating-stick. It is still to be found on the lowest overhanging boughs when it is three-quarters of an inch long, and the lepidopterist who cannot find this conspicuously handsome emerald larva with purple " slashes " by scrutinizing the undersides of the leaves on a bough must be a duffer indeed. Search from 24th May to 14th June, according as the season be early or late—and for goodness sake take care not to squash the baby.

We all dig up the pupa at times, but I'm not sure that many of us make a " dead set " at *anceps* after he has gone to ground. And some of us miss him altogther by digging in the wrong places. Of course, *anceps* patronizes, often, oaks which one cannot dig—as I have indicated; but for all I have said there have been occasions when I have unearthed the pupa at the roots of oaks whereon I had failed to find the larva or which I had considered to be " unlikely " trees. So far as open wooded country is concerned, in my experience the moth much prefers oaks that grow on a slope, or at least on gently sloping ground, and I have not yet found either pupa or larva at or on trees growing on the *lowest* ground in a park. But this, of course, may be merely fortuitous so far as I am concerned.

At all events, not a single pupa of this moth that I have found has been right up against, or close to, the trunk, let alone in the crannies beneath the trunk: they have *all* been from six inches to a foot from the tree and *always under grass*. When about to pupate the larva seems to avoid the angles formed by roots, preferring a spot in a grassy sod a little away from the trunk or nearest root. Therefore, whenever you approach, in September, an oak which you think may harbour *anceps*, look for a nice piece of springy turf going to within a few inches of the trunk, on the north or east side; then insert your digger in the turf not less than a foot from the tree, and very carefully lever up a goodly sod. The pupae are never—again I must add, in my experience—very deep: usually about an inch below the surface. If there is a cocoon there, you will probably find it right amongst the roots of the grass. Therefore tear up the sod very slowly and carefully. If you draw blank, put in your digger again and lever up the grass right up to the trunk. When once you have found the fine big pupa of this fine big moth, memorize the exact site and you will quickly spot the kind of place to search in future.

Oh dear, what a lot I have left unsaid about this most interesting moth! But I must cut my cackle or the Editor will be reminding me about " paper restrictions." Next time I shall deal with *D. ruficornis*, and perhaps with *D. trimacula*, too.

## BUTTERFLY COLLECTING IN WOOD WALTON, HUNTS., AREA, THE CHILTERN HILLS, AND ROYSTON, HERTS., DURING 1946.

By H. A. Leeds.

(*Concluded from p. 52.*)

7th September, *V. atalanta* and *V. cardui*; 23rd, *C. croceus* male with a large circular piece torn out of the right hindwing, possibly by a bird: it fed at a red dahlia flower first and then at a yellow one and I wondered—if there is anything in choice of colour—why it did not settle on one of the mauve flowers with their assimilation to the colour of lucerne flowers, which this species frequents for the nectar. The young leaves of lucerne are the *best food* for the larvae. During the many times of watching the hundreds of single and semi-double variously coloured dahlia flowers in the garden it seemed to me that the presence of nectar was more important than favour of colour, as in the first instance the various species would settle on a red, yellow, white, mauve, etc., flower, afterwards often flying to another colour for the next refreshment, sometimes taking a cue from the presence of one of the numerous Bumble bees; there was not much resentment on the latter's part, but in feeding around the centre the bee's bulk would dislodge the butterfly, whilst occasionally a rapid flapping of its wings denoted that the bee, apparently accidentally, had trodden on the butterfly's claws and was momentarily preventing its flight. I have never seen any bee attempt to sting a butterfly.

On 27th September during a sunny and still morning another *C. croceus* was noticed flying low and rapidly from the south; I could not distinguish the sex as it passed me so quickly, rising over two hedges of a garden it proceeded due north across a large pasture field.

I did not see *A. cydippe*, nor *A. paphia*, but learned that they occurred sparsely in Monk's Wood during July. Nothing was known of *L. camilla*.

*G. rhamni* was so regularly seen on fine days that I failed to note this year's emergence date, but I believe they *definitely hibernated* on 28th September as several were on the dahlias on that date. The 29th was very hot, and in the afternoon more butterflies were on the dahlias than previously, so they were counted definitely as: 26 *atalanta*, 2 *io*, 2 *brassicae*; the movements of *urticae* defied exactness but at least numbered 80. No *rhamni* appeared that day so I especially watched for them in this district afterwards without seeing any. On 29th, *cardui* was not present, although previously, and afterwards, several were noticed.

I had hoped to spend a fortnight in the Chiltern Hills soon after the August Bank Holiday, but could only arrange for accommodation from 20th July to 2nd August; this had commenced six days later than last year. Contrary to most of England, the weather was mostly fine and sunny, and so far as rain was concerned it only kept me indoors one evening, whilst a sharp shower at noon, preceded and succeeded by hot sunshine on 23rd July, caused the emergence of many *coridon* at Kop Hill, and after going elsewhere and seeing very few—none in Oxon—I could always find plenty of fresh males to examine at that hill during the evening; hardly any females occurred until 1st August, my last evening,

*Photo : P. Siviter Smith.*

*Satyrus* (*Melanargia*) *galathea*, L.—melanic form taken at Uly, Glos., 22/6/45, by D. P. Murray.

when about three dozen were examined; all were of very healthy appearance, except where in a few cases injury could be attributed to partial crushing by the hooves of three horses grazing on Kop Hill, which is now enclosed by barbed-wire, necessitating a circuitous route for entry through the gate from the farm

At Saunderton some grass fields, where *coridon* and *icarus* formerly bred, were freshly ploughed; also the nearest field to the Askett-Kimble road, but the large adjacent field sloping to Pulpit Hill is untouched and was brightened across it by the yellow and orange flowers of Bird's-foot Trefoil, *Lotus corniculatus*, a larval food-plant of *icarus*, and on 1st August four were seen flying there, and about 20 *coridon* on Pulpit Hill during a walk in early morning; a few *coridon* first hatched there during the afternoon of 23rd July, but increased maegerly.

In *coridon* no aberrations worth noting were retained in Bucks.; four dexarcuata aberrations interested me as they occurred on a small isolated bank where on 30th July five males were caught and two of them had on the right forewing a long thick arcuata marking *dipping* at the basal end to a lower spot, and at the other end to the bottom twin-spot which extended pointedly towards the opposite chevron, both were exactly alike and before release each was notched; the next day 1 in 3, and on the following day 1 in 4 on the bank were identically marked, and the other three wings of all four were typical; all of the 12 males were released. These reminded me that the late Mr C. H. Williams obtained three and another collector one antistriata some years ago on a small area of the beech hedge western-separation from Royston (Therfield) Heath. I was about a hundred yards away that morning and they took all four in a few minutes, and directly afterwards let me examine them but they were not so exact in markings as the four dexarcuata.

On 21st August Dr Newton, of Alconbury Hill, kindly took me in his car to Royston, Herts.—on a previous visit he had taken a male underside ab. *caeca* of *L. coridon* there. It was a sunny afternoon, and from the top of its central road I surveyed the Heath after an absence of seven years. Below was a combine-harvester cutting and threshing some of the wheat which for about two miles bounded the main road and extended in width to the hills. The crop covered the numerous pathways formerly used by the race-horses and where *coridon* bred, fed and accumulated: access then was everywhere available from the parallel road. All that afternoon provided an opportunity for the many females of *coridon* to deposit ova; several of them and a few males were in fresh condition. I wondered if the intersex *roystonensis* still occurred on the hills which it formerly favoured; it was easy to watch the females for any sign of the asymmetrical wings but none appeared. One, however, had a few scales of *inaequalis* on a left hindwing, and in 1945 Dr Newton took two of them on the Heath, but no *roystonensis*.

I noticed a worn infrasemisyngrapha, and kept a male underside suffescens-postobsoleta; and female undersides, antialbescens; nigrescens; and an I-nigrum-arcuata.

In Hunts., *icarus* during both spring and summer emergence encountered abnormal periods of rain; very few appeared when short intervals of sunshine permitted a limited walk along the roads. The most

desirable place was two miles distant, where on the steep slope of a deep railway cutting the larval foodplants Bird's-foot Trefoil, *Lotus corniculatus*, grew on the lower part, and Rest-harrow, *Ononis spinosa*, on the upper half of the slope and was intersected by a long irregularly shaped crevice several inches wide. A somewhat level rough grass verge about eight yards wide was above the cutting and contained many anthills. All of this nearly a hundred yards long had remained unburnt. Only twice could I reach that part in the Spring and then on the first occasion, 7th June, it was warm when I left home but a cold and strong wind commenced when the top was reached, and a male underside *icarus* ab. *caeca* was boxed from a cluster of grass stems which swirled around the not fully extended wings and soon must have badly damaged it; about four yards away on the slope in the cutting a female underside *agestis* ab. *postjuncta* was bottled; soon a wet express train warned me of approaching rain: rain regretfully curtailing my search I hastened home and arrived just as rain commenced. Some days elapsed before the second journey and then *icarus* was nearly done; a wet train again warned me and rain began before the house was reached.

The second emergence there was rather late, as on 23rd August only one male was out, but on 26th many were flying madly in hot sunshine and almost directly I noticed a much damaged female *icarus* resting on a stem. Picking it up with the forceps I found that nearly all the forewings borders were torn off, the twin spots connected with the opposite chevron and the torn termination of other extended submedian spots indicated that when complete it was ab. *antiradiata*; releasing it and hoping to find another I *quietly* began using the net as I did not wish to frighten any of them over the boundary fence into a field of barley. It was a rough place with most of them flying over the steep and cracked slope of the cutting and occupied two hours' working. It was only in the last three examined that a perfect female underside ab. *antiradiata* occurred, but in the previous three a very heavily marked female underside ab. *antidiscoelongata* was taken; none of 37 elongated spots reached a chevron. About 80 *icarus* had been examined and yielded a few other aberrations.

Wet weather prevented another visit until 7th September, when, among the few fresh *icarus*, another *antidiscoelongata* female was picked up, but as it apparently was full of ova, and not so good as the previous one, it was liberated; a singular rightwing of a female underside was taken then and contained: antidex-lunacuspidis-basielongata-sagittata, the other wings typical except that the left forewing had a dexelongata basal mark.

On 12th September the *icarus* of 1946 finished. Relatively, they had produced a considerable percentage of aberrations, and amongst others the following were taken:—Male undersides, infraalbescens; postaurantiaextensa; parvipuncta; *obsoleta*; and a major taken 12th September was the last fresh *icarus* seen. (On 31st July a confluentiae, in Bucks., contained: dexarcuata,-sinis-I-nigrum-arcuata.) Female uppersides, postradiosa,-caeruleo; radiosa-atrescens; syngrapha; syngrapha-inframarginata; *brunnescens*; ultraalbocrenata well decorated; and antimaculae. Female undersides, postsinis-irregularia blackish streaked; apicoextensa; costajuncta; semilimbojuncta; and *obsoleta*.

*A. agestis*, female underside, apicoextensa. *P. napi*, male underside hindwings with the veined markings extremely broad, taken 9th April. *V. atalanta*, upperside, postsinis-flavescens, i.e., a yellowish band. *A. urticae*, uppersides, sinissubsuffusa; antidex-partimtransformis in which the bleached patch partly obliterated the outer costal black spot; postdex-flavescens; sinisparvipuncta-dexunipuncta, Raynor; *tripuncta*, Raynor; *connexa*, Btlr.; *parviguttata*, Raynor. The following particulars are of a very complex upperside, 2 small discal spots on forewings = *parvipuncta*, Raynor, a violet sheen on the blue spots in margins of leftwings = sinisviolascens, Slev., but on the rightwings these marginal spots are *white* except for a faintish tint of lavender, which disappears under a lens = dex-alboguttata, ab. *nov.*, Leeds, the right forewing has the outer border white bleached between the veins, and on the inner side of the border three black wedges well extend into the orange ground below the subapical black spot = antidex-margotransformis-cuneata, respectively, on the right hindwing the orange band is much reduced in length owing to dark obliteration of its upper part = postdex-aurodifferentiae, the right forewing is indented on costa near the apex = antidex-teratological.

Where no other author is shown, the aberrational terms are from the *Monograph of Lysandra coridon* Bright and Leeds.

At the commencement of a shower, on two occasions *atalanta* flew to a thick whitethorn hedge for shelter and were seen to turn over just previous to entry, one noticed going into a small opening was found to be clinging to an inner branch with the wings downward closed, a position doubtless facilitated by the upside-down entry.

One dull evening about mid-October a patch of mustard, a foot high, was being dug in for manure when quite a dozen lethargic *urticae* were dislodged from about four square yards. The mustard was grown near a row of dahlias.

Two single dahlias had bilateral colouration, their eight petals were equally divided with four petals on one side *yellowish*, and the other four petals *mauve*, the centre was yellow which, however, is usual in the flowers of either colour. They occurred *on opposite branched stems*, one blossomed first and was of perfect formation and measured slightly more than 3½ inches in expanse; the other flower was several days later and a little smaller, not quite symmetrical in shape, but the yellowish and mauve colours were equally divided. The plant was grown from a seed and produced many other flowers which did not vary in their yellowish colouration.

## COLLECTING NOTES.

Period of Activity of the Asparagus Beetle (Crioceris asparagi, L.).—At the time of writing the Asparagus at Boxmoor is between six inches and one foot high, and I found a single specimen of the beetle to-day crawling on one of the shoots. This is the first that I have found in an active state this year. Last year (see *Ent. Rec.*, **58**, 123) the beetle made its first active appearance in the neighbourhood on almost

the same date (30.4.46) though it did not attack the newly planted Asparagus bed until the last week in May. In common with other late hibernators, the very cold spell has not affected the emergence time. Joy (*Handbook of British Beetles*, **1**, 392) gives the period of activity as June to August, but this is quite erroneous and the beetle may be found in an active state from the last few days in April until the first week in October. Mating continues into the first week of September but is rare. During September and October the beetles may often be found in the hollow stems of dead Asparagus and as has previously been stated they are then as common on the neighbouring plants as they are on the Asparagus. Another point of minor interest is that isolated plants grown as a garden decoration are far less prone to attacks than are beds.—BERNARD VERDCOURT, 29th April 1947.

CONSIDERING the severity of the past winter, it is both surprising and encouraging to record the large numbers of *V. urticae* and *V. io* on the wing during the last three weeks in this part of Dorset. I have not seen so many for years. Only two *P. c-album* have been observed during this period, whereas last year they were numerous.—LEONARD TATCHELL, Swanage, 10th May 1947.

## CURRENT NOTE.

ANNUAL Exhibition of the Amateur Entomologists' Society will be held at Buckingham Gate Central School, Wilfred Street, London, S.W.1 (near Victoria Station), on Saturday, 26th July 1947, 2 to 5 p.m.

" BUTTERFLIES " has been a prominent and unusual headline in our newspapers. To put the matter simply, a man in Australia stole some butterflies from State Museums. This fact was brought into the court in London by the police. The acting prosecutor repeated the information ascertained by and given him by the police. The charge was on 1600 specimens only, but the defendant had admitted that 8000 in his possession had been stolen. The theft took place in Australia from several Museums. The information as to the defendant or regarding the theft itself was meagre and mainly irrelevant. At any rate, the man belonged to no entomological circle and was unknown as a nature lover. Absolute silence was kept as to how he, a perfect stranger, was allowed special facilities of private access for such systematic acquisition. So far the prosecution was extremely weak as if something was being held back.

The defence of this man was equally weak and the evidence was mainly paltry or generally irrelevant. Nothing was said of his occupation or business. Finally it was stated that he was temporarily deranged by troubles over his matrimonial affairs. This was the only fact that was apparently got into evidence at last. And it was this fact that decided the magistrate to fine the defendant £100 for his aberrations. What becomes of the rest of the stolen 8000 butterflies? This did not transpire. The whole matter seemed to turn out to be most unsatisfactory.—HY. J. T.

# EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr Hy. J. Turner, "Latemar," West Drive, Cheam.

*Wanted*—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Instituto Miguel Lillo, Calle Miguel Lillo 205, Tucuman, Republica Argentina.*

*Desiderata*—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—*H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.*

*Wanted.*—*Lycaena* (*Heodes*) *phlaeas* from all regions including British Isles. Also wanted other species of Chrysophanids from all areas. Exchange or purchase considered. *Duplicates.*—Foreign Lepidoptera, e.g., Satyrids, Charaxes, Papilios, and others; full lists sent.—*P. Siviter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.*

*Wanted* for cash or exchange many species of ova, larvae or pupae, especially local forms and *A. grossulariata* from different localities, also Seitz Vol. 1 and Supplements to Vols. 1-4. Offers also, Tutt's *Practical Hints*, Parts 1 and 2, Buckler's larvae, Vols. 1-6, and Tutt's *British Noctua*, Vols. 2, 3, and 4.—*Dr J. N. Pickard, F.R.S.E., 36 Storeys Way, Cambridge.*

*Wanted.*—Various monthly parts of *Entomologist's Record* for 1914, 1915, 1916, 1917, 1919, and 1920. Please report any odd monthly parts (in wrappers as issued) prior to these years.—*P. B. M. Allan, 4 Windhill, Bishop's Stortford, Herts.*

*Wanted.*—Males of *Morpha menelaus, M. didius, M. rhetenor* in papers.—*Leonard Tatchell, Rockleigh Cottage, Swanage, Dorset.*

*Wanted* urgently for experimental purposes, pupae of *betularia, porcellus elephanor.—Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.*

*Wanted*, set or in papers: *Apatura iris, Vanessa polychloros, Argynnis adippe* and *aglaia, Melitaea cinxia, Erebia epiphron* and *aethiops, Coenonympha tiphon, Thecla betulae, T. pruni* and *w-album, Lycaena astrarche* and *artaxerxes, Lyc. arion, Nemeobius lucina, Adopoea lineola* and *actaeon, Angiades comma, Cyclopides palaemon.* In exchange for other British and foreign species.—*Chas. B. Antram, Clay Copse, Sway, Lymington, Hants.*

*Wanted*, British butterflies, set or in papers, in exchange for *Morpho papirius, Morpho didama, and other Morphos.—Chas. B. Antram, Clay Copse, Sway, Lymington, Hants.*

*Wanted.*—Various Books on Lepidoptera. Please send lists and price. Also wanted, Live Exotic and English Lepidopterous Material for cash or exchange for similar material or Set English Imagines.—*J. K. Goody, "Weldon," 26 Carr Wood Road, Bramhall, Ches.*

*Sale or Exchange—R.E.S. Trans. and Proceed.*; bound, 1911 to 1916, 1918 to 1919; unbound, 1921 to 1923, 1925; also 1917 and 1924 less part 5. New Series—*Trans.*, Vols. 1 and 2, Vol. 3, part 1. *Proceed.*, Vol. 1 and Vol. 2, part 3. *Trans. Suffolk Naturalist Society*, Vol. 3 and Vol. 4, part 1. *Wanted*, bound or unbound, *Entomologist*, Vols. 2 and 3, 1926 to 1930, 1940 to 1942. *Ent. Mont. Mag.*, 1922, and 1924 to 1942; also various volumes of *R.E.S. Trans.* List on application.—*F. W. Smith, Boreland of Southwick, by Dumfries.*

*Wanted*, for experimental purposes, a few pupae of *Endromis versicolora*, purchase or exchange.—*R. W. Parfitt, 1 Dunsdon Avenue, Guildford, Surrey.*

*Wanted.*—Spuler's *Die Schmetterlinge Europas*, Vol. I. Various unbound parts containing pages 1-144, and I-XVI with plates as issued. *Exchange.*—Various numbers of the *Entomologist's Record* and *Entomologist.—S. Wakely, 36 Stradella Road, Herne Hill, London, S.E.24.*

*Wanted.*—Volume V (five) of Tutt's *British Lepidoptera.—T. R. Eagles, 32 Abbey Road, Enfield, Middlesex.*

## MEETINGS OF SOCIETIES.

*Royal Entomological Society of London*, 41 Queen's Gate, S.W.7.: October 1st and 15th, at 5.40 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section*: Last Fridays in month, at 7 p.m., at the Birmingham Museum and Art Gallery. Particulars from the Hon. Secretary, G. B. Manly, 72 Tenbury Road, King's Heath, Birmingham, 14.

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*Communications promised*:—O. Querci, A. H. Turner, H. Donisthorpe, A. E. Wright, R. R. U. Kaufmann, B. Verdcourt, P. J. Lempke, E. Romei, B. P. Beirne, D. G. Sevastopulo, An Old Moth-Hunter, Major F. L. Johnson, E. P. Wiltshire.

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# ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION





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# THE VARIATION OF LYMANTRIA MONACHA, L.

By B. J. Lempke.

When studying the classical article of Goldschmidt on the genetics of the melanic forms of *Lymantria monacha*, L. (1921, *Zeitschr. indukt. Abst. u. Vererb.-ehre*, **25**: 89-163), I was struck by the difference which may exist between the results of the geneticist and the conceptions of the systematist. It sometimes happens that the same hereditary factor manifests its influence in one sex of a species more than in the other. The result is that we see two different phaenotypes which may have received different names. If there is only the question of one factor the solution is easy. As soon as it has been proved that the two forms genetically belong together, we drop the younger of the two names.

Matters become, however, complicated if two or more factors are at work. Such is the case with *Lymantria monacha*, L., where the black markings depend on the action of three different factors which may occur in all possible combinations. Moreover, the male is more strongly blackened by the same factor than the female. The result is a rather large number of different phaenotypes, many of which are found in both sexes. But then they never are genetically identical. Names are, however, given to phaenotypes in the study of variation. It is therefore inevitable that a certain phaenotype of the ♂ of *monacha* is genetically different from the same phaenotype of the ♀. Goldschmidt was no doubt aware of this difficulty, for while he uses a few of the well-known " aberrational " names for some forms of the ♀ (though never correctly owing to inexactness of the text books), he never does so with the ♂. In this sex the phaenotypes are only indicated with the formula of their genetical constitution. With this result a geneticist is satisfied. But the systematist wants to indicate his forms by names. The ideal solution is a combination of the results of both and it is the object of this article to try and attain this.

Goldschmidt's results may be summarized as follows: Factor *B* causes an augmentation of pigment starting from the central lines. Factor *C* is sex-linked, blackens the hindwings and extends the black on the forewings from the central bands and outer margin. Factor *A*, when present alone, intensifies the black markings of the white specimens and, when combined with *B* and (or) *C*, increases their effect. All these factors are dominant to the type. This work is accompanied by three excellent plates with many figures. As not every lepidopterist will be able to consult Goldschmidt's publication, I shall cite the figures of the most used text books when they represent one of the phaenotypes discussed. I shall also indicate in what percentage the different forms are present in the Dutch material, so that a comparison with other countries is possible. As a rule the species is far from common in Holland and cases of serious damage are very scarce. The basis of my research was the material of our two most important collections, those of Amsterdam and Leiden.

Though there is, of course, no absolute proof that the phaenotypes I distinguish are identical with Goldschmidt's genotypes, the result is at any rate a logical succession of forms. It will also be seen that not all

phaenotypes are genetically known, so that there is still an opportunity for further investigation. The formulae used are those of Goldschmidt.

THE FORMS OF *Lymantria monacha*, L.

1. f. *kusnezovi*, Kolossov, 1928, *Ent. Zeitschr.*, **41**: 481. " Black or grey pigment fails completely. The head, tegulae and thorax are only covered with white hairs. The forewings are in no way distinguished from the hindwings as regards the colour, the scales on them are white with yellowish tint and very feeble addition of grey tints which are scattered without any regularity and which are only visible with tenfold enlargement . . . The rosy tint on the belly is feebly observable."

Described after 1 ♀ from Ekaterinenburg, Ural, Russia. Wholly white specimens are no doubt extremely scarce and are probably only to be expected in the ♀, which is on an average less strongly marked than the ♂. I never saw an example (nor of the three following forms with reduced markings). As specimens without markings or with reduced markings did not occur among the very large material of Goldschmidt, it is clear that these forms depend on factors which were not present in his stocks.

2. f. *gracilis*, Kroulikovsky, 1911, *Revue russe d'Ent.*, **11**: 445, 1911. " Alis anticis totis albis margine externo late nigricante. (♀.) Rarissime in Rossia orientali.

The forewings are absolutely white, but the outer border is adorned with a broad dark border. The body is as with the type; the moth, a ♀, has a very particular " facies."

It is, perhaps, not by chance that these two extreme forms are described from eastern Russia (the *gracilis* ♀ came from the Government of Viatka), for in the Far East the feebly marked ♀ becomes racial (see subsp. *yunnanensis*).

3. f. *lutea*, Auel, 1908, *Zeitschr. wiss. Ins. biol.*, **4**: 39. " A feebly banded specimen which still has small remains of the bands on costa and inner margin of the forewings, the hindwings are still paler than those of the type form, and the pale red colour of the abdomen stretches almost to the thorax."

Described after a ♀ taken near Potsdam in 1907. The form is also mentioned by Auel, 1909, *op. cit.*, **5**: 159. " The pale aberration preceding the type form in which the bands have disappeared in the centre" (that means: the central part of the bands fails). A rather strange name for a white form.

4. f. *obsoleta*, Schultz, 1910, *Ent. Zeitschr.*, **24**: 36. " The dark transverse lines fail in the central part of the forewings, whereas they remain in the basal and outer marginal parts."

Neither locality nor sex stated.

5. f. *monacha*, L., 1758, *Syst. Nat.* 10 ed.: 501. " P. *Bombyx* elinguis, alis deflexis albis atro-undatis, abdominis incisuris sanguineis."

The well-known type form with white forewings which are crossed by blackish sharply-dentated transverse lines. Genetical formula of the ♂, *bb* (*cX*) (*cX*); of the ♀, *bb* (*cX*). If the factor *A* is also completely

absent (in this case the symbol *aa* is to be added after the two preceding formulae), the transverse lines are thin. This is the most elegant form. It is not figured in any text book. 12% of the Dutch males belong to it, 15% of the females.

Males in which the factor *A* is present as a heterozygote (*Aa*) have thicker transverse lines, but are otherwise typical. (South, pl. 46, fig. 3; Barrett, II, pl. 69, fig. 1; Spuler, pl. 28, fig. 30a.)

Females which are *Aa* or *AA* show the same characteristic, but to a lesser degree, and in the middle of the inner margin a thick, but centrally still white, blotch appears. (South, fig. 5; Barrett, II, pl. 69, fig. 1a.)

7% of the Dutch males, 29% of the females.

[♂♂ which are *AA* show a dark powdering between the central transverse lines. This phaenotype is a trans. ad f. *mediofasciata*, Lpk. Barrett, fig. 1b. 16% of the Dutch males.]

6. f. ♀ **dorsomaculata** nov. Forewings with strong transverse lines (as the *Aa* males of f. *monacha*) and with a completely black spot in the middle of the inner margin.

This phaenotype is only found in the female, and is easily separable. Genetical formula, *Bb* (*cX*). Combined with *AA*, a slight dark powdering is shown between the central lines. 5 and 4% of the Dutch females.

7. f. **mediofasciata** nov. (*nigra*, Freyer, 1833, *N. Beitr.*, **2**: 5, pl. 98, fig. 3, ♀, nec fig. 2, ♂). Forewings with complete dark central band.

Genetical formula of the ♂, *Bb* (*cX*) (*cX*); of the ♀, *BB* (*cX*). Combined with *Aa* and *AA*, there is some dark suffusion along costa and (in the ♂) along the outer margin. A well-known phaenotype, often (but wrongly) named *nigra*, Frr.

The same phaenotype, only with somewhat darker hindwing is, however, produced with quite another genotype: ♂, *bb* (*cX*) (*CX*), only the *aa* group (for *AA* see f. *transiens*, No. 12); ♀, *bb* (*CX*), in which *aa* and *AA* cannot with certainty be distinguished. As phaenotypically the difference is not very great and as there are in material of unknown descent even cases of doubt, it will be the best solution to name only one phaenotype (South, fig. 4, fig. 6; Barrett, fig. 1c; Seitz, pl. 20, g, fig. 2). All the figures cited are of the paler type. Dutch males, 6% (pale) and 4% (dark); females, 11% (pale) and 5% (dark).

8. f. *fasciata*, Hannemann, 1916, *Int. Ent. Zeitschr. Guben*, **10**: 37. "A form of *L. monacha* with broad dark central band. The specimen has in the middle of the dark band a white ring with black central point."

Type from Sadowa near Berlin. Distinguished from the preceding form by the broadness of the central band. The white ring round the discal spot seems of less importance. I have not seen a specimen of this form. After writing the above I saw 2 ♂♂ in a Dutch collection. They have a broad black band from second to fourth transverse line but are otherwise typical. A very fine form.

9. f. *mediofusca*, Lambillion, 1919, *Rev. Mens. Soc. Ent. Nam.*, p. 38. " Forewings on the upper side with a broad brown irregular band which occupies half the wing; base white with a black point; outer area white with the markings of the type."

Type from Hertogenwald, Belgium. In numbers 8 and 9 the band very probably extends from the second to the fourth transverse line (in No. 7 from the third to the fourth).

10. f. ♂ **intermedia** nov. The whole forewing powdered with grey brown, the black markings normal, but heavy.

This phaenotype only occurs in the ♂ with the genetical constitution *BB* (*cX*) (*cX*). In the *aa* type there are still some remains of the white ground colour which have completely disappeared when *AA* is present. 7% of the Dutch males.

11. f. ♂ **mixta** nov. Forewings typically white with very intensive transverse lines, hindwings melanic.

A special type of the *bb* (*CX*) (*cX*) males, " possibly caused by a multiple allelomorph to (*CX*) " (Goldschmidt). The figure of Seitz, pl. 20g, fig. 1, represents this type very well. Rare, only 1½% of the Dutch males.

12. f. *transiens*, Thierry Mieg, 1886, *Le Naturaliste*, **8**: 237. "This aberration is a transition between the type and ab. *eremita*. It participates in both forms, the whole of the wings being much darker than in the type and much less than in ab. *eremita*. ♂ and ♀. Northern Europe."

In order to have a definite meaning for this name, I fix it for the form which has the (smaller) black central band of f. *mediofasciata* and a black outer border. It is a well-known phaenotype, though not figured in the text books. The ♂♂ are the *AA* type of *bb* (*cX*) (*CX*), the females are the *aa* type of *Bb* (*CX*). 7% of the Dutch males, 5% of the females.

13. f. *nigra*, Freyer, 1833, *Neue Beitr.*, **2**: 5, pl. 98, fig. 2, ♂. The original description is of no use.

The figure shows a ♂ of a higher degree of melanism than the preceding form. The forewings have a broad black central band, extending from the antemedial (the second) transverse line to the postmedial one (the fourth), and a black outer border. In *transiens* the central band extends from the discal (third) line to the fourth. The result is that *transiens* is white with two black bands, whereas *nigra* is black with two white bands (basal and submarginal). The form is not to be found among Goldschmidt's figures and must be rare. I have only one ♂ of it.

14. f. *oethiops*, De Sélys, 1857, *Ann. Soc. Ent. Belg.*, **1**: 52; *transiens*, Lambillion, 1909, *Rev. Mens. Soc. Ent. Nam.*, p. 10. " Completely black, with the red border of the body hardly visible, and a row of white spots parallel to the outer margin of the forewings."

This phaenotype, which often also shows some traces of white at the base, is especially known in the ♀. In this sex it is the *AA* type of *Bb* (*CX*). The hindwings are very dark. In a further grade the white

spots are reduced through black powdering. This is formed by females the formula of which is *BB* (*CX*). They are the darkest which are figured by Goldschmidt and also the darkest I have seen in Holland. I never saw completely black females. As there is no sharp distinction I prefer to indicate this phaenotype as " dark *oethiops*."

The form is, however, also found in the ♂, though Goldschmidt neither figures nor mentions it, so that it is impossible to state its genetical formula. It is much rarer here than the ♀ : 3% of the Dutch males, 10% of the females (7% lighter, 3% darker).

15. f. ♂ **albibasa** nov. Forewings black with white base.

Only found in the males. Their genetical constitution is *Bb* (*CX*) (*cX*). 4% of the Dutch ♂♂.

16. f. *eremita*, Hb. [1803-1808], *Samml. Eur. Schm., Bomb.*, fig. 246. Ground colour blackish with clearly visible transverse lines.

The ♂♂ belonging to this phaenotype have the formula *BB* (*CX*) (*cX*). It is besides the type one of the best known forms of *monacha*. I never saw females of it and they are not among Goldschmidt's figures. But Seitz (pl. 20g, fig. 4) shows an *eremita* of this sex, in which it must be extremely scarce and the genetical constitution of which is unknown.

Figures of *eremita* ♂♂ are given by Mosley (1899, *Nat. Journal*, **8**, pl. xxv, fig. 3), by Seitz (*l.c.*, fig. 3) and by Spuler (pl. 28, fig. 30b).

The commonest form of the Dutch males: 20%!

17. f. *atra*, Linstow, 1907, *Entom. Zeitschr.*, **21**: 97. " This aberration has unicolorous black forewings without markings, grey-brown hindwings and a black body."

The darkest form, only known in the ♂. Genetical constitution: *Bb* (*CX*) (*CX*), and *BB* (*CX*) (*CX*). Figured by Mosley, *l.c.*, fig. 6, under the wrong name of *eremita*. 5% of the Dutch males.

There remain still a few forms which fall outside the preceding series from unicolorous white to unicolorous black.

18. f. *brunnea*, Stipan, 1923, *Ent. Zeitschr.*, **37**: 40. " Strikes very particularly by the brown-grey colour of all the wings, body, antennae and legs. The markings of the forewings are indistinct."

Described after a ♀.

19. f. *subfusca*, Schultz, 1910, *Entom. Zeitschr.*, **24**: 36. " All that is black with the type form is here yellow-brown, and the abdomen does not possess a red colour but a yellow-brown one."

Described after a ♀ from Winsen in Germany.

20. f. *flaviventer*, Kroulikovsky, 1901, *Rev. Russe d'ent.*, **9**: 303 (*flavoabdominalis*, Schultz, 1910, *l.c.*). " The red of the abdomen replaced by yellow. Rare, among the type form."

Up to the present only one subspecies of *monacha* has been described. This makes it necessary to fix the typonominal form of the species. In his original description of 1758 Linné did not state a locality and gave only one reference, viz.:—"*Wilk. pap.*, 19, t. 3, a. and," which refers to *The English Moths and Butterflies* of Benjamin Wilkes. It is there-

fore the English race which coustitutes the typonominal one of the species. It is true that three years later, in the second edition of the *Fauna Succica*, Linné cited the species as an inhabitant of Sweden, but even if a type specimen from that country is still present in the famous London collection, it can never be proved that this was already present in 1758. As far as we know at present, the whole of Europe is inhabited by the same subspecies.

From Tse-kou, S.W. of Ta-tsien-lou, Yunnan, was described:

subsp. *yunnanensis*, Colenette, 1933, *Nov. Zool.*, **39**: 23, pl. III, fig. 3. " ♀ . . . Forewing whitish; five fuscous patches on the costa at approximately equal distances apart, the first basally, the fifth near the apex; a small fuscous spot in the cell and an angled fuscous streak along the discocellulars; a fuscous patch postmedially on the inner margin; traces of a crenate fuscous subterminal fascia; a series of fuscous interneural terminal spots, continued round the apex and also on to the fringe, which is otherwise whitish. Hindwing pinkish buff; a broad indistinct tawny-olive subterminal fascia; a series of fuscous interneural terminal spots, continued on to the fringe, which is otherwise pinkish buff. *Underside* of both wings, and fringes, tawny olive, marked indistinctly as on upperside; on the hindwing a fuscous discocellular spot and an indistinct postmedial fascia.

♂. Very similar to Swiss specimens of *L. monacha monacha*, the markings on the forewing fine but distinct, the dark terminal band on the hindwing merging without a definite boundary into the ground colour."

Gaede (1932, Seitz, *Suppl.* **2**: 102, pl. 8g, fig. 3) mentioned the form (without naming it) as a subsp. of *Lymantria ascetria*, Hb., and figured the ♂, but an examination of the male genitalia by Colenette showed the form to be co-specific with *Lymantria monacha*, L.

The figure in the *Nov. Zool.* shows a female with strongly reduced markings on the forewings: only the dark costal spots, the dark spot in the middle of the inner margin, and the spots on the fringe are present.

In summarizing the results of my article I append a list of all forms of *Lymantria monacha*, L., the genetical constitution of which is known, and using the formulae of Goldschmidt. As all forms are checked with the original descriptions and figures of previous authors, the list may provide a definite basis for further research.

| Genotype of the ♂. | Phaenotype of the ♂. |
|---|---|
| *bb* (*cX*) (*cX*) ..... | *monacha*, L. |
| *Bb* (*cX*) (*cX*) ..... | *mediofasciata*, Lpk. |
| *BB* (*cX*) (*cX*) ..... | *intermedia*, Lpk. |
| *bb* (*cX*) (*CX*) *aa* ..... | *mediofasciata*, Lpk. (darker specimens). |
| *bb* (*cX*) (*CX*) *AA* ..... | *transiens*, Thierry Mieg. |
| *bb* (*CX*) (*CX*) ..... | " Black specimens, not to be distinguished from other black ones," says Goldschmidt. Not figured by him; presumably *atra*, Linstow. |

| | |
|---|---|
| *Bb* (*cX*) (*CX*) ..... | *albibasa*, Lpk. |
| *BB* (*cX*) (*CX*) ..... | *cremita*, Hb. |
| *Bb* (*CX*) (*CX*) ..... | *atra*, Linstow. |
| *BB* (*CX*) (*CX*) ..... | *atra*, Linstow. |

| Genotype of the ♀. | Phaenotype of the ♀. |
|---|---|
| *bb* (*cX*) ..... | *monacha*, L. |
| *Bb* (*cX*) ..... | *dorsomaculata*, Lpk. |
| *BB* (*cX*) ..... | *mediofasciata*, Lpk. |
| *bb* (*CX*) ..... | *mediofasciata*, Lpk. (darker specimens). |
| *Bb* (*CX*) *aa* ..... | *transiens*, Thierry Mieg. |
| *Bb* (*CX*) *AA* ..... | *oethiops*, De Sélys. |
| *BB* (*CX*) ..... | *oethiops*, De Sélys. (darker specimens). |

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## ADDITIONS TO THE LAMPTON LIST OF COLEOPTERA.

By Horace Donisthorpe, F.Z.S., F.R.E.S., etc.

In 1945 [*Ent. Record*, **57**, pp. 28-29; 40-41 (1945)] I described a patch of waste ground at Lampton, Middlesex, which is within three minutes walk from my house at Heston, and which has proved a most prolific collecting ground for beetles. I may here mention that at one corner of the ground there is a very large boulder which I have loosely described as prehistoric. Last year I took photographs of it, and gave them to the Geological Department of the British Museum (Nat. Hist.). They tell me it is much older than prehistoric, being pre-glacial, and probably Eocene.

The additions to the above list are as follows:—

Carabidae—*Amara plebia*, Gyll., in vegetable refuse.

Staphylinidae—*Atheta atramentaria*, Gyll., in vegetable refuse; *A. soror*, Kr., sweeping; *Tachyporus solutus*, Er., sweeping; *Oligota granaria*, Er., and *O. flavicornis*, Lac., beating willows. The former is usually found in granaries, cellars, and the like. *Xantholinus fulgidus*, F., in vegetable refuse.

Silphidae—*Silpha aevigata*, F., on pavement.

Phalacridae—*Olibrus millefolii*, Pk., sweeping Yarrow (*Achillea millefolium*).

Coccinellidae—*Scymnus limbatus*, Steph., a short series taken by beating willows. This is a good and distinct species and not a variety of *S. suturalis*, Thunb., which occurs on fir trees.

Histeridae—*Onthophilus striatus*, F., in vegetable refuse.

Nitulidae—*Meligethes picipes*, Stm., sweeping.

Lathridiidae—*Melanophthalma distinguenda*, Com., sweeping.

Dermestidae—*Helocerus claviger*, Er., and *Anthrenus varius*, F., sweeping umbels.

Eucnemidae—*Throscus carinifrons*, Bonv., sweeping.

Telephoridae—*Telephorus bicolor*, F.; *Malachius bipustulatus*, L., ab. *immaculatus*, Rey; and *Malthodes marginatus*, Lat., sweeping.

Bruchidae—*Bruchus atomarius*, L., and *B. loti*, Pk., ab. *ireneae*, Donis., sweeping.

Chrysomelidae—*Lema melanopa*, L., and *Longitarsus waterhousei*, Kuts., sweeping; *L. laevis*, Duft., sweeping Mug-wort (*Artemisia vulgaris*), abundant; *Cassida nebulosa*, L., sweeping Good King Henry (*Chenopodium Bonus-Henricus*), scarce.

Oedemeridae—*Nacerdes melanura*, L., on path.

Curculionidae—*Rhynchites nanus*, Pk., beating willows; *Apion marchicum*, Hbst., sweeping; *Phyllobius urticae*, De G., sweeping nettles; *Pseudostyphlus pilumnus*, Gyll., sweeping Common Feverfew (*Matricaria Parthenium*); *Gymnetron melas* and *Anthonomus rubi*, Hbst., sweeping; *Cryptorhynchus lapathi*, L., beating willows, rather scarce; *Ceuthorhynchus resedae*, Marsh., and *Ceuthorhynchidius posthumus*, Germ., sweeping Wild Mignonette (*Reseda lutea*); *C. chevrolati*, Biss., twice, sweeping.

[Lampton Sarsen.—The large slab of stone, approximately 5 ft. by 5 ft. and 1½ to 2 ft. thick, standing in a corner of the waste ground at Lampton, is a sarsen. (This term, commonly applied to residual blocks of Eocene sandstone with siliceous cement, probably originated as the countrymen's name for any strange rock and is possibly a corruption of Saracen.)

To be more explicit about the origin of this block of stone: it is a portion of a bed of medium-grained white sand laid down in the delta of a river in the Eocene period. This portion, because its constituent grains had become welded together by secondary silica, survived when the softer parts of the bed were eroded away. Probably neither the cementation, nor the isolation by erosion, took place where the block now lies. Sarsens on the dip-slopes of the Chilterns originated in the Reading Beds, while those occurring on the south side of the London Basin represent consolidated portions of the Bagshot Beds. The source of the Lampton sarsen is not certain. If human transportation is ruled out, I suggest that it was moved to its present position by floods in the Thames valley during the Ice Age, and thus came to rest on the Taplow Terrace.

The block is bounded on two sides by flat joint-planes; the upper surface is irregularly weathered and holes have formed where the siliceous cementation was weak.—K. P. Oakley.]

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## SOME REMARKS ON BISTON BETULARIA L.

By B. J. Lempke.

A gynandromorph of *Biston betularia*, L., was mentioned by Voss in *Insektenbörse*, **15**: 146, 1898. The right side was ♂ and belonged to f. *carbonaria*, Jordan; the left side was ♀ and showed the characteristics of f. *mixtus*, Stgr., "black mixed with some white," the abdomen was black. Staudinger, however, never described such a form. No

doubt *mixtus* was a catalogue or trade name and the first who published it with a description was Voss, so that he must be considered the author of the name.

At first sight it seems that this name is a synonym of f. *insularia*, Thierry-Mieg, the well-known " intermediate " between type and *carbonaria*. The Danish genetician Lemche has, however, shown (*Journal of Genetics*, **24**: 235-241, 1931) that f. *insularia* can always be distinguished from pale examples of *carbonaria* by its abdomen, which is not unicolorous black as with the latter form but black with small white dots. Dark examples of *insularia* have the same wing pattern as the heterozygotes of *carbonaria*, black with small white specks. But in examining the abdomen the forms are easy to separate and then it appears that true *insularia* is far less common than *carbonaria* and that many specimens which look like *insularia* are in reality only pale heterozygous *carbonaria*. So it is at least in Holland.

In applying this means of distinction to the gynandromorph with its completely black abdomen it will be clear that the male side was homozygous *carbonaria* and the female side heterozygous. And, also, that f. *mixtus* Voss is not a synonym of *insularia* but a perfectly valid name, indicating the heterozygotes of *carbonaria*. The phaenotype represented by it has black wings, more or less powdered with white specks, and a black abdomen. That it is distinguished by a name is fully justified by the fact that its genetic constitution is different from f. *carbonaria* (and, of course, from f. *insularia*).

I should like to draw the attention of breeders interested in genetics to f. *funebraria*, Lbll., *Rev. Mens. Soc. Ent. Nam.*, 1905, p. 15. This form has black forewings like f. *carbonaria*. The hindwings, however, have a broad white band along the costa which suddenly stops near the apex and which is traversed by two black lines, one in the middle of the white band, the other close to its end near the apex. The remainder of the hindwings is black (except the inner margin of many specimens) and contrasts sharply with the white costal band.

This form is without any doubt hereditary. The collection of the Amsterdam Zoological Museum contains a good series of it. Most specimens result from ab. ovo breedings, but particulars of the families are not known. Of one of them there are also a few examples closely resembling f. *mixtus* in having the black area strongly powdered with fine white specks. It is obvious that we must consider them the heterozygotes but then it is clear that *carbonaria* and *funebraria* are rather closely related forms. Lemche figured several specimens of *insularia*, *mixtus* and *carbonaria*, obtained from his breeding experiments, but there is no *funebraria* among them. It is also lacking on the beautiful coloured plate of Bowater, the first reviewer of genetics in Lepidoptera (*Journal of Genetics*, **3**: 299-314, pl. xxvii, fig. 1-11, 1914). This is also an indication that *funebraria* is not a modification of *carbonaria* but an independent hereditary form.

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## SOME UNUSUAL FORMS OF GENITALIA.

By Rev. Desmond Murray.

With Plate III.

A few examples of the above were given in a recent number of the *Ent. Record* (Vol. LVIII, 1946, p. 98); since then some other species from N. America have been studied which show even more extreme asymmetrical structures. It would be difficult to find any more perfect examples than *Zale lunata*, Drury, or *Matigramma pulverilinea*, Grt., from California.

The first moth is warm brown in colour, 45 mm. in expanse, closely resembling No. 4, which is a dull greyish brown, slightly larger, with similar markings, from S. America.

Another example of this genus was given in the last paper (No. 5) which occurs both in N. and S. America. All this group of dull coloured moth, which resemble each other very closely in wing colouring, in every case, are found to have asymmetrical genitalia.

No explanation has so far been given for this abnormality, or why it occurs almost exclusively amongst certain genera.

It is much more rare amongst the *Rhopolocera* for only the *Hesperiidae* seem to show want of symmetry. It is noteworthy that this family, in some sense, is a link between the two orders; some authors have considered them to be rather the first family of moths than the last of the butterflies, according to our classification. Their semi-nocturnal habits, dull colouring, position of wings at rest and other features make them altogether peculiar. The genus *Erynnis* especially in nearly every case show asymmetrical genitalia. Our own single species, *E. tages*, L., has different forms of voles (see Pierce and Bierne *Gent. of the Buttf.*, 1941) and all the N. American species show extreme forms.

The author does not venture to offer any explanation for these peculiarities; it is evident, however, that the solution of the problem would help us to understand better how such structures come to be formed and why they occur.

About ninety per cent. of the genitalia of Lepidoptera are perfectly symmetrical, each species having its own peculiar form and species being differentiated by their genitalic structures. There must be some reason then why there are exceptions to the rule as in the examples given.

If the exception proves the rule perhaps the exception may also give us the key to the asymmetrical structures, could it be found. The drawings are made to the same scale by aid of the *camera lucida*.

Explanation of Plate: The male genitalia of

1. *Matigramma pulverilinea*, Grt. Arizona, N. Amer., 9/42.
2. *Zale* sp. 40 mm. Tucson, Arizona, A. Amer., 8/40.
3. *Zale* sp. 40 mm. Texas, N. Amer., 5/46.
4. *Zale* sp. 50 mm. Tornas Ottoni, Brazil, S. Amer., 6/12.
5. *Zale lunata*, Drury. Napa, California, N. Amer., 11/45.


1.
2.
3.
4.
5.
MURRAY del.

## TUKDAH DIARY, SEPTEMBER AND NOVEMBER 1945.

By D. G. Sevastopulo, F.R.E.S.

(*Continued from p. 58.*)

27th October.—Another fine sunny morning on the forest road produced two fresh species—*Precis atlites*, L., and *Arhopala rama*, Koll., *rama*. Evans calls *D. adonira* rare; this morning I saw four settled on a square yard of road. A dead *Dermaleipa* (*Lagoptera*) *juno*, Dalm., and a *Ditrigona triangularia*, Moore, were picked up in the road. A sunny afternoon down among the tea, but nothing about worth recording. Larvae of *A. sylvata*, *Comibaena subhyalina*, Warr., and another Geometer (the pupa failed to survive the change to Calcutta) were found. A female *A. pulchella* at light.

28th October.—A sunny morning on the forest road produced, in addition to the usual common things, a number of *V. indica* and *H. brahma* settled and flying over the road. A female *S. hippoclus* was caught settled on the road and four fresh species—*Neptis yerburyi*, Btlr., f. *sikkima*, Evans, *Cosmolyce* (*Lampides*) *boeticus*, L., *Lycaenopsis transpecta*, Moore, and *Lycaenopsis cardia*, Fldr., f. *dilecta*, Moore —were caught. *N. ananta* was about in some numbers again, and *L. khairava* has become quite common on one short length of road. In the afternoon walked down to Rungli Rungliot, some one thousand feet lower, fine and sunny but nothing of note flying; *A. hyperbius* males were common. Two or three moths at light.

29th October.—Another fine morning on the forest road. All the usual things flying and *D. melaneus* was commoner than I have seen it so far. In addition, tattered specimens of *D. tytia* and *N. radha*, and two fresh examples of *Arhopala comica*, de N., were caught. Larvae found—*S. cynthia*, *L. katinka*, *Dasychira grotei*, Moore, an Arctiid (whose pupa did not survive the change to Calcutta) and *A. indica*. The brood of *cynthia* would inevitably have starved; they were on a small bush, with none other within a couple of hundred yards, that would barely have sufficed to feed one larva to maturity, let alone ten, and although the species feeds on a large number of plants, individual larvae are very averse to changing their food-plant. Spent the afternoon blowing larvae and found two Nematodes in one of *P. aerata*, a small Geometer about an inch long. Light a failure.

30th October.—In spite of quite a cold wind, a cicada was singing loudly a good half-hour before sunrise. Another fine sunny morning on the forest road, another *L. sura* and single males of *Heliophorus epicles*, Godt., f. *indicus*, Fruhs., and *Baoris assamensis*, WM., both hitherto unrecorded. Another dead male of the black and scarlet Zygaenid was picked up on the road and a female *Metrocampa haliaria*, Wlk., was found settled under a leaf. *L. sidonis* is an annoying insect; not only does it vary its flight in a most disconcerting way, but it also has the irritating habit of appearing much larger than it really is, so that it is often chased in the expectation of its proving something more interesting than its rather dull self. In the afternoon a search was made for the shade lovers, *Mycalesis* and *Melanitis*, without finding a single one. A larva of *D. polyphaenaria* was found, and

also larvae of two other Geometers (the pupae failed to survive the change to Calcutta). Light a failure.

31st October.—Another sunny morning on the forest road, the only species of interest being *Padraona pseudomaesa*, Moore, f. *pallida*, Evans. Two larvae of a Hemitheid (still unidentified) were found. Watched another of the large wasps with its spider; although the spider must weigh full three times as much as the wasp, it was being dragged backwards along a very uneven path at quite a fair rate. In the late afternoon a walk through the forest beating and searching produced *C. erycinoides*, *Psilopepla* (*Nudaria*) *suffusa*, Hamps., two specimens of *T. crocoptera*, one of an orange form quite unlike that found previously, and a Larentiid (still unidentified). A number of males of a dark Zygaenid were flying high up around a tree, their bipectinated antennae showing up clearly as they flew, and a pair of the scarlet and black Zygaenid (see subsequent note) were taken *in cop.* Larvae of *D. quadralis* and *A. sylvata* were found. Discovered a Chrysomelid with a most extraordinary method of pupation. The larvae hang themselves up together in small numbers like a pupating Nymphalid larva and the pupa does not free itself entirely from the larval skin but remains dangling from the end of it. Coleopterists will probably tell me that this is a common thing. Two or three moths at light.

1st November.—Another sunny morning on the forest road but nothing, except a single *H. androcles*, worth recording. A single wing of *Iotophora iridicolor*, Btlr., was picked up on one of the forest paths. It was common last year in May and June but I have not seen one this year. A brood of small larvae of a Noctuid, but I am afraid that they will not pupate before leaving for Calcutta (they did not, and all failed to pupate although they fed up quite well). An afternoon walk, again on the forest road but lower down, produced *P. cama*, *S. hypselis*, *L. cardia* and *Hasora alexis*, F., f. *alexis*, with larvae of *P. rhetenor*, a Limacodid (which died), *Sypna latifasciata* (the species has been identified from fig. c, pl. 67, of Seitz' *Palaearctic Noctuidae*, iii, but neither I nor the Forest Entomologist can find any written description or reference to the species), and *A. sylvata*. Nothing at light.

2nd November.—Still another sunny morning on the forest road, but nothing new to record. The trees on either side of one stretch were full of very noisy monkeys. Several *S. orbiferata* at rest. They sit with their white, fuscous-blotched wings spread in a rough triangle, the dark olive abdomen arched between them, and look rather like a smear of bird excreta; when disturbed they have the odd habit of quivering the abdomen up and down. In the afternoon went down through the forest, where a male *Medasina parisnattei*, Wlk., fell out of a tree at my feet for no apparent reason. A *Polydorus* and a *Cyrestis* were seen, but neither species could be identified. Nothing at light.

3rd November.—The only previously unrecorded species on the forest road this morning was *Arhopala areste*, Hew., *areste*. All the usual things in their usual numbers, except *A. fylla*, which seemed rather more common. In the afternoon a female *Colias electo*, L., *fieldi*, Men., a female *A. hyperbius* and a *H. alexis* were caught. *Alexis* rests under leaves in the sunshine. In the evening an expedition was made to secure a series of the black and scarlet Zygaenid. Males were flying freely at about 4.30, but high up round trees, and the occasional one

that came within reach was very difficult to catch as they disappear against the dark background of the trees. The flight is obviously a mating flight as a male was seen to settle high up in a tree and, when dislodged by repeated stick-throwing, a mated pair vol-planed into the undergrowth, whence they were eventually recovered. Five males were also obtained. (This was probably the most interesting insect obtained. The male is not unlike *Pidorus miles*, Btlr., but is larger and lacks the yellow costal fascia. The female has semi-hyaline smoky forewings and black-veined whitish hindwings, not unlike an *Agalope*. Both the British Museum and the Forest Entomologist state that it is an undescribed species, the latter even suggesting that the genus may be a new one. How it has escaped discovery is a mystery, as it is both common and conspicuous.) Nothing at light.

4th November.—A beautiful sunny day, but very dull from the collecting point of view. Nothing worth recording from the forest road in the morning, and in the afternoon went to an open grassy area on the hillside which, in England, would have swarmed with butterflies, but which produced nothing but a few *Y. sakra*, *Z. flegyas* and a couple each *N. hylas* and *A. hyperbius*. The beetles are emerging from the pupae mentioned on the 31st October, a yellow Chrysomelid with blue-black spots. Nothing at light.

5th November.—The forest road produced the hitherto unrecorded *Rapala schistacea*, Moore, and *D. ouida* and *H. androcles* seemed rather more common than they have been up to now. Spent the afternoon sitting in the sun in the garden. Quite a number of butterflies flew over but mostly too high to identify for certain, but two *Appias lalage*, Dbl., *lalage* were seen. A pair of *V. cashmirensis* were observed settled the one behind the other with their wings open and the hindmost one drumming on the wings of the other with its antennae. Nothing at light. As a matter of interest I put a thermometer outside at about half-past seven and the temperature was just over 50° F.

6th November.—Reversed my usual procedure of walking in the morning and doing my writing in the afternoon. Spent the first part of the morning writing and then sat and sun-bathed in the garden. The following butterflies were seen:—*A. lalage*, *C. electo*, *D. melaneus*, *Y. sakra*, *N. hylas*, *V. cashmirensis*, *V. indica*, *A. hyperbius*, an unidentified *Lycaenopsis*, probably *transpecta*, and *H. brahma*, also *P. bieolor*. An afternoon on the forest road produced two males of *I. pyrene* and a female *Dodona eugenes*, Bates, f. *venox*, Fruhs., in addition to the usual things. A male *M. simpliciata* was caught drinking on the damp road and a female *Crocallis lentiginosaria*, Moore, was found on the underside of a leaf. A larva of *Cechenena lineosa*, Wlk., f. *lineosa* was also found. Nothing at light.

7th November.—Nothing new flying on the forest road in the morning, but larvae of a *Corgatha* and a *Geometer* (both of which failed to survive the transfer to Calcutta) were found. Blew caterpillars in the afternoon and in the evening went for a stroll through the forest, finding *L. divisa* and *Erebomorpha metachromata*, Wlk., at rest, and seeing a *Choaspes benjaminii*, Guer., f. *xanthopogon*, Koll., flying at about 5.45 p.m. Light a complete failure.

8th November.—Tried the lower portion of the forest road for a change this morning, but the only interesting butterfly seen was an *A. areste*, which I missed. A single *M. troglodytus* was caught flying, the only imago of the species seen so far, and a Lithosiid and a Larentiid (both still unidentified) were caught at rest. Larvae found included *L. katinka*, *P. fenestrata* and a Noctuid (the pupa of the latter died in captivity).

(*To be continued.*)

## COLLECTING NOTES.

Gonepteryx rhamni in January.—A male of *G. rhamni* was flying strongly in my garden on 16th January 1947, a bright and sunny morning only a day or two before the onset of very cold conditions.—W. F. Lloyd-James, "Holly Tree Cottage," Middle Barton, Oxford, 20th May 1947.

Substitute Foodplants: Verbascum Group.—Further to my last note on this subject (*Ent. Rec.*, **57**, p. 89), I have now to report two further examples of *Celsia* being eaten by larvae more usually associated with *Verbascum*.

(1) During my recent holiday in N. Cyprus I found larvae of *Cucullia verbasci* locally common on the petrophile plant *Celsia arcturus*, L., originally described by Linnaeus as a *Verbascum*. In captivity they willingly ate *Verbascum sinuatum*, the only *Verbascum* of the district, which is commonest on the coast and rather scarcer at 1000 ft., the altitude at which I found the larvae. I never found one on the *Verbascum* wild, though some plants of it were growing within 20 yards of the *Celsia*. This is all the more remarkable because in the Lebanon *C. verbasci* feeds on mullein and comes right down to sea-level. Incidentally, this is the first record of *C. verbasci* from Cyprus; the same can be said of *C. barthae*, Boursin, of which I found the larvae on *Scrophularia sphaerocarpa* at 2000 ft. I hope to publish soon separately a list of Lepidoptera taken by me in Cyprus not given in Rebel's list of the island's butterflies and moths (*Mitt. Muench. Ent. Ges.*, XXIX, Heft IV, 1939, p. 488 ff.).

(2) *Cucullia lychnitis*, Ramb., on the same or a very similar species of *Celsia* in the Rowanduz Gorge, Kurdistan, Iraq, in 1935. I have only just realised that this was not a *Verbascum*, and am able to correct my former impression because I photographed the larva on its foodplant at the time of capture.—E. P. Wiltshire.

Substitute Foodplants: An Example of Economic Importance from Cyprus.—I do not think *Pieris brassicae* would be able to survive the hot dry summer in Cyprus if its only foodplant there were the garden cabbages, etc., which it attacks during the winter half-year. I noticed in the Kyrenia district this year that in April it began ovipositing on *Capparis* as soon as this rather Tropical plant, ubiquitous on dry rocky ground along the coast, came out in leaf. Caper bushes were covered with numerous Large White larvae in May. I think this substitute

foodplant accounts for its repeated broods throughout the summer in Cyprus, and probably also in Cyrenaica, where a very large form occurs. I can nowhere find a previous mention of *brassicae* eating this alternative, which, though not actually placed in the *Crucifera* family, comes next to it in the *Capparidaceae*, and immediately precedes the *Resedaceae*, some of which, as has already been noted in this series of articles and notes entitled " Substitute Foodplants," also provide alternative pabulum for certain kinds of *Pieris*.

In mid-May I counted 59 pupae or pupating larvae of this butterfly on the hotel veranda at Kyrenia; they had all just climbed up there from two or three large caper bushes between the veranda and the sea, and on these bushes there were still numbers of smaller larvae feeding. All the pupae were of pale grey colouring, speckled with black and yellow; they were in a strong light, though shaded, on white-washed, yellow-washed, or pale grey surfaces. One which pupated in captivity in a closed tin with no light was green, until emergence. About one-third (20) of these pupating larvae failed to chrysalise on account of parasites; these seemed to be the same species of apantelid with small yellow cocoons which we see on fences in England. Nearly all the actual pupae were healthy.—E. P. Wiltshire, F.R.E.S.

Zygaena ignifera.—Korb related that this species was discovered by his wife near Huelamo on Serrania de Cuenca (New Castile). Several years ago Dr Selgas, then municipal doctor at Valdemoro de la Sierra, sent me one male of *ignifera* that he had taken during one of his trips across the mountains above Cuenca. In 1925 Lord Rothschild asked me to get specimens of that moth, which was missing in his museum. At the beginning of July 1926 my wife and I arrived at Cuenca and went by a car to the village of Uña, where the road ends.

From Uña we made many long trips to Huelamo, Valdemoro and other localities, making an interesting collection but seeing no *ignifera*. After two months of useless research I made a trip up the Cerro S. Felipe at the boundary between Castile and Aragon, taking very few butterflies, and while coming home I lost the way, in a wide pine-wood, reaching Uña in the afternoon. People told me that my wife had gone alone into the country without coming back, although it was late. Some men were searching for her.

I knew that my wife wished to climb up to a rocky hill where I supposed no Lepidoptera might live. I went directly to that place, where my wife was collecting some *ignifera*. She was sorry because most specimens were already worn, and she had remained looking for them as the *Zygaena* are generally more frequent before sunset. Other specimens were taken on following days, always avoiding killing the damaged ones.

In 1928 and 1933 we took many *ignifera* at the same place and never elsewhere. No other species of Lepidoptera was seen on the hill of the *ignifera* which occurs in front of Uña about half-an-hour's walking. To go from Uña to that hill one must go down along the road towards Cuenca for some yards, turning aside to left, crossing the dry river and taking the path for Rincón del Juez and Ciudad-Icantada. Almost at the beginning of that path the hill rises to the left.—O. Querci, Vindicio, Formia (Latina), Italy.

## REVIEW.

Butterfly Lives. By S. Beaufoy, B.Sc., F.R.E.S. Small quarto, 130 pp., 200 photos., 12/6; Messrs Collins, St James Place, S.W.1.—More than two dozen of these " lives " of our British Butterflies are chosen and illustrated by six, seven, or eight most excellent nature photographs of the striking incidents in the life of each species, including each stage. All the figures are somewhat enlarged, but only sufficiently to bring out the special characteristics. Of course, ova must be considerably enlarged. The chrysalis needs enlargement to show the changing development before emergence of the imago; in the caterpillar to disconnect the marking as well as the clothing of the spines, hairs, etc., and in some cases the effects of the intersegmental colour. The size of the imago is not more than $\times 1\frac{1}{2}$. Distortion is avoided throughout.

In some of the figures the enlargement seems to bring out the texture of the surface so well as to suggest the colour. Perhaps the most remarkable instance of this is the figure of male *icarus*; one is unable to look at the figure without a suggestion of the colour of three wings assuredly; but of the other wing, what?

There is a small amount of descriptive text to each species. For the accuracy of this we can trust to the " Foreword " by the sponsor of the whole work, the well-known E. B. Ford, F.R.S., whose own famous work is *The Biology of Butterflies*, which, strangely, was not distributed for review.—Hy. J. T.

## " BRITISH NOCTUAE " SUPPLEMENT IN 1947.

December 1946—The Text of Vol. III concluded (261)-(264).

January and February 1947—A Supplement on Diptera.

April 1947—The Appendix to Vol. III commenced (265)-(268). This will contain the very numerous further additions to Vols. I, II, III. Then the Index to Vol. III. The volume cannot be completed until 1948 (early).

May 1947—Owing to illness the MS. could not be prepared for printing and an instalment of Vol. IV was begun (1)-(4).

June 1947—The Appendix to Vol. III was continued (269)-(272).

September 1947—Continuation.

## EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr HY. J. TURNER, "Latemar," West Drive, Cheam.

*Wanted*—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Instituto Miguel Lillo, Calle Miguel Lillo 205, Tucuman, Republica Argentina.*

*Desiderata*—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—*H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.*

*Wanted.*—*Lycaena* (*Heodes*) *phlaeas* from all regions including British Isles. Also wanted other species of Chrysophanids from all areas. Exchange or purchase considered. *Duplicates.*—Foreign Lepidoptera, e.g., Satyrids, Charaxes, Papilios, and others; full lists sent.—*P. Siviter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.*

*Wanted* for cash or exchange many species of ova, larvae or pupae, especially local forms and *A. grossulariata* from different localities, also Seitz Vol. 1 and Supplements to Vols. 1-4. Offers also, Tutt's *Practical Hints*, Parts 1 and 2, Buckler's larvae, Vols. 1-6, and Tutt's *British Noctua*, Vols. 2, 3, and 4.—*Dr J. N. Pickard, F.R.S.E., 36 Storeys Way, Cambridge.*

*Wanted.*—Various monthly parts of *Entomologist's Record* for 1914, 1915, 1916, 1917, 1919, and 1920. Please report any odd monthly parts (in wrappers as issued) prior to these years.—*P. B. M. Allan, 4 Windhill, Bishop's Stortford, Herts.*

*Wanted.*—Males of *Morpha menelaus, M. didius, M. rhelenor* in papers.—*Leonard Tatchell, Rockleigh Cottage, Swanage, Dorset.*

*Wanted* urgently for experimental purposes, pupae of *betularia, porcellus elephanor.*—*Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.*

*Wanted*, set or in papers: *Apatura iris, Vanessa polychloros, Argynnis adippe* and *aglaia, Melitaea cinxia, Erebia epiphron* and *aethiops, Coenonympha tiphon, Thecla betulae, T. pruni* and *w-album, Lycaena astrarche* and *artaxerxes, Lyc. arion, Nemeobius lucina, Adopoea lineola* and *aclaeon, Angiades comma, Cyclopides palaemon.* In exchange for other British and foreign species.—*Chas. B. Antram, Clay Copse, Sway, Lymington, Hants.*

*Wanted*, British butterflies, set or in papers, in exchange for *Morpho papirius, Morpho didama, and other Morphos.*—*Chas. B. Antram, Clay Copse, Sway, Lymington. Hants.*

*Wanted.*—Various Books on Lepidoptera. Please send lists and price. Also wanted, Live Exotic and English Lepidopterous Material for cash or exchange for similar material or Set English Imagines.—*J. K. Goody, "Weldon," 26 Carr Wood Road, Bramhall, Ches.*

*Sale or Exchange—R.E.S. Trans. and Proceed.*; bound, 1911 to 1916, 1918 to 1919; unbound, 1921 to 1923, 1925; also 1917 and 1924 less part 5. New Series—*Trans.*, Vols. 1 and 2, Vol. 3, part 1. *Proceed.*, Vol. 1 and Vol. 2, part 3. *Trans. Suffolk Naturalist Society*, Vol. 3 and Vol. 4, part 1. *Wanted*, bound or unbound, *Entomologist*, Vols. 2 and 3, 1926 to 1930, 1940 to 1942. *Ent. Mont. Mag.*, 1922, and 1924 to 1942; also various volumes of *R.E.S. Trans.* List on application.—*F. W. Smith, Boreland of Southwick, by Dumfries.*

*Wanted*, for experimental purposes, a few pupae of *Endromis versicolora*, purchase or exchange.—*R. W. Parfitt, 1 Dunsdon Avenue, Guildford, Surrey.*

*Wanted.*—Spuler's *Die Schmetterlinge Europas*, Vol. I. Various unbound parts containing pages 1-144, and I-XVI with plates as issued. *Exchange.*—Various numbers of the *Entomologist's Record* and *Entomologist.*—*S. Wakely, 36 Stradella Road, Herne Hill, London, S.E.24.*

*Wanted.*—Volume V (five) of Tutt's *British Lepidoptera.*—*T. R. Eagles, 32 Abbey Road, Enfield, Middlesex.*

## MEETINGS OF SOCIETIES.

*Royal Entomological Society of London*, 41 Queen's Gate, S.W.7.: October 1st and 15th, at 5.40 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section*: Last Fridays in month, at 7 p.m., at the Birmingham Museum and Art Gallery. Particulars from the Hon. Secretary, G. B. Manly, 72 Tenbury Road, King's Heath, Birmingham, 14.

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*Communications promised*:—O. Querci, A. H. Turner, H. Donisthorpe, A. E. Wright, R. R. U. Kaufmann, B. Verdcourt, P. J. Lempke, E. Romei, B. P. Beirne, D. G. Sevastopulo, An Old Moth-Hunter, Major F. L. Johnson, E. P. Wiltshire.

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*Change of Address*:—Capt. E. S. A. Baynes, F.R.E.S., to 2 Arkendale Road, Glenageary, Co. Dublin, Eire.

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# ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION





## CONTENTS.



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# THE VARIATIONS OF ANTHROCERA CARNIOLICA SSP. MAGNAUSTRALIS, VERITY.

By Orazio Querci.

At Formia, on the Gulf of Gaeta and at the base of the Aurunci Mountains, it hardly ever rained in the winter of 1946. On 29th April a heavy shower wetted this country, which became verdant and many *Anthrocera carniolica*, Scopoli, emerged from 8th to 21st May in a meadow near the ruins of the small church of St Antonio (that had been destroyed by bombs), at a level of 150 to 200 feet. Having collected a suitable series of these moths, we now try to show how they varied.

*Male variations.*—(1) Expanse of the forewings, from tip to tip, 26 to 31 mm. in most specimens; slightly elongated shape of wings; vivid scarlet ground colour; wide spots outlined by white circles of moderate extent; scarlet apical crescents mixed with some white scales; rather thin dark blue bands along the margins of the hindwings. Among 158 males, which we have before us, we see about 100 specimens which might be referred to the form that agrees with Verity's description (*Rodia*, 1st March 1946, vol. xxxi, p. 66) of race *magnaustralis* which he made from *carniolica* taken by us, in the same place, in May 1938. (2) Two males differ from those of the form No. 1 by the reduction of the white rings around the spots, and by the apical crescents that are quite red. (3) In seven specimens only the basal and lowest middle spots are faintly encircled by white rings. (4) In four specimens all the spots are almost obliterated. (6) In eleven specimens both the central and basal pattern are as in the form No. 1, but the apical crescents are replaced by a crown of red spots more or less encircled by a few white scales. (7) In two males the spots are smaller than in the others even if they are compared with specimens of the same size. (8) Two large males of a reddish tinge instead of scarlet, with wide spots and thick apical crescents. (9) Four males in which the spots are irregularly outlined and more or less confluent. (10) In two specimens there is a white line along the costal margin of the forewings. (11) One single male in which the dark border of the hindwings is exceptionally wide. (12) Four males in which the tone of the red is less vivid than in the others of the series. (13) One dwarf male only 20 mm. in expanse. (14) The other five smallest males of the series, 23 to 25 mm. (15) The five largest males of the series, 32 to 34 mm. (16) Five males have a red ring on the abdomen.

*Female variations.*—We have before us 165 females showing the following forms: (17) Shape of wings still less elongated than in males; expanse of wings 29 to 32 mm.; wide and rounded spots; thick apical crescents outlined by shining complete white rings of moderate extent; rather thin brown border along the margin of the hindwings; tone of the red as vivid scarlet as in the males. About 100 specimens in our series have a similar feature and they agree with Verity's description of this showy race *magnaustralis*. (18) One single female in which the apical crescents are small even if compared with other specimens of the same size. (19) In eight specimens the round spots are thinly encircled by white, and the apical crescents are quite red. (20) In seven females

all the spots and apical crescents are thickly encircled by white more than in the other specimens of the series. (21) In nine females the apical crescents are formed by a series of red spots more or less encircled by white scales. (22) In eight females the central spots are round and confluent. (23) In thirteen beautiful females the spots, encircled by white, are irregularly outlined and more or less confluent in different ways. (24) Eleven striking females with the spots irregularly outlined and thinly encircled by white differently confluent. (25) The most extreme reduction of white scaling around the irregularly outlined spots. Two specimens looking different from all the others. (26) Two magnificent aberrations in which the spots are widely confluent. In one of these females the confluence is so wide that in the middle zone of the forewings there are only two small white ocelli with a black pupil in each. This latter specimen reminds us of *Anthrocera ignifera*, Korb, that we took in Spain. (27) Along the costal margin of the forewings there is, in two females, a white line as in the males of the form No. 10. (28) In one fresh female the ground colour is pinkish instead of scarlet. (29) Five perfect females in which the anal zone of the hindwings is clear yellowish. (30) Similar to No. 29, but the lowest spots, instead of being rounded, as in most specimens, are large and ovoidal. Two specimens.—(31) The anal zone is even clearer than in the forms 29 and 30. Single specimen.—(32) The ten largest females of the series, 33 to 35 mm. (33) The smallest female, 24 mm. (34) The other four small females of the series 25 to 27 mm. Many females have a red ring on the abdomen.

In other Italian localities and in Spain and Greece we have taken a large number of *carniolica*, but there we did not find similar exuberant specimens nor so many showy forms (males Nos. 9 and 10; females Nos. 24 to 30). The race *florentina*, that we collected during eight years at Florence, is also variable, but in the opposite direction from *magnaustralis*, as there the spots are generally small, and there are frequently not only specimens lacking the apical crescents on the upperside, but there also occur some males and females five-spotted on both sides of the forewings. At Formia we have found a single male (No. 5) which is almost five-spotted above.

As most books of mine were lost when my home was ravaged by bombs, in Rome, I asked Mr Berio of Genoa to identify the individual forms. He has kindly done this, but as he has only read my descriptions without looking at the specimens, he says he is doubtful whether the names are correct: Forms 2, 3, 19, rounded spots thinly outlined with white *pseudocarniolica*, Rocci.; Forms 3, 18—reduced apical crescent: trans. ad *apennina*, G. F. Turati.; Forms 6, 21—apical crescent formed by a series of red spots with a few white scales, *intermedia*, Turati; Forms 9, 24, 25—irregularly outlined and confluent spots, *bohatschi*, Rocci.; Forms 10, 27—a white line along the costa of the forewings, not identified; Form 11—wide margin along the hindwings: *laticlavia*, Burgeff.; Forms 12, 28—pinkish ground colour: *carnea*, Rocci; Forms 13, 33—dwarf specimens: *minima* Rocci; Form 26—widest confluence of the spots: *jurassica*, Blachier; Forms 29—31: pinkish anal zone, not identified. (N.B. Clear and yellowish, not pinkish in text.)

Vindicio, Formia (Latina), Italy.

## GLAUCOPSYCHE LYSIMON AND CUPIDO MINIMUS.

By Dr Enzo Romei.

In the spring of 1925 I took at Sidi Mesri, near Tripoli, some *Glaucopsyche* that, compared with Hübner's figures of *lysimon* (1), looked to be co-specific but different chiefly in the wider extent of violaceus suffusion on the wings of the males and paler tinge of the females.

In June of the same year I collected on Sierra Nevada (Andalusia) near Jerez del Marquesado, 3000 feet, a few *lysimon* of the race that Oberthür named *vandalusica* (2). They were different from those of Tripolitania and very like Hübner's types reproducing Portuguese specimens. In 1927 Querci and his wife took in Portugal many *lysimon* both in the spring at Alcacer do Sal (Extremadura near the boundary with Alemtejo) at sea level, and afterwards close to Covilha, 2500 feet, on Serra da Estrela, where some *lysimon* were more or less on the wing from mid-June to the end of October. Those specimens varied in size, but their pattern was always similar both to that of type-figures and to that of the Andalusian specimens, never producing forms similar to those of *lysimon* from Sidi Mesri.

Before naming the presumed new African race, I paid attention to the one which Trimen (3) had named *knysna* as a new species, but which later (4) he referred to *lysimon* stating that: "The only differences presented by South African from European examples are an average larger size and a more distinct spotting on underside."

We have never seen any *lysimon* from South Africa, but we inferred that they should be different from those in North African countries because the latter are generally smaller than European ones, and because Oberthür (2), who had some *knysna* from Madagascar, noted that they were different from those of Algeria which do not differ from the ones of Sidi Mesri that I have named *volpii* (5).

Series of *volpii* co-types should be in both the British and Tring museums. I should be pleased if they were compared with some *knysna* to decide whether they are different, or not.

Bollow, in Seitz's supplement (6), writes: "Romei classifies as a separate race: *volpii* from Sidi Mesri in Tripoli. This is reported to vary considerably from the name type form so that the author is almost of the opinion that it is a separate species. Unfortunately, the description, which covers two pages, does not help one to form a correct opinion as to the exact appearance of the insect, as the treatise deals chiefly with extraneous matter such as references to Oberthür's books, etc., which are not very helpful. The butterfly is said to resemble specimens from Portugal which Querci has captured, but it is rather smaller. The male is a brighter and lighter violet in tone. The marginal band is lighter and more extended on all the wings than in the name type form. The insect can only be recognized when combined with a locality label." I note that Herr Bollow has not exactly translated my Italian diagnosis and that he could never understand what I have written because I have described a race of *Glaucopsyche lysimon*, Hübner, while Bollow considers *volpii* to be a race of *Cupido minimus*, Fuessli, although the name *lysimon* is printed both on the title and again three times in the following description.

At the end of Bollow's comment about *C. minimus* I also read: "The name established by Verity of *noguerae* is a *nomen nudum*. Verity indicated that *minima* is very rare in Spain; he has seen a specimen marked Sierra Nevada in South Kensington and he has named the race *noguerae*. This procedure designates better than any words what one must think of Mr Verity and his new races." This is another Bollow misunderstanding because the race *noguerae* has been named by Mr Haig-Thomas from specimens from Sierra Alta in Aragón (7) and not by Dr Verity from a single *minimus* taken on Sierra Nevada in Andalusia. My daughter, Dr Lycaena Romei, has already noted (while I lived in Somalia) this mistake of Bollow (8), but then she believed that Verity had published a note about *C. minimus noguerae*. Now I can add that, having asked Dr Verity where his note had been printed, he has written us: "I do not remember to have mentioned *noguerae* in any of my papers." Meanwhile, I see that Bollow's errors: "*Zizera minima volpii*, Rom." and *Zizera minima noguerae*, Ver." have been reproduced in Bang-Haas' Catalogus (9).

*References.*—(1) Hübner, *Samml. eur Schmett.*, 1804, ff. 534-535. (2) Oberthür, *Et. Lép. comp.* 1910, iv. p. 301. (3) Trimen, *Trans. Ent. Soc. London*, 1882, p. 222. (4) Trimen, *South Afr. Butt.*, 1887, ii, p. 45. (5) Romei, *E., Boll. Lab. Zool. Portici*, 1927, p. 275. (6) Bollow, in Seitz's Suppl., 1930, p. 252. (7) Haig-Thomas, *Ent. Rec.*, 1929, p. 46. (8) Romei, L., *Boll. Soc. Ent. Ital.* 1941, p. 62. (9) Bang-Haas, *Catalogus Lep.* (1937), p. 38, n. 110.

Vindicio, Formia (Latina), Italy.

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## ACENTROPUS NIVEUS, OLIV., IN NORTH LANCASHIRE.

By Albert E. Wright, F.R.E.S.

During the period of 26 years that I have resided at Grange-over-Sands and on many visits before doing so, I have only on one occasion seen this insect here. This was at the light of my window on the 29th July 1939, when in the space of ten minutes seven put in an appearance, 5 ♂♂ and 2 ♀♀. They were all in perfect condition, the ♂♂ were uniform in size, 14 mm., and the ♀♀ were 19 and 17 mm. Barrett, in his "British Lepidoptera," vol. ix, page 302, states: "I have even known a specimen enter the open window of a well-lighted room and fly around it in the wildest and most vigorous manner." This observation is very different to my experience when the moths entered the open window in a gentle and leisurely manner, and immediately settled down on the back of a couch within a foot of the entrance, and made no further progress towards the light. When I boxed them, they showed no alarm, and did not attempt to escape, but settled down quietly.

The following day I paid a visit to a park opposite my home, where there is a circular moat of stagnant water, which contains lilies and other water plants (but no *Potamogeton*) and I examined these carefully but was unable to find any trace that *niveus* had been there. The nearest habitats to Grange-over-Sands are at Witherslack (Westmorland), 5 miles away, and Holker Moss, Lancs., four miles away in the

opposite direction, so I can only surmise that the strange appearance at my light was a local migration. There does not appear to be any suitable place here for the aquatic habits of the larvae. I have not read in entomological magazines that migration has been suggested before for this species.

The moth appears to be very local in the North of England. The only records I possess are as follows:—

*Lancashire.* Mansbridge's revised edition of Ellis's list, published 1940, gives Holker Moss, 1935, common (Burrows) and the seven given above.

*Cheshire*, in Ellis's list. " Said to be common in the lake at Eaton Park near Chester, but I do not know the authority " (Ellis).

*Yorkshire.* Porritt's list, 2nd edition (1904). " Has occurred near York," see " Entomologist's Weekly Intelligence," vi, 171.

*Derbyshire.* H. C. Hayward's list (1926), Trent, Drakelow, and Willington.

*Westmorland.* Mansbridge's list (1940), Witherslack.

[Presumably these ♀♀ of *A. niveus* were fully winged, in which state they are rarely found. According to the latest research work by Danish entomologists, the normal food-plant of *A. niveus* is *Potamogeton canadensis*.—W. F.]

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## NOTES ON BRITISH ORTHOPTERA, 1945-46.

By J. A. Whellan, B.Sc.

The following notes continue those in the *Ent. Record*, Vol. LVII, p. 6. Localities recorded there are not repeated here.

*Tetrix subulata*, L. Surrey. In view of the recent recognition of *T. ceperoi*, I. Bol., as a British insect I checked that the Bookham specimen recorded above was named correctly. A few were seen in very wet ground bordering a pond on Shalford Common, but owing to the rapid escape of the only example I caught I could not be sure of the species in this case.

Bucks. Fairly plentiful in a damp ditch and by ponds on Dorney Common. Some were mature and others quite small on 25th August. The stunted form *Sahlbergi* occurred among the normal form.

Kent. A single winged example in a wet place on Swanscombe Marshes, 25th May.

*T. vittata*, Zett. Though most usually in very dry places, as barish slopes on chalk downs, I found this again in three unusuallly wet places —by Hatchett Pond, S. Hants., on damp ground by a sandpit at Betchworth, Surrey, and on the margin of Terrybank Tarn, Westmorland. In the last place I took one example with short antennal segments which may be *T. bipunctata*, L. Other localities were Surrey. Rather dry heathy ground at Byfleet. Common in a dry chalky field by Norbury Park and mature on 7th April. In grass and on bare ground at Tillingdown, near Caterham.

W. Lancs. Among heather on Winmarleigh Moss.

Westmorland. Grassy bank by Black Essett Plantation.

Middlesex. On bare chalky ground near Harefield.

*Stenobothrus lineatus*, Panzer. Though usually regarded as an insect of calcareous ground, I found this, not very plentifully, in a sandpit at Henfield, W. Sussex. It's stridulation, a clear note falling in pitch and strength, occurs at roughly one second intervals for several seconds, and is produced by a rather jerky alternate motion of the legs.

*Omocestus viridulus*, L. This insect I now think is definitely partial to damp conditions. It is the only common grasshopper in central Perthshire, and though often in apparently dry places the humidity of the atmosphere probably renders the conditions ecologically similar to evidently moist ones further south.

Surrey. In damp, grassy places, but rather rare at Byfleet. Tillingdown valley, in lush but quite dry herbage. Abundant in damp places on Westend Common.

W. Sussex. Abundant in damp ground at Amberley Wild Brooks.

W. Lancs. Roadside banks at Weeton. Open grassy land at Caldervale. St Annes golf links.

Mid-West Yorks. Malham Cove, mature on 8/6/46.

N.West Yorks and Westmorland. Abundant in the Sedbergh district, ascending to 1500 ft. at Cautley Spout.

Westmorland. Abundant on Hale Moss and at Terrybank Tarn.

Cumberland. Abundant in Borrowdale.

E. Perth. Up to 1200 ft. in heather on Ben Vrackie.

Mid Perth. In many grassy places often among *Agrostis tenuis*, between Pitlochry and Loch Tummel.

*Myrmeleotettix maculatus*, Thunb. Almost invariably an insect of very dry ground, I was surprised to find a single nymph in quite a damp locality in heather at 1500 ft. on Ben Vrackie, East Perth. Though not recorded for Perth by Burr, Lucas gives Aberfoyle (West Perth) and Glen Farg (Mid Perth).

E. Kent. Abundant on dunes and mature on 13th June.

S. Hants. Dry places on Beaulieu Heath.

W. Sussex. Abundant amongst sparse Arrhenatherum grass on the beach at Shoreham.

Surrey. Very abundant on Shirley Hills. Rather local and not plentiful on Box Hill.

*Chorthippus bicolor*, Charp. Mature on 22nd June at Byfleet. Probably the most abundant species in S. England. In general my idea that it likes drier ground than *Ch. parallelus* was borne out, yet in a dry, grassy field at Shirley, Surrey, where I observed grasshoppers almost daily, *Ch. parallelus* was much the commoner of the two and delighted, with *Ch. bicolor*, to bask on the sun-baked side of a wooden hut and stridulate. On 31st October, a fine, warm day after a week of cold, wet weather with violent gales, I was surprised to find *Ch. bicolor* hardly less plentiful here than in the summer. The males were stridulating vigorously, zzz-zzz-zzz, at about two second intervals, each zzz being produced by several very rapid strokes of the legs and thus being really several notes running together. Moreover, several males were assiduously pursuing females, doubtless with the idea of mating but they always were violently kicked away when near the female, only to resume the pursuit which was sometimes quite rapid. The numerical superiority of *Ch. parallelus* had now quite disappeared as I saw only

one female. No later observations were made here but *bicolor* would doubtless remain for some days more.

W. Kent. In long grass, mainly Agropyron, on the river wall at Gravesend with *Ch. albomarginatus*, which was much more plentiful.

W. Sussex. Damp sandpit at Henfield, not very plentiful.

E. Sussex. Abundant on downs above Kingston by Lewes.

Surrey. Merstham Downs. Edge of Westend Common. Grassy roadsides at Broadmoor. Shalford Common. Ashtead Common. Upland meadow at Shirley. All in dry grass. Heathery places at Byfleet. Dry stubble field near Normandy. Dry slopes of Box Hill.

Bucks. Rare on Dorney Common in wet grass and the only Acridian seen.

S. Hants. Rather damp place on Beaulieu Heath.

Middlesex. Roadsides and dry broken ground at Harefield.

N. Essex. Abundant in dry roadside grass at Cressing and Bishop's Stortford.

W. Lancs. Abundant in the sand-dunes at St Annes and the only grasshopper occurring there. Mature on 30/6/46.

Isle of Man. Abundant on recently burnt ground at Dhoon Glen. All the examples were very dark, some almost completely black.

*Ch. parallelus*, Zett. The stridulation may be described as dze-dze-dzer-dzer—about twelve times, the first chirp scarcely audible building up to a maintained maximum about the sixth chirp. The chirps occur at about half-second intervals and each is normally produced by one rub of both legs together. More rarely the chirp interval is halved by rubbing the legs alternately, producing a much more rapid song, composed, however, of about the normal number of chirps. The degree of frequency of the song seems irregular. Males and females within a foot seem to keep still during the song but otherwise to remain unaffected by it.

Surrey. Rather dry meadow at Shirley associated with but much less common than *Ch. bicolor* and *Ch. albomarginatus*, both of which were abundant. This is the only time I have found it and *Ch. albomarginatus* together, but it is sufficient to prove that they are not quite mutually exclusive as suggested by Burr, *Ent. Rec.*, Vol. 51, p. 48. Normally it is the commonest grasshopper on the grassy slopes of chalk downs but on the dry slopes of Box Hill, which would seem very suitable for it, it is much less common than *Gomphoceros rufus* and *Stenobothrus lineatus*, perhaps being squeezed out by these more local species, which ars so abundant there.

Abundant in Tillingdown Valley in long grass. In lank grass by Broadmoor Ponds. Wetter part of Westend Common, including one macropterous individual. Abundant at Ashtead Common. Grassy places at Byfleet, mature on 22nd June. Rough grassy ground at Shirley.

E. Sussex. Damp sandpit at Henfield, the most abundant species.

Cumberland. Rarely in a wet place in Borrowdale.

W. Sussex. Downs above Kingston by Lewes.

Middlesex. Harefield Downs.

E. Perth. At 1200 ft. in heather on Ben Vrackie, fairly commonly.

In all the downland localities except Box Hill this was the most abundant species.

*Chorthippus* ssp. *albomarginatus*, De Geer. Nymphs were very small at Swanscombe on 21st May and only one mature example was seen at Stone on 30th June. It varies much less than *Ch. bicolor* and at Allhallows I estimated at least 90 per cent. to be the normal fawn colour, pale rubiginosa, the remainder mainly hyalosuperficies and one each porphyrica and near fuliginosa. The same was observed at Gravesend, where again one porphyrica was seen. The stridulation ts-ts-ts-ts-ts lasting about a second has the timbre of that of the other *Chorthippus* species. With rare exceptions an insect of long grass where it is often quite the dominant species almost to the exclusion of other Acrididae as on the Thames sea-wall. Though still present, its numbers had greatly diminished by 29th September at Gravesend.

W. Kent. Abundant on the sea-wall at Allhallows, Gravesend, Swanscombe, and Stone.

E. Sussex. Abundant in Lewes Levels.

W. Sussex. Abundant at Amberley Wild Brooks in wet grass.

Surrey. Abundant in an ordinary meadow at Shirley.

Cambridge. Abundant in Wicken Fen.

*Gomphocerus rufus*, L. Surrey. Occasional in lush herbage in Tillingdown Valley. Abundant on Box Hill, and one nymph of the forma *porphyrica* was seen during the L.N.H.S. excursion in 1946, the only example I have seen which was not the uniform brown *rubiginosa*.

*Meconema thalassina*, Fab. Surrey. Working Ashtead Woods with R. M. Payne we beat four examples from mature oaks in 2½ hours, evenly spread over the woods. At first I took this to mean that the species was rather rare there but subsequently, observing how easily it walked upside down on the lids of glass-topped tins, and how difficult it was to dislodge therefrom by sudden jarring, features I have not observed in other species, conclude that this faculty enables it to withstand beating. One female was also found sitting on an oak trunk about 10 ft. above the ground at Shirley.

*Pholidoptera griseo-aptera*, De Geer. A small nymph was seen on 9/5/45 on bramble near Chadwell St Mary, S. Essex, the first mature one on 22/7/45, and it was still common at Horne, Surrey, on 14/10/45. Other localities were Ripley, Normandy, Box Hill and Ashtead in Surrey, Southease in E. Sussex and Houghton Bridge in W. Sussex.

*Platycleis occidentalis*, Znr. Well-grown nymphs were common in dry grass bordering the dunes at Sandwich, E. Kent, on 13/6/45, and fed readily on various grasses, one maturing on 13/7/45.

*Metrioptera brachyptera*, L. At Byfleet the stridulation was heard, tss-tss-tss recalling that of *Pholidoptera griseo-aptera* but fainter. Two colour forms were present, one with a considerable amount of green on the elytra and other light parts, the other, which was much less numerous, an almost uniform leaden brown. Neither was quite like the form from the much drier locality at Thursley Common in which the general coloration was a rather rich brownish red. I saw one insect on a bramble stem by the Byfleet canal which had long greenish elytra exceeding the abdomen and I feel sure it was a macropterous example but he saw me at much the same time as I saw him and proceeded without delay into the undergrowth where I was unable to trace him.

W. Lancs. I was surprised to find this quite abundantly on the remnant of Winmarleigh Moss. The locality is essentially similar to the Yorkshire Thorne Waste, where the species has been known since Dale's time, and I have little doubt that, though this is, as far as I am aware, the first Lancashire record, the species has occurred, and in many cases still does, on most of the mosses in Lancashire and Cheshire.

*Roeseliana roeselii*, Hgb. This I found abundantly by the Thames estuary at Allhallows-on-Sea and Gravesend, W. Kent, and Tilbury, S. Essex. In all cases, as previously observed, their habitat was in long dry grass, in one case *Agropyron* on a raised bank crossing a salt-marsh. On 15/7/45 at Allhallows I saw only one nymph. The pronotal margin of all the adults was fawn, yet at this date many must have been more or less teneral, so that a green coloration can hardly indicate a teneral condition. The nymph, which appeared quite healthy, and four adults were enclosed in a jar overnight with grass. The following morning the nymph had been completely devoured. I thereupon isolated the adults and subsequently they fed freely on grass. At Gravesend on 29th September none were seen or even heard although conditions were favourable, so it seems that they had died off by this date.

*Tettigonia viridissima*, L. Nymphs were fairly common in a dry grassy place at Sandwich, E. Kent, on 13/8/45 and fed readily on grass.

*Conocephalus dorsalis*, Thunb. At Allhallows-on-Sea on 15/7/45 this insect occurred rather sparingly on a raised bank crossing a salt-marsh. I saw only one mature, a female. Though more sluggish than most locustids, the tendency to plunge downwards on the least disturbance was equally well marked, making capture difficult (I have since noticed that this tendency is equally apparent in S. Rhodesian species.) Although Burr, *Ent. Rec.*, LI, p. 48, says it requires a stem with pith in which to oviposit, on this bank only grasses, chiefly *Agropyron*, were present. The stridulation is a long-continued reeling note, reminiscent of that of *Roeselii* but fainter and higher pitched. At Wicken Fen, Cambs., this is perhaps the most abundant of *Orthoptera* and stridulates freely even in dull weather. It was also found in W. Sussex abundantly at Amberley Wild Brooks, and less plentifully in a rushy place by the Arun south of Amberley. In all cases the localities were decidedly wet.

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## COLLECTING NOTES.

The Clouded Yellow in Bury and Anglesey.—I would like to put on record the fact that yesterday evening when I was out collecting "small coppers," I saw a male clouded yellow in good condition fly out of a bramble bush. I have no records of this butterfly being found in this or neighbouring districts before. This must be a marvellous year for butterflies. When I was in Anglesey a week ago, the cliffs were a mass of butterflies, the Clouded Yellow being by no means uncommon.—N. M. Bailey, Bury, Lancs., 25.viii.47.

COLIAS CROCEUS IN SOUTH YORKSHIRE.—Since a visit of this butterfly to our district is a rare event I should like to record its recent occurrence here. At least a dozen specimens were observed in the near vicinity of Rotherham between the dates 10th-18th August.—T. D. FEARNEHOUGH, 25 Ramsey Road, Sheffield.

UNUSUAL FOOD-PLANT OF DIACRISIA LUTEA, HUFN.—For the last thirty years or so *D. lutea* has occurred in my backyard, the larvae feeding on Fig. This year imagines turned up as usual but the fig trees were entirely free of larvae. Eventually they were discovered feeding on Lily-of-the-Valley (*Convallaria majalis*, L.).

This is not the first occasion that I have found larvae of the *Arctiinae* on Monocotyledons. In India I have found larvae of *Creatonotus transiens*, Wlk., feeding on Grasses, and there is a record of *Amsacta moorei*. Btlr., being an actual pest on cereals in the Bombay Presidency.—D. G. SEVASTOPULO, F.R.E.S., London, 7.viii.47.

AN ABERRATION OF APHANTOPUS HYPERANTUS.—On 24th July 1947, near Balcombe, Sussex (Forest Ridge district), I captured an example of *Aphantopus hyperantus* with the underside var *arete*, Müller. It is a ♀, and is very similar to that figured in *Butterflies* (Ford, 1945) on Pl. 32, fig. 8, but the ground colour is darker. Ford mentions, on p. 222, that "specimens possessing reduced rings (on the underside) are often referred to as var. *arete*, and those with the dots only as var. *caeca*, Fuchs." But, as he says, var. *caeca* is a name generally reserved for varieties of butterflies with immaculate undersides. So I consider myself correct in naming this specimen var. *arete*, and not var. *caeca*, as it possesses only dots on the underside.—R. J. R. LEVETT, Netheroak, Balcombe, Sussex, 28th July 1947.

THE MIGRATORY LOCUST, AND THE SYRPHID FLY, VOLUCELLA ZONARIA, PODA, IN THE ISLE OF WIGHT. — When crossing St Boniface Down, 6.viii.1946, I heard a swish and saw a grass stem bend about six feet away. Hastily placing my net over the spot, I got down to investigate. Seeing what was in the net I remarked to my wife and a friend: "If I have not got a Locust here I shall be greatly surprised." On submitting it to Dr Urarov he confirmed my suspicion and identified it as *Locusta migratoria*.

On 6th September 1946, an acquaintance came along with a specimen of *Volucella zonaria*, Poda, from W Cowes. When asked why he caught it, not being a Naturalist, he said he was struck by its behaviour: he heard it knock against the window two or three times as if trying to get in the room. Thinking it was a curious wasp he went outside and, placing a cigarette carton over it, he closed it in and thought I might like it.

Since I have been on the island I have taken about eight examples of *V. inanis*, L., *V. bombylans*, L., and *V. pellucens*, L. are not so common on the island as I found them in the Midlands; the last I bred from a nest of *Vespa vulgaris*, L., in 1946. — J. W. SAUNT, E. Cowes, 1.v.1947.

Scents in Moths.—Whilst many male moths are well provided with secondary sexual characteristics in the form of tufts of hair on the legs, wings or abdomen, very few records appear to exist of these hair tufts producing any scent. The following two Indian records may, therefore, be of interest.

*Acherontia styx*, Westw. (Sphingidae).—The tufts from the underside of the abdomen give off a strong, pungent scent, generally reminiscent of one of the aromatic umbellifers, but it could not be recognised specifically.

*Catephia linteola*, Guen. (Noctuidae).—Hampson, in the *Fauna of British India*, Moths, ii, writes: "Fore legs in male with thick tufts of scales from coxae, and very long fringe of hair from femora and tibiae." These scales are long and ribbon-like, and chestnut in colour. When the leg is straightened and the scale tuft exposed, it emits a strong scent of burnt almonds. I was unable to detect this scent when the leg was folded and the tuft concealed.—D. G. Sevastopulo, F.R.E.S.

N. polychloros and C. hyale in the Swanage District.—It may be worth recording that 2 *N. polychloros* were seen on 28th July, and 4 *C. hyale* on 3rd August. *V. cardui* and *V. atalanta* have been very abundant, and in perfect condition, evidently the offspring of the many worn specimens seen in June. On 13th and 14th August *M. stellatarum* appeared in hundreds. It is the largest concentration I have ever seen of this species.—Leonard Tatchell, 27th August 1947.

C. croceus in the Isle of Purbeck.—This species has been abundant all over the Isle this past month. From Studland to Kimmeridge following the coast line it was to be met with all the way, particularly at Studland, Anvil Light House ravine and Winspit Slopes. August the 3rd was the great day. When walking through a large field overlooking the sea 200 passed me in less than an hour; only 8 var. *helice* were observed, 4 of which were captured. Most of the specimens seen were coming in from the S.E.—Leonard Tatchell, 26th August 1947.

## CURRENT NOTES.

Letters are reaching me regarding the action of the Royal Entomological Society of London increasing the annual subscription of the Society from two to three guineas. It seems a most ungracious attitude to the older fellows who are standing through two inflations. Most of them took part in the raising of the status of the Society some twenty years ago.

This is backed by a bribe to the younger generation to join the Society. Does the University ask for students who have not gone through the schools? It is a move which will damage our local societies whose members have mainly helped to raise the status of the R.E.S. for many years past.

Is the Society in want of funds? Surely not while they publish so much of microscopic work containing only the least modicum of biologi-

cal information all soused in genitalic jargon, the whole rarely enlightened by figures of the beasties being added. It seems an age of retrograde action.—Hy. J. T.

The magazine of the Vienna Entomological Society (*Zeit. des Wien. Entomolog. Gesell.*) is the first of the German-speaking countries to endeavour to continue their exchange of publications. We have received the issues from 1940 to 1945 and the continuation is promised. Many plates have been issued and long articles are published on the Micro-Lepidoptera.

We should like to have short " Current Notes " from Entomologists in touch with the many areas occupied (supposedly temporary) by the military during the war. We understand some (a very few) are wholly given up; others only part returned to the public; others still in occupation will apparently be retained permanently.

Braunton Burrows, 700 acres, not yet released; is this the best for observation of bird and insect? Portions of Dartmoor are opened; are they all the area taken over at the outbreak of war? The Isle of Purbeck is a very special Natural History area; the report is that it is to be closed permanently. Of the great Ashdown Forest area nothing seems to be known. Netly Heath, on top of the North Downs, where I was " arrested," examined, etc., early in the war, when I attempted to go through the huge dump, is freed again, but not safe with the debris of barbed wire, etc. The other Surrey dump near Leith Hill blew up, but not by enemy action. In January 1947 576,000 acres was still occupied by the Authorities.—Hy. J. T.

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Correction.—No. 6, page 78, line 32; alter " 37 " to " 7," as the *antidiscoelongata* had seven elongated submedian spots on each frontwing.—H. A. Leeds.

# EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr HY. J. TURNER, "Latemar," West Drive, Cheam.

*Wanted*—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Instituto Miguel Lillo, Calle Miguel Lillo 205, Tucuman, Republica Argentina.*

*Desiderata*—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—*H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.*

*Wanted.*—*Lycaena* (*Heodes*) *phlaeas* from all regions including British Isles. Also wanted other species of Chrysophanids from all areas. Exchange or purchase considered. *Duplicates.*—Foreign Lepidoptera, e.g., Satyrids, Charaxes, Papilios, and others; full lists sent.—*P. Siviter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.*

*Wanted* for cash or exchange many species of ova, larvae or pupae, especially local forms and *A. grossulariata* from different localities, also Seitz Vol. 1 and Supplements to Vols. 1-4. Offers also, Tutt's *Practical Hints*, Parts 1 and 2, Buckler's larvae, Vols. 1-6, and Tutt's *British Noctua*, Vols. 2, 3, and 4.—*Dr J. N. Pickard, F.R.S.E., 36 Storeys Way, Cambridge.*

*Wanted.*—Various monthly parts of *Entomologist's Record* for 1914, 1915, 1916, 1917, 1919, and 1920. Please report any odd monthly parts (in wrappers as issued) prior to these years.—*P. B. M. Allan, 4 Windhill, Bishop's Stortford, Herts.*

*Wanted.*—Males of *Morpha menelaus, M. didius, M. rhetenor* in papers.—*Leonard Tatchell, Rockleigh Cottage, Swanage, Dorset.*

*Wanted* urgently for experimental purposes, pupae of *betularia, porcellus elephanor.—Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.*

*Wanted*, set or in papers: *Apatura iris, Vanessa polychloros, Argynnis adippe* and *aglaia, Melitaea cinxia, Erebia epiphron* and *aethiops, Coenonympha tiphon, Thecla betulae, T. pruni* and *w-album, Lycaena astrarche* and *artaxerxes, Lyc. arion, Nemeobius lucina, Adopoea lineola* and *actaeon, Angiades comma, Cyclopides palaemon.* In exchange for other British and foreign species.—*Chas. B. Antram, Clay Copse, Sway, Lymington, Hants.*

*Wanted*, British butterflies, set or in papers, in exchange for *Morpho papirius, Morpho didama, and other Morphos.—Chas. B. Antram, Clay Copse, Sway, Lymington, Hants.*

*Wanted.*—Various Books on Lepidoptera. Please send lists and price. Also wanted, Live Exotic and English Lepidopterous Material for cash or exchange for similar material or Set English Imagines.—*J. K. Goody, "Weldon," 26 Carr Wood Road, Bramhall, Ches.*

*Sale or Exchange—R.E.S. Trans. and Proceed.*; bound, 1911 to 1916, 1918 to 1919; unbound, 1921 to 1923, 1925; also 1917 and 1924 less part 5. New Series—*Trans.*, Vols. 1 and 2, Vol. 3, part 1. *Proceed.*, Vol. 1 and Vol. 2, part 3. *Trans. Suffolk Naturalist Society*, Vol. 3 and Vol. 4, part 1. *Wanted*, bound or unbound, *Entomologist*, Vols. 2 and 3, 1926 to 1930, 1940 to 1942. *Ent. Mont. Mag.*, 1922, and 1924 to 1942; also various volumes of *R.E.S. Trans.* List on application.—*F. W. Smith, Boreland of Southwick, by Dumfries.*

*Wanted*, for experimental purposes, a few pupae of *Endromis versicolora*, purchase or exchange.—*R. W. Parfitt, 1 Dunsdon Avenue, Guildford, Surrey.*

*Wanted.*—Spuler's *Die Schmetterlinge Europas*, Vol. I. Various unbound parts containing pages 1-144, and I-XVI with plates as issued. *Exchange.*—Various numbers of the *Entomologist's Record* and *Entomologist.—S. Wakely, 36 Stradella Road, Herne Hill, London, S.E.24.*

*Wanted.*—Volume V (five) of Tutt's *British Lepidoptera.—T. R. Eagles, 32 Abbey Road, Enfield, Middlesex.*

## MEETINGS OF SOCIETIES.

*Royal Entomological Society of London*, 41 Queen's Gate, S.W.7.: October 1st and 15th, at 5.40 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section*: Last Fridays in month, at 7 p.m., at the Birmingham Museum and Art Gallery. Particulars from the Hon. Secretary, G. B. Manly, 72 Tenbury Road, King's Heath, Birmingham, 14.

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*Communications received*:—Thomas Greer, Fergus J. O'Rourke, O. Querci, H. Donisthorpe, Malcolm Burr, Surg.-Lt. Comm. H. M. Darlow, D. G. Sevastopulo, D. Fearnehough, R. J. R. Levett, E. C. S. Blathwayt, E. P. Wiltshire, A. E. Wright.

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OCTOBER 1947

# ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION



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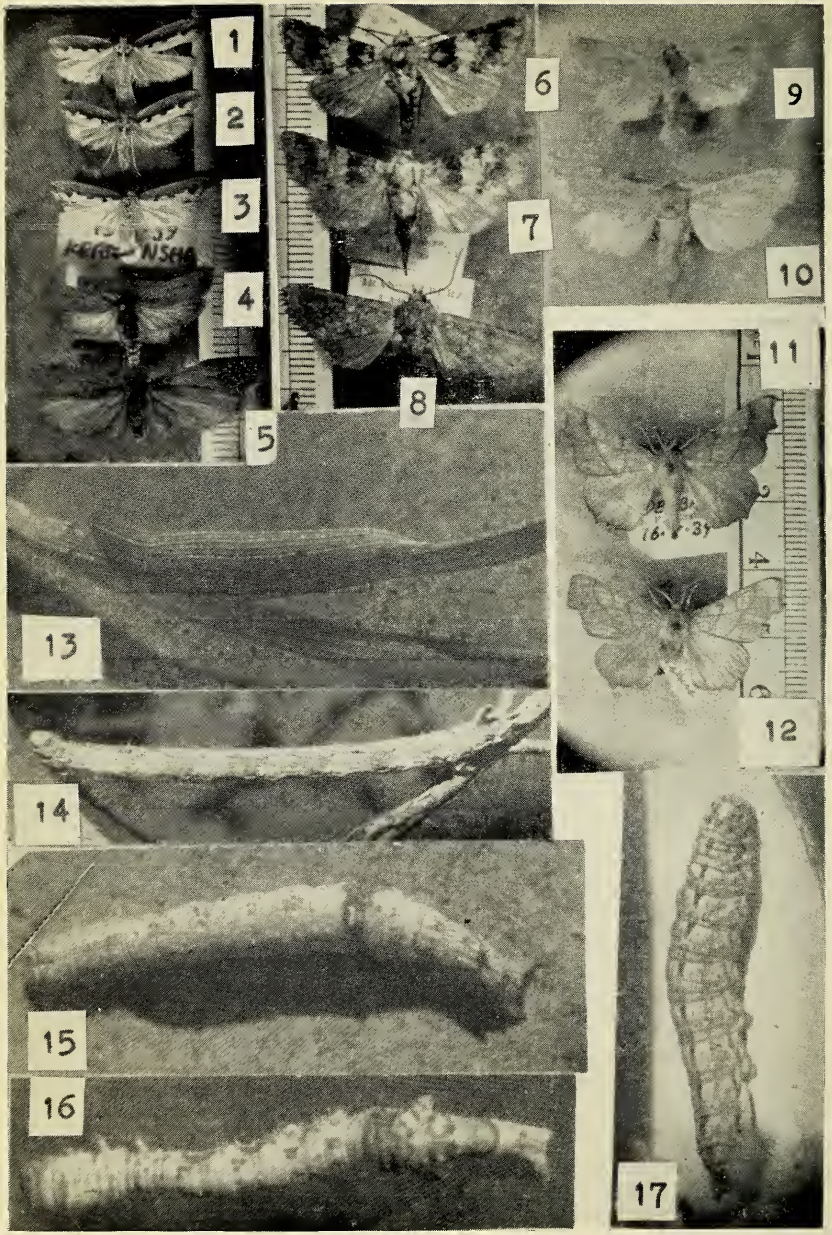



*Photo by E. P. W.*

# MIDDLE EAST LEPIDOPTERA, VIII: SOME MORE NEW SPECIES AND FORMS FROM IRAN.

By E. P. Wiltshire, F.R.E.S.

Plate V.

The sixth and seventh articles in this taxonomic series described material caught by others in Arabia and Egypt and appear in *Bull. Soc. Fouad I d'Ent.* (Cairo), 1947. In the present article I return to material taken by myself in Iran (Persia). The plate illustrating the new species and forms also illustrates my immediately following article: "Early stages of Oriental Palearctic Lepidoptera, IX."

Agrotidae, Hadeninae.

*Hadena nana*, Hufn. (=*dentina*, Esp.), f. *monotona*, f.n. (Fig. 8).

This form, probably the Elburz race, is larger and more monotonous than f. *reducta*, Rebel; it has a dull olive forewing with slightly paler stigmata and band-lunules, but none of the blackish-purple and whitish markings of the nymotypical form except for one or two black proximal wedges of the submarginal line; the median field is concolorous, not darker. Consequently its specific identity can only be discerned from the genitalia. The hindwing is dull brown, and the underside similar.

Span: 36 mm.

Holotype:—♂, 6-13.vii.39, c. 9000 ft., Lar valley, Elburz Mts., N. Iran.

*Harmodia* (=*Dianthoecia*) **gladys**, sp. n. (Figs. 6 and 7.)

*Antenna*, ♂ ♀, setose-ciliate.

Thorax, grey or whitish-grey.

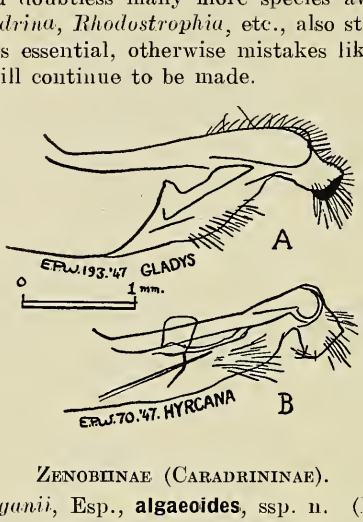
Forewing, median field pure white; elsewhere, obscured with greyish and orange scales. Cross-lines, black, wavy. A broad band of slate-blue or blackish scales before the ante-median line. Orbicular and reniform stigmata, white, the latter partly obscured by greyish scales; the former can have a grey centre. Marginal field, marked as in *caesia*, *hyrcana*, and *cimelia* Brandt. Hindwing, grey, with darker marginal band.

Span: 34 mm.

Holotype and Allotypes: ♂ ♀, c. 9000 ft., 6-13.vii.39, Lar valley, Elburz Mts., N. Iran.

This new species comes in the *caesia* group near *mesolampra*, Brandt, and is best distinguished by the male genitalia (valva-shape). Figs. a and b show the difference between its valva and that of *hyrcana*, Draudt. It is perhaps closest to *H. pfeifferi*, Draudt, though very different in facies, and vesica. The types were taken together with a greater number of *hyrcana*, which is very variable. I consider the record, by Draudt-Seitz and by Schwingenschuss, of *caesia-atlantis* from N. Persia to be an error and to refer to the rosy form of *hyrcana*, Draudt. At Lar this rosy form outnumbers the olive form (typical *hyrcana*). The genitalia show clearly that these forms are one species and distinct from *caesia*; Draudt, however, has not published in his *Harmodia*-revision (*Ent. Rundsch.*, *50-51* (1933-4)) a picture of the genitalia of *hyrcana*, nor have I been able to examine a type; however, he identified the above olive Elburz forms as *hyrcana*, so there is little doubt of their identity. According to Brandt both *mesolampra*, Brandt,

and *cimelia*, Brandt, have distinct genitalia from the two here shown. This group is evidently richly represented on the Anatolian-Iranian plateau peaks, and doubtless many more species await discovery. As in the genera *Caradrina*, *Rhodostrophia*, etc., also strong there, a study of their genitalia is essential, otherwise mistakes like the record of *H. caesia* from Iran will continue to be made.




ZENOBIINAE (CARADRININAE).

*Archanara sparganii*, Esp., **algaeoides**, ssp. n. (Figs. 9 and 10.)

♂, forewing, pale rosy-buff with grey suffusion especially close to the nervures near the cell. There are never two or three black spots in a line as in typical *sparganii*; in some specimens there is faint grey spot at the corner; the terminal dots, when present, are faint and grey. The dots on the nervures representing the ante- and post-median lines are clearest, as in *algae*, Esp., but these too are sometimes missing. Fringes, pale pink. Underside, strongly grey-suffused, leaving the costa and nervures paler pink-brown.

Hindwing, dirty whitish, paler submarginally. Post-median line indicated in some specimens by grey smudges on nervures.

♀, paler, i.e., less rosy and less grey-suffused; otherwise similar.

Span: 29-34 mm.

Holotypes and Allotypes: ♂♀, 19.vi.41, c. 5500 ft., Shiraz, Fars, S.W. Iran, along a marshy mountain stream. In coll. m.

Paratypes: ♂♂♂♂, 12 and 19.vi, ditto.

Like the Syrian form, which has no special name, this race is smaller and rosier than the European, but, as its name implies, resembles *algae*, Esp. (=*cannae*, O.) rather than typical *sparganii*. The adult can be distinguished from *algae* by the genitalia. My records of *algae* from Iran, therefore (February 1944 and July 1945) (*Ent. Rec.*, *56* and *57*), should be corrected.

GEOMETRIDAE.

Notes on the *Ennomos fuscantaria*, Steph., group.

Before examining the genitalia of my Tehran specimens of this group (see *Ent. Rec.*, *57* (1945), p. 84, and *58* (1946), p. 84) there seemed no doubt that these were correctly determined, especially since Prout had determined Brandt's Persian specimens as *fuscantaria algeriensis*, Prout, and the facies of mine did not correspond with that of "*effractaria*, Freyer" (see Wehrli, 1934, *Mitt. d. Muench. Ent. Ges.*, *24*, H. 2,

p. 38, and *Seitz*, Suppt., Vol. IV, pl. 24), but agreed closely with *fuscantaria*, some of them being exactly like the figure of subsp. algeriensis, Prout, on the *Seitz* plate referred to above, the series varying, like European *fuscantaria*, to include var. *effuscaria*, Rebel. Wehrli distinguished his Turkish "*effractaria*" specifically from *fuscantaria* by the more numerous small spines on the aedeagus and the narrower scobinated gnathos with a comb-like projection lacking in *fuscantaria*, among other characters. On examining the male genitalia of my Tehran form I found these to agree with what Wehrli said of his Turkish species. I also found, on examining the moth so like *erosaria*, Schiff., from Shiraz (see *Ent. Rec.*, *57*, p. 84, and *58*, p. 84) that despite the different facies this had identical if rather smaller genitalia. Therefore neither the Tehran nor the Shiraz form are *fuscantaria*, and both require names.

Whether Wehrli's Turkish form is really *effractaria*, Freyer, seems to me still not proved, for (1) Wehrli does not say he saw Freyer's type, (2) he says Freyer's plate represents an aberration, (3) Freyer's type was bred from a larva found on alder at Sarepta (=Stalingrad), and (4) there is no alder at Tehran or Shiraz. Perhaps therefore the Anatolian-Iranian species recognised by Wehrli and here under discussion has no valid name yet, in which case the first of the two following names must become the specific name.

*Ennomos* (? *effractaria*, Freyer, subsp.) **fraxineti**, n. (Plate , Fig. ).

Differs from the Anatolian form by its forewing upperside suffusion which is very like that of *fuscantaria*, Steph. Two fasciae clearly visible. Hindwing with fascia visible except near costa; margin slightly less indented than that of *fuscantaria*. Forewing underside, costa not invaded by the darker submarginal colouring basad of the postmedian fascia, which reaches the costa at an angle less than 90°. The orange-brown discal spot typical of *fuscantaria* is absent. Hindwing underside also without discal spot; the marginal field is suffused with brown and there is a similar suffusion close to the fascia which crosses the fork of nervures 6 and 7; in *fuscantaria* this fascia is obsolete and crosses these veins above their fork. Male genitalia, see above.

Expanse, 33-35 mm.

Holotype and paratype, ♂♂, in coll. m., 16.viii.39, Derband, near Tehran (6000 ft., oasis biotope), and 25.vi.39, Tehran, 5000 ft., garden with many ash-trees. A third male corresponds to ab. *effuscaria*, Rebel, of *fuscantaria*, Steph., and can be called ab. **effuscaria**, ab. n., of this species:—30.vi.39, Tehran, as above. In coll. m.

*Ennomos* (?*effractaria*, Freyer, subsp. or f.) **zandi**, n.

This may be an aberration or a race; in the absence of more than one specimen from Shiraz, I cannot say which. ♂, forewing, devoid of darker suffusion, and resembling that of *erosaria*, Schiff.; uniformly orange-yellow with darker orange fasciae. From ab. *effuscaria*, Wilts., it differs by its more uniform and warmer yellow colour; also, the antemedian fascia is bent at right angles on the cell and the postmedian fascia is gently curved inwards below the cell. Length of forewing costa: 15 mm.

Holotype: ♂, in coll. m., 25.vii.41, Shiraz, 5000 ft. (garden, with abundant *Fraxinus*, *Populus*, etc.), S.W. Iran.

*(To be concluded.)*

## MORE NOTES ON TURKISH DERMAPTERA,

By Malcolm Burr, D.Sc., F.R.E.S.

The discovery of two new species of earwig by the same person, in the same country in the Palaearctic Region and in the same year is a most unusual event, if not unique. One of these, *Forficula hincksi*, Burr, is one of the regular Mediterranean earwigs, analogous to *F. lesnei*, Finot, *F. pubescens*, *F. aetolica* and *F. kasnakovi*, but the discovery of *Pseudisolabis* ssp. *kosswigi*, Burr, is an outstanding event, owing to the geographical distribution of this little known genus. The species were both described and discussed by me in the *Trans. R. Ent. Soc.* this summer.

Professor Kosswig told me that he found the original pair under stones near the highest spring on Mt. Honos, in the *vilayet* of Denizli, in south-western Turkey; he turned over a great many stones, without finding any more. Afterwards he found the species further south, one under the stones of an old ruin in open country.

It was with great hopes of finding a colony and securing a good series that I went to another mountain, Bozdagh, not far from the original Honos dagh. There are at least two, probably more, mountains of this name in southern Turkey; the best known is near Ödemish, not far from Izmir, and there is a Bozdoghan south of Aydin. The Bozdagh that I visited is about 50 kms. south of Denizli, and is marked on some maps as Bordagh. The word Bozdagh means Grey Mountain.

My companion, Mr Peter Davis, a most energetic botanist, and I camped at the village of Abas, at about 1100 m. above the sea.

The spot looked very promising. It was in the lower part of the zone of *Pinus brutea*, well watered by a copious brook that was trained down through the village. On the more or less open ground around there were plenty of nice, big flat stones. So, full of hope, I started turning them over. But this was heavy work, and fatiguing, especially when not crowned with any success, for I did not find a trace of an earwig, and, in fact, very little life at all. So I lay down to rest a little alongside the bubbling brook, the music of which lulled me into a gentle slumber. Presently I awoke with a start and caught sight of a small insect running across my leg. I pounced on it and found it was a female of *Ps. koswigi*.

During the three days collecting on Bozdagh I turned over a really considerable number of stones, all in the neighbourhood of water, for earwigs require moisture, but not a sign of another specimen did I see.

I enlisted the services of some village boys, who hunted in their gardens and vineyards and brought me *E. auricularia*, some *F. lurida*, the common Levantine earwig, and a female *F. smyrnensis*, a handsome insect, which I had not previously seen alive. There were also several *F. hincksi*, an interesting find, as until then it had been known only from Silifke, on the south coast, where Professor Kosswig discovered it. Mr Davis, seeing this, told me he had found one among his flower presses at Ankara, and succeeded in producing the specimen and a fragment. This was interesting, because I had no doubt that it was a female *F. hincksi*, while the fragment was undoubtedly a male forceps, thus extending its range right up into the central plateau.

Our next mountain was Sandrsdagh, in the southern part of the *vilayet* of Mughla. In contradistinction to Bozdagh, which is limestone, Sandrsdagh consists entirely of serpentine, metamorphic schists and quartzites, with no lime at all, and so has a different flora. Here, too, I hunted diligently for *Ps. kosswigi*, but here again hard work was not rewarded, and it was chance that came to the rescue, for Davis found a single female in his tent at Gökce Ova, at an altitude of 1760 m. As this was on 22nd July, and we had left Bozdagh on the 17th, I think it very unlikely that the insect had been brought in the baggage and survived, and we can fairly suppose, I think, that it occurs also on Sandrsdagh.

The only other earwig I procured on that very interesting mountain was a single *F. auricularia* from the village of Aghla, at 800 m. I promised the village boys good *bakhshish*, and showed them an earwig, but they brought all sorts of rubbish, and were not half so smart as the boys at Abas.

Fethiye on the south coast seemed promising, and I spent several days there, doing a good deal of sweeping, but failed to find a single earwig.

From the south I moved up to the central plain and on 13th August Tevfik Bey Karabagh, a very keen young Turkish orthopterist, took me to a favourite collecting spot of his called Haci (Hadji) Kadin Dere, that is, the Glen of the Lady Pilgrim. The brook was dry and it was no longer so teeming with life as it had been when Davis was there in early July. The season is over early on the steppe. Even the numerous little susliks must have been aestivating, for I was surprised not to see any popping about. In this glen I swept a clump of *Saponaria officinalis*, and was rewarded by getting a big series of undoubted *F.* ssp. *hincksi*, thus putting its extension up on to the steppe plateau beyond doubt. Visiting the glen again a few days later, I found the same species by sweeping among the herbage, together with *F. auricularia*, by beating low trees, hazel and oak chiefly. The contrast between the two species is striking, *F. auricularia* being so much darker, bigger and stronger, is certainly the most successful earwig in Europe. I did not find *F. lurida*, which accompanies the common kind in western and southern Turkey.

From Ankara I went to Zonguldak, the little coal port on the north coast. The country consists of steep and high hills densely clothed in a jungle of bracken, heath, *Sambucus ebule*, *Cistus*, and, above all, masses of Rhododendron, which must be a wonderful sight when in flower; higher up, beech and oak, but all small trees, in dense thickets through which one can hardly break a path. I worked here two days with considerable energy, but found a single earwig. That was a male *F. auricularia* but of a quite unusual form. The basal dilatation was exceedingly short, represented only by the vestige of a tooth quite near the base, the specific tooth, not very strong, being developed much further down. The result was completely to alter the appearance of the creature, as the whole forceps were so unusually slender. It was most disappointing that I could not find another, as it would be extremely interesting to see whether this was an individual freak, or a local race. I collected in other localities in the district, but did not see another earwig.

## IMMIGRANT LEPIDOPTERA AT BICKENHALL, SOMERSET, AND THE OCCURRENCE OF CATOCOLA NUPTA, LINN., IN DERBYSHIRE.

By A. H. Turner.

The season which is now closing has been rich in immigrant Lepidoptera, and the following records for Bickenhall, Somerset, may perhaps be added to what must already be a prodigious list:—

*Colias croceus*, Fourc. Very common throughout the Summer, and still about in some numbers. One ab. *helice*, Hb., and one ab. *pallida*, Tutt, are the only ones of interest among many examined.

*Macroglossum stellatarum*, Linn. As everywhere, exceptionally common.

*Vanessa atalanta*, Linn. Intermittent during the Summer, but now abundant on ripe fruit.

*Vanessa cardui*, Linn. A few at intervals.

*Danaus archippus* (*plexippus*, Linn.). A specimen was seen on a grass stem on 13th September. As no net was to hand, I had to watch it disappear towards the South.

*Momophila noctuella*, Schiff. A few during the past two weeks only.

*Nycterosea obstipata*, Fab. A single male appeared in a " light trap " on 15th September.

*Rhodometra sacraria*, Linn. A fresh female was taken in the garden on 19th September.

Taking advantage of the numbers present, some observations have been made of the favourite flowers of *C. croceus* and *M. stellatarum*. In the case of *C. croceus* first favourite appears to be the *Hypochoeris radicata* (Common Cat's Ear), followed closely by *Trifolium pratense* (Red Clover); others being *Prunella vulgaris* (Self Heal), *Taraxacum officinale* (Dandelion), and later various species of Aster. With *M. stellatarum* an easy first is, of course, *Kentranthus ruber* (Red Valerian), followed in order by *Anchusa angustifolia*, *Perowskia atriplicifolia*, *Crucianella stylosa*, *Dianthus caesius* (Cheddar Pink), *Zinnia elegans* and *Nicotiana affinis*. They seem to completely ignore a large bed of geraniums.

I have also pleasure in recording an apparent extension of range of *Catocola nupta*, Linn., into South Derbyshire. During August I saw one at Melbourne and two at Repton in that area. The species was not included in the late H. C. Hayward's *Lepidoptera of Derbyshire*, or his *Lepidoptera of Repton and the Neighbourhood*.

[*P.S.*—The above immigrants have been reported to Capt. Dannreuther.]

## COLEOPTERA AT WICKEN FEN, ETC.

By Horace Donisthorpe, F.Z.S., F.R.E.S., etc.

Having spent August 8th-22nd at Wicken, Cambridgeshire, I propose to publish a few notes on some of the Coleoptera captured during that period. Miss D. E. Kirk accompanied me and we made excursions to Soham, Swaffham Prior, etc. The weather was extremely hot, no rain fell during our stay, and Miss Kirk was unfortunate to get a sunstroke on 9th, which laid her up for three days.

*Silpha opaca*, L., was taken earlier in the year by A. A. Allen sweeping the leaves of sugar-beet. Miss Kirk and I obtained a small series, running on paths, and under grass roots, etc., at the edge of a large sugar-beet field at Burwell Fen.

It is exactly 70 years since I first took this beetle; the specimen being in my cabinet to-day. It was running in the orchard in the grounds of my father's country house, The Mansion, Earlshilton, Leicestershire.

*Pogonochaerus dentatus*, Fourc. Sweeping in a field at Wicken. On my first visit to Wicken Fen, many years ago, I took a specimen of this beetle at Upware.

*Chrysomela fastuosa*, Scop. A specimen was swept in a sugar-beet field at Padney on August 21st.

*Epitrix atropae*, L. On August 18th we went to Swaffham Prior, with Miss Jenkinson, to visit her aunt, Mrs Norman, a sister of Mrs Jenkinson, with whom I always stay at Wicken. Mrs Norman, whom I have known for many years, is the superintendent of the Hostel for Land Girls, into which the fine old Prior House has been turned.

Some plants of *Atropa belladonna* (Deadly Nightshade) having been found in the grounds, the *Epitrix* occurred in abundance on them. The beetle is a new record for Cambridgeshire. I have written a special note on it to be published shortly.

*Cassida nebulosa*, L. Last year I discovered this beetle to be not uncommon at Burwell Fen. This year, it and its larvae were in great abundance at Burwell and sparingly at Wicken. It was present in abundance on *Chenopodium Bonus-Rex Henricus* (Good King Henry Goosefoot); also on *Chenopodium album* (White Goosefoot); and one plant of *Galeopsis tetralis* var. *versicolor* (a beautiful variety of Common Hemp-nettle) was heavily attacked by the beetle.

Other records for Cambridgeshire are:—Bottisham (Stephens); Cambridge, and Gamlingay (Babington); Whittlesea (Blatch); Holwoods (Fryer); Waterbeach (Nicholson); and North Fen (Miss Florence Kirk, and H. Donisthorpe).

*Cassida nobilis*, L., was swept off sugar-beet at Burwell and Padney.

*Acalyptus carpini*, Hbst. Sweeping in Wicken Fen. Allen took it at Wicken Fen last year; and it was taken by the late Dr Power at Burwell Fen.

*Rhinoncus castor*, F. Burwell Fen, by sweeping *Polygonum Persicaria* (Spotted Persicaria). Other Cambridgeshire records:—Mepal (Fryer); North Fen (Donisthorpe).

*Rhinoncus bruchoides*, Hbst. Burwell Fen, abundant on *Polygonum Persicaria* and *P. lapathifolium* (Pale-flowered Persicaria). Previous records for Cambridgeshire:—Holwoods (Fryer); Waterbeach (Nicholson); Wicken Fen (Donisthorpe).

*Nanophyes lythri*, F. This little weevil is always common at Wicken Fen on *Lythrum salicaria* (Purple Loosestrife). On this visit I swept it sparingly at Burwell Fen.

On several occasions a pair of Montagu's Harrier was observed soaring above the fen. This rare hawk was pointed out to me on my first visit to Wicken Fen as long ago as 1880. It is satisfactory to know that it still breeds in this locality.

## THE CLIMBING RATE OF THE ANT FORMICA RUFA, L., IN SWITZERLAND.

By Fergus J. O'Rourke, M.Sc., F.R.E.S.

A few spare moments at Chalet-à-Gobet (864 metres altitude), near Lausanne, enabled me to make some further observations on the speed of ants. In this case, however, the insects were not, as in the cases previously considered (Pickles 1946, O'Rourke 1947), walking on a level surface but were ascending and descending the South and East faces of a pine tree at 1700 hours Central European Time on 21st April 1947. Unfortunately, I had no thermometer and thus was unable to do more than estimate the temperature, which was about 60° F. (15° C.). There was a fairly steady stream of worker *rufa* going up and down the trunk of the tree, and although they did not follow any definite path it was noted that the ants descending followed a more direct path than those which were on their way upwards. These latter also showed a greater tendency to greet other ants and exchange antennal strokes. The time taken to cover a vertical distance of two metres was recorded by stop-watch and is shown in the table below (it may be noted that the actual distances covered by the ants were greater than two metres as their paths were never direct, although they were more nearly so in the case of those coming downwards).

TABLE SHOWING THE TIME TAKEN TO COVER TWO METRES (VERTICAL).

| | *Ascending Ants.* | | | *Descending Ants.* | |
|---|---|---|---|---|---|
| No. | Time. | Speed in Cms. per Min. | No. | Time. | Speed in Cms. per Min. |
| 1 | 166 secs. | 72.3 | 6 | 115 secs. | 104.3 |
| 2 | 103 secs. | 116.5 | 7 | 98 secs. | 122.4 |
| 3 | 101 secs. | 118.8 | 8 | 84 secs. | 142.9 |
| 4 | 84 secs. | 142.9 | 9 | 98 secs. | 122.4 |
| 5 | 127 secs. | 94.5 | 10 | 136 secs. | 88.3 |
| Average | 116 secs. | 103.5 | | 106 secs. | 113.2 |

These figures are very interesting as there is so little difference between the averages of the two groups, indeed if one allows for the more indirect paths taken by the ants ascending there is no significant difference between the times taken to ascend or descend a distance of two metres. It may be noted that by a curious coincidence the speeds of the fastest ants in both groups were the same. In all fairness, it must be noted that number 4 was recorded as being a large specimen whereas number 8 was only of average size. The three slowest specimens were also noted as being small. The average size of the specimens collected was 7.05 mm., while the largest was 8.65 mm. and the smallest was 4.90 mm.

The ratio of the speeds of the fastest and slowest specimens is roughly the same as the ratio between the length of the longest and that of the shortest ant—the speed being apparently dependent on the size of the insect (it may be observed that in a previous note the speed of the female *Tetramorium caespitum* was recorded as five times that of the worker although the female was only twice the length of the worker (O'Rourke 1947).

It would seem from these observations that the gradient along which an ant walks does not affect its speed. If this is true, it is a very remarkable fact indeed and one for which some explanation is required.

The variation in speed between individual specimens is well marked and is probably due, as already suggested (O'Rourke 1947), to a corresponding variation in the metabolic rates of each ant (cf. Chen 1937). Pickles' (1946) suggestion that the speed of an ant depends on the interest it takes in its surroundings was certainly clearly seen at Chalet-à-Gobet. Some individuals ascending the tree stopped every few centimetres to salute their fellows or explore the bark while others went upwards almost vertically without stopping. These latter were the ones used to determine the speeds recorded above.

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## COLLECTING NOTES FOR 1947.

By Surgeon Lieut.-Commander H. M. Darlow, R.N., F.R.E.S.

In 1946 my collecting began half-way through the season by my return from foreign parts. This year activities have again been cut short by my departure to more foreign parts, so that full investigation of the results of the hard winter has been impossible.

There are three good reasons why 1947 should have been a good year for Lepidoptera. Firstly, the early stages of the great majority of species were protected for many weeks by a thick layer of snow from the attacks of insectivorous birds, shrews, etc. Secondly, the consequent starvation killed off a lamentable number of the latter, thus permitting the survival of large numbers of larvae in the spring. And thirdly, the warm weather of May and early June with southerly and easterly winds was ideal for the arrival of immigrant species, of which I have observed the following:—

*Vanessa cardui*.—This species was first seen on 28th May flying round and round a rock on the undercliff at Ventnor, I.O.W. It was a very worn specimen. The wind was easterly and of force three. At least a score more were seen in the same locality and under the same circumstances on 11th June. Both worn and fresh specimens were seen, and three couples were watched in the process of courting. A worn specimen was seen feeding at valerian at Totley in Derbyshire on 19th June, the wind being light and sou-westerly. Two fresh specimens were seen at Bedford flying at random on 20th July, which might have been the first of the local brood to emerge. Two further specimens were seen on the 22nd and 27th.

*Vanessa atalanta*.—A very worn specimen was seen sunning itself on a wall early on the morning of 31st May at Gosport, following a fortnight of glorious weather with light south-east winds. A fresh one was seen in the same locality on 15th July, and three more at Bedford on 20th, 25th, and 26th.

*Colias croceus*.—On the 11th June I saw at least a dozen specimens of this species on the Ventnor undercliff. As I was after *Melitaea cinxia* at the time, I made no attempt to record exact numbers, but they seemed to be everywhere. The majority appeared to be in good condition though some were very worn. One ab. *helice* was seen. The wind was light and easterly, and though none were actually seen to come in from the sea, several flew off inland in great haste, as if having rested sufficiently on the shore to continue their journey.

On 25th July two fresh specimens were seen at Bedford, flying at random. The wind was light and westerly. Though I have collected in Bedford for twenty-three years, I have never personally seen the species there, though I have seen *C. hyale*.

On 1st August I saw one fresh looking specimen at Totley, flying at a great rate north-east, the wind being westerly and light.

*Macroglossum stellatarum*.—The first to be seen this year was at Totley on 27th June feeding at valerian, and I later saw two more on 16th July at Gosport.

*Plusia gamma*.—First taken on 12th June at light in Gosport. A second one was taken whilst dusking at Totley on 17th June. In July one was taken at light in Gosport on the 12th, one whilst dusking at Bedford on the 20th, and two more under similar circumstances on the 23rd.

All three species of genus *Pieris* appeared to be as common as usual. *P. brassicae*, however, was much more common in the last week of July in North Derbyshire than in Bedford, where *P. rapae* was more abundant, and I took a creamy yellow aberration. Numbers of the latter species were observed drinking on patches of moist ground, a habit which allowed an easy search for varieties. *P. rapae* was observed to oviposit frequently on *Aubrietia* and related species both in Bedford and at Totley.

The winter does not appear to have reduced the native species, at least in the localities that I worked. *Nymphalis io* was first seen on 11th April at Bembridge, I.O.W., and a second was seen the following day in Gosport, after which it became more frequent. It was abundant in Bedfordshire and Hampshire in July, and a large brood of larvae was taken between Lindrick and Maltby in South Yorkshire in the first week in July. On the whole it appears commoner than last year.

A point of interest—on 26th July at Bedford I saw a large specimen at rest on a footpath with its wings closed. It remained thus for about five minutes, when it was suddenly pounced upon and carried off by a house-sparrow which descended from an ash tree about twenty yards away. So there was one sparrow who did not know that *N. io* was supposed to look like a dead leaf.

*Aglais urticae* and *Gonepteryx rhamni* appeared as common as usual, though I have been quite unable to find *Polygonia c-album* in any of its stages. Of the species that hibernate in the early stages *Argynnis*

*euphrosyne* and *A. selene* were seen in large numbers in various East Hampshire localities and both species were taken together near Wickham on 1st June, one good blotched aberration of *A. euphrosyne* being taken. It was observed that when both species were in the cyanide bottle at the same time *A. selene* took considerably longer to die. *Melitaea cinxia* was abundant at Ventnor on 11th June, and one aberration was taken with all the markings of the underside of the hindwings concentrated in the basal half of the wing, leaving a clear cream disc. *Argynnis aglaia* was very abundant at Maltby wood in South Yorkshire on 26th June, and *A. paphia* was also plentiful together with *Limenitis camilla* in West Walk Wood, Wickham, Hants, on 6th July.

The eight common Satyrid species have all been abundant and some remarkedly so. *Pararge aegeria* was first taken on 26th April at Bembridge, I.O.W., in the same patch of woodland as I last took it in October 1946. It has turned up in Bedford and can now be taken in most local copses and even in Bedford Park, where the shrubberies have been allowed to lapse into a state of jungle during the war. The invasion of a woodland flora undoubtedly accounts for their presence there. I even took a female in my house in the town, though I have never seen it within seven miles before. *Aphantopus hyperantus* has also invaded the town from its nearest station two miles away.

On 13th July I saw a male Grayling feeding at a bed of Sweet Williams at Gosport. This supposedly flower-avoiding butterfly returned again and again to the Sweet Williams and also to a patch of Violas. I watched it probing the flowers with its proboscis. This is the first time I have ever observed the species feeding.

Of the Lycaenids, *Aricia agestis*, *Polyommatus icarus*, *Celastrina argiolus*, *Heodes phlaeas* and *Callophrys rubi* were found as abundantly as usual, especially the second brood of *C. argiolus* which fairly swarmed in Bedford. An abnormally large race of *P. icarus* was found in a railway cutting at Totley. It was large even for a spring brood and dwarfs all my other specimens. The second brood has not emerged to date (1st August).

*Thymelicus sylvestris*, *Ochlodes venata*, *Erynnis tages* and *Pyrgus malvae* were everywhere abundant in the South, especially *E. tages* and *O. venata*. I took *Thymelicus lineola* at Putnoe Wood, Bedford. It was abnormally abundant and fairly swarmed, completely swamping *T. sylvestris*. This colony has been known for many years though, to the best of my knowledge, its extent and connections with the main headquarters of the species in the south-east have never been plotted. Local entomologists please note

It is obvious that the severe winter has in no way reduced the butterfly fauna observed; indeed in many instances it has increased it considerably. Moths have been equally abundant and I have obtained numerous individuals of species I had previously regarded as rare. The Zygaenids produced a particularly rich harvest of aberrations and interesting data which I propose to make the subject of a separate paper.

STOP PRESS:—Totley, North Derbyshire, 11.8.47, seven *Colias croceus*. 16.8.47, twenty-one *Colias croceus*. 17.8.47, between Manchester and Liverpool, twelve *Colias croceus*. 18.8.47, at 2000 B.S.T. 100 miles west of Uhant, four *Vanessa atalanta* came aboard ship together with *Plusia gamma*.

## EFFECTS OF THE SEVERE WEATHER ON SPRING LEPIDOPTERA AT WESTON-SUPER-MARE UP TILL END OF APRIL 1947.

By E. C. H. Blathwayt, M.A. (Oxon.).

I was interested to read Mr A. H. Turner's list of Lepidoptera at Taunton in the June number of the *Entomologist's Record* and thought that the following few notes on the effects of the winter weather on Lepidoptera at Weston-Super-Mare might be of interest as such effects were very different from those stated by Mr Turner in some cases.

Weston-Super-Mare is only 30 miles from Taunton and in the same county. Like Taunton, we experienced exceptionally severe weather in late January, February, and early March. Strangely enough, this weather had no effect whatever on the numbers of common " Quakers " at Sallow although the time of emergence was about two to three weeks later in 1947 than in 1946 and about four weeks later than in 1945.

On 12th April last many *Orthosia gothica, O. cruda, O. incerta, O. stabilis*, and *O. munda* were seen at Sallow, including some nice forms of *O. incerta* and *O. munda*. There were also odd specimens of *O. miniosa* and *O. gracilis*. *E. badiata* was common at Sallow and also on the wing. On subsequent nights the common " Quakers " appeared at Sallow in average numbers though 12th April was certainly the most prolific night. After Sallow was over all five common species were seen regularly at light, though owing to double summer time this was rather late.

Comparing my 1947 and 1946 notes I should say that there was no difference in the numbers of the " Quakers," though *O. stabilis* was not as common in either of these years as in 1945, when it swarmed at Sallow in the middle of March.

The first *Biston strataria* was seen this year on 22nd March, but it was not quite as common later as in 1946. *Selenia bilunaria* did not appear till 26th April, about a month later than in 1946. *Lampropteryx suffumata* was first observed on 20th April this year and was afterwards common.

*Xylocampa areola* was scarcer than in 1946 and was not seen till 19th April. *Ectropis bistortata* was common in April.

In the middle of January 1947 all the usual common early Spring Geometers were emerging; this brood was no doubt killed by the subsequent weather but early in March there was a fresh emergence which included fresh specimens of *Operophtera brumata* and *Erannis defoliaria* as well as *Theria rupicapraria, Erannis leucophaearia, E. marginaria, Alsophila aescularia* and *Phigalia pedaria*.

I should perhaps also mention that *Nothopteryx polycommata* began to emerge in my cages on 13th March and was out in the wild state about a week later in usual numbers. The locality for this species is, however, a few miles from Weston-Super-Mare though in North Somerset.

In conclusion, however, I should like to say that Butterflies were no commoner or earlier at Weston-Super-Mare than at Taunton, and my observations in this direction were very similar to those of Mr Turner.

" Amalfi," 27 South Road, Weston-Super-Mare, 27.6.47.

## TUKDAH DIARY, SEPTEMBER AND NOVEMBER 1945.

By D. G. Sevastopulo, F.R.E.S.

(*Continued from p. 94.*)

In the afternoon watched a female *A. hyperbius* for some time on the open hillside. In spite of its close resemblance in colour and pattern, I consider it a poor mimic of one of the tawny Danaids as its flight and habits are so entirely different. A number of *A. lalage* were flying, but quite uncatchable. Found a number of larvae of the *Corgatha* on lichen on a large rock; once you know what to look for these lichen-covered larvae are not hard to find. Nothing at light. Walking a friend home along the forest paths, some two miles there and back, at about 9.30 p.m., did not see a single moth enter the beam of my torch, but a number of glow-worms, not fire-flies, were seen in the grass.

9th November.—No new butterflies on the forest road in the morning, but *Gelasma* (*Thalassodes*) *thetydaria*, Guen., was found resting on a leaf. There is quite a nip in the air now when out of the sun. In the afternoon went for another walk on the forest road for *L. sura*, which seems more common in the afternoon than in the morning, and took a short but rather worn series. If one of these butterflies is missed, it can almost always be found again at the same place some ten minutes later. A number of *A. lalage* were flying out of reach and a male *Hebomoia glaucippe*, L., *glaucippe*, flashed past. On the way home an example of *Teldenia vestigiata*, Btlr., was found resting on a newly-dug bank, its white colour showing up plainly against the red-brown of the soil. Light again a failure.

10th November.—In the morning walked up through the forest to the eighth mile on the Ghoom-Kalimpong road to see the snows, and had a fine view. Nothing exciting flying, but the path was carpeted with wings of *M. simpliciata*. In the afternoon went down the hillside to a field of flowering Buckwheat hoping to find some Lycaenids. The only species about were *V. indica*, *V. cashmirensis* and *A. hyperbius*, not a Lycaenid of any sort. Nothing at light.

11th November.—Spent both the morning and the afternoon on the forest road. *D. adonira* is going over fast and is being replaced by *D. ouida*. A female *Cepora nadina*, Luc., *nadina*, was caught, and also a specimen of *A. lalage*, the first to come within reach of my net. An interesting capture was a dwarf male of *A. fylla*, of rather less than half the normal wing expanse. Four larvae of *S. viridifusca* were found. In spite of the cold nights, moths must still be flying in numbers, as the forest paths are always strewn with wings. A female *Hermonassa consignata*, Wlk., at light.

12th November.—Spent the morning on the sunny hillside between the forest and the tea, but very few butterflies even of the common species flying. On the way back caught a male *Abisara neophron*, Hew., *neophronides*, Fruhs., just in the shade of the forest itself. Nothing of note in the afternoon and again nothing at light.

13th November.—The hill road produced nothing this morning, but a single *Precis orithya*, L., *ocyale*, Hb., turned up in the garden. In the afternoon made another expedition to the buckwheat field but with

the same negative result. On the way home found several larvae of *E. repleta* and one of *Conservula indica*, Moore, on bracken. A *Macroglossum* emerged in my cages this afternoon, and, on looking him up, I find that he is *aquila*, Bsd., against which Bell & Scott note "rather rare, and early stages unknown," so I have discovered the larva of one of the fifty odd species of Indian Hawkmoth whose early stages are unknown. It is strange to see how many species of *Sphingids* in this book (*Fauna Brit. Ind., Moths*, v) have the note that the authors have never seen the imago in the wild. During the last two months I have found ten species of Sphingid larvae, three *Macroglossum*, a *Panacra*, a *Theretra*, four *Rhagastis* and a *Cechenena*, and an ovum of an eleventh, a Choerocampid of some sort, but I have only seen two imagines of one *Macroglossum*. Nothing at light.

14th November.—The only things of interest on the forest road this morning were three specimens of *Arhopala*, of which I caught one only, a female *areste*. This is my last collecting expedition; we go down to-morrow and my time henceforward is likely to be fully occupied with packing and good-byes. I have a large number of unidentified pupae still to emerge and a fair number of larvae, which I hope will survive the change. Calcutta is reported to be fairly cool, so the change in temperature should not be too great, although I have a strong suspicion that it is the difference in altitude, and consequently in atmospheric pressure, that does most of the mischief. (A fair percentage survived, but a number failed to emerge.) In the afternoon found a fine Boarmiid larva on a friend's roses. Hope it will survive (it did not). Nothing at light.

## COLLECTING NOTES.

The Colour of Machaon Pupae.—Last season when rearing some sp. larvae of *P. machaon* I noticed a distinct colour difference between pupae which formed in the rearing cage and others from larvae taken from the cage just before changing. It occurred to me that the differences might be due to light conditions.

This year, having successfully reared some fifty pupae of *P. machaon britannicus* from wild ova, I took the opportunity of experimenting with pupating conditions. When fully grown the larvae were provided with a plentiful assortment of twigs upon which they spun up very readily. Eighteen of the larvae were transferred with their twigs to a large tin box from which all light was excluded. These formed pupae which were all brown in colour with very heavy black markings, in some the wing cases being almost entirely black. Another lot of eighteen larvae were allowed to pupate in a large wooden box, painted white on the inside and having a muslin-covered lid. The pupae formed in this box were mostly of the pale brown type with some darker brown markings, but several were coloured with a mixed pattern of brown and green. A third batch of fourteen larvae were placed, attached to twigs, in the full light of a large window. All these gave green pupae with some darker green markings.

Since it seemed possible that some darkening in colour might result in pupae which formed at night, a close watch was kept on the

larvae placed in the window. However, by coincidence or design, all these larvae changed to pupae during daylight hours, morning being the favourite time. No doubt temperature changes play an important part in determining the actual time of pupation.

It would seem from these experiments that the very variable colouring of *machaon* pupae is greatly affected by lighting conditions just before and at the time of pupation. I have no experience of *machaon* pupae in their natural sites, but it would be interesting to hear of any observations on the relation between pupating position and colour.—T. D. Fearnehough, 25 Ramsey Road, Sheffield.

Migrant Insect Records.—*L. exigua*—Common in the Reading district since mid-August. A new brood is just emerging this week as fresh specimens are appearing on the wing again. The species comes freely to street lamps. *R. sacraria*—One ♂ taken at rest on a clover leaf in a field at Aldworth (about 10 miles from Reading) on 3rd September; four more specimens (one ♂, three ♀) taken on street lamps in Tilehurst (three miles from Reading centre) the same evening; and two more females on 4th September on the lamps. Since these days when I took six specimens and my friend one, I have seen no more, which rather surprises me. The specimens were in perfect condition except one, which was rather worn. *C. hyale*—One ♂ taken at Aldworth in a lucerne field on 3rd September. This is the first record for the Reading district for many years. Subsequent search has revealed no more specimens. The field is full of *M. stellatarum* (freshly emerged brood) and *C. croceus* with about 20 per cent. var. *helice* among the females. These are, of course, the third brood. *H. peltigera*—I took a single specimen at light on 18th August at Tilehurst. So far, only one *convolvuli* has been taken here this year, a fresh specimen brought into the local museum. All the above except *convolvuli* and one *sacraria* are in my collection, so I think that I have had a good year's collecting as far as migrants are concerned.—L. H. Williams, 10 Lower Armour Road, Tilehurst, Reading, Berks., 16/9/47.

Aberration of Vanessa cardui, L.—*Vanessa cardui* was common in this district during the month of August, and on the 31st I took at Scabious, *Scabiosa succisa* an aberration of this species similar to the one depicted in South's *British Butterflies*, plate 49, figure 4; this aberration is also figured in *The Entomologist*, vol. xiii, page 73, and was bred on 3rd September 1879 from a larva taken on the River Lea at Clapton Park. The coloured illustration in South of this aberration does not show on the hindwings the outer marginal row of white spots. —Thomas Greer, Sandholes, Co. Tyrone.

E. antiopa in Sussex.—A specimen of this species was brought alive to the Worthing Museum on 1st September. It had flown into the room of its captor, who, though not an entomologist, "thought it must be a Camberwell Beauty," and feared he might have damaged it in capturing it. However, on being set it was found to be in perfect condition, with very white border and rather small white spots.—G. Wheeler, Worthing.

C. CROCEUS.—A specimen of this species (still commonly called *edusa*) haunted the Michaelmas Daisies in my garden yesterday for some hours, the first I have seen here for many years, though I have not infrequently seen it in the town.—G. WHEELER, Worthing, 24th September.

THE PIERIDS.—Both *P. brassicae* and *P. rapae* are still in great numbers in the garden here. Until last week the latter had been far the commoner, but lately the case has been reversed. Both species were scarce earlier in the year.—G. WHEELER, Worthing.

EXPERIMENTS WITH DDT AND GAMMEXANE.—As a result of propaganda during the war, India, like so many other countries, has become DDT-minded, and a large number of DDT preparations, as well as others containing the newer Gammexane, are being imported from abroad and find a ready sale. As a matter of interest I conducted a few tests with products of both types manufactured by a well-known British firm. The tests were not elaborate, the insects being exposed to the action of the compounds by letting them crawl backwards and forwards over blotting paper heavily sprinkled with it. The insects were then shut up in tins, either with or without food, and other, untreated insects kept as controls.

*Dysdercus cingulatus*, F. (HEMIPTERA, Pyrrhocoridae)—Three adults treated with DDT at 18.00 hours, 8.ix.46; one was dead at 17.00 hours, 14.ix, and two at 18.00 hours, 15.ix.46. Two adults exposed to the Gammexane compound, 17.00 hours, 10.ix.46; one was dead at 17.00 hours, 14.ix, and the other at 18.00 hours, 16.ix.46. Controls lived for two and five days respectively.

*Eupterote undata*, Blanch. (LEPIDOPTERA, Eupterotidae)—Four larvae about 1¼ inches long, probably in their 4th instar, were treated with DDT at 17.00 hours, 5.ix.46. At 07.00 hours, 6.ix, two were twitching and these were dead at 17.00 hours; by this time a third larva had started to twitch and this was dead at 07.00 hours, 7.ix; the fourth larva started to twitch before 07.00 hours, 7.ix, and was dead at 17.00 hours, 7.ix.46. None of the treated larvae ate anything, controls fed normally. Another slightly larger larva was treated with the Gammexane compound at 17.00 hours, 13.ix.46; this moulted successfully during the night 18-19.ix.46 and fed up and pupated normally.

The twitching of the DDT-treated larvae was very distinctive, a sort of St Vitus' dance that affects the whole body.

*Parasa lepida*, Cr. (LEPIDOPTERA, Limacodidae)—Three full-grown larvae were treated with DDT and two with Gammexane at 17.00 hours, 17.ix.46; both Gammexane larvae were dead at 06.00 hours, 18.ix.46, but the three DDT larvae spun up on 19 and 20.ix.46 and imagines emerged normally.

*Spodoptera mauritia*, Bsd. (LEPIDOPTERA, Noctuidae)—Three full-grown larvae were treated with DDT and three with Gammexane at 08.00 hours, 9.x.46; at 18.00 hours the same day all three Gammexane larvae and one DDT one were dead. The remaining two DDT larvae pupated during the night, 10-11.x.46, and imagines emerged normally.

The compounds used in these experiments were in powder form and of the usual strength sold to the public as insecticides.—D. G. SEVASTOPULO, F.R.E.S., London, 28.vii.47.

# EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr HY. J. TURNER, " Latemar," West Drive, Cheam.

*Wanted*—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Instituto Miguel Lillo, Calle Miguel Lillo 105, Tucuman, Republica Argentina.*

*Desiderata*—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—*H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.*

*Wanted.—Lycaena (Heodes) phlaeas* from all regions including British Isles. Also wanted other species of Chrysophanids from all areas. Exchange or purchase considered. *Duplicates.*—Foreign Lepidoptera, e.g., Satyrids, Charaxes, Papilios, and others; full lists sent.—*P. Siviter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.*

*Wanted* for cash or exchange many species of ova, larvae or pupae, especially local forms and *A. grossulariata* from different localities, also Seitz Vol. 1 and Supplements to Vols. 1-4. Offers also, Tutt's *Practical Hints*, Parts 1 and 2, Buckler's larvae, Vols. 1-6, and Tutt's *British Noctua*, Vols. 2, 3, and 4.—*Dr J. N. Pickard, F.R.S.E., 36 Storeys Way, Cambridge.*

*Wanted.*—Various monthly parts of *Entomologist's Record* for 1914, 1915, 1916, 1917, 1919, and 1920. Please report any odd monthly parts (in wrappers as issued) prior to these years.—*P. B. M. Allan, 4 Windhill, Bishop's Stortford, Herts.*

*Wanted.*—Males of *Morpha menelaus, M. didius, M. rhetenor* in papers.—*Leonard Tatchell, Rockleigh Cottage, Swanage, Dorset.*

*Wanted* urgently for experimental purposes, pupae of *betularia, porcellus elephanor.—Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.*

*Wanted.*—Various Books on Lepidoptera. Please send lists and price. Also wanted, Live Exotic and English Lepidopterous Material for cash or exchange for similar material or Set English Imagines.—*J. K. Goody, " Weldon," 26 Carr Wood Road, Bramhall, Ches.*

*Sale or Exchange—R.E.S. Trans. and Proceed.*; bound, 1911 to 1916, 1918 to 1919; unbound, 1921 to 1923, 1925; also 1917 and 1924 less part 5. New Series—*Trans.*, Vols. 1 and 2, Vol. 3, part 1. *Proceed.*, Vol. 1 and Vol. 2, part 3. *Trans. Suffolk Naturalist Society*, Vol. 3 and Vol. 4, part 1. *Wanted*, bound or unbound, *Entomologist*, Vols. 2 and 3, 1926 to 1930, 1940 to 1942. *Ent. Mont. Mag.*, 1922, and 1924 to 1942; also various volumes of *R.E.S. Trans.* List on application.—*F. W. Smith, Boreland of Southwick, by Dumfries.*

*Wanted*, for experimental purposes, a few pupae of *Endromis versicolora*, purchase or exchange.—*R. W. Parfitt, 1 Dunsdon Avenue, Guildford, Surrey.*

*Wanted.*—Volume V (five) of Tutt's *British Lepidoptera.—T. R. Eagles, 32 Abbey Road, Enfield, Middlesex.*

## MEETINGS OF SOCIETIES.

*Royal Entomological Society of London*, 41 Queen's Gate. S.W.7: November 5th and 19th, at 5.40 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society*: Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section*: Last Fridays in month, at 7 p.m., at the Birmingham Museum and Art Gallery. Particulars from the Hon. Secretary, G. B. Manly, 72 Tenbury Road, King's Heath, Birmingham, 14.

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*Communications received*:—Thomas Greer, Fergus J. O'Rourke, O. Querci, H. Donisthorpe, Malcolm Burr, Surg.-Lt. Comm. H. M. Darlow, D. G. Sevastopulo, D. Fearnehough, R. J. R. Levett, E. C. S. Blathwayt, E. P. Wiltshire, A. E. Wright.

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# ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION



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# MIDDLE EAST LEPIDOPTERA, VIII: SOME MORE NEW SPECIES AND FORMS FROM IRAN.

By E. P. Wiltshire, F.R.E.S.

(*Concluded from p. 111.*)

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Hyponomeutidae.

*Ethmia* (=*Psecadia*) **chosroes**, sp. n. (Fig. 5.)

♂; palp, with light brown scales; end-joint only half length of middle joint.

Frons, with black scales. Antenna, black, with scanty light brown scales. Head, with pale ochreous-brown scales. Thoracic scales, sooty brown.

Legs, brown, except for hind tibia which is yellow. The hind tibia spurs are brown with a few black scales.

Abdomen, sooty-brown, with paler brown scales at the somital joints below. Genitalia covered with long, yellow hairs and scales. This colour extends anteriorly up the sides of the last two or three segments only, unlike the ♂ *caradjae* in which the last three segments are entirely yellow; (according to Osthelder the ♀ *caradjae* has only the last segment yellow).

Forewing, glossy grey-brown, with two black dots, the larger on the cell-end and the smaller on the median, so as to be in line with the apex. Fringes, concolorous.

Hindwing, paler than forewing, uniform grey-brown, with concolorous fringes. The termen is not blackish as in *caradjae*.

Underside, both wings, like hindwing upperside.

Span: 29-33 mm.

Holotype: ♂, 6.v.40, Pireh-Zan oak woods, 7000 ft., Fars, S.W. Iran.

Paratypes: ♂♂♂♂, same date and place. In coll. m.

The holotype has two long-legged red mites adhering to the abdomen, and a third on the palps.

This fine new species comes near *caradjae*, Rebel, but differs therefrom in the shape of the palp, the amount of yellow on the abdomen, and also in having an ochreous-brown, not black, head, brown not black legs, and a greyer forewing.

*Ethmia* (=*Psecadia*) **cambyses**, sp. n. (Fig. 4.)

♂; palp, with long blackish hairs except on last joint, which has black scales only.

Frons and rest of head with black and metallic brown scales. Antenna, black with pale cilia.

Thorax, black; tegulae and patagia with metallic brown scales. Legs, black or blackish brown, except for the bright yellow hind tibia and the pale brown hind tarsus.

Abdomen, only first two tergites black; rest of tergites with copious yellow hairs and scales. Yellow colouring, less extensive underneath.

Forewing, glossy grey-brown, with four black dots, arranged on the cell in two oblique parallel pairs, the outermost pointing approximately at the apex. Fringes, concolorous.

Hindwing, lightly-scaled and transparent except near the termen, where the grey-brown scales are thicker. Fringes and termen, as on forewing.

Undersides, like uppersides, except that black spots are absent.

Span: 24 mm.

Holotypes and paratypes: ♂♂, 10.v.40. Pireh-Zan oak woods, c. 7000 ft. Fars, S.W. Iran. In coll. m.

This new species comes near *E. maracandica*, Reb., which, however, has the hind tarsi black. *E. lugubris*, Stgr., and *vidua*, Stgr., both differ in having much less yellow on the abdomen, and the former also in having yellow hind tarsi. Even *maracandica* has somewhat less yellow on the abdomen than *cambyses*, for it was described as having the first four abdominal tergites black.

For Rebel's key to the other smoky-winged *Ethmiae*, see *Iris*, **19**, p. 237. To judge from the *Zoological Record*, the above two new species are the first addition to this interesting group since then.

*Ethmia* (=*Psecadia*) *bipunctella*, F., subsp. **griseicostella**, subsp. n.

This form comes between *confusella*, Reb., and *iranella*, Zy. Its yellow abdomen and blackish-spotted hind tarsi distinguish it from the former, while it is more heavily marked than the latter, a form which is only known from high up in the Elburz Mountains and proves to be rather badly named, since the new form here described is far more widespread in Iran. It is more like the normal *bipunctella* (Europe) though smaller and with a less smoky hindwing. The costa is whitish-grey and grades through grey and brownish-black into the deep black cell-stripe. The markings on this part of the forewing are as in normal *bipunctella*, not reduced and separated as in *iranella*. The sub-apical suffusion of the forewing fringe is smaller and fainter than in *bipunctella*, especially in the Tehran examples.

Span: 20-22 mm.

Holotype and one paratype: ♂♂, 17.vii and 24.vii.39, Tehran, c. 5000 ft., gardens, N. Iran.

Paratypes: ♂, 13.x.39, Kermanshah, c. 5000 ft., W. Iran; two ♂♂ hatched, 23.v and 28.v.40 ex. l. *Echium* sp., full grown in xi.39, Kermanshah.

(The Kermanshah form (Fig. 3) is the same size as the Tehran but the grey suffusion on the forewing is less marked, the black markings being purer black. More material from both localities is needed to show whether another name for the Kermanshah form is justifiable.)

Notes on *Ethmia pusiella*, ssp. *orientella*, Car.

According to *Osthelder, f. *orientella*, Car., is the autumnal brood of *pusiella*, Roem., in S.E. Turkey, while f. *ardosiella*, Car., is the spring brood there. This does not hold good for Iraq and Iran. I think the race here is *orientella*, Car.; at any rate, it comes close to it, being more lightly marked than typical *pusiella*, with less smoky hindwings. Perhaps *orientella*, Car., is a synonym of *candidella*, Alph. I have not taken *ardosiella* in Syria, Iraq or Iran at any season and

*Osthelder, L. 1935. Lepidoptera—Fauna von Marasch in Turkisch Nordsyrien. (*Mitt. Muench. Ent. Ges. e. V.*, XXV, Heft 111, pp. 79-81.)

have fairly positive evidence that there is no spring generation of *pusiella* at all in Central Iraq and S.W. Iran. My observations here were as follows:—

*Bagdad, c. 100 ft. Iraq.*

Larva found full grown in ii.36 and 37 all produced adults in x and xi. The imago was also only taken wild in these months, though the habitat was searched throughout the year. Foodplant, *Asperugo procumbens*.

*Fars, S.W. Iran.*

Adult taken only in x and xi.40, commonly in gardens, which were worked all year round, at Shiraz (5000 ft.). Larvae were also found wild in spring on *Asperugo* in the woody gorge of Tang-Ab (4000 ft.) near Firuzabad; these spun up in early iii and the adults emerged in mid x.

In these two rather different habitats, therefore, both of which however share the peculiarity of a long dry summer, *pusiella* is obviously univoltine autumnal, with a long pupal aestivation. This suggests the possibility that *ardosiella*, Car., is a distinct species, of univoltine vernal phenology.

## EXPLANATION OF PLATE.

Figs. 1-12 illustrate " Middle East Lepidoptera, VIII "; they are about natural size.

Figs. 13-17 illustrate " Early stages of Oriental Palearctic Lepidoptera, IX "; they are considerably enlarged.

Figs. 1-3. *Ethmia bipunctella*, F., subsp. *griseicostella*, Wilts. Types (Iran). ♂♂♂.

Fig. 4. *Ethmia cambyses*, Wilts. Type (S.W. Iran). ♂.

Fig. 5. *Ethmia chosroes*, Wilts. Type (S.W. Iran). ♂.

Figs. 6, 7. *Harmodia gladys*, Wilts. Types (N. Iran). ♂♀.

Fig. 8. *Hadena nana*, Hufn., subsp. *monotona*, Wilts. Type (N. Iran). ♂.

Figs. 9, 10. *Archanara sparganii*, Esp., subsp. *algaeoides*, Wilts. Types (S.W. Iran). ♂♀.

Fig. 11. *Ennomos* (?*effractaria*, Freyer, subsp.) *fraxineti*, Wilts. Type. ♂.

Fig. 12. *Ennomos* (?*effractaria*, Freyer, f.) *zandi*, Wilts. Type (S.W. Iran). ♂.

Fig. 13. *Pararge roxelana*, Cr. Larva (Cyprus).

Fig. 14. *Dyscia simplicaria*, Rebel. Larva (Cyprus).

Figs. 15, 16. *Catocala diversa*, Hubn. Larva (S.W. Iran).

Fig. 17. *Catamecia deceptrix*, Stgr. Larva (S. Iraq).

## EXPLANATION OF TEXT FIGURES.

Fig. a. Distal portion (ventral open view) of right valva, *Harmodia gladys*, Wilts. Type.

Fig. b. Distal portion (ventral open view) of right valva, *Harmodia hyrcana*, Draudt.

## NOTE ON THE BUTTERFLIES OF THE NEW FOREST AREA IN 1947, IN CONNECTION WITH WEATHER CONDITIONS.

By Chas. B. Antram.

Following my notes which appeared in the " Journal " early in the year, the season for Butterflies may now, 20th October, be considered over, and these further notes close the year 1947.

Lepidopterists did not know quite what to expect in the way of the prevalence or otherwise of butterflies this year after the wretchedly wet and sunless summer of last year followed by an abnormally severe winter. Contrary to all expectations, the collector has had a splendid time as weather has been hot and continuously fine, resulting in most species being exceedingly abundant. The weather was not very nice in April but improved in early May.

*May*:—Besides a Brimstone or two, a few Tortoiseshells, Peacocks and Commas, nothing was about. On the 7th May the first Orange Tip, Speckled Wood and the common Whites were observed. On the 13th May the temperature registered 82°, and the Orange Tip with others appeared in quantity and one or two Holly Blues. A Green Hairstreak was seen on the 14th, and a day or two later the Grizzled Skipper was out in numbers. By the 24th the Pearl-bordered Fritillary appeared but did not become later on as plentiful as usual. I think the same may be said of the Small Pearl-bordered Fritillary which appeared on about the 21st of June as the larger species was going off.

Someone writing in the " Sunday Times " of the 25th May records the Duke of Burgundy Fritillary as abundant in a New Forest wood, so I visited a spot I knew of in Dorset on the 29th and found the insect in plenty. Although not in the New Forest area which these notes are supposed only to cover, I found with it, in and around the same locality, the Marsh Fritillary and Green Hairstreak both very plentiful and therefore record them. By the 28th May the Brimstone, Large White and Green-veined White were very plentiful. The Dingy and the Grizzled Skipper appeared about now, and became only fairly plentiful.

*June*:—On the 1st of June I thought it about time to beat Oak for the Purple Hairstreak and was surprised to find the larvae full-fed. All I beat out on that date and following few days had pupated by the 6th, which was earlier than usual for this butterfly, probably owing to the perfect weather we had been having.

Regarding the Holly Blue, very few indeed of the Spring brood were seen and they were anything but common in the 2nd brood in July-August. By 11th June very few Green Hairstreaks remained, the season for them being nearly over and a little earlier than usual. On the 21st June the Small Pearl-bordered Fritillary appeared in good numbers, although not as many as in most years, also the Silver-studded Blue became very plentiful about this time. The Purple Hairstreak began to emerge on the 27th, and by the 13th July were simply in hundreds. A very fine locality for this species is in Churchplace Enclosure close to Lyndhurst Road Railway Station. I visited the locality on

the 13th July and found the butterfly congregated in hundreds on young Spanish Chestnut trees in blossom, but out of reach of my short-handled net. I returned next day with a very long handle to the net with which I could reach the higher branches and by this means captured several with one sweep of the net. The sexes were in equal proportions. I have never seen this insect in such profusion and congregated together like this on Spanish Chestnut in blossom.

A specimen of the White Admiral was seen on the 24th June, which is early for its appearance, and this butterfly was well out by the 3rd of July but not in its usual abundance.

*July*:—The Silver-washed and High Brown Fritillaries were well out in the first week of July but were not as plentiful as usual and var. *valezina* was scarce. The Gatekeeper, also known as the Hedge Brown, put in its appearance in the middle of July and was very numerous everywhere. The Brimstones, 2nd brood [?], and Small Cabbage Whites now became exceedingly plentiful, the latter beating all previous records. The Small Skipper made its appearance in great numbers everywhere. By the 25th July the White Admiral and Silver-washed Fritillary were nearly over but the Common Blue (scarce) and Small Copper (plentiful), of the 2nd brood now appeared. On the 11th October I had the great good fortune to capture a perfect specimen of the silvery-white form known as ab. *alba*, of the Small Copper and saw another in the same locality three weeks previous but failed to secure it. This I believe is very rare and it has been delightful to see a couple in the one season.

Specimens of the Clouded Yellow now suddenly appeared with one or two of its var. *helice* between the 25th and 28th August, and we have had them with us ever since, i.e., up to nearly the end of October. There is little doing in the butterfly line in the New Forest after the White Admiral and the Fritillaries are over at the end of July, but one's interest then passes to the open downs, and on the Western border of the New Forest in Dorset one gets busy after the Chalk-Hill Blue, its numerous vars., the Adonis Blue, the Small Blue, the Lulworth Skipper, etc. I may here mention that one or two Chalk-Hill Blues were observed in Hants. close to Sway this year.

*August and onwards*:—I must make a few special remarks on the Clouded Yellow in 1947, which appears to have about broken all records with the exception perhaps of the year 1877, when Frohawk records it in the greatest profusion, reaching from the Orkney Islands to Land's End and Ireland. So far as the New Forest area is concerned, this butterfly has swarmed and been nearly as numerous as the Common or Garden Cabbage White. A fair number were over from the Continent in the early spring. These resulted in a very large brood towards the end of July which continued into the third week of August and overlapped another brood, just as plentiful, but which produced a much larger percentage of the vars. *helice* and *pallida* than the earlier brood. While I took 20 specimens of the vars. in the earlier brood, it was more like 60 in the later. There were a few also of the var. *chrysantheme* taken. A friend of mine has bred a large proportion of *helice* and *pallida* from larvae of the earlier brood and another collector in

this district has taken close on 100 specimens of these two forms and intermediate forms. One rather worn specimen of the Pale Clouded Yellow was taken here on the 12th October and others observed in other parts of the district. It does not follow that the Clouded Yellow, occurring so commonly this year, will appear again next year. There may be a complete absence of it in Britain as there is no hibernating stage. Fresh migrants from the Continent have to visit us in Spring and if the weather is favourable it will be able to breed here and perhaps produce a couple of broods as in 1947.

It would appear from the foregoing that in this year of 1947, so far as the New Forest is concerned, most of our species of butterflies have been more plentiful than usual while other species have been about normal. Only a few like the Holly Blue in both broods, the Common Blue and Small Copper in the early broods have been very scarce. If we pop over into Dorset it can be recorded that the Chalk-hill Blue, Small Blue, the Lulworth Skipper and Marbled White simply swarmed. Near Corfe Castle I took altogether 609 specimens of these four species in less than six hours, amongst which were a large number of fair to good vars. of the first mentioned.

Therefore, the sunless and wet summer of last year followed by the very severe winter has had no deleterious effect on most species, but it is probably only the very fine summer following that has saved the situation. A point to note is that the frost and snow in the past winter, *although prolonged with hardly a break*, does benefit those insects undergoing hibernation in the egg, larva and pupal state. It is very changeable weather, such as severe frost followed by mild conditions, repeated frequently during a winter, that kills off insect life in hibernation. The transition from bad to fine weather was rapid this year and species in hibernation were not deceived into developing at the wrong time. Some people give the scarcity of birds as one reason for such numbers of butterflies this year. The death rate among birds such as thrushes, tits, wrens, etc., was very high, and no doubt many larvae escaped being devoured. Parasitic flies may have been killed off in the past very severe winter and, if so, this would be another contributary cause.

I would invite correspondence with anyone on the points raised, as my diagnosis may not be entirely correct, and I have probably missed some important point which will help in coming to more definite conclusions.—" Clay Copse," Sway, near Lymington, Hants.—20th October 1947.

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## BUTTERFLIES AROUND MONTREUX, SWITZERLAND.

By L. Richmond Wheeler, M.Sc., Ph.D., F.L.S.

From 23rd May to 13th June 1947 my wife and I had the good fortune to stay in Montreux, at the east end of Lake Geneva, with Dr J. C. Willis, who, besides being an eminent botanist, possesses great knowledge of this beautiful locality and of Switzerland generally. Under his guidance we had many delightful rambles in the hills, lower mountains, and valleys behind (east of) Montreux, helped on many occa-

sions by the mountain railways. I also made two fruitful excursions to the Rhone Valley, one to the flat plain near the Lake, the other to the fine, wooded, gorge above Aigle.

The surface of the Lake is about 1,450 feet above sea-level, and many of our walks were taken at elevations of 2-4,000 feet, with one long one over the Col de Jaman, 5,000 feet +, and another at Rochers de Naye, about 7,000 feet.

The weather was almost uniformly fine and hot, with sunshine nearly all day. Nevertheless, very few butterflies were visible in Montreux itself, and, in accordance with the general impression Dr Willis had formed during a residence of many years, individuals were never abundant anywhere, although the steep sides of the mountains up to about 5,000 feet were ablaze with masses of brightly-coloured flowers, the dominant species of which changed with great rapidity. But butterfly species were numerous too, at least forty being represented in the 108 specimens I collected during this period; I also observed the Peacock, Comma (var. *hutchinsoni*), and Wall Butterflies, Small or Essex Skippers, and possibly some other species. Captures were difficult sometimes owing to the steepness of hill-sides and ravines, and individuals and species were naturally most common on sunny slopes and along the rocky gorges of mountain streams. Probably most species appeared in Aigle Gorge on the latest day I had for collecting, and their numbers should be greater in the summer months. I was content to get one or two examples only of butterflies common in Britain, and sometimes failed to do even this in my keenness not to miss the rare representatives of species unobtainable at home.

Most of the butterflies I saw or caught were in excellent condition, their vivid coloration corresponding with the brilliance of the flowers. But a few showed injuries, usually the complete loss of the tornal area of one or both hindwings, which might well have been caused by lizards; no beak-marks appear to be visible. Birds also were remarkably few in number and species, except for swifts over Montreux, blackbirds and chaffinches, and the eagles, swans, and other large kinds that haunt the Lake and the mountains. On the other hand, lizards were fairly common in the day-time.

The butterfly species I captured are as follows:—

| Genus. Species. | Locality. | Height. | Notes. |
|---|---|---|---|
| PAPILIONIDAE. | | | |
| *Papilio podalirius*, L. | Sanloup. | c. 4,000′+ | One only, my first day; and both tails missing! |
| *P. machaon*, L. | Caux, etc. | 3-4,000′ | Several seen, notably at Umbelliferae above Caux. |
| *Parnassius apollo*, L. | Above Les Avants. | 4,000′+ | Near spring, road to Jaman; flies with *Aporia*. |
| PIERIDAE. | | | |
| *Leptidea sinapis*, L. | Above Montreux. | 2-4,000′ | Singly, not uncommon; hill-sides and gorges, not in woods. |
| *Aporia crataegi*, L. | Rhone V. and hills. | Lake level to 4,000′+ | Common; all in good condition. |
| *Pieris brassicae*, L. | Various. | c. 2,000′ | Very few seen anywhere. |
| *P. rapae*, L. | Various. | c. 2,000′ | Ditto. |
| *P. napi*, L. | Various. | c. 2,000′ | Ditto. |

| Genus. Species. | Locality. | Height. | Notes. |
|---|---|---|---|
| *Euchloë cardamines*, L. | Various. | 2-4,000′ | Very few and only singly. |
| *Colias hyale*, L. | Hills above Les Avants. | 4,000′+ | Not uncommon—singly. |
| *C. croceus*, Four. | Ditto. | 4,000′+ | Not common. |
| *Gonepteryx rhamni*, L. | Rhone V. and hills. | Lake level to 4,000′+ | Ditto. |
| SATYRIDAE. | | | |
| *Pararge maera*, L. | Hillsides and gorges. | 2-4,000′ | Not uncommon; all in good condition; often settles on vertical rocks. |
| *P. aegeria*, L. | Woods and wooded gorges. | 2-4,000′ | Common in suitable localities. |
| *P. achine*, Scop. | Woods in Aigle Gorge. | c. 2,000′ | On 12.6.47 in excellent condition; white bar. U., very clear. |
| *Erebia medusa*, F. | Hillsides and gorges. | 2-4,000′+ | Fairly common. |
| *E. stygne*, Och. | Above Col de Jaman. | 5,000′ | One only; v. dark, no orange rings U.: half l.h.w. cut off. |
| *E. lappona*, Esp. | Rochers de Naye. | 7,000′ | One only, flying over steep grass slope; grey U. looks snowy in reflected light. |
| *Satyrus galathea*, L. | Near Lausanne, Montreux, and Aigle. | Lake level to 2,000′ | Appearing from 10th June. |
| *Maniola jurtina*, L. | Paths above Montreux. | 2-3,000′ | Not common; appearing from 8th June. |
| *Coenonympha pamphilus*, L. | Hills near Les Avants, etc. | c. 4,000′ | Not common; mostly good sized. |
| NYMPHALIDAE. | | | |
| *Argynnis euphrosyne*, L. | Hillside meadows. | c. 3,000′ | Uncommon. |
| *A. cydippe*, L. | Woods in Aigle Gorge. | c. 2,000′ | Few; splendid specimens in grassy clearing. |
| *Euphydryas aurinia*, Rott. | Hillsides and Rhone V. | Lake level to 4,000′ | In marshy spots; uncommon. |
| *Melitaea dictynna*, Esp. | Ditto. | Ditto. | Meadows; uncommon; v. thick black scaling. |
| *M. athalia*, Rott. | Ditto. | Ditto. | Meadows; uncommon. |
| *Vanessa cardui*, L. | Caux; near hotels. | c. 3,500′ | V. few; condition v. good. |
| *Aglais urticae*, L. | Montreux to Jaman. | 2-5,000′ | Appearing in June; brilliant colouring. |
| *Limenitis camilla*, L. | Woods, Aigle Gorge. | c. 2,000′ | 12th June; excellent condition; one with h.w. torni missing. |
| LYCAENIDAE. | | | |
| *Cupido minimus*, Fues. | Meadows, Les Avants to Jaman. | 4-5,000′ | Fairly common; most in good condition. |
| *Polyommatus icarus*, Rott. | Near Les Avants. | 2-3,000′ | Very few; one taken 8th June. |
| *Lysandra bellargus*, Rott. | Caux, Les Avants, etc. | 3-4,000′ | Males common, end May, vivid blue; females taken 9th June. |

| Genus. Species. | Locality. | Height. | Notes. |
|---|---|---|---|
| *Cyaniris semiargus*, Rott. | Ditto and Rhone V. | Lake level – 4,000′ | Singletons in good condition on flowers and grass. |
| *Chrysophanus dorilis*, Hufn. | Gorges des Chauderons. | c. 2,000′ | One seen and taken (above Montreux). |
| *C. hippothoë*, L. | Jor, on road to Jaman. | 4,500′ | Many ♂♂ and one ♀, all resting on Blue Rampion heads, 9th June, noon chilly after sunshine; v. good condition. |
| *Thecla ilicis*, Esp. | Aigle, road to Gorge. | c. 1,700′ | Pair, flying together near Privet flowers; ♀ – r.h.w. half missing. |
| HESPERIIDAE. | | | |
| *Erynnis tages*, L. | Rhone V., etc. | Lake level upwards. | Uncommon. |
| *Syrichtus malvae*, L. | Hills near Les Avants. | c. 3,500′ | Uncommon. |
| *Carterocephalus palaemon*, Pall. | Track to Aigle G. | c. 1,800′ | One only, on flower head, 12th June; worn. |
| *Ochlodes venata*, Br. & G. | Rhone V. and above Montreux. | Lake level – 2,000′ | Not uncommon. |

There seems to be a regrettable lack of portable modern books about Swiss butterflies in any language, except *Papillons de la Suisse* by Giggisberg and Hunzinger, 1944, Librairie Payot, Lausanne, which deals in French with the principal butterflies and moths (c. 3 francs Swiss; illustrated). English entomologists still use *The Butterflies of Switzerland, etc.*, by the Rev. G. Wheeler, 1903, Elliott Stock (5/-, no figures), which is very helpful as regards localities and dates of appearances, though the generic names are much out of date; and Volume I of Seitz' *Macrolepidoptera*, with its valuable coloured plates, though that dates back to 1906. Frohawk and other later authors can be used for the species that also occur, or are supposed to occur, in Britain. For help in identifying those that do not, I am greatly indebted to Colonel G. K. Gregson, R.A., D.S.O., and to Mrs Gregson for her assistance and kind hospitality.

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## OBSERVATIONS ON VARIATION AND HYBRIDISATION IN ZYGAENA LONICERAE, ESP., AND ZYGAENA FILIPENDULAE, L. (LEP.).

By Surgeon Lieutenant Commander H. M. Darlow, R.N., F.R.E.S.

In 1947 five double colonies of *Zygaena lonicerae*, Esp., and *Zygaena filipendulae*, L., were kept under observation with the view to studying variation, hybridisation, parasites and emergence dates, and in an endeavour to establish minor racial differences between isolated colonies, if any. Altogether six hundred and eighty-one imagines were examined, including two hundred and forty-eight *Z. lonicerae*, four hundred and thirty-two *Z. filipendulae*, and one hybrid *filipendulae* × *lonicerae*.

The following is a list of the colonies, their localities and salient characteristics:—

(i) Wickham, Hampshire, on a flowery bank by the roadside.

(a) *Z. lonicerae.* Thirty cocoons were collected on 1st June and a few full-grown larvae were observed. No imagines of any Zygaenid species was seen on the wing. The imagines emerged from the collected cocoons between 17th and 25th June, 22nd June being the optimum date. Only eighteen emerged, death occurring three times in the pre-pupal stage and nine times in the pupal stage. No parasites were found on dissection, and the cause of death is considered to have been trauma at a critical stage of development. Several pupae became impacted on emerging from the cocoons. Only one aberration, a *semi-confusa*, was bred. Twenty worn normal specimens were examined in the field when the colony was revisited on 6th July.

(b) *Z. filipendulae.* Colony discovered on 6th July about 200 yards from colony of *Z. lonicerae.* Eighteen fresh specimens examined, of which two had a reduced sixth spot and were kept for dissection. Of two other minor aberrations one had an abnormally wide hindwing border and the other had markedly pointed apices of all four wings, and confluent fifth and sixth spots. Large numbers of cocoons were found to have been opened, presumably by small birds. (*Vide infra.*)

(ii) Totley, North Derbyshire, on railway embankment.

(a) *Z. lonicerae.* Seventy-three cocoons were collected in the third week of June when no imagines were on the wing, from which imagines emerged without mortality between 24th June and 8th July, the optimum date being 27th June. Sixty imagines were examined in the field on 1st July. There was a marked tendency to crippling both in captivity and in the wild state. Two aberrations were bred in which the hindwings were splashed or shaded with orange in such a way as to suggest disease, or perhaps drenching with an acid meconium. Again many cocoons were discovered with the contents extracted by birds.

(b) *Z. filipendulae.* Colony centred about two hundred yards from the previous one. Between 20th June and 1st July three hundred and fifty-three imagines were examined in the field. There was tendency to reduction of the upper spot of the middle pair, which was quite absent in one specimen and greatly reduced in many others. There was also a tendency to dwarfism at the tail end of the brood. Two unusual aberrations were taken. In one case the spots on the forewings were brick red and the ground colour of the hindwings was pale orange. The other aberration was asymmetrical, the left side being normal and the ground colour of the forewings and hindwing border being replaced by transparent metallic blue, and the spots on the forewing and the ground colour of the hindwing being replaced by pale rose pink. It was quite fresh and undamaged in any way. The antennae and genitalia were normal and symmetrical. Two specimens with a reduced sixth spot were kept for dissection. One male and two females were taken with confluent fifth and sixth spots, rather rounded wings and very narrow hindwing borders, an association of characters found in several other localities, but which appeared out of place in this particular colony in which the hindwing border was on the average rather, and in some cases markedly, broad.

(iii) Maltby Wood, Maltby, South Yorkshire.

(a) *Z. lonicerae.* Five fresh normal imagines were examined on 29th June.

(b) *Z. filipendulae.* Six imagines examined, of which one had a reduced sixth spot and was retained for dissection.

(iv) Lindrick Golf Course, South Yorkshire.

(a) *Z. lonicerae.* Two fresh normal imagines were taken on 2nd July and thirty-four cocoons collected. The imagines emerged between 4th and 13th July, the optimum date being 5th July. There was no mortality. There was a marked tendency to emerge in the evening as opposed to early morning as is usual in *Zygaena*. Of those that emerged on 4th July, one had a minute sixth spot, and when fresh was distinctly greener than normal *Z. lonicerae*. On dissection it proved to be a hybrid. (*Vide infra.*) Another, a female, resembled *Z. filipendulae* very much more closely and probably was of that species, as a single crippled *Z. filipendulae* emerged from the same batch of cocoons on 7th July. All the rest were typical *Z. lonicerae*.

(b) *Z. filipendulae.* Same locality, but were already on the wing when *lonicerae* cocoons were collected Only four were seen and all had been on the wing for some days. Three had fused fifth and sixth spots, rounded wings and very narrow hindwing borders.

(v) Rough country between Alverstoke and Clay Hall, Gosport, Hampshire.

(a) *Z. lonicerae.* Very localised colony discovered on 12th July. Thirty-nine very worn, but otherwise normal, specimens were examined. Three pupae were collected which produced normal imagines on 20th July, very late considering the extremely worn state of those examined in the field.

(b) *Z. filipendulae.* An enormous colony extending for about a mile with local concentrations. One normal male was seen on the wing on 5th July and nine more on 14th July. Seventy-eight pupae were collected between 5th and 14th July which produced imagines between 15th and 25th July. Thirty-six failed to produce imagines (46% mortality), due to various causes discussed below. Two imagines with reduced sixth spots were kept for dissection. One female was taken with confluent fifth and sixth spots and narrow hindwing borders

The analysis of these observations is summarised as follows:—

EMERGENCE DATES.

In Hampshire *Z. lonicerae* emerges about ten days before *Z. filipendulae*, and both species emerge earlier inland than on the coast; whilst in South Yorkshire and North Derbyshire *Z. filipendulae* emerges a week earlier than *Z lonicerae*. Though it may sound like wishful thinking, according to my lists of captures, all those specimens with a reduced sixth spot had an emergence date intermediate between the optimum dates of the two species, but, as is explained below, these are not necessarily hybrids. Emergence dates, however, do seem to have a bearing on hybridisation.

HYBRIDISATION.

Eight male imagines with a reduced sixth spot were dissected but all except one had genitalia indistinguishable from normal *Z. filipen-*

*dulae*. The one exception was a specimen with a very much reduced sixth spot, which emerged from a batch of *lonicerae* pupae collected at Lindrick. The emergence of this batch extended from 4th to 13th July, and this particular individual emerged on the 4th together with five normal males of *Z. lonicerae* and one female with a small sixth spot, which was probably *Z. filipendulae*.

The genitalia of the hybrid (hybr. *inversa*, Tutt) were identical with those depicted and described by Doctor E. A. Cockayne and myself in 1941. (*Ent. Rec. and Journ. Var.*, LIII, 11, 113.) In the locality in which the pupa was collected *Z. filipendulae* emerged before *Z. lonicerae*. The uncus of *Z. lonicerae* is short and of such a shape as not to prohibit copulation between a female *Z. filipendulae* and male *Z. lonicerae*, which would in this locality be on the wing at the same time. The opposite situation is known to occur and produces the hybrid *intermedia*, Tutt, but for the above reasons this particular hybrid seems far more likely to be the product of a male *lonicerae* and a female *filipendulae*.

Females with a reduced sixth spot are rare, which suggests that all true hybrids may be males, which in turn may help to account for more frequent specific crosses and obvious signs of intergrading between the two species. However, I think this unlikely as female hybrids have certainly been produced on crossing other Zygaenid species.

All the other specimens with reduced sixth spots seem to be referable to ab. *hippocrepidis*, Stephens., and do not appear to be hybrids, even though this year's observations indicated an intermediate emergence date. Actually ab. *hippocrepidis* appeared to be six times commoner where *Z. lonicerae* emerged before *Z. filipendulae*, which is the opposite to what one would expect from the mechanics of the genitalia, if it were a true hybrid. Obviously the whole matter requires large scale breeding experiments and prolonged observation over a number of years before it can be fully elucidated.

In any case ab. *hippocrepidis* appears to grade into the normal form of *Z. filipendulae* and the sixth spot was always found to be not less than half the size of the fifth, whereas in the true hybrid it was very much smaller.

### PUPAL MORTALITY.

The mortality in the colonies at Totley, Wickham and Gosport was enormous, owing to attack by what is assumed to be insectiverous birds capable of hovering whilst pecking open the cocoon. Hodgson, *Ent.*, LXXVIII, 990, 176, suggested that House Sparrows or Goldfinches might be the culprits. Goldfinches were seen in all three localities and in large flocks at Gosport. House Sparrows were not seen in any of the three colonies.

The only colony found to be parasitised was that at Gosport. The pupal deaths in captivity amounted to 36 out of 78 (46%). In nineteen cases it was due to one of two species of ichneumon, and in seven cases to the tachinid, *Neopales pavida*, Mg. In twelve cases the cause of death was not obvious.

Why this colony alone should produce so high a pupal mortality from parasitisation is hard to say, but in 1946 the mortality was even higher (55%) and another tachinid species was also involved, *Phryxe vulgaris*, Fall. I am indebted to Mr H. Audcent for identification of the tachinids.

## STOMORHINA LUNATA, F. (DIPT. (CALLIPHORIDAE=LARVAEVORIDAE)) AT BRISTOL.

By E. C. M. d'Assis-Fonseca.

On 20th September this year I was walking round my garden with a net with the intention of collecting a few *Comma* butterflies which were plentiful about some of the fruit trees when I noticed an unusual looking fly on a small clump of Golden Rod (*Solidago canadensis*, L.). I captured the specimen and identified it as a female *Stomorhina lunata*, F., of which there are not very many British records. On the same day, and during subsequent days up to 26th September, I collected altogether 19 males and 12 females of this species, all from the same clump of Golden Rod. The species is generally regarded as an immigrant, being well known on the Continent, where the larvae are said to feed on the eggs of locusts and grasshoppers, and it seems likely that the same conditions which have driven the Clouded Yellow butterfly over to this country in such huge numbers this summer may also have caused a mass emigration of *S. lunata* from France. If this assumption is correct, my recent experience would suggest that the species must have been fairly abundant in the south-west of England during September, and it would be interesting to know whether other collectors have had a similar experience.

It is of interest to note that the species may be a regular visitor to this part of the country, as I took a single male in Blaize Woods, near Bristol, on 8th July 1945, and a single female at Edington, near Bridgwater, on 21st June 1947.—Westerleigh, Cote Drive, Westbury-on-Trym, Bristol—3rd October 1947.

## COLLECTING NOTES.

Pieridae, etc., near Seaford, Sussex.—*Colias croceus* has been more abundant in this district during this autumn of 1947 than at any time during the previous nine years. Plenty of the female *helice* and *pallida* varieties have appeared lately near the coast, where the others are most common too; these large numbers are clearly due, partly at least, to immigration.

But up to the date of writing I had not observed any *C. hyale*, though watching closely for them. However, to-day I saw several, in a downland valley miles inland! The *croceus* and other autumnal species were also enjoying the sunshine there. *Hyale* appeared in this neighbourhood at almost exactly the same date in 1945.

*Pieris rapae*. This butterfly has been a perfect pest this fine dry summer, the females vastly predominating during the second half of August and most of September. In July the earlier occurring males were, as usual, more in evidence. But *P. brassicae* was comparatively uncommon.

We have never seen such masses of Small Tortoiseshells, some small, some big, as appeared this year, notably at *Buddleia* blossom. Other ordinary species have mostly been common too.

But no rarities (other than *hyale*) have come my way in England this year.—Richmond Wheeler, 2nd October.

THE WHITE ADMIRAL IN SUFFOLK.—On 21st September 1947 I saw a White Admiral (*Limenitis camilla*) flying in a wood near Ipswich. It kept out of reach of my net, but it appeared to be in fresh condition, and a little smaller than usual. It has been reported to me that another was also seen in another wood in Suffolk in September. There was also a letter in the *Field* reporting one having been seen in Berkshire this September.

I saw my first White Admiral of the year in Suffolk on 17th June, about ten days earlier than usual. Is it possible that there was a second generation during this hot summer? Have any other specimens been reported?—S. BEAUFOY, F.R.P.S., 98 Tuddenham Road, Ipswich, Suffolk.

LEPIDOPTERA IN DORSET.—September—Two larvae of *A. atropos which* duly pupated. October—Scores of *M. stellatarum* still about. Many *H. convolvuli*, all in more or less good condition. In my small garden quite near the sea scores of *C. croceus*, *P. atalanta*, *P. cardui*, all in fairly good condition. I have not seen so many *cardui* for years. During a 50-mile run through the Isle of Purbeck last Thursday, 9th October, *C. croceus* was to be seen everywhere.—LEONARD TATCHELL, Swanage.

AUGIADES (OCHLODES) VENATA (=SYLVANUS) IN OCTOBER.—Whilst looking over the hordes of butterflies feeding on Michaelmas Daisy here on 5th October in the garden I was most surprised to see a female *A. venata*, freshly emerged, resting with wings half open, on a bloom. There was absolutely no doubt at all about it and it gave plenty of time for observation and identification. Unfortunately, I had no net with me and was unsuccessful in catching it in my hand. The latest date of emergence so far recorded is August in backward years. As this August and September have been so exceptionally warm and dry I see no reason for believing it to be other than a second brood emergence. Further visits to the spot have failed to turn it up again.

It might also be of interest to mention that these flowers have in the past few days provided food for swarms of *P. atalanta*, *P. cardui*, *A. urticae*, *P. c-album*, *P. rapae*, and *Heodes phlaeas*, with a good sprinkling of *N. io*, *G. rhamni*, *P. napi*, *C. croceus*, and *P. brassicae*. The only moth has been *P. gamma* and that in great numbers. I can never remember a year in which there has been such a concentration of the autumn Lepidoptera.—NIGEL T. EASTON, F.R.E.S.

THE ASSEMBLING OF PHOTHEDES CAPTIUNCULA, Treit.—In July, I paid a visit to the Blackhall Rocks area of the Durham coast in order to see how the war years had affected the insects. As is well enough known, to workers here, many of the Lepidoptera there have been the objects of remorseless persecution in the past, with the result that their numbers had greatly decreased. Amongst these insects was the least Minor. However, when I reached one of the stations which had suffered worst I was delighted to discover the insect in considerable numbers. In fact, its numbers equalled what had been present in the early years of the century. This I found to be the case throughout that stretch of the coast. Proceeding northward, I came to a rather dismal area which we had always regarded as hopeless from the standpoint of

*Phothedes captiuncula*. Again, I was surprised at the presence of the insect in quantity. At one point I discovered a female on a rush stem, and around it was a cloud of buzzing males whilst no fewer than seven were at rest on the rush.—(Professor) J. W. Heslop Harrison, King's College, Newcastle-upon-Tyne.

Colias hyale, L., and C. croceus Fourc. on the Isle of Coll, Inner Hebrides.—I do not think that the Pale Clouded Yellow has been recorded from any Scottish area previously; nevertheless a single specimen was observed flying along the eastern shores of Loch Cliad, Isle of Coll, on 30th June. During the remainder of our stay, the weather was too broken for us to make further investigations in that area. However, as we had to make some further observations on the Irish Ladies' Tresses Orchid, we returned to Coll on 27th August. On the succeeding day, we determined to visit Loch Cliad once again. On our outward journey we were attracted by the butterflies, chiefly *Vanessa atalanta*, sucking nectar from the flowers of the Devil's Bit Scabious which grows so plentifully just a little above the shores of Loch an Duin. Amongst these, however, was a single *Colias croceus*.—J. W. Heslop Harrison, King's College, Newcastle-upon-Tyne.

Pieris napi, L., in the Inner and Outer Hebrides.—Only a few years have elapsed since we discovered this insect in the Outer Hebrides in the Isle of Barra, and demonstrated that the pretty tales about its being an immigrant in certain of the Inner Isles were entirely fanciful. Now it is known to range from Barra to Benbecula in the Outer Isles, and to occur on every island in the Inner Group. On the Isle of Benbecula, we had considered it to be very local, and to have its northern limits fixed at Loch na Liana Moire. Now, as the outcome of our stay in the Gramisdale district of Benbecula, we can state that the insect is plentiful right up to the fords between Benbecula and North Uist. There is thus every probability that the Green Veined White will be discovered on North Uist.

In the Inner Isles, it had been looked upon as local and rare in Tiree. On this island, again, we were able to extend its known range for, whilst exploring the rocky Ceann a' Mhara in the extreme west in the month of June, we found the insect in numbers in the gullies, and along the small streams in which water cress grows.—J. W. Heslop Harrison, King's College, Newcastle-upon-Tyne.

Insects at the Flowers of the Cushion Pink (Silene acaulis, L.). —Early in June once more our researches demanded our presence in the Isle of Rhum, and just as is our usual practice, in order to break ourselves in, we made an early ascent of Barkeval where, at a height of nearly 2000 feet, the Cushion Pink abounds. Fortunately, when we reached its stations we found it in full flower. Moreover, it was being freely probed by immigrant *Plusia gamma* with which, even at that height, were a few queens of *Bombus hortorum*. Working along the ridge I began my descent amongst the broken rocks to the west. However, before the *Silene acaulis* was left behind, a strange-looking moth was netted at its flowers. This turned out to be a fine specimen of *Hadena bombycina*, Hufn.—J. W. Heslop Harrison, King's College, Newcastle-upon-Tyne.

Polyommatus icarus, race clara, Tutt, on the Isle of Ronay, Outer Hebrides.—This island is a very rugged piece of land lying just south of Eaval on North Uist, and between that island and Benbecula. We had never visited it previously owing to the difficulty of gaining access to it. However, after a very wet and rough passage in a fishing boat, we managed to land on it on 20th August, only to discover that it was enveloped in fog. With only one compass to serve a divided party, after many vicissitudes, we managed to reach the north-east of the island, where the sun broke out. On a low grassy cliff there we came across a number of plants of the Bird's Foot Trefoil, attached to which was a strong colony of Common Blues. These, when captured for examination, proved to be very large and fine specimens of the form *clara*, Tutt.—J. W. Heslop Harrison, King's College, Newcastle-upon-Tyne.

Butterflies on the Isle of Tiree.—During a period spent on the Isle of Tiree in the early weeks of July for the purpose of studying the machair vegetation there, some attention was paid to the insects. These were very far from plentiful as the long continued dry frost in the first three months of the year had done great damage. Amongst the butterflies I saw were *Aglais urticae*, *Maniola jurtina*, var. *splendens*, *Polyommatus icarus*, var. *clara*, *Coenonympha tullia* and *Eumenis semele*. The last-named pair I believe to be new to the island, although both were to be expected when one considers their abundance on the Isle of Coll.—John Heslop Harrison, M.Sc., Department of Botany, Queen's University, Belfast.

Aglais urticae ab. nigra, Tutt.—*A. urticae* has been more than usually abundant in North Devon this year, and several minor varieties, including v. *polaris*, have occurred in my garden, but on the morning of 31st August last I was surprised to see a fine specimen of ab. *nigra*, Tutt, amongst a dozen or so of the type on a small patch of Gilia. It approximates very closely fig. 4, plate 22, p. 93, in Frohawk's *Varieties of British Butterflies*, but is slightly asymmetrical in the amount of black markings and the reddish-brown colour of the fore-wings is not so bright. Incidentally, I may add that the blossoms of Gilia have proved more attractive to insects than any others in my garden at this season.—E. Barton White, F.R.E.S., Braunton, N. Devon.

## CURRENT NOTE.

The *Zeit. Ent. Wien. Gesell.*, Pts. 1-4 and 5-8 (1946), recently to hand contain much matter on the Micros. There is a long paper on the natural pose of Lepidoptera with many diagrams and illustrations from nature. One of the latter is that of *Papilis podalirius*, which was an admirable reproduction, reminding us that we saw one many years ago pose on the flowers in the Circus Maximus in Rone in Easter week. Another useful article is one on the Variation in *Hybernia aurantiaria* with a diagramatic plate of twenty forms. We must compliment those who are carrying on this fine magazine established in 1916.

# EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr Hy. J. TURNER, "Latemar," West Drive, Cheam.

*Wanted*—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Instituto Miguel Lillo, Calle Miguel Lillo 205, Tucuman, Republica Argentina.*

*Desiderata*—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—*H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.*

*Wanted.—Lycaena* (*Heodes*) *phlaeas* from all regions including British Isles. Also wanted other species of Chrysophanids from all areas. Exchange or purchase considered. *Duplicates.*—Foreign Lepidoptera, e.g., Satyrids, Charaxes, Papilios, and others; full lists sent.—*P. Siviter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.*

*Wanted* for cash or exchange many species of ova, larvae or pupae, especially local forms and *A. grossulariata* from different localities, also Seitz Vol. 1 and Supplements to Vols. 1-4. Offers also, Tutt's *Practical Hints*, Parts 1 and 2, Buckler's larvae, Vols. 1-6, and Tutt's *British Noctua*, Vols. 2, 3, and 4.—*Dr J. N. Pickard, F.R.S.E., 36 Storeys Way, Cambridge.*

*Wanted.*—Various monthly parts of *Entomologist's Record* for 1914, 1915, 1916, 1917, 1919, and 1920. Please report any odd monthly parts (in wrappers as issued) prior to these years.—*P. B. M. Allan, 4 Windhill, Bishop's Stortford, Herts.*

*Wanted.*—Males of *Morpha menelaus, M. didius, M. rhetenor* in papers.—*Leonard Tatchell, Rockleigh Cottage, Swanage, Dorset.*

*Wanted* urgently for experimental purposes, pupae of *betularia, porcellus elephanor.—Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.*

*Wanted.*—Various Books on Lepidoptera. Please send lists and price. Also wanted, Live Exotic and English Lepidopterous Material for cash or exchange for similar material or Set English Imagines.—*J. K. Goody, "Weldon," 26 Carr Wood Road, Bramhall, Ches.*

*Sale or Exchange—R.E.S. Trans. and Proceed.*; bound, 1911 to 1916, 1918 to 1919; unbound, 1921 to 1923, 1925; also 1917 and 1924 less part 5. New Series—*Trans.*, Vols. 1 and 2, Vol. 3, part 1. *Proceed.*, Vol. 1 and Vol. 2, part 3. *Trans. Suffolk Naturalist Society*, Vol. 3 and Vol. 4, part 1. *Wanted*, bound or unbound, *Entomologist*, Vols. 2 and 3, 1926 to 1930, 1940 to 1942. *Ent. Mont. Mag.*, 1922, and 1924 to 1942; also various volumes of *R.E.S. Trans.* List on application.—*F. W. Smith, Boreland of Southwick, by Dumfries.*

*Wanted*, for experimental purposes, a few pupae of *Endromis versicolora*, purchase or exchange.—*R. W. Parfitt, 1 Dunsdon Avenue, Guildford, Surrey.*

*Wanted.*—Volume V (five) of Tutt's *British Lepidoptera.—T. R. Eagles, 32 Abbey Road, Enfield, Middlesex.*

*Wanted*—Bristol board suitable for mounting Coleoptera. Also, Puton, A., 1878, "*Synopsis des Hémiptères-Hétéroptères de France.* Badonnel, A., 1943, *Faune de France*, No. 42, Psocoptères.—*H. G. Stokes, 12 Roman Road, Salisbury, Wilts.*

## MEETINGS OF SOCIETIES.

*Royal Entomological Society of London*, 41 Queen's Gate, S.W.7 : November 19th and December 3rd at 5.40 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society* : Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section* : Last Fridays in month, at 7 p.m., at the Birmingham Museum and Art Gallery. Particulars from the Hon. Secretary, G. B. Manly, 72 Tenbury Road, King's Heath, Birmingham, 14.

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*Communications received* :—Thomas Greer, Fergus J. O'Rourke, O. Querci, H. Donisthorpe, Malcolm Burr, Surg.-Lt. Comm. H. M. Darlow, D. G. Sevastopulo, D. Fearnehough, R. J. R. Levett, E. C. S. Blathwayt, E. P. Wiltshire, A. E. Wright.

**All Communications should be addressed to the Acting Editor, HY. J. TURNER, " Latemar," 25 West Drive, Cheam.**

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# THE PLEISTOCENE RACES OF CERTAIN BRITISH INSECTS AND DISTRIBUTIONAL OVERLAPPING.

By J. W. Heslop Harrison, D.Sc., F.R.S.

In 1916 I published a comprehensive series of papers (*Naturalist*, 1916, pp. 163-166; 194-198; 273-278; 358-362; 377-382) under the general title "The Geographical Distribution of the Subfamily Bistoninae" in which the whole of the world species of the group were reviewed. In that work, the view was advanced for the first time that many British species of Lepidoptera, of which *Nyssia zonaria*, Dup., affords a good example, had survived the vicissitudes of the Great Ice Age on Lands, long since overwhelmed by the waves, lying to the west of the present shores of Ireland and the Outer Hebrides. From those havens of refuge, it was suggested that, as the climate ameliorated at the close of the Glacial Period, and the ice sheets waned, such forms pressed to the west and south to recolonize areas set free of ice.

Later (*Trans. Nat. Soc. Northl. Durh. and Newcastle-upon-Tyne N.S.*, Vol. 6, 1924), a second paper* appeared from the pens of Mr Wm. Carter and myself which extended the same idea to cover the distributional and other problems presented by the British races of the butterfly *Aricia agestis*, Hb. (=*A. medon*, Esp.). At the same time, it was demonstrated that the Durham and Northumberland habitats of the species constituted a zone of hybridization in which ordinary southern *medon* (*agestis*) overlapped and interbred with the Scottish subspecies *artaxerxes*, Fab. It was likewise established that, as a result of this interbreeding, there had come into being a mixed population comprised of individuals exhibiting all the characteristics of one or other of the parent subspecies, intermingled with others displaying every possible recombination of those characteristics. A further point made was that the position was complicated to a remarkable extent by the presence of aberrant insects owing their genesis to genetic interactions of various types.

Included in the hybrid population, as was clearly indicated, were forms alleged by many to represent a distinct race, intermediate to *agestis* and *artaxerxes*, to which Stephens, quite arbitrarily, applied the name *salmacis*—a procedure wholly indefensible.

Further, the thesis was developed that *artaxerxes* itself had evolved in isolation from a contingent of *A. agestis*, cut off during the Glacial Period by an ice barrier from the main stocks of the species. In accordance with the then accepted opinion that *agestis* still existed in Ireland, these refugia were placed in ice free areas lying beyond the present-day coasts of that country. Now that the claims of the species to a place in Irish faunal lists have been rejected, we are compelled to look to the West of Scotland, or to the Scottish Western Isles, for the required refuges. Moreover, whilst it cannot be denied that Tertiary relict forms, exemplified by the moss *Myurium Hebridarum*, Schimp., have persisted throughout the whole of the Glacial Period, it seems almost certain that the history of all the British species studied in the papers discussed can only be dated back to the last Interglacial Period, or even

*The contents of this paper are summarized by Ford in his "Butterflies" (pp. 296-298, p. 314), but no reference to the original work is supplied.

to some period of temporary retrogression during the last Pleistocene glaciation.

Let us now consider the possibility that it is to the Western Scottish areas to which we have to look for ice-free refuges in which *artaxerxes* evolved. Clearly, if these were able to maintain colonies of *A. agestis* during the last Pleistocene glaciation, they must have supported its food plant, *Helianthemum vulgare*, Gaertn. That being so, if one has to base a judgment on the present status of the plant in the West of Scotland, the whole of the Hebrides, Inner and Outer, must be excluded, for only on Lismore of all the Western Isles does rockrose grow. Attaching due weight to the glacial phenomena observable on Lismore, and to its geographical position, it seems very unlikely that it provided the necessary refugia. However, when we realize that rockrose flourishes elsewhere in v.-c. 98, and that other obvious Interglacial survivors like *Zygaena purpuralis*, L., and *Z. achilleae*, Esp., may still be captured in the Oban area, it appears quite possible that sheltered ice-free areas existed in Argyllshire in which *agestis* persisted, and gave rise to the subspecies *artaxerxes*.

Again, in spite of the fact that, taking only the present range of the rockrose into account, the Inner and Outer Hebrides cannot be brought in the discussion, the plant may not have been absent from the islands during the final Interglacial Period. Toward its closing stages, high land levels, marking isostatic adjustments resulting from the removal of the ice load, supervened. Almost certainly, the islands of the Rhum, Eigg, Canna and Muck series would constitute, with the adjoining mainland, one continuous stretch of land. This would entail exposure of the limestone formations now just under the sea on the southern approaches to Muck. Besides, the now rapidly weathering limestone areas of the Monadh Dubh, Rhum, must at that period have been much more extensive. In addition, whilst preferring limestone, rockrose does not reject basalts of which Rhum, Eigg and Canna provide an abundance. Since Rhum was, for the most part, free from ice during the last Pleistocene glaciation, the chance that rockrose, with the insect, survived in the Small Isles area cannot be disregarded. That the islands remained isolated long enough for widely divergent forms to evolve must be granted, as endemic species like the eyebrights, *Euphrasia Heslop-Harrisonii*, Pugsl., and *E. rhumica*, Pugsl., as well as the strange endemic orchid related to *Orchis ericetorum*, Linton, prove so decisively. This would imply that, whilst eustatic rises in sea level at the close of the Ice Age once more cut off the islands from the mainland, as the late glacial raised beaches demonstrate, later the insect, during a period of renewed land connections, again isostatic in origin, was able to pass to the mainland.

At this stage two points need emphasis; it is quite possible, although not likely, if due weight is attached to the fact that *artaxerxes* never leaves rockrose, that the other food plants of typical *agestis*, various species of *Erodium*, should be taken into consideration. Secondly, since an Irish relict colony of rockrose has been discovered, Ireland may still have provided the species with its refugium.

For a long period I regarded *Aricia agestis* as unique in providing an example of overlapping and interbreeding races in Britain. Now, as the outcome of protracted studies of Hebridean insect faunas, I re-

cognize that the species furnishes only one of the many instances available, not only in the Lepidoptera, but also in other insect orders. Amongst the Lepidoptera, *Polyommatus icarus*, Rott., with its race *clara*, Tutt; *Maniola jurtina*, L., with *splendida*, B. White; *Argynnis aglaia* with *scotica*, Watk.; *Eupithecia pulchellata*, Stph., with *hebudium*, Sheld.; *Coenonympha tullia*, Mull., with its two subspecies; *Euphyia bilineata*, L., with *atlantica*, Staud.; *Thera cognata*, Thnb., with its island race, and the Protean *Triphaena comes*, Hb., supply an excellent group of examples. In particular, I have already shown (*Vasculum*, xxx, p. 58, 1945) that the case of the common blue butterfly, *Polyommatus icarus* with its race *clara*, Tutt, runs exactly parallel with that of *A. agestis*. On the Durham coast, forms precisely the same as those captured in the Outer Hebrides fly alongside every type of intergrade between *clara* and the type. Indeed, so extreme are some of the Durham females, that this summer I was quite unable to differentiate a series caged up for eggs from a similar lot from the Isle of Barra. Also in harmony with the *agestis* position, in inland areas in Northumberland and Durham the ordinary English insect, with some intergrades, dominates the colonies.

Of the other species mentioned, the influence of the Scottish Interglacial races of *Argynnis aglaia* and *Euphyia bilineata* is also felt as far south as the North of England. On the other hand, the zones of hybridization involving *M. jurtina*, *T. cognata* and *E. pulchellata* with their Hebridean races are restricted in some instances to the Inner Hebrides, and in the others to the same islands and the adjacent areas of the mainland. In the case of *Triphaena comes*, intergrading masked by dominance, epistasis and other phenomena depending upon segregation and recombination, occurs in the Hebrides, and north of a line from the Clyde to Angus, although light infiltration south of this line may be encountered.

In all of these instances, the weight of the evidence brings strong support to the opinion that these Scottish Interglacial races are correctly described as Hebridean, inasmuch as they have originated in ice-free Hebridean areas cut off during the last Pleistocene glaciation when the mainland was still enveloped in an icy covering.

Conspicuous amongst the representatives of other insect orders possessing a glacial history closely resembling that of *Polyommatus icarus* stands the Hymenopteron *Bombus smithianus*, White. This humble bee, whilst found on other fringing islands in the British area providing glacial relict stations, reaches its maximum population density in the Outer Hebrides, and in certain members of the Inner Group. In these islands it forms a very striking element of the insect fauna. As far as the Outer Isles are involved, it may be observed in every island, great and small, from Lewis to Barra Head. In the Inner Isles, it forms a permanent inhabitant of the Isles of Coll, Tiree, Gunna, Rhum, Eigg, Canna, Muck and Hyskeir. In addition, it has occurred sporadically on Raasay, South Rona and Scalpay. Although close search has been made for it, it has never been detected in Mull, Skye and Soay.

Most workers, including myself, rank *B. smithianus* as a distinct species; others, however, are inclined to regard it as a subspecies of *B. muscorum*, L. In any case, it has been evolved from *B. muscorum* at some date, geologically speaking, comparatively recent, and with that

species it clashes in the Rhum and Raasay groups of islands. On Rhum, Cann and Eigg, *B. smithianus* occurs in preponderating numbers whilst on Raasay its occurrence is sporadic, and *B. muscorum abounds.* Further, it should be emphasized that on all these islands a third related species, *B. agrorum*, L., flies also. In the Isle of Rhum, where the problem has been studied most closely, the ranges of *B. smithianus* and *B. agrorum* tend to remain distinct. Very different are the relations between *B. smithianus* and *B. muscorum*; whilst pure *B. muscorum* occurs but rarely, intergrades, generally, but not always, approaching *B. smithianus* are of frequent occurrence. On Eigg and Canna the same holds true. On the other hand, in Raasay at the Point of Eyre, insects forming a complete transition from *B. smithianus* to *B. muscorum* have been taken on several occasions. Obviously, in the zones of overlap, interbreeding has taken place ending in the evolution of hybrid populations of varying degrees of complexity.

Once more the explanation of these mixed populations lies in the fact that in *B. smithianus* we are dealing with a glacial "overwinterer" which has emerged from its Hebridean retreats to make contact with and interbreed with contingents of *B. muscorum* advancing northward and westward in the rear of the retreating ice. Nevertheless, as far as Raasay is concerned, the warning must be given that the postulated movement of *B. smithianus* may be quite recent; indeed, in my opinion, one irruption of that species took place during the last decade. On the contrary, it seems certain that, on Rhum, Eigg and Canna, the clash took place so long ago as Boreal times when Rhum and its neighbours received their quotas of southern plants and animals from mainland sources.

Of the other groups, the Odonata include at least one species on which the same type of phenomena is apparent; this is *Sympetrum striolatum*, Charp., and its race *nigrofemur*, Selys. Throughout the Hebrides, and more especially in the islands containing *Bombus smithianus*, the race *nigrofemur* swarms. In fact, this season (1947) it has hawked over the lochs, and far away from them, in prodigious quantities.

Even on the Scottish mainland, and in England as far south as Co. Durham, the blacklegged form may be found. However, it is noteworthy that, in Northumberland and Durham at least, intermediates crop up. Thus, once again, the phenomena made familiar by *Aricia agestis* and its subspecies *artaxerxes* have been repeated. In other words, it is clear that, in the race *nigrofemur*, we have a western Interglacial race, interbreeding in a zone of overlap with a second subspecies of southern proclivities. It deserves mention, too, that in the west the Welsh counties produce intergrades. This occurrence is just what one would anticipate from the superior mobility of such far-wandering forms as the different *Sympetrum* species.

The Hemiptera-Homoptera and Coleoptera likewise yield examples of the same type of behaviour although in these orders the necessary observational and breeding work with selected species are only in the initial stages. Amongst the Homoptera the Psyllid *Livia juncorum*, Latr., has been chosen, and as far as the work has gone, it appears clear that a dark Hebridean race exists which overlaps with the ordinary mainland form to give rise to intergrading forms on Gunna, Tiree and

Coll, and doubtless elsewhere. Much the same seems to apply to *Psylla dudai*, Sulc., and amongst the Coccids to *Chionaspis salicis*, L.

In the Coleoptera the two forms subjected to study are *Coccinella 11-punctata*, L., with its race *boreolitoralis*, Donis., and *Carabus problematicus*, Hbst. The first named insect, when bred in numbers from the Rhum sand dunes, produced forms intermediate between the extreme *boreolitoralis* and the ordinary form, as well as representatives of that race. With *Carabus problematicus*, it is obvious that breeding operations cannot be undertaken. Besides, the problem is of a more complex nature than in other cases discussed. Nevertheless, up to the present, the picture emerging is not out of harmony with that outlined for the other insects dealt with above. However, a programme is being built in which it is proposed to bring under consideration its races from the northern Atlantic islands up to and including Iceland.

It will have been observed that, in reviewing the above species and the races, no mention has been made of clines. The failure to do so has been deliberate, and depends entirely upon the fact that field observations lend no support to the cline theory. Practically every scrap of evidence procurable supports the idea that we are concerned rather with zones of hybridization, occasionally irregularly distributed, developed by the interbreeding of Pleistocene stocks with others whose arrival in the British area can only be dated back to early Holocene times.

Take, for example, *Coenonympha tullia* treated so fully in Ford's *Butterflies* (pp. 292, 293; map 4, p. 342) as illustrating a cline. As far as Great Britain and the Scottish Western Isles are concerned, the map fails to give a correct distributional picture. The insects flying in the Cleveland District of Yorkshire, as well as those encountered in Northumberland, are not true *philoxenus* forms. Indeed, I have individuals in my series from Glaisdale indistinguishable from others taken in Kincardine. Moreover, amongst my Coll captures are some assignable to what Ford considers genuine *tullia*. Again, internal evidence exists in the book proving that that worker realized that the position was not truly that of a cline. In dealing with Islay populations, he is compelled to admit that they include specimens of *scotica*, *tullia* and "even specimens closely approaching *philoxenus*." One cannot wonder, therefore, that he has to write "The population must have evolved on somewhat independent lines." Finally, he attaches too little importance to the distribution of *Philoxenus* on the Continent for it suggests a very recent (probably boreal) advent of that race in Britain.

In conclusion, attention should be directed to the fact that the work outlined above is still in progress and that other reports will appear in future.

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## VESTRIAS PURPUREUS, THNB., AND ITS PREY.

By Dr G. H. Lowe.

This bug preys upon an ant of the genus *Monomorium* closely allied, if not identical, to **Monomorium pharaonis*, L. This ant is very common in Malaya, living in houses. I have never found it in any

*The ant is *Monomorium pharaonis*, L., only the specimens are very pale in colour.—H. D.

other situation. It nests in the cracks of walls, behind the plaster, in the joints of furniture, and similar situations. It does not construct any nest, or alter the nesting cavity in any way. On two occasions I have found nests in a spectacle case, left untouched in a drawer in my dressing table for several weeks. The nests I have seen have contained comparatively small numbers of ants, but numerous nests may occur in one house.

This ant is active throughout the day and night, but during daylight the workers are generally seen singly, unless they are engaged in exploiting some chance food supply. At night long columns of ants run about the walls. Although it nests in perfectly dry situations, it must have water, so that the nests are more common in bathrooms, and in bedrooms where there are hand basins, than elsewhere in the house. Every night columns of ants can be seen running to, and from, the nearest water supply. Other columns run from hole to hole in the plaster walls, or between cracks between the tiles of the bathroom walls. This is a " two-way traffic," and many ants, going in either direction, have distended crops. To the human observer much of this running to and fro seems to be an aimless expenditure of energy.

The large, dark-coloured, dealated females accompany the columns of workers at night, and I have counted six on my bathroom walls at one time. I have not seen winged females, or males, of this species. Perhaps this ant distributes itself by means of branch nests, and the habit of the queens of accompanying the columns would assist in such a method of nest formation. Nesting, as it does, in odd situations, it can easily be transferred from house to house in furniture, and household goods.

A small colony of this ant lived in the joints between the legs and the top of a table in my sitting room at Sungei Patani. A few ants were engaged all day in carrying water supplies to the nest from the flower vase which stood on the table. I had tea at this table, and numbers of ants always appeared to feed on the sugar, and jam, and to carry off small crumbs. Any worker which found food would first fill its crop before returning to the nest. A few minutes after it had disappeared beneath the table a small column of ants would appear following its back-trail to the food. At first there would be some straggling, but a definite trail soon became established. At night a reading lamp stood on the table, and small insects would come to the light. After resting on the globe for some time many of these insects fell on to the table as if overcome by the heat, and the ants came out to carry them off to the nest. Dealated queens often accompanied these foraging parties, but always in a hesitating manner, as if they were uncertain if they should have come with this particular party. The queens took no part in the transport of the food.

This species of *Monomorium* is omnivorous, but it does not seem to attack living adult insects. It will eat ants' eggs, larvae and pupae, but does not attack the adult ants. It has a large sting, but I have never seen it fight. The trails it follows are laid down by scent. If a finger is rubbed across the track the trail is obliterated, and there is much confusion until the trail is re-established across the gap. Food is eaten where it is found, or cut up into small pieces, and brought

home. There is no co-operative effort to bring home larger insects. If a dead insect is small enough to be brought home by a single ant it is carried to the nest, and such help as is occasionally given by a companion appears to be accidental. It is doubtful, however, if it would be any advantage to this ant if large insects were brought back to the nest. The entrance is nearly always too small for large articles to be brought into the nest, and, as it is frequently situated on a vertical wall, it would be very difficult to support a large insect outside the nest whilst it was being cut into small pieces.

Although this ant is common throughout Malaya, except at Hill Stations, I have only seen the bug at the house where I lived at Alor Star, Kedah. Both the larval and adult bugs frequent the trails of the *Monomorium*, particularly at night. The bug appears to be able to see the ants from about half-an-inch away. It makes a few quick steps forward, and a forward lunge with its beak. The ant is generally transfixed through the base of the abdomen, but sometimes the thorax is pierced. The first pair of legs are not used to catch the prey, but they are used to manipulate the ant on the beak just after it has been captured. This manipulation appears to be to keep the ant's jaws, or sting, away from the bug's beak. After a few seconds all movements by the ant cease, and the bug's front legs are then placed on the wall, and the ant remains stuck on the beak. The meal takes from five to ten minutes, and then the sucked-out body of the ant is pushed off, and the bug starts looking for a fresh victim.

If the column of ants temporally thinned out the bug would move to a fresh area. It appeared to find the ants by sight. The ants never attacked the bug, but, on the other hand, the bug appeared to avoid getting mixed up with the moving column. Stragglers, rather than ants of the main body, were attacked. The ants seem to be quite unaware of the presence of the bug.

Several of these bugs lived on the walls of my bathroom, and the cast skins of the larvae could be found in the angles of the walls. During the daytime the bugs often hid behind the wall fittings, such as the mirror, and I think the eggs must have been laid in these hiding places, as I never found any eggs on the walls. The fate of insects' eggs in the neighbourhood of *Monomorium* would be almost certain destruction. Possibly the eggs are distasteful to the ants, or possibly this bug produces eggs which hatch almost as soon as they are laid. Certainly the larvae were no more numerous than the adult bugs. On one occasion, for instance, one adult, and two larvae, of different ages, were present in my bathroom.

Both larvae and adults are equally voracious. The usual gait of the bug is a deliberate walk. If disturbed they run a few steps, but the adults did not attempt to fly away. I never found them eating anything other than this species of ant, and I never saw one attacking or eating a queen ant. I suggest that this bug is distasteful to the house gecko, which is very common in Malayan houses, and that the striking red and black colouration is a warning. Otherwise such a slow-moving insect, which wanders about on the exposed walls at night, could not hope to survive.

## FIELD NOTES FROM ANATOLIA.

By Malcolm Burr, D.Sc., F.R.E.S.

### I. BOZ DAGH.

*Ex Anatolia semper aliquid novi!* The old saying is as true of Anatolia as of Africa, though Pliny did not realise it in spite of his knowledge of the country. For Asia Minor certainly has a remarkably varied and rich fauna and flora and may be correctly described as a naturalist's paradise.

There is, however, a certain reservation, and that is that, at least in certain places and at certain times, there is a surprising scarcity of individuals. Half-a-dozen summers' collecting in the neighbourhood of the Bosphorus had shown me that the fauna there is not nearly so rich and plentiful as in Macedonia, where the whole place seemed to offer good collecting ground. But in Anatolia, so far as my experience goes, one has to work harder to fill one's bottle than on the Bosphorus, and there harder than in Macedonia. In very few spots did I come across that exuberance of insect life that one would expect in full summer in the southern latitudes, which we know in plenty of favoured spots even in England.

For one thing, the season is early in Anatolia, and for the most striking groups May and June are the best months. So it was unfortunate that it was impossible for me to get into the field before July, with the result that I missed such interesting Orthoptera as *Saga*. *Bradyporus*, *Tmethis*, *Nocarodes* and their relatives, as well as the numerous apterous *Phaneropteridae* so characteristic of the country.

My previous visit to Anatolia had been too early, for it was in April that I had made a reconnaissance on the central steppe, round the great salt lake, when the exuberance of bird life was astonishing, but insects had hardly begun to appear.

It was not until 13th July that I arrived in the pleasant little town of Denizli, centre of the *vilayet* of that name, in the south-west of Turkey. Here my object was to find a colony of the newly-discovered earwig, *Pseudisolabis kosswigi*, Burr, with Oriental and Australian affinities, that Professor Kosswig had found on the neighbouring mountains. Here I joined forces with Mr Peter Davis, a keen and energetic botanist with an encyclopædic knowledge of his subject. Not only did I enjoy his companionship, but shared the privileges given him by the Forest Administration, without which our work would have been extremely difficult. A Forest officer, Kamil Bey, accompanied us, which added to our pleasure and facilities.

Our first destination was Boz Dagh, a mountain of Mesozoic limestone attaining an altitude of over 2400 metres. We left early in the afternoon, over a fairly high pass down into the plain of Acipayam. Stopping for a moment at the highest point, where there is an outcrop of coarse conglomerates, I found several of the mantid *Bolivaria brachyptera*, Pall, which indicated that we were still in the area of the steppe fauna, *Oedaleus decorus*, Germar, and a beautiful yellow-winged *Oedipoda aurea*, Uv. It was the first time I had seen this beautiful grasshopper and a delight it is. It is distributed over the Anatolian

plateau into Palestine, but in the purely Mediterranean area seems to be replaced by another form.

At this point a violent storm broke upon us, and it was a bedraggled party that arrived in the evening in the little town of Acipayam, centre of the bitter almond district, and in the doss-house where we spent the night I met with the real exuberance of insect life which is quite erroneously believed to be characteristic of hotels, both real and so-called, in this part of the world. As a matter of fact, this was the only place in Turkey where I have been seriously worried by *Cimex*, and, in seven years' residence in the country, only the second place where I have seen them at all.

The next day the Forest Director of the district, Galip Bey, took us by lorry to Abas, the last village on Boz Dagh, at an altitude of 1100 m., just above which we camped for a few days. The place looked promising for my earwig, with just the conditions that Kosswig described for his type locality on Honos Dagh, an adjoining mountain. There was the bubbling brook and there were plenty of stones to turn over. So I set to work with a will. But, just as Kosswig had found, to turn over stones is one thing and to find the earwig another. He told me he had turned over an enormous number of stones, all apparently suitable, but found only two earwigs, a male and a female, but under different stones. Now turning over stones becomes tiring work, especially when one continuously draws blank, and when I felt I could not turn over another to save my life, I doze down under the shade of a *Pinus brutea* and was lulled into a dose by the murmur of the rippling water. I awoke with a start, and caught a glimpse of a small black insect running across my leg. Barely awake, I pounced and popped it in a tube. Then, wide awake, I looked carefully. It was *P. kosswigi* all right, but a female.

In spite of all my efforts, I never found another. I enlisted the services of some village boys, providing them with tubes of spirit, and showed them my specimen. Then next day they brought me a tube packed with earwigs, that they had found in the gardens and vineyards of the village. There were four species, but not a *kosswigi*. They were *Forficula auricularia*, L.; *F. lurida*, Fisch., its Levantine relative; the handsome *F. smyrnensis*, Serv., that ranges from the Aegean coast into Azerbaidjan, and *F. hincksi*, Burr, that Kosswig had recently discovered on the south coast. I saw no more earwigs while on the mountain.

Another species new to me was *Sphingonotus theodori*, Uv., similar to *Sph. caerulans* with bright yellow hind tibiae. It was not at all numerous, occurring sparingly on the open stony patches up to nearly 2000 metres. The other Oedipodids there were the universal *Oed. caerulescens*, L., the beautiful pink-winged *Oed. miniata*, Pall. (=*O. gratiosa*, Serv) and the handsome yellow-winged *O. aurea*, Uv. But none of them were numerous.

There were no Tettigonids to be seen; we had found a belated *Poecilimon* in a village by the way and Davis brought me a *Tylopsis*, an abundant early summer species. He also brought me two very interesting grasshoppers quite unfamiliar to me, two males, which he had found crawling on the ground among the needles of *Pinus brutea*. They turned out to be *Orchamus*, a Pamphagid genus. The next day I spent

several hours quartering the ground where he had found them, but did not see one. I had always missed the *Pamphagidae* in my European collecting, as I had never reached the ground early enough in the year, and these two must have been the last, lingering on at this high altitude. Afterwards Davis took a female Pamphagid on the branch of a pine, a good six feet above the ground. This will probably turn out to be the female, but its occurrence up a tree is interesting, since the Pamphagids are normally ground-loving insects. In Northern Rhodesia I had once taken a large female Pamphagid climbing up a tree, several feet above the ground.

Cockroaches were scarce. I came across a single *Loboptera decipiens*, Germ., a general Mediterranean species, and, after much search, a single *Ectobius* among dead leaves by a spring.

A few hundred metres above Abas *Pinus brutea* gives place to *P. nigra*, which extends to the top of the tree zone. After a good climb up here, I was surprised to see several butterflies, for down at Abas all I had noticed were a few obscure Lycaenids. But here I saw *Argynnis*, I think *A. pandora*, which seems to be the commonest species in Turkey, and a *Satyrus*. The explanation was the existence a little further down over a ridge of a good-sized patch of alpine meadow, called *yayla* in Turkey, with a rich flora of juicy grass and plenty of wild flowers. Here were plenty of butterflies, which I took to be *A. pandora*, *Colias croceus*, one resembling *Maniola jurtina*, another like *Eumenes semele*, *V. cardui* and a chequered skipper that was unfortunately too clever for me. There were several dragonflies about, but few Orthoptera. I got *Chorthippus dorsatus* and *Acrydium depressum*. The presence of the former here was rather surprising; there were not many and, unfortunately, some marauding wasps stole several of them when drying. Not a sign of a Tettigonid. On the track up to the ridge *Oed. aurea* was the dominant grasshopper; *O. caerulescens* was rarer, and *O. miniata* rarer still.

While I was in the *yayla* my companions had made their way to the top of the mountain, from which they did not return till long after dark. Davis reported the altitude as 2421 m., above the tree zone; I had asked him to look out for *Parnassius* and *Erebia*, but he did not see either. He brought down, however, some interesting Orthoptera, including four female *Nocarodes* sp., two species of *Poecilimon* and a red-winged *Celes variabilis*, the latter from a lower altitude. When worked out, the two former may very likely prove to be new species. He brought also a *Thecla* and a very pale *Satyrus*.

There are many advantages in doing field work with a botanist, delightful companionship and the chance of learning at least the generic names of interesting plants, but there is one disadvantage, that is that when on a collecting expedition with an ambitious programme, he is always in a hurry; he can complete his work in a small area in a few days, whereas the entomologist wants to linger. That is, I think, one of the reasons that my results were relatively so meagre. In any case, I found I had to work far harder to get a bottle full of Orthoptera on Boz Dagh and I was definitely disappointed in the amount of material collected, though what we did get was clearly very interesting.

Of other insects, not a sign of Trichoptera, though plenty of dragonflies. Very few beetles, surprisingly few. Davis brought down *Procerus gigas* and a single Chrysomelid from a high altitude and there were some bronze *Cetonias*. A big dark *Asilus* was common, sitting on stones, but on this occasion I did not see one with prey. We had a strong lamp in our camp, but only one single insect flew to us to light, a small hawk moth.

On the 17th July we said good-bye to Boz Dagh. It is an interesting mountain that would well repay more leisurely examination. It must be distinguished from the better known mountain of the same name near Odemish, so, in alluding to it, it should be made clear that it is the Boz Dagh in the *vilayet* of Denizli. On our maps it is shown in error as Bor dagh.

Back at Acipayam, we were entertained to lunch by Galip Bey. He has a delightful house on the slopes of a big row of hills, commanding a splendid view of the strange, dry valley filled with bitter almond trees and a corresponding range of mountains, apparently treeless, on the far side. I came to the conclusion that it must be rather a pleasant job to be Forest Director in such interesting surroundings. Round his house were the usual *Oed. miniata* and some *Calliptamus*. I saw one clear-winged insect hawking along the sun-baked hill-side like a harrier, very difficult to see in the blazing sunlight. I caught it, and was glad to find it was an *Ascalaphus*.

On the way back to Denizli, we stopped at a spring called Vali Cheshme, at 1280 metres, where I picked up *Chorthippus parallelus*, *Ch. albomarginatus*, *Oedaleus decorus*, an *Arcyptera*, a *Stauronotus*, a *Stenobothrus*, perhaps *nigro-maculatus*, a *Calliptamus* and *Oed. miniata*.

A surprising fact stuck in my mind. I had not seen one single Decticid.

*(To be continued, with a plate to the 2nd part in January.)*

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## REPORT.

## AUCTION SALE IN LONDON OF VARIETIES OF BRITISH BUTTERFLIES.

By L. Hugh Newman.

The first portion of the Rev. J. N. Marcon's famous Eastbourne Collection of butterfly varieties was offered for sale by Auction at Messrs Debenham, Storr & Sons Ltd. of 26 King Street, Covent Garden, W.C.2, on 22nd October 1947, and the total for some 280 lots realized approximately £1020.

It has become almost a tradition that outstanding Collections when catalogued for Auction should commence with a melanic Swallow-tail, and lot 1 of this Sale was no exception. A magnificent male, ab. *obscura* of *P. machaon* bred by L. W. Newman in June 1935 from stock obtained from the Norfolk Broads fetched £15, which is about average for this form nowadays. A fine and rare ab. *alba* of the same species, however, realized only £5 5/-, although it was undoubtedly a much more uncommon insect.

Hermaphrodites amongst butterflies, with perhaps the exception of those occurring in *icarus*, usually command high prices; a *rhamni* and a *cardamines* at £7 5/- and £16 respectively were about what one would expect. But a *P. napi* following soon after realized £23, but it was a unique di-morphic specimen, left side being female ab. *citronea* while the right side was typical white male. As this insect was figured in Frohawk's " Varieties " it was picked up remarkably cheap by the buyer, having been sold previously to the late Dr Hope for £37.

Fritillaries are " fashionable " amongst Auction Sale buyers, and some high prices were given: i.e., £10 for a *euphrosyne* ab. *obsoleta*; £21 for an unusual melanic variety of the same species. A *cydippe* with jet black forewings and smoky hindwings sold for £16 10/-, an ab. *charlotta* at £21. Its aberrations are rare and an ab. *melaina* and an ab. *confluens-melaina* realized £12 and £11 10/- respectively. An outstanding female ab. *ater-discus* went up to £20. Prices for *paphia* were as usual high, ranging from £12 for an hermaphrodite to £9 for an extreme ab. *melaina* and there are a great number of these latter forms about in various Collections.

The Vanessa family are never quite as popular as the Fritillaries but there were some fine aberrations offered, amongst the best being a unique male *cardui*, with more than half of the apical portion of the forewings jet black, and figured in Mosley's " Varieties "; it realized £9 10/- and was worth double this figure. Another variety ab. *radiata* was withdrawn at £9, not having reached the reserve placed on it.

No high prices were recorded amongst the Browns, and a unique *homeosis* of *hyperantus* only realized £6 15/- and an hermaphrodite *megera* went for the same sum but to a different buyer. A sooty-black *galathea* that at the time of cataloguing was assumed to be unique fetched £13, but actually another very similar specimen existed which had been caught this season, and it was exhibited a few days after the Sale at the South London Society's Exhibition.

*L. dispar*, the extinct Large Copper, was represented by three insects; they sold for £6 10/-, £5 15/- and a female variety for £10 10/-. The highest price given at this Sale was for an albino *phlaeas*. It was a historic insect, figured by Barrett and the bidding opened at five pounds. The price soon passed the twenty pound mark and a duel for the insect ensued between a well-known private collector and a dealer; the hammer fell at £45, and the Small Copper is now in the possession of Mr H. Douglas Bessemer. The last lots consisted of some beautiful varieties of the Blues, the finest being an extreme *anti-digittata* which realized the high sum of £20.—" The Butterfly Farm," Bexley, Kent.

(*To be continued.*)

## COLLECTING NOTES.

Occurrence of Ethmia bipunctella.—While on holiday at Eastbourne I took on the 11th August a very fine freshly-emerged specimen of *Ethmia bipunctella*. I had been collecting micros on Beachy Head and returning by the road nearest the sea. Unfortunately, having no

lamp with me at the time, it had almost become too dark for boxing, except by holding the net up to the sky. The next morning, turning out the bag, I had a welcome surprise. I immediately made a black and white sketch of the insect and sent it to my friend, Mr S. Wakely, for determination and any information to aid in finding more. This was not to be; several more visits failed to produce any more. The specimen was a male and taken on the wing about 10 p.m. B.S.T.—C. V. Smith, 23 First Avenue, Heworth, York.

Larva of Acronicta alni.—On reading through back numbers of the *Entomologist's Record* I find occasional notes on the distribution of *Acronicta alni*, and think it perhaps worth mentioning that I found a fully-grown larva of this species on 6th August 1947 in Eccleshall Woods, south-west of Sheffield. It was climbing up a pine trunk and had reached a level about five feet from the ground. The nearest possible food-plant was a Pedunculate Oak about 20 yards away. I took the larva home and offered it oak, birch, apple, pear and hawthorn. It commenced to feed on the oak and also ate birch. On 8th August it stopped feeding and commenced to walk round and round its cage. After three days of perambulation it finally went to earth p.m. on the 11th August after one abortive attempt. All the yellow markings changed to white during this time. The pupa is at present healthy, I think.

This perambulating habit does not always have so happy a conclusion, however. On 7th July I took a half-grown larva of *Acronicta aceris* walking up a wall at Bradford. The nearest vegetation consisted of Hop, Yew and Horse Chestnut within a radius of ten yards and a Plane Tree about 50 yards away. It refused all these and also sycamore, pear, plum, apple and ash. It walked round its cage until it died about a week later. No parasites were found on dissection, nor was there any other sign of fatal disease other than starvation.

It would be interesting to know whether the *Acronicta* larvae indulge in this dangerous wandering habit any more than other species. —H. M. Darlow, Surgeon Lieut. Cdr., R.N.

Heodes phlaeas has provided almost up to the present date (12th November) some interesting forms of aberration here. Otherwise the extreme succession of rain, frost, prolonged snow and heat seemed to have no effect in varietal production. The glorious season of sunshine suited my health and every advantage of it was taken for hunting.—H. A. Leeds.

Late Dates for Colias croceus and Polygonia c-album.—I saw flying and also settled a ♂ specimen of *Colias croceus* on 3rd November last on the Old Bat and Ball Cricket Ground, Gravesend (it was in a good condition). On the 8th of November I captured flying in my garden at Greenwich a specimen of *Polygonia c-album*.—F. T. Grant, 37 Old Road W., Gravesend.

Three Broods of C. croceus (edusa) in Britain?—Thank you for having sent me a forward copy of my Note on the Butterflies of the New Forest area in 1947 in connection with weather conditions. " I think it might be recorded that *Colias edusa*, the Clouded Yellow, so

far as this part of the New Forest is concerned, has been three brooded in 1947 as fresh specimens have been taken any sunny day up to the 10th November and on which date several nice specimens of the type as well as a good number of the var. *helice* have come to the net. I should imagine this very late date for them to be still about in some numbers is a record.

This insect has been with us throughout the year without any distinct break between the three broods, which have overlapped, but it is pretty definite there have been the three broods as some of the specimens taken on the 10th November had only just emerged."—CHAS. B. ANTRAM, Clay Copse, Sway, near Lymington, Hants.

COLOUR OF PAPILIO PUPAE.—I was very interested in Mr Fearnehough's experiment with the pupae of *P. machaon* (1947, *Entomologist's Record*, 59: 122) as for some years past now I have been experimenting with two of the common Indian *Papilio* species—*polytes*, L., and *demoleus*, L.; my experiments with the former being fairly well advanced but without any conclusive results, with the latter species only at the beginning.

As soon as my larvae pass their last evacuation and start to wander, they are placed in either (a) cylindrical cigarette tins with the bottom and sides enamelled in various colours and the top covered with a piece of glass, or (b) in glass tubes suspended in a south verandah, or (c) in complete darkness in old, rusty, glass-topped tins shut up in a closed biscuit tin. Colour of the immediate surroundings does not seem to be the controlling factor as I have had eighteen green pupae out of twenty in black enamelled tins and only thirteen out of seventeen in green tins, in fact the tendency seems to be for a higher proportion of brown pupae to appear in the paler-coloured tins. At one time I thought it might be a question of light, but I have had nine green pupae out of twenty formed in darkness and four out of seven in those formed in the suspended glass tubes. All the foregoing figures apply to *polytes*.

I have since inclined to the view that there might be some connection between the amount of movement after the larva ceases to feed and the colour of the pupa, larvae which move more producing brown pupae. Both *polytes* and *demoleus* feed on various species of *Citrus*, and a larva which wandered little would be likely to pupate among leaves and be green, whilst one that wandered more would pupate on the branch or trunk of the tree and be brown. Mr Fearnehough's results, however, seem to preclude this idea, as his larvae all appear to have hung up under the same conditions and only to have been exposed to the different situations after they had spun their girdle and pad.

In India *Papilio* larvae almost invariably start to wander in the evening after dark, hang up during the night before daybreak, and complete the change to the pupa some twenty-four hours after they have started to wander.

The late Sir Edward Poulton published at least one paper on his experiments on the pupal colour of *P. machaon*, and, writing from memory, considered his results inconclusive.—D. G. SEVASTOPULO, F.R.E.S., London, 29.x.47.

Colias croceus in Lancs.—On 28.viii.47 one *C. croceus* was seen in the town centre of Rochdale. Between 25 and 28.viii.47 four were seen and one caught in Bury by myself: the rarity of this occurrence can best be illustrated by the fact that at most eight other species of butterflies are recorded yearly from Bury.—M. M. Bailey, Hill Crest, Limefield, Bury, 28.viii.47.

Stomorhina lunata, F. (Dipt. Calliphoridae) in South Herts.—Mr E. C. M. d'Assis-Fonseca's notes on this interesting species (*Ent. Rec.*, November 1947, p. 137) prompt me to record the capture of a ♂ on a dahlia in a park at Cockfosters, Herts, on 19th October 1947. The locality is about eleven miles from the heart of London. This, I believe, brings the total of known British captures of this species to 45, of which five were by Mr F. Jenkinson in 1901, and 32 by Mr d'Assis-Fonseca this year. The question of whether the sudden increase in the number of British records of this fly in 1947 is connected with the season's immigration of locusts from France is raised by Dr van Emden (*Proc. Roy. Ent. Soc. Lond.*, Ser. C, Vol. 12, No. 9, 1947).—C. N. Colyer, F.R.E.S., 8 Canning Court, Newnham, N.22, 21st November 1947.

Extra Broods of Lepidoptera in 1947.—The exceptionally warm summer of 1947 produced extra broods of many Lepidoptera, and amongst those noted were:—At Whitminster (elev. 60 feet), Glos., *Spilosoma lubricipeda* (*menthrastri*) on 20.viii (a full-grown larva was noted on 22.viii), and *Euchalcia* ("*Plusia*") *chrysitis* on 23.viii; at Rodborough (elev. 600 feet), Glos., *Pieris brassicae* on 3.x, *Pararge megera* on 12.x, and *Stenoptilia bipunctidactyla* on 13.x.—T. Bainbrigge Fletcher.

## CURRENT NOTES.

The *Bull. and Annal. Soc. Ent. Belge* comes out regularly and the other Belgian paper *Lambillionea* is issued in composite parts at intervals. The Dutch journal *Entom. Bericht.* is in quite regular issue and the *Tijd. v. Ent.* appears at intervals. The Russian *Rev. Russe d'Ent. U.S.S.R.* comes at long intervals up to date. *Opuscula Ent.* and *Ent. Tidskr.* of Sweden are regular as usual and the Spanish *Eos* volumes are regular as well as pretentious. Very few of the publications of the day have short collecting notes and news matter which are so interesting and useful.

In parts I-II of the *Bull. & Ann. Soc. Ent. de Belge* the Abbé Dufrane has given a Summary of his very large collection of the *Pieridae* of the World, especially remarking on the variation in detail. He has described a large number of aberrations and made reference to the varieties which have hitherto been noted in Seitz great work. All students interested in this Family will have to refer to the work of this author comprised in the pages 45-75. Such work is very interesting.

THE Journal of the Münich Society, *Mitt. Münch. Ent. Gesch.*, is the first of the German Entomological periodicals to reach us. A great deal of matter was published during the early years of the war. Several hundred pages and many plates were issued with each part. The papers were long and comprehensive, dealing with groups and describing new species. The Micros had a good deal of space devoted to them, but the short Collecting Notes were very few.

THE *Bull. Soc. Ent. France* is being issued regularly as usual. There is a reappearance of the French journal which has been so popular and useful, *Amateur Papillon*, as *Revue Francaise Lepidopterologie.*

VOL. V of the *Bol. Entomologia Venezolana*, the issue for 1946 contains comprehensive articles and a large section of a Catalogue of the Insect Life of the Country. (1) A series of Records from which one can get detailed information on the Lepidoptera by R. D. Lecky (in French); (2) the same author deals with the Sphingidae; (3) H. K. Jownes assisted by Cresson and others treat particularly of the *Ichneumonidae* of the Neotropical Region (in English); (4) E. L. Bill contributes a Catalogue of the *Hesperiidae* of Venezuela. The volume is a mass of detailed references in its 200 pp.

ONE of our valued correspondents, Bryan P. Beirne, Ph.D., M.R.I.A., has presented a very long, detailed and illustrated paper to the Royal Entomological Society, under the title " The Origin and History of the British Macro-lepidoptera." This treatise of about 100 pages is well classified and has 45 diagrammatic maps, not on plates, but in the text where needed. It is one of the most valuable papers that have recently been published and will doubtless produce a fund of matter for discussion and thought.

THE Spanish Journal *Eos* reaches us regularly and contains many valuable articles on the Coleoptera, Hymenoptera and Lepidoptera of that country. The two parts for 1947 so far comprise 164 pp., 7 plates and many text figures and diagrams. Two of the plates are devoted to Lepidoptera; plate 1 illustrates a paper on new species of the genus *Crambus* by R. Agenjo; plate 2 illustrates another paper by the same author, this time dealing more with the synonymy of the species figured and described. There are numerous figures of Coleoptera with plates showing the kind of habitats of some of them.

THE Verrall Association of Entomologists. A notice in regard to the revival of the " Verrall Supper " at the Holborn Restaurant on 13th January next has been posted to all who were subscribers to the Association in 1939, possibly not always to the correct address. If any such subscriber does not receive the notice will he please communicate with the Hon. Sec.—J. E. COLLIN, Raylands, Newmarket, Suffolk.

ENTOMOLOGY and Agriculture are closely allied, hence we have had sent to us a beautiful and artistic little pamphlet by the Plant Protection Ltd. for notice. It is entitled " Science in the Service of Agriculture," and besides the appropriate letterpress of 20 pp. contains seven very delightful sketches such as are rarely seen except in very high-class work which avoids the precision and hardness of photography.

# EXCHANGES.

Subscribers may have Lists of Duplicates and Desiderata inserted free of charge. They should be sent to Mr HY. J. TURNER, "Latemar," West Drive, Cheam.

*Wanted*—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Instituto Miguel Lillo, Calle Miguel Lillo 205, Tucuman, Republica Argentina.*

*Desiderata*—Dipterous parasites bred from Lepidopterous larvae or pupae, or from any other animal.—*H. Audcent, Selwood House, Hill Road, Clevedon, Somerset.*

*Wanted.*—*Lycaena* (*Heodes*) *phlaeas* from all regions including British Isles. Also wanted other species of Chrysophanids from all areas. Exchange or purchase considered. *Duplicates.*—Foreign Lepidoptera, e.g., Satyrids, Charaxes, Papilios, and others; full lists sent.—*P. Siviter Smith, 21 Melville Hall, Holly Road, Edgbaston, Birmingham, 16.*

*Wanted* for cash or exchange many species of ova, larvae or pupae, especially local forms and *A. grossulariata* from different localities, also Seitz Vol. 1 and Supplements to Vols. 1-4. Offers also, Tutt's *Practical Hints*, Parts 1 and 2, Buckler's larvae, Vols. 1-6, and Tutt's *British Noctua*, Vols. 2, 3, and 4.—*Dr J. N. Pickard, F.R.S.E., 36 Storeys Way, Cambridge.*

*Wanted.*—Various monthly parts of *Entomologist's Record* for 1914, 1915, 1916, 1917, 1919, and 1920. Please report any odd monthly parts (in wrappers as issued) prior to these years.—*P. B. M. Allan, 4 Windhill, Bishop's Stortford, Herts.*

*Wanted.*—Males of *Morpha menelaus, M. didius, M. rhetenor* in papers.—*Leonard Tatchell, Rockleigh Cottage, Swanage, Dorset.*

*Wanted* urgently for experimental purposes, pupae of *betularia, porcellus elephanor.*—*Dr H. B. D. Kettlewell, Homefield, Cranleigh, Surrey.*

*Wanted.*—Various Books on Lepidoptera. Please send lists and price. Also wanted, Live Exotic and English Lepidopterous Material for cash or exchange for similar material or Set English Imagines.—*J. K. Goody, "Weldon," 26 Carr Wood Road, Bramhall, Ches.*

*Sale or Exchange*—*R.E.S. Trans. and Proceed.*; bound, 1911 to 1916, 1918 to 1919; unbound, 1921 to 1923, 1925; also 1917 and 1924 less part 5. New Series—*Trans.*, Vols. 1 and 2, Vol. 3, part 1. *Proceed.*, Vol. 1 and Vol. 2, part 3. *Trans. Suffolk Naturalist Society*, Vol. 3 and Vol. 4, part 1. *Wanted*, bound or unbound, *Entomologist*, Vols. 2 and 3, 1926 to 1930, 1940 to 1942. *Ent. Mont. Mag.*, 1922, and 1924 to 1942; also various volumes of *R.E.S. Trans.* List on application.—*F. W. Smith, Boreland of Southwick, by Dumfries.*

*Wanted*, for experimental purposes, a few pupae of *Endromis versicolora*, purchase or exchange.—*R. W. Parfitt, 1 Dunsdon Avenue, Guildford, Surrey.*

*Wanted.*—Volume V (five) of Tutt's *British Lepidoptera.*—*T. R. Eagles, 32 Abbey Road, Enfield, Middlesex.*

*Wanted*—Bristol board suitable for mounting Coleoptera. Also, Puton, A., 1878, "*Synopsis des Hémiptères-Hétéroptères de France.* Badonnel, A., 1943, *Faune de France*, No. 42, Psocoptères.—*H. G. Stokes, 12 Roman Road, Salisbury, Wilts.*

*Wanted for Cash.*—Tutt's *British Butterflies*, 1896: *Transactions and Proceedings Royal Ent. Soc. Ldn.* (must be almost if not quite complete).—*Lionel Higgins, Linkwood, Woking.*

*For Sale.*—Tutt's *British Noctuas*, 4 vols., complete: *Index Entomologicus*, by W. Wood, F.R.S., to complete illustrated catalogue of the *Lepidoptera of Great Britain*, 2 vols., half calf, pub. 1839, excellent condition.—*Geo. Nicholson, Rosedale, 24 Nuns Moor Crescent, Newcastle-on-Tyne, 4.*

## MEETINGS OF SOCIETIES.

*Royal Entomological Society of London*, 41 Queen's Gate, S.W.7 : Jan. 21 (Annual meeting) and Feb. 4, at 5.40 p.m. *South London Entomological and Natural History Society*, c/o Royal Society, Burlington House, Piccadilly, W.1; 2nd and 4th Wednesdays; 6.0 for 6.30. *London Natural History Society* : Tuesdays, 6.30 p.m., at London School of Hygiene or Art-Workers' Guild Hall. Syllabus of Meetings from General Secretary, H. A. Toombs, Brit. Mus. (Nat. Hist.), Cromwell Road, S.W.7. *Birmingham Natural History and Philosophical Society—Entomological Section* : Last Fridays in month, at 7 p.m., at the Birmingham Museum and Art Gallery. Particulars from the Hon. Secretary, G. B. Manly, 72 Tenbury Road, King's Heath, Birmingham, 14.

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**Short Collecting Notes and Current Notes. Please, Early.—Eds.**

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*Communications received* :—Thomas Greer, Fergus J. O'Rourke, O. Querci, H. Donisthorpe, Malcolm Burr, Surg.-Lt. Comm. H. M. Darlow, D. G. Sevastopulo, D. Fearnehough, R. J. R. Levett, E. C. S. Blathwayt, E. P. Wiltshire, A. E. Wright.

*Change of Address* :—G. S. Kloet, F.Z.S., F.R.E.S., to 110 Sackville Street, Manchester, 1; Messrs Kloet & Hincks to 110 Sackville Street, Manchester, 1.

**All Communications should be addressed to the Acting Editor, Hy. J. TURNER, " Latemar," 25 West Drive, Cheam.**



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# THE BRITISH GENERA OF TRYPETIDAE (DIPTERA), WITH NOTES ON A FEW SPECIES.

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

The Diptera are an Order of Insects in which (compared with many other Orders) colour and pattern are comparatively rare; it is not surprising therefore that the Trypetidae with their prettily marked wings, and (at least in life) delicate coloration of body, quickly attract the attention of students. They belong to a division of the Diptera in which the males have a long coiled penis, and the females an unusually long, strongly chitinized basal section to a telescopic ovipositor; they may be distinguished from other species with banded or spotted wings by the combination of the presence of lower (incurved) fronto-orbital bristles, and a peculiarity in the course of the first (mediastinal) wing vein, which ends (*faintly*) *bent almost vertically up towards costa* at a point where there is a distinct break in costa, and where the costal spines are inserted. The insects are found on the flowers and leaves of various plants, in which (as well as occasionally in the stems and berries) the larvae feed.

One does not collect and study the Trypetidae long before becoming aware that there are various types of wing-markings, and that these different types are to a very large extent indicative of certain groups, not only of species, but also of genera. This fact naturally leads one to expect to find sub-family characters in the wing pattern, but when it comes to specifying these characters for such major (or even for minor) groups in the family, one is confronted with many difficulties. Satisfactory definitions of such groups are by no means easily drafted, either when based upon wing pattern alone, or any combination of this and other characters, even for such a limited fauna as that of the British Isles. This is not because there is a dearth of other characters, but because, in so many cases, characters which appear at first sight very promising, have a disconcerting way, sooner or later, of appearing where they are not wanted, or of failing to retain definable limits.

Chaetotactic characters have often proved most useful and reliable in classifying the Diptera, and one would therefore expect to find in the Trypetidae some correlation of such characters with those of wing pattern, but though this is often evident, there are remarkable cases of species with similar wing pattern exhibiting wide differences in some of their chaetotaxy. In Trypetidae, as in all insects there is still much to be done in order to arrive at the correct phylogenetic value of each of the many different characters.

The classification here adopted does not very materially differ from that of Hendel, though based upon somewhat different characters from those recently used by him in Lindner's " Die Fliegen." The chief differences being:—(1) The division of the family into three sub-families instead of two, and the addition of an extra tribe, the Acidiini; (2) The removal from the Tephritinae of Hendel's tribe Terellini (more correctly Trypetini), and the addition to this tribe of the genus *Xyphosia*, with the consequent alteration of the tribal name Xyphosiini to Aciniini; and (3), the removal of *Ensina* from the Tephritinae to the Myopitini of the Trypetinae.

Hendel's Terellini (comprising the various sub-divisions of the genus *Trypeta* of our List) are undoubtedly more related, both in wing pattern

(when present), and in chaetotaxy, to the Acidiine than to the Tephritine stem of the family; the inner and outer vertical bristles are similar in structure, and the postocular ciliation, even if sometimes pale, is fine and not coarse and spine like; the distinctive incurved posterior upper orbital bristle is found also in *Oxyaciura tibialis* of the Acidiini, but not in the Tephritinae.

*Xyphosia* exhibits relationship to the Acidiine stem in the obviously hairy frontalia, the dense arrangement of hairs on costa of wing, and the similarity, both in structure and colour, of outer and inner vertical bristles on head.

*Ensina* shows greater relationship to *Myopites* than to *Tephritis* in its frontal chaetotaxy, and in similarity of structure of inner and outer vertical bristles, while there is a tendency to greater development and chitinization of the lateral abdominal membrane, as in other Myopitini.

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## TABLE OF SUB-FAMILIES.

1(4). The outer bristle of the pair of diverging vertical bristles behind upper corner of each eye, is of similar bristle-like construction to inner one (though often shorter), and seldom differs from it in colour. *Wings very seldom* (DITRICHINAE) *reticulated.*

2(3). Wings with dark bands or patches *which are not broken up by numerous hyaline spots or windows*, or dark with a few hyaline costal and hind marginal wedge-shaped indentations, or darkened *about base* with dark streaks radiating outwards. Postocular ciliation usually black and fine, if pale, *or if wings almost or quite clear*, the posterior of two upper orbital bristles on frons *inclined inwards, or absent.* TRYPETINAE.

3(2). Wing with numerous hyaline spots or streaks giving them a reticulated appearance. (British species easily recognized by having a polished black scutellum and end of abdomen, i.e., last tergite, if without, the species are aberrant Tephritinae). DITRICHINAE.

4(1). Outer vertical bristle of different construction to inner one (shorter and more spine-like), and often differing in colour. If of same dark colour, wings not banded. Wings usually with numerous hyaline spots and streaks in any dark bands or patches which may be present, or with very ragged dark patches, or with only apical, median, or costal, dark patch, with, or without, radiating streaks. If (rarely) almost hyaline then posterior orbital bristle truly reclinate, and anal cell with pointed lower corner. Postocular ciliation very seldom black and fine, usually whitish and spine-like. Posterior upper orbital bristle never inclined inwards, and slightly backwards, usually whitish. TEPHRITINAE.

### TRYPETINAE.

Table of British tribes and genera.

1(42). Cross-vein closing anal cell sharply bent outwards below so that lower angle of cell is pointed, if not so (*Goniglossum*), or

doubtfully so (*Rhagoletis*) then there are two pairs of upper orbital bristles. Frontalia often hairy.

(*Ensina* of the Myopitini with somewhat pointed lower angle to anal cell has a very distinctive facial profile, *with very short* face and strongly projecting epistoma, and has only one upper orbital bristle.)

2(31). Posterior of the two upper orbital bristles when (usually) present always reclinate in British species. Anterior dorso-central bristle on thorax usually behind a line connecting supra-alar bristles (except in *Cryptaciura*). Frontalia hairy even if hairs only minute. Tribe *Acidiini*.

3(6). Wings with distinctive markings as stated below, *and cross-vein closing discal cell strongly sloping outwards* so that lower angle at end of cell is very acute.

4(5). All cells about base of wing with dark spots or stripes followed by a transverse yellowish-brown band from which at least two bands diverge, one (rather irregular) along costa to tip of wing, another (narrower) along the sloping outer cross-vein. Males with anterior upper orbital bristle broadly expanded, scale like, at tip. Ceratitis, McL.

One species (*capitata*, W.) imported into this country in fruit and occasionally successful in rearing a brood over here.

5(4). Wings with a dark patch on basal half extending as far as middle cross-vein; apical half of wing with four very narrow radiating bands, one curving up from middle of wing to end of radial vein and then along costa to tip of wing, a lower one from middle of wing along the sloping outer cross-vein to hind margin, and two shorter ones from middle of wing, one upwards to costa, the other downwards to end of anal vein. Male orbital bristles all normal.

Phagocarpus, Rdi.

One species (*permundus*, Harr.) breeding in whitethorn, and other, berries.

6(3). Wing venation not as in above two genera, *and outer cross-vein upright*.

7(16). Wings with a sharply defined, isolated, often wedge-shaped (widest on costa), hyaline, costal indentation immediately beyond stigma, and sometimes a second one beyond the first.

(If colour of wing markings is not intense or the wedge-shaped indentation is doubtfully isolated, *and there is no strong sternopleural bristle*, see *Acidia cognata*.)

8(9). Cubital vein bristly on radio-cubital node only. Anterior dorso-central bristle close to transverse thoracic suture and a long way in front of a line connecting supra-alar bristles.

Cryptaciura, Hend.

One species (*C. rotundiventris*, Fln.) reputed to have been bred from " Burdock " but I have a note that Mr J. J. F. X. King bred it in 1910 from *Heracleum*.

9(8). Cubital vein bristly from base to at least middle cross-vein. Anterior dorso-central bristles never so far forward.

10(13). Head in profile somewhat triangular with front of frons more projecting than front mouth-edge.

11(12). Third antennal joint with blunt end. Two costal, wedge-shaped, hyaline, indentations immediately beyond stigma. No sternopleural bristle. PLATYPARELLA, Hend.

One species (*P. discoidea*, F.) breeding in stems of *Campanula latifolia*.

12(11). Third antennal joint acutely pointed. Only one costal indentation beyond stigma. One strong sternopleural bristle. PLATYPAREA, Lw.

One species (*P. poeciloptera*, Schrnk.) breeding in stems of *Asparagus officinalis*.

13(10). Head in profile not triangular. Front of frons no more projecting than front mouth-edge.

14(15). Arista bare. Wings with only one wedge-shaped costal indentation beyond stigma. PHILOPHYLLA, Rdi.

One species (*P. heraclei*, L.) well known as the Celery fly but mining the leaves of this and other related plants.

15(14). Arista pubescent. Wings with two costal, hyaline, indentations (one long and one short) beyond stigma. MYIOLIA, Rdi.

One species (*M. caesio*, Harr.), the larvae mining incorrectly recorded as the leaves of *Lychnis diurna*.

16(7). Wings with the hyaline mark immediately beyond stigma usually connected with other hyaline areas, if wing markings are faint and hyaline mark is wedge-shaped, *and there is no sternopleural bristle*, see *Acidia cognata*.

17(28). Wings occasionally with *Myiolia*-like markings (*Acidia*) and then no sternopleural bristle; markings usually more broken up (*Spilographa*-like), *never* with more or less complete cross-bands of *Urophora* or *Trypeta* pattern with apical band connected on costa with preapical transverse band. Yellowish species, with thorax never mainly black, nor with rounded shining black patches.

18(19). Wing markings *Myiolia*-like in having *two* separated hyaline stripes (one short, one long) beyond stigma, the shorter one extending from costa to cubital vein on basal side of middle cross-vein, the longer one (further from stigma) extending from costa somewhat diagonally backwards past outer side of middle cross-vein. No strong sternopleural bristle. ACIDIA, Dsv.

One species (*A. cognata*, W.), the larvae mining the leaves of *Petasites* and *Tussilago*.

19(18). Either no hyaline stripe extending from costa towards basal side of middle cross-vein (this cross-vein being underneath end of stigma), or one which is confluent with hyaline area on other side of that cross-vein.

20(21). The pleural sclerite below basal corner of scutellum (immediately below thoracal squama) clothed with long pale hairs. No presutural bristle above notopleural depression. RHACOCHLAENA, Lw.

One species (*R. toxoneura*, Lw.).

21(20). This sclerite quite bare. Presutural bristle present.

22(23). Mouth-edge at sides towards front with a series of about six, strong, spinose bristles. CHAETOSTOMA, Rdi.

One species (*C. giraudi*, Frauf.).

23(22). Mouth-edge without a series of strong spines towards front, though there may be 1-2 towards behind.

24(25). Only one upper orbital bristle. Hind tibiae with short *black* antero-ventral spurs. Male with frons in front produced on each side into a process bearing long, black, blunt, spines. Vidalia (= STEMONOCERA, Rdi.)

One species (*S. cornuta*, Scop.), the larvae mining leaves of *Eupatorium cannabinum*.

25(24). Two upper orbitals on each side of frons. No short *black* apical spurs to hind tibiae. Male frons normal.

26(27). Third antennal joint with blunt end. Hind femora without distinct antero-ventral bristles near tip. Trypeta (= SPILOGRAPHA, Lw.)

Five species (*S. zoë*, Mg., *Wiedemanni*, Hend., *artemisiae*, F., *immaculata*, Mcq. = *hamifera*, Lw., and *virgata*, Coll.).

27(26). Third antennal joint somewhat pointed above at tip. Hind femora with 1-2 distinct antero-ventral bristles near tip. ZONOSEMA, Lw.

Two species (*Z. alternata*, Fln., and *Meigenii*, Lw.). Larvae of former in Rose "hips," of the latter in *Berberis* berries.

28(17). Wing markings forming more or less complete transverse bands (*Urophora* or *Trypeta*-like), the apical and preapical bands joined together on costa. Thorax mainly black, or if yellowish with shining black, rounded, patches.

29(30). Thorax black with humeri and scutellum yellow. *Urophora*-like species. RHAGOLETIS, Lw.

One species (*R. cerasi*, L.), possibly not indigenous but imported in cherries, in which the larvae live.

30(29). Thorax yellowish with shining black (or brownish-black) patches. Face sloping forward to a strongly projecting epistoma. Proboscis long and geniculate. GONIGLOSSUM, Rdi.

One species (*G. Wiedemanni*, Mg.). Larvae feed in berries of *Bryonia dioica*.

31(2). Posterior of two upper orbital bristles inclined inwards and slightly backwards (never absent). Anterior dorso-central bristles never behind a line connecting supra-alar bristles. Frontalia bare, or only rarely (*Xyphosia*) hairy. Tribe *Trypetini*.

32(41). Cubital vein bare above except sometimes on, or near, radio-cubital node, bare beneath. Frontalia bare.

33(34). Mouth-edge on each side in front distinctly and strongly bristled. No presutural dorso-central bristle. CHAETOSTOMELLA, Hend.

One species (*C. onotrophes*, Lw.). Larvae in flower-heads of a number of different Compositae.

34(33). Mouth-edge not so distinctly bristly, without strong black bristles on each side in front.

35(36). A presutural dorso-central bristle present on thorax. CHAETORELLIA, Hend.

One species (*C. jaceae*, Dsv.). Larvae in flower-heads of *Centaurea*.

36(35). No presutural dorso-central.

37(38). Male with a remarkable prolongation of second antennal joint, bearing spines. Female with facial orbits more ridged and prominent than usual, and hairy from vibrissal angle upwards for whole length. Antennae wider apart at base than width of basal joint. CERIOCERA, Rdi.

Two species (*C. cornuta*, F., and *microceras*, Hering). Larvae in flower-heads (*cornuta*) and in stems (*microceras*) of *Centaurea scabiosa*.

38(37). Antennae of male and face of female normal.

39(40). Wings banded or spotted, or if clear third antennal joint rounded at tip. Hairs at vibrissal angle of face continued above level of front mouth margin even if only fine and pale. TRYPETA, Mg.

Six species (*T. colon*, Mg., *falcata*, Scop., *ruficauda*, F. (*florescentiae*, Fln.), *tussilaginis*, F., *Winthemi*, F., and *vectensis* Coll.).

40(39). Wings clear and third antennal joint somewhat pointed at tip. No hairs on vibrissal angle above level of front mouth margin. TERELLIA, Dsv.

Two species (*T. serratulae*, L., and *longicauda*, Mg.). Larvae of former in various Thistle flower-heads, of the latter in flower-heads of *Cnicus eriophorus*.

41(32). Cubital vein bristly for whole length above and below. Frontalia hairy. XYPHOSIA, Dsv.

One species *X. miliaria*, Schrnk. Larvae in flower-heads of various Thistles.

42(1). Cross-vein closing anal cell convex exteriorly (or if slightly concave (*Ensina*) not very sharply bent outwards below) *and only one upper orbital bristle present*. Frontalia bare. No bristles above hind femora near tip except in *Ensina*. Tribe *Myopitini*.

43(46). Cross-vein closing anal cell convex exteriorly. No keel between bases of antennae. No bristles above hind femora near tip.

44(45). Epistoma (front mouth-edge) not prominent and proboscis not so long or slender. Neither proboscis nor palpi projecting beyond front mouth-edge. UROPHORA, Dsv.

Seven species (*U. cardui*, L., *quadrifasciata*, Mg., *jaceana*, Hering, *solstitialis*, L., *cuspidata*, Mg., *stylata*, F., and *spoliata*, Hal.).

45(44). Epistoma produced forwards. Proboscis long, slender, and geniculate. Both proboscis and palpi projecting well beyond front mouth-edge. MYOPITES, Breb.

Two species (*M. Blotii*, Breb., and *Frauenfeldi*, Schin.). Larvae of former in flower-heads of *Pulicaria dysenterica*, the latter in *Inula crithmoides*.

46(43). Cross-vein closing anal cell concave exteriorly. One upper and three lower fronto-orbital bristles. A prominent facial keel between bases of antennae. Epistoma produced. A pair of bristles above tip of hind femora. ENSINA, Dsv.

One species (*E. sonchi*, L.). Larvae in flower-heads of a large number of different Compositae.

## DITRICHINAE.

Table of British genera.

1(2). Scutellum with only two bristles. A presutural dorso-central bristle present. Two upper and three lower fronto-orbital bristles, the anterior upper one above level of posterior lower one. Only one hyaline spot in stigmal area of wing. DITRICHA, Rdi.

One species (*D. guttularis*, Mg.). Larvae in galls at base of stem of *Achillea millefolium*.

2(1). Scutellum with four bristles. No presutural dorso-central bristle. Three upper and four lower fronto-orbital bristles, the anterior upper one very strong and black, its base beyond a line connecting each posterior lower orbital bristle. Two hyaline spots in stigma. (= HOPLOCHAETA, Rdi.)

One species (*H. pupillata*, Fln.). Larvae in flower-heads of various species of *Hieracium*.

## TEPHRITINAE.

Table of British tribes and genera.

1(4). Cubital vein distinctly bristled above and beneath. Some of the hyaline spots on wing milk-white from some points of view, in strong contrast to others. Usually very little contrast in colour and vestiture between ovipositor of female and previous tergite. Tribe *Aciniini*.

2(3). Two upper and two lower orbital bristles on each side of frons. Third antennal joint with blunter tip in British species. An elongate hyaline spot at middle of wing. ICTERICA, Lw.

One species (*I. Westermanni*, Mg.). Larvae reputed to feed in flower-heads of *Senecio*.

3(2). Two upper and three lower fronto-orbital bristles. Third antennal joint more pointed above at tip in British species. No elongate hyaline spot in middle of wing. ACINIA, Dsv.

One species (*A. corniculata*, Zett.).

4(1). Cubital vein bare above except, occasionally, on radio-cubital node, bare or bristly beneath. Hyaline wing spots uniform in colour. Base of female ovipositor usually contrasting sharply in colour and vestiture with previous tergite. Tribe *Tephritini*.

5(8). Two hyaline spots in wing stigma, or if only one (*argyrocephala*) no bristle above hind femora near tip and cubital vein bare beneath.

(*Sphenella* might sometimes be considered to have two spots in stigma but is easily known by its wing markings.)

6(7). Usually only one pair of lower fronto-orbital bristles, and a line drawn across frons between them (or if two pairs between posterior pair) is much nearer to edge of lunule above antennae than to a line connecting anterior upper orbitals. An antero-dorsal bristle present near tip of hind femora. Bristles on at least front femora pale, or mainly pale. OXYNA, Dsv.

Three species (*O. parietina*, L., *flavipennis*, Lw., and *proboscidea*, Lw.).

7(6). Always two pairs of lower fronto-orbital bristles. The distances mentioned above more equal, and, in British species, no bristle above hind femora near tip. Bristles on front femora dark. CAMPIGLOSSA, Rdi.

Two species (*C. grandinata*, Rdi., and *argyrocephala*, Lw.). Larvae of former said to form galls on *Solidago*, of latter on *Achillea ptarmica*.

8(5). No, or only one hyaline spot in wing stigma. Two or three pairs of lower orbital bristles. One or two bristles above hind femora near tip.

9(10). Wings with lower half clear except for a narrow dark band across middle *which covers both the (approximated) cross-veins*. Hind femora with a pair of bristles (dorsal and antero-dorsal) near tip, *and 1-2 distinct strong antero-ventral bristles towards tip*. Frons hairy.

SPHENELLA, Dsv.

One species (*S. marginata*, Fln.). Larvae in swollen flower-heads of species of *Senecio*.

10(9). Wings not as above. Hind femora without strong antero-ventral bristles near tip.

11(12). Usually at least a pair of bristles above hind femora near tip, if only one, the subapical cross-band of hyaline spots on wing commences in a spot on costa close to or beneath end of radial vein (as in all species), and the triangle of hyaline spots with base on costa has its centre more beyond middle cross-vein. Proboscis as in previous three genera usually elongate and geniculate. Cubital vein bare beneath. Thoracal squamae very little developed. PAROXYNA, Hend.

Seven species (*P. tessellata*, Lw., *parvula*, Lw., *Loewiana*, Hend., *elongatula*, Lw., *plantaginis*, Hal., *misella*, Lw., and *praecox*, Lw.).

12(11). Only one (antero-dorsal) preapical bristle to hind femora. The subapical distinctive pattern of hyaline wing markings, when present, commencing on costa well beyond end of radial vein, and the triangle of hyaline spots with base on costa with its centre more nearly above middle cross-vein. Proboscis not unusually elongate.

13(14). Two pairs of both upper and lower fronto-orbital bristles. Cubital vein bristly beneath in British species. Thoracal squamae more developed than in *Paroxyna*.

TEPHRITIS, Latr.

Ten species (*T. vespertina*, Lw., *ruralis*, Lw., *leontodontis*, De G., *conjuncta*, Lw., *separata*, Rdi., *conura*, Lw., *formosa*, Lw., *bardanae*, Schrnk., *hyoscyami*, L., and *cometa*, Lw.).

14(13). Two pairs of upper and three pairs of lower orbital bristles on frons, anterior lower pair sometimes small. Cubital vein bare beneath.

15(16). Only one (basal) pair of long scutellar bristles. Wings with radiating, star-like, markings near tip only.

TRYPANEA, Schrnk.

Two species (*T. amoena*, Frfld., and *stellata*, Fuessl.). Larvae of former mainly in flower-heads of *Lactuca spp.*, of latter in those of various Compositae.

16(15). An apical pair of small as well as a basal pair of long scutellar bristles. Wings almost without markings in the British species. ACANTHIOPHILUS, Beck.

One species (*A. heliantii*, Rossi).

*Tephritis guttata*, Fln., the type of a recently published generic name (*Heringina*, Aczel) has not been confirmed as a British species, and its record as such was probably a misidentification. It is known to me only from descriptions.

It is highly probable that some of the genera listed above will sooner or later be discarded or rank as subgenera only. They have all been included because so many of them are monotypical and the Tables therefore serve, more than they otherwise would, for distinguishing species. In regard to species there is much greater variation in the wing markings than some students appear to realize, consequently the use of small differences in wing markings as the sole means of distinguishing species gives very unsatisfactory results.

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## NOTES ON SOME GENERIC AND SPECIFIC NAMES.

### *Phagocarpus*, Rondani, and *Anomoia*, Walker.

Unfortunately the generic name *Anomoia* proposed by Walker in 1835 had previously (1834) been published (definitely as " the designation of a genus," though undescribed and undefined except by the inclusion of only one named and described species) for a genus of the Chrysomelidae in Dejean's " Catalogus Coleopterorum." This constituted a valid publication of that generic name according to Article 25 of the Rules and Opinion 1, and as there appears to be no sound reason for a request that this name should be repressed, the name *Phagocarpus*, Rdi. (1870) must replace that of *Anomoia*, Wlk. (1835), preoccupied.

### *Acidia*, Desvoidy.

Though a name *Acidia* had twice been published in zoological papers prior to its use by Desvoidy as the designation of a genus of Trypetidae, the case is a very different one from that of *Anomoia*. On neither prior occasion was *Acidia* published as the intended designation of a genus as required by Article 25. The first publication of this name was in *Illig. Mag.*, III, 79 (1804) in an abstract (practically a translation into German by Illiger) of Latreille's classification of the Coleoptera in his *Hist. Nat. Crust. Ins.*, Vol. III. Latreille's commencement of the description of a genus with " Genre. AKIS; *Akis* " was printed by Illiger as " 124. AKIS [besser *Acidia*]" and there is proof that the remark in brackets was *not* intended as a published emendation of Latreille's generic name, because *Akis* and *not Acidia* was used for the genus and printed in an index to the generic names on p. 139, whereas in the case (in the same Abstract) of an actual emendation of *Proteinus* of Latreille into *Protinus* on p. 53, the latter name was used for the genus and published in the index, and not the former.

In the second publication of a name *Acidia* by Bosc, *Nouv. Dict.*, II, 584 (1816), in an article on a family of the Mollusca the name was an obvious misprint for *Ascidia*. After printing on p. 583 the generic name as " ASCIDIE, *Ascidia* " he referred on p. 584 to " L'Ascidie brune, *Acidia rustica* qui est couleur de rouille," etc., etc.

Under these circumstances there are sound grounds for a decision to ignore these two references and retain the name *Acidia*, Dsv., for a Trypetid genus. To place the matter beyond doubt an application will be made in due course for that name to be placed on the reserved list of generic names.

*Chaetostoma Giraudi*, Frauenfeld.

The description by Frauenfeld of a *Spilographa Giraudi* in 1864 (*Verh. Ges. Wien.*, xiv, 382) appears to have been long overlooked. The name is not given in Kertesz' " Katalog " of the Palaearctic species (1905). Frauenfeld gave a figure of the wing, and this together with the description leave little room for doubt that his species was the same as that described by Rondani in 1870 as *Chaetostoma curvinervis*.

*Stemonocera*, Rondani, and *Vidalia*, Desvoidy.

Hendel has recently used the name *Vidalia*, Dsv., in place of *Stemonocera*, Rdi., but *Vidalia impressifrons* (the genotype) was a species from the East Indies described as blackish with thorax flavescent, femora black, wings " d'un noir atre avec la base et six taches ou points diaphanes " and arista " plumosulum." The wing pattern is therefore obviously entirely different from the *Spilographa*-like wing markings of *Stemonocera*. In 1913 (*Ent. Mitth.*, II, 39) Hendel gave *Vidalia*, Dsv., and *Rioxa*, Wlk., as synonyms, and with some reason because the type of *Rioxa* was described as having " wings blackish with a white discal streak and five white dots " thus not unlike the description of those of *Vidalia* and very different from the wing markings of *Stemonocera*. Bezzi, however, in 1913 (Mem. Ind. Mus.) accepted Desvoidy's genus for some Indian species, and his statement that they had a " characteristic armature of frons of male which is very like that to be observed in the European *Stemonocera cornuta*, Scop." appears to have been sufficient to cause Hendel to use *Vidalia*, Dsv., in place of *Stemonocera*, Rdi., in spite of the well-known fact that a development in the males of frontal prominences and peculiar spines and bristles occurs in various widely separated genera of Trypetidae. Moreover, either Desvoidy did not know the male of *Vidalia impressifrons*, or the male had no abnormal frontal prominences, because he did not mention any peculiarity except " front un peu enforcé " which is certainly not the case in the female of *Stemonocera*.

It is impossible to believe that an East Indian species with *Aciura*-type of wing markings and a sunken frons belongs to the same genus as our *Stemonocera cornuta*, the use of the name *Vidalia*, Dsv., should not be accepted for our British species.

*Spilographa*, Loew, and *Trypeta*, Meigen.

Attention has already been called (*Ent. Rec.*, 1937, Suppl., p. 2) to the advisability of accepting the first designation of a genotype for

*Trypeta*, and thereby retaining it for the group of species with which it has been so long associated.

*Rhagoletis*, Loew, and *Zonosema*, Loew.

Hendel (1927) did not consider that these two genera were distinct and used the name *Rhagoletis*, in spite of *Zonosema* having page priority. The difference in the type of wing markings and the *Urophora*-like general appearance of *Rhagoletis*, so different from that of *Zonosema* should be sufficient justification for retaining them as separate genera, and this course is here adopted.

*Ceriocera cornuta*, Fabricius *nec* Scopoli.

The fact that there is no real necessity to change the name of this well-known species has already been pointed out (*Ent. Record*, 1937, Suppl., p. 3), and an application will be made to the International Zoological Commission to retain the well-known name.

The generic name *Orellia*, Dsv. (1830).

This genus was founded upon a single species *O. flavicans*, Dsv., which was considered by Walker (1835) to be the same as *Trypeta Wiedemanni*, Mg. (genotype of *Goniglossum*, Rdi.) and was used in that sense by Schiner and others, and in a wider sense to include *Carpomyia*, Rdi., by v. Röder in 1891. It was so used by Kertesz in his " Katalog " of Palaearctic Diptera of 1905, but Rondani had suggested many years previously (1869) that Desvoidy's species was the same as *Trypeta falcata*, Scop., and this view was adopted by Bezzi (his fellow countryman) in 1910, and accepted by Hendel and others in spite of the fact that Desvoidy's description is equally as inapplicable to *Trypeta falcata* as it is to *Goniglossum Wiedemanni*. *Orellia* was described as having " Characters des Sitarée mais les bords lateraux du péristome très développés." *Sitarea* had " péristome plus large, transversal, presque arrondé avec l'épistome non saillant." *Orellia* therefore must have a large, almost round, mouth-opening, with jowls below eyes very deep, but epistoma (or front mouth-edge) not prominent. Such characters are not present in *Trypeta falcata*, and presumably not in *T. punctata*, Schrnk, usually considered a form or variety of *falcata*. The species *O. flavicans* was described as having " corselet jaune avec des points d'un beau noir." In the thorax of *T. falcata*, and *punctata* the black spots are similar to those of *T. jaceae*, Dsv., which were described by Desvoidy as " petits points noirs." The " points d'un beau noir " of *flavicans* were certainly larger and brightly shining. From this and the characters given for the genus, *Orellia flavicans*, Dsv., may have been a species of *Carpomyia*, Costa, or *Myiopardalic*, Bezzi, but cannot have been *Trypeta falcata*, Scop., or its variety *punctata*, Schrnk.

The resurrection of old names on the flimsiest evidence, and their acceptance without real justification, is a menace to stability in nomenclature. This has been realized by the Zoological Commission who, in Opinion 107, ruled that no change should be accepted " unless the argument is unambiguous, and unless the premises are not subject to differences of opinion."

*Urophora*, Desvoidy, and *Euribia*, Latreille and Meigen.

In 1937 (*Ent. Record*, Suppl., p. 4) I followed Enderlein (*Die Theirw. Mitteleur. Abt.*, xvi, 157) in using the generic name of *Euribia*, is only possible if *Euribia*, Mg., 1800, is suppressed as a generic name, otherwise *Euribia*, Latr., becomes a homonym of *Euribia*, Mg., 1800, and cannot be used. The Zoological Commission has now decided that Meigen's "1800" generic names must be dealt with individually. Latreille in 1802 professed to recognize Meigen's genus *Euribia* and listed *umbellatarum*, F. (a *Palloptera*), and *cardui*, L. (an *Urophora*) as two of the species belonging to the genus, of these two *cardui*, L., has been designated the genotype, but this designation cannot be accepted because in the case of such a generic name the genotype (by Opinion 46) must be one of the originally included un-named species, i.e., a species agreeing with *all* the facts given in the original generic publication, viz. (among other things) a species known in nature at that time to Meigen, with antennae " à deux articulations," and arista " légèrement barbu." Apart from other considerations *T. cardui* has a bare arista and therefore cannot be the type of *Euribia*, Mg. Under these circumstances it is better to retain the use of the name *Urophora*, Dsv., for *cardui*, L., and similar species. A pubescent arista is a more conspicuous feature in the genus *Palloptera*, and *P. umbellatarum*, F., *may* have been one of the eighteen species originally included under *Euribia*, by Meigen, but it cannot be said to be possible to recognize that species as one agreeing with *all* the facts given in the original generic publication.

We know from the Introduction to Meigen's "1800" paper that the names of originally included species were *intentionally* withheld in order that the genera should not be rendered available for use except by Meigen himself. Meigen further withheld all details of wing venation upon which his " new classification " was mainly based, and stated that the species upon which the genera were founded were certain particular species known to himself in nature at that time, making it practically impossible to select an originally included species as genotype, and, by Opinion 46, when it is impossible to recognize one of the unnamed originally included species the genus remains a *genus dubium*. There are actually only a very few cases among these generic names of Meigen for which a genotype can be selected in strict accordance with Opinion 46, and *Euribia* is not one of them. To *pretend* to recognize such a genotype is absolutely contrary to the principle laid down in Opinion 107 mentioned above.

*Noeeta*, Desvoidy, and *Hoplochaeta*, Rondani.

When Loew in 1862 founded his genus *Carphotricha* upon three species he was evidently unaware that Rondani in 1856 had established the genera *Ditricha* and *Hoplochaeta* upon two of these species. He, however, pointed out that Desvoidy's genus *Noeeta*, which had been used by Walker in 1836 for one *guttularis*, Mg., species and subsequently discarded, could not have been founded upon any of these species. The character, especially emphasized by Desvoidy for his genus, of peristoma (i.e., mouth-opening) " plus long que large " is alone sufficient to prove this fact, because in both *guttularis*, Mg., and

*pupillata*, Fln., it is practically circular or even wider than long; moreover, it is impossible to believe that Desvoidy could have overlooked the polished black scutellum and last abdominal tergite of either of these species. The use of *Noeeta* in place of either *Ditricha*, Rdi., or *Hoplochaeta*, Rdi., is therefore not in accordance with the published facts and should not be accepted.

*Icterica*, Loew.

Coquillett in 1910 quoted the N. American *Trypeta seriata*, Lw., as type of this genus, but when Loew founded *Icterica* he wrote in reference to *Oxyphora*, " it would appear more natural to withdraw *O. Westermanni* from the genus and to form a new genus of it, together with the above described as well as the next following species " (these last two being *T. seriata*, Lw., and *T. circinata*, n. sp.). When one " forms a new genus of a species " that species must surely be accepted as the genotype.

A question arises as to whether *I. Westermanni* is the same as *Oxyphora cardui*, Dsv., in which case *Oxyphora* would presumably replace *Icterica*. Loew adopted this synonymy without adopting the above implication, but Rondani and others have rejected it. *Oxyphora* was described as having a bigeniculate proboscis similar to that of *Oxyna*, and an obviously pubescent arista, and Desvoidy even expressed a doubt whether it was really distinct from *Oxyna*. *Icterica* does not possess these characters and is abundantly distinct from *Oxyna*, therefore the synonymy suggested by Loew appears most doubtful, and should not be accepted.

*Oxyna proboscidea*, Loew, and *Tephritis nebulosa*, Wiedemann.

Hendel in 1927 suggested the use of the name *nebulosa*, W. (1817) in place of *proboscidea*, Lw. (1844), but the evidence in Wiedemann's description does not support this synonymy. It is true that Wiedemann's species was probably one of the three described by Loew in 1844 as *parietina*, L., *flavipennis* n. sp., and *proboscidea*, n. sp., but only one of these three (*parietina*, L.) has the female ovipositor entirely shining black, and as *nebulosa*, W., was described as having " der Griffel des ♀ . . . gläenzend schwarz," it should be accepted as a synonym of *parietina*, L., if the name *parietina*, as adopted by Meigen and the majority of subsequent writers for this Trypetid, is to be retained. In *O. proboscidea* and *flavipennis* the female ovipositor is extensively brownish. Hering in 1936 appears to have redescribed *O. proboscidea*, Lw., as *nasuta*, n. sp.

*Campiglossa*, Rondani, and *Spathulina*, Rondani.

The type of *Campiglossa* is *Tephritis irrorata*, Fln., which differs from *grandinata* in having all the lower orbital bristles white, while there is not so distinct a triangle of hyaline spots in costal margin of wing beyond stigma, i.e., the spots between radial and cubital veins are smaller, and it apparently always has one (antero-dorsal) bristle above hind femora near tip; therefore *grandinata* and *irrorata* may not be congeneric, but for the present I retain them in the same genus, and add the closely allied *T. argyrocephala*, Lw., a species which is certainly out of place in *Tephritis*, but agrees in many characters with

our British *grandinata*. None of these species can be correctly placed in *Spathulina*, Rdi. (type *sicula*, Rdi. = *tristis*, Lw.), distinguished by its shining black abdomen, black wings with only a few hyaline spots, and scutellum with only one pair of (basal) bristles.

It should be noted that our British *grandinata* has paler femora than Rondani described them, and the dark abdominal spots are not "subconfluentium." *T. Beckeri*, Rübs. (1910), bred from stem-galls on *Solidago*, is given by Hendel as a synonym of *grandinata*, but in this species though the femora appear to be similar in colour to those of our British species, the abdomen was described as all dark (pechbraun), and not maculated. Our British species has not yet been bred, and a suggestion has been made by Niblett (*Ent. Record*, 1939, p. 71) that search should be made for galls on *Solidago* in the autumn and early winter, but Rübsaamen found the galls made by *Beckeri* empty in August, and only by collecting them in July did he breed the fly.

A remarkable variety of *Paroxyna Loewiana*, Hendel.

The typical form of this species is by no means common in Britain. In July 1909 I found it in some numbers in Stoke Wood, Herefordshire, and have taken it on the Inverness-shire banks of the River Spey near Grantown, while Mr A. H. Hamm has bred it from the flower-heads of *Solidago virgaurea* gathered in S. Devon. It normally has whitish outer vertical bristles and postocular ciliation (as usual in this section of the genus), the short white hairs on thorax rather coarse, abdomen rather distinctly maculated, femora extensively darkened, and cross-veins of wings rather close together, the outer one (at end of discal cell) almost directly under a large hyaline spot in the cell above, but a very remarkable variety has been bred in some numbers from flower-heads of *Solidago virgaurea* gathered by Mr Albert E. Wright in the neighbourhood of Grange-over-Sands (Lancs.), in which the postocular ciliation (or the greater part of it) is apparently always black, the outer vertical bristle often black, the short white hairs on thorax finer, abdomen as indistinctly maculated, femora often entirely yellow, and cross-veins rather further apart, the outer cross-vein being usually *beyond* the large hyaline spot in cell above.

The colour of outer vertical bristle and postocular ciliation is a very remarkable case of reversion to what appears to be a primitive condition, in a feature which has been regarded as sufficiently stable to be used in a primary division of the family, but while there appears to be always *some* black bristles in the postocular ciliation, the outer-vertical bristles (as well as the other characters mentioned) are subject to variation towards normal.

As already mentioned, all the specimens were *bred*, and it is therefore possible that the variation may be due to the abnormal conditions under which the later larval and pupal stages of these insects were passed, especially as I have not yet seen any captured specimens of the variety (nor indeed captured specimens of the typical form) from Grange-over-Sands.

## APPENDIX.

### Note I.

The Notes on British Noctuae were begun in 1926 as a Supplement to the four volumes published in 1892 by the late J. W. Tutt. These consisted of only the species dealt with in the first three volumes, and the mass of references were in pencil in interleaved copies of the first three volumes. Since 1926 and onward a huge number of additional forms have been described necessitating inclusion. Then an Addendum to these three volumes. This will be continued in due course, but will be slower in appearance; it necessitates a great deal of dictionary work which I am now unable to do with facility owing to eyesight deterioration. As to Vol. IV, I have notes on only a few species partly ready and they will be used later in the year.—Hy. J. T.

### Note II.

P.S.—In order to save repetition in the Descriptions of the combinations of the stigmata in the varieties of the British Noctuae we give the following interpretation of the four names, which have been largely used in Holland by our kind correspondent, B. J. Lempke:—

I. ab. *juncta*:—In which the orbicular and reniform stigmata touch each other without breaking their circumscription, thus usually retaining their shape.

II. ab. *semiconfluens*:—In which the circumscription of both the orbicular and reniform is broken by two junction lines, which may be (1) towards the top end, (2) in the middle, or (3) towards the bottom end. The whole of the internal two areas are united and completely encircled, but the junction is only partial.

III. ab. *confluens*:—In which the same two stigmata are united into a more or less irregularly complete blob, within the one encirclement.

IV. ab. *clausa*:—This is for the case in which the first and second complete transverse lines on the forewings actually converge sufficiently to meet at a point on the inner-margin.

## CORRECTIONS, ADDITIONS, ETC., TO VOLUME I.

To pp. (11)-(12),*T. batis*, add:

ab. *privata*, Whrli, *Mitt. Thurgau. Nat. Ges.*, Heft. XX, 263 (1913).

Orig. Descrip.—" The isolated spot at the inner margin of the forewings is absent. The other markings are normal."

To pp. (29)-(30), *Achlya (A.)-(P.) flavicornis*, add:

ab. *pseudoalbingensis*, Franzius, *Ent. Zeit.*, LII, 160 (1938).

Orig. Descrip.—" In February of this year, in No. 44 of Vol. LI of this *Zt.*, I reported the occurrence of a perfect black-green stigma of *flavicornis*. All my enquiries have now been satisfied that such a form has been unknown until now. Since it is here still doubtful whether this form has occurred, and my form may not be a solitary find, I name my variety and call it the name ab. *pseudoalbingensis*." Type in my collection. Berlin.

[A figure shows a deep black form, with grass green orbicular; normal markings faintly visible.—F.A.C.]

To *l.c.*, add:

ab. *angustefasciata*, Heydemann, *Ent. Zt.*, LII, 48 (1938).

Orig. Descrip.—" Of the double black lines, which normally include the marginal area, the outer ones are almost completely obsolete and the inner ones, which are, however, only at the costa clearly marked in black, have remained; they have approached each other at half the distance so that both angularly touch about the grey circumscription of the orbicular stigma. Below this they run at a short distance and strongly narrowing the central area and only feebly indicated, to the inner margin." Holland.

To pp. (52)-(53), *A. leporina*, add:

ab. *continua*, Lempke, *Ent. Ned. Lep.*, 209 (1939).

Orig. Descrip.—" The subterminal line complete and strongly toothed extends from the costa to the inner margin of the forewings."

To *l.c.*, add:

ab. *sagittata*, Lempke, *Ent. Ned. Lep.*, 209 (1939).

Orig. Descrip.—" A row of large sagittate black spots occurs in the marginal area of the forewings.

To *l.c.*, add:

ab. *flavescens*, Lempke, *Ent. Ber.*, IX, 128 (1935).

Orig. Descrip.—" Grond kleur lich teel (al of niet met zwarte schubben bestowen). Schiemonnikoog (wiss)." [Cream?]

To *l.c.*, add:

ab. *fasciata*, Lempke, *Ent. Ned. Lep.*, 209 (1939).

Orig. Descrip.—" The blackish median shade is sufficiently wide to show up the forewings."

To *l.c.*, add:

ab. *alba*, Gillmer, *Ins. Börse*, XXIII, 119 (1906).

Orig. Descrip.—" Slevogt mentioned in his *Fauna of Kurland* (1903), p. 67, white specimens without any markings."

To pp. (61)-(62), *A. alni*, add:

ab. *obscurior*, Caspari, *Jahrb. Nass. Ver.*, LII, 179 (1939).

Fig.—*l.c.*, plt. IV, f. 9.

Orig. Descrip.—" Vvls bijria eenkleurig bruinzwart met nog vrij duideliik zichtbare teekening, avls ereneens verdonkerd."

To p. (65), *A. psi*, add:

ab. *saltowensis*, Sultz., *Int. Ent. Zt.*, XXIV, 185 (1930).

Orig. Descrip.—" Ground colour of the forewings darker brown-grey."

To p. (66), *A. auricoma*, add:

ab. *obscurior*, Lempke, *Ent. Ned Lep.*, 206 (1939).

Orig. Descrip.—" The forewings ground is a very deep blackish-grey-brown."

To *l.c.*, add:
ab. *virga*, Lempke, *Ent. Ned. Lep.*, 206 (1919).
Orig. Descrip.—" The marginal area of the forewing is darker than the rest of the wings."

To pp. (78)-(79), *A. albovenosa*, add:
ab. *geminipuncta*, Boldt., *Cat. Ned. Lep.*, 199 (1939).
Orig. Descrip.—" On the upper side of the forewings there appear two black dots in the upper and lower corners of the median cell."

To pp. (99)-(100), *L. lithargyria*, add:
ab. *punctilinea*, Lempke, *Tijd. v. Ent.*, 280 (1940).
Orig. Descrip.—" Along the outer margin of the forewings a row of black dots from costa to inner margin (in place of the outer line)."

To pp (111), *L. comma*, add:
ab. *bistriata*, Lempke, *Tijd. v. Ent.*, 280 (1940).
Orig. Descrip.—" There is also a black streak along the outer half of the upper side of the cell."

To p. (113), *L. obsoleta*, add:
ab. *completa*, Lempke, *Tijd. v. Ent.*, 281 (1940).
Orig. Descrip.—" Besides the row of dots in place of the outer line there is also a clear coherent inner line."

To *l.c.*, add:
ab. *impunata*, Lempke, *Tijd. v. Ent.*, 281 (1940).
Orig. Descrip.—" The veins on the forewings bordered with black, but the row of black dots fails."

To *l.c.*, add:
ab. *impuncta*, Lempke, *Tijd. v. Ent.*, 281 (1940).
Orig. Descrip.—" The row of black dots is present, but the veins are not bordered with black."

To *l.c.*, add:
ab. *rufescens*, Lempke, *Tijd. v. Ent.*, 281 (1940).
Orig. Descrip.—" Ground colour of the forewings reddish."

To. p. (114), *L. straminea*, add:
ab. *punctilinea*, Lempke, *Cat. Ned. Macrolep.*, V, 193 (1940).
Orig. Descrip.—" On the forewings a complete row of black dots in the place of the outer line from costa to inner margin."

To. p. (115), *L. impura*, add:
ab. *impuncta*, Lempke, *Tijd. v. Ent.*, 273 (1840).
Orig. Descrip.—" Forewings without a trace of black dots."

To. p. (117), *L. pallens*, add:
ssp. *orientasiae*, Bryk., *Iris*, LVI, 44 (1943).
Orig. Descrip.—" Forewings bone-yellowish, paler than the typical form from Sweden or Germany, without the reddish tint. The intranervular stripe, which extends from the middle of the discus and to the outer margin, more strongly contrasting. The intranervular marginal

points, which mostly fail in the typical form, or are hardly to be seen, always well visible. The second point in the distal part between CU (1) and CU (2) near the foremost typical one also always present. Hindwings also somewhat duller, but less than in the still undescribed form Kamschatka. Underside: submarginal line of the forewing indicated a row of indistinct intranervular points. Length of forewing, 16.7-17.7 mm." Kuriles.

To *l.c.*, add:
ab. *punctilinea*, Lempke, *Cat. Ned. Macrol.*, V, 194 (1940).
ORIG. DESCRIP.—" Forewings with a complete row of black dots from costa to inner margin."

To *l.c.*, add:
ab. *venata*, Lempke, *Tijd. v. Ent.* (1840).
ORIG. DESCRIP.—" Hindwings with black veins."

To p. (127), *T. elymi*, add:
ab. *depunctata*, Nordstroem, *Svenska Fjar.*, 192 (1940).
ORIG. DESCRIP.—" The row of dots in place of the outer line is absent."

To *l.c.*, add:
ab. *renifera*, Nordstroem, *Svenska Fjar.*, 192 (1940).
ORIG. DESCRIP.—" Forewing has a recognizable distinct reniform."

To p. (128), *L. flava* (*hellmanni*), add:
ab. *pulverosa*, Warr.-Stz., *Pal. Noct.*, III, 236, plt. 49, f. (1911).
ORIG. DESCRIP.—" Has the grey dusting very strong, the dots of outer line obsolete and the veins dark."

To. p. (132), *T. pygmina* (*fulva*), add:
ab. *fusca*, Lempke, *Tij. v. Ent.*, 400 (1942).
ORIG. DESCRIP.—" Ground colour of the forewings black."

To pp. (135)- . . . *concolor* (*extrema*), add:
ab. *depunctata*, Lempke, *Tij. v. Ent.*, 401 (1942).
ORIG. DESCRIP.—" The row of dots in the place of the outer transverse line is absent."

To *l.c.*, P. 47, *E. arcuosa*, add:
ab. *luciola*, Procaska, *Zoo. bot. Ges. Wien*, LXX, 97 (1920).
ORIG. DESCRIP.—" Ground of the forewings coppery-red. One with red-brown forewings."

To p. (137), *C. minima* (*arcuosa*), add:
ab. *nivescens*, Lempke, *Tij. v. Ent.*, 418 (1942).
ORIG. DESCRIP.—" Ground colour of the ♂ forewing near the yellow as the principal form of the ♀; marking, however, as feeble as that of the normal ♂."

To. p. (147), *N. neurica*, add:
ab. *pallida*, Lempke, *Tij. v. Ent.*, 394 (1941).
ORIG. DESCRIP.—" Ground colour of the forewings pale yellowish-brown."

To *l.c.*, add:
ab. *spalleki*, Kit., *Ver. Zoo. bot. Ges. Wien*, LXVII, 138 (1916).
ORIG. DESCRIP.—" It has quite normal marking and ground colour a black-brown, well darkened basal and marginal areas of forewings with a suffusion of the orbicular and reniform. The waved lines stand out clearly from this lighter shiny, brownish, yellow-greenish ground colour." Houbok, Austria.

To *l.c.*, add:
ab. *rufescens*, Edel., *E.M.M.*, XLVII, 207 (1911).
ORIG. DESCRIP.—" Reddish."

To *l.c.*, add:
ab. *fusca*, Edel., *l.c.*
ORIG. DESCRIP.—" Blackish."

To *l.c.*, add:
ab. *brunnea-ochrescens*, Strnd.
DESCRIP.—(Stz., *Pal. Noct. Sup.*, III, 194 (1935)) " Pale forewings dusted with pale ochreous-brown."

To p. (131), *N. algae*, add:
ab. *impunctata*, Lempke, *Tij. v. Ent.*, 392 (1941).
ORIG. DESCRIP.—" The row of dots in place of the outer line is absent on the forewings."

To pp. (159)-(160), *C. lutosa*, add:
ab. *strigata*, Rebel, *Berge*, 9ed., 226 (1909).
ORIG. DESCRIP.—" With an indented transverse outer line on all wings, also on the forewings indications of an inner transverse line."

To pp. (162)-(165), *G. ochracea* (*flavago*), add:
f. *reducta*, Lempke, *Tij. v. Ent.*, **85**, 434 (1942).
ORIG. DESCRIP.—" The dark band at the base of the forewings fails for the greater part or completely."

To pp. (167)-(168), *H. oculea* (*nictitans*), add:
f. *grisea*, Lempke, *Tij. v. Ent.*, **85**, p. 438 (1942).
ORIG. DESCRIP.—" Ground colour of the forewings dirty yellowish without any reddish tint; reniform stigma white."

To *l.c.*, add:
f. *aurigera*, Hydm., *Ent. Zeit.*, **45**, 304 (1932).
ORIG. DESCRIP.—" The forewings are lit up over the whole discal area and the base as well with a golden yellow tone, especially including the 3 clear large stigmata. These are a very fine violet-brown colour. Of the same colour are all the lines which cover the discal area and the marginal portion. The apex bears a golden-yellow spot, before which a sharply edged darker violet-brown streak lies. Head, breast, thorax a little golden-yellow especially on the violet-brown neck. Abdomen pale, rose-brown, golden-yellow hair on the back. Hindwing pale grey-yellow, with grey central line fringed with pale yellowish, and with the wide border grey. Fringes yellowish-rose. Underside equally very

pale, delicate pale yellow, fine reddish-brown powdered, without any grey toning, veining throughout red-brown with pale red-brown.

To pp. (176)-(178), *H. micacea*, add:
ab. *discolor*, Kroul., *Bull. Soc. Imp. Nat. Moscou.*, p. 70 (1894).
FIG.—Sepp. I, Vol. IV, plt. 39, 4-5.
DESCRIP.—" Ground colour of forewings greyish with green tinge."

To p. (67), *H. leucostigma*, add:
ab. *confluens*, Lempke, **85**, 447 (1942).

To *l.c.*, add:
ab. f. *nigrobrunneata*, Bois.-Rey., *Z. Ariss. Ins.-biol.*, XXVI, 39 (1931).
ORIG. DESCRIP.—" Forewing unicolorous black-brown with yellow or white reniform."

To *l.c.*, add:
ab. *pallida*, Heyd., *Ent. Zt.*, LII, 47 (1938).
FIG.—plt. I, 18, ♂.
ORIG. DESCRIP.—" The freshly caught perfect specimen from Lobith (Holland) is strikingly palish brown, the dull grey marginal area is wholly obsolescent, so that on the forewing only the yellowish-white reniform shows distinctly. The hindwing is dusky white, actually paler than in the typical form with dull grey veins and marginal line." Colln. Scholten.

To *l.c.*, add:
ssp. *kurilibia*, Bryk., *Iris*, LVI, 50 (1942).
ORIG. DESCRIP.—" Approaches the examples which are known as f. *fibrosa*, Hb., but is not such a warm brown, more yellow-brown and more uniform, because the outer band of the forewings is not particularly pale. Reniform stigma white centered with a dark sickle mark. The parallel, proximal [Neben kontur] somewhat further removed from the reniform stigma; of a delicate yellowish orbicular stigma feebly differentiated, oblong oval and placed a bit obliquely. Underside of hindwings with a delicate submarginal line distally from the disc. Length of forewing 16 mm." Kuriles. 1 ♂.

To *l.c.*, add:
f. *purpurascens*, Lempke, *Tij. v. Ent.*, **85**, 432 (1942).
ORIG. DESCRIP.—" Forewings purplish, central area dark purplish with chalky-white circumscription of the reniform stigma."

To *l.c.*, add:
ab. *pallida*, Heydemann, *Ent. Zt.*, **52**, 47 (1938).
ORIG. DESCRIP.—" Strikingly pale reddish-brown, the dull grey marginal area completely obsolete so that in the forewing only the yellowish-white reniform stigma remains distinct. Hindwings dirty white, also paler than with the typical form, with dull grey nervures and marginal line." Holland.

To pp. (199)-(200), *X. rurea*, add:
ab. *albata*, ab. nov.

Orig. Descrip.—" The markings of the forewing are of the usual colour and pattern, but the ground colour is pure white. Type: ♂, I. of Lewis, Outer Hebrides, 1901; MacArthur. The parallel form in *Apamea secalis*, L., is ab. *struvei-excessa*, Turner."

To pp. (206)-(207), *X. scolopacina*, add:
ab. *beneditoi*, Agen., *Eos.*, XX, 185 (1945).
Figs.—*l.c.*, plt. VI, 5.

Orig. Descrip.—" The only example I know of this form shows the thorax and the upper surface of the forewings of a colour intermediate between that shown by the background of the f.w. in figures 7 and 9 of Plate XXIX in Culot. They lack the orbicular and have the reniform almost effaced. All the lines are lacking, except the black dots which define the external tops of the angles of the elbowed line, and a weak dusting of clear reddish colour, which represents the extrabasal line, and which is more accentuated on the internal border of the wing.

" Terminal area with the same pattern as in the typonominal form, and its coloration more intense than the dusting of the subbasal line. Between the nervures blackish-chestnut streaks instead of black. Fringes clear reddish, with the hairs situated on the prolongations of the nervures of the colour of the wing ground. Upper surface of h.w. less fuscous than in the typonominal form and with a soft golden tinge scattered over their surface. Undersurface of f.w. and h.w. suffused with a bright golden tinge, without black scales and without the fine black postmedian line which in *scolopacina* runs across the wings from the costal border of the f.w. to the anal border of the h.w. Fringes golden with a few greyish-chestnut scales." Gijon, Spain.

To p. (237), *M. fascuncula*, add:
ab. *marmorata*, Heydmn., *Stett. Ent. Zeitg.*, **103**, 21, (1942).
Fig.—plt. IV, f. 42, 43.

Orig. Descrip.—" A very striking and little larger race. Forewings dark red-brown. Central area above the inner margin dark brown, inner and outer lines black with snow-white inner marginal curve and pale yellowish spot beside it. Marginal area mixed with yellow and red-brown. Costa black-brown, spotted with reddish and white. Outer margin dark brown-yellow." Black Forest.

To pp. (246)-(247), *M. literosa*, add:
f. *hispanica*, Hdmn., *Stett. e. Ztg.*, **103**, 21 (1942).
Fig.—plt. IV, f. 19.

Orig. Descrip.—" Costa much paler, whitish-grey especially in the marginal area; forewings a little narrower. Lines and inner circumscription of the stigmata thin black. Posterior wings in the basal part almost white, only towards the outer margin tinted with pale grey, as with no other form of *literosa*. Under surface too shining white without the usual dots, forewings only along the costa thinly powdered with grey. Hind wings only very thinly powdered with grey. Marginal lines black grey. Fringes pale grey, those of the hindwings whitish-thinly divided with grey." Granada, Spain.

To *l.c.*, add:
f. *juncta*, Lempke, *Tij. v. Ent.*, **85**, 460 (1942).

To pp. (268)-(270), *M. brassicae*, add:
ab. *pauper*, Lempke, *Tij. v. Ent.*, 321 (1840).
ORIG. DESCRIP.—" Forewings unicolorous brown, orbicula and reniform stigmata feebly indicated, the rest without any trace of marking."

To. p. (269), *M. persicariae*, add:
ab. *badia*, Lempke, *Tij. v. Ent.*, 320 (1840).
ORIG. DESCRIP.—" Ground colour of the forewings dark red-brown. Subterminal line yellow-brown."

To p. (272), *M. persicariae*, add.
ssp. *japonibia*, Bryk., *Iris*, LVI, 42 (1942).
ORIG. DESCRIP.—" Much larger than the type form with striking broad white stigma, which is yellowish in the centre and in the front brown. Hindwings a bit paler. Underside paler without the reddish tint. Abdomen and thorax paler. ♀ darkened as ab. *unicolor*, Stdgr., but the reniform stigma also much larger, the centre yellowish. Hindwings darker."

To. p. (280), *P. leucophaea* (*fulminea*), add:
ab. *hilaris*, Wehrli, *Mitt. Thurn. Nat. Ges.*, Heft XX, 244 (1913).
ORIG. DESCRIP.—" Submarginal line and W mark broad, visibly white, sharp, claviform stigma not sharp, orbicular and reniform with broad white border, the band and also transverse lines filled with white, the arrow marks indistinct and reduced. Posterior curve on the hindwings broadly blackish."

To *l.c.*, add:
ab. *variegata*, Lempke, *Tij. v. Ent.*, **85**, 451 (1942) [includes *radiata*, Wahlgrn.-Lempke].
FIG.—*Sven. Fjarl.*, plt. XXVI, 20b (still darker).
ORIG. DESCRIP.—" Ground colour of the wings black-brown with normal pale transverse lines."
Lempke says " The form is not identical with f. *obscura*, Turner (*B.N. Supp.*, I, 288 = Culot, plt. XXII, 4) from Geneva which lacks the subterminal line completely and looks much more unicolorous than our fine variegated form." " The pale grey-brown typical form (Stz., plt. 44i, f. 6) flies in our dunes along the coast of the North Sea; the inland form is the dark *variegata*."

To pp. (284)-(286), *E. matura*, add:
ab. *wahlgreni*, Nordst., *Svensk Frjlr.*, 100 (1940).
ORIG. DESCRIP.—" Examples of f. *radiata*, Whlgrn., with ground colour light brownish, lighter than in the typical form."

To *l.c.*, add:
ab. *conjuncta*, Lempke, *Tij. v. Ent.*, **85**, 453, (1942).
ORIG. DESCRIP.—" A dark streak runs from the claviform stigma to the outer line."

To pp. (296)-(298), *C. graminis*, add:
ab. *lepida*, White, *Scot. Nat.*, II, 178 (1873).
ORIG. DESCRIP.—" Usually rather smaller than the typical form, wings darker, nearly unicolorous."

To pp. (296)-(298), *C. graminis*, add:
ab. *juncta*, Lempke, *Tij. v. Ent.*, **83** (1942).

To pp. (318)-(320), *G. trigrammica*, add:
ab. *obsoleta*, Lempke, *Tij. v. Ent.*, 417 (1942).
ORIG. DESCRIP.—" Central shade fails, the other transverse lines obsolete."

To *l.c.*, add:
ab. *henrioti*, E. B., *Actes Linn. Bordeaux*, **79**, 56 (1928).
ORIG. DESCRIP.—" The more accentuated middle line unites with the internal line, between the middle line and the external line a central dot is found of the same colour as these lines." Gironde Marshes. ab. *obsoleta*, Lempke, is a syn."

To pp. (332)-(333), *C. morpheus*, add:
ab. *semiconfluens*, Lempke, *Tij. v. Ent.*, **85**.

To pp. (333)-(335), *C. alsines*, add:
f. *rufescens*, Lempke, *Tij. v. Ent.*, **85**, 423 (1942).
ORIG. DESCRIP.—" Ground colour of the forewings reddish."

To *l.c.*, add:
f. *clausa*, Lempke, *Tij. v. Ent.*, **85**, 423 (1942).

To *l.c.*, add:
f. *elegans*, Lempke, *Tij. v. Ent.*, **85**, 423 (1942).
ORIG. DESCRIP.—" Forewings clear yellow-brown with sharply contrasting markings."

To pp. (333)-(335), *C. ambigua*, add:
ab. *obscurior*, Prout, *Ent. Rec.*, VI, 228 (1895).
ORIG. DESCRIP.—" The name explains itself."

To pp. (338)-(340), *C. taraxaci*, add:
ab. *suffusa*, Prout, *Ent. Rec.*, VI, 227 (1895) (*blanda*), add:
ORIG. DESCRIP.—" The darkest form of this species, obscure deep fuscous."

To *l.c.*, add:
ab. *pallida*, Lempke, *Tij. v. Ent.*, LXXXV, 420 (1942).
ORIG. DESCRIP.—" The transverse lines on the forewings are completely absent."

To pp. (341)-(343), *C. clavipalpis* (*quadripunctata*), add:
f. *thunbergi*, Nordstrm., *Ent. Tdskr.*, **57**, 225 (1933).
FIG.—plt. XI, figs. 27-29.

ORIG. DESCRIP.—" This is a new name =*leucoptera*, Stdgr. (nec Thnbg.); darker, grey-brown, often with indistinct markings; with or without dark marginal area. In Sweden, together with the typical form."

To *l.c.*, add:
ab. *bilineata*, Prout, *Ent. Rec.*, VI, 224 (1895).
ORIG. DESCRIP.—" The striking form in which there are no transverse markings except the very distinct inner and elbowed lines."

To *l.c.*, add:
ab. *obsoleta*, Lempke, *Tij. v. Ent.*, LXXXV, 420 (1942).
ORIG. DESCRIP.—" The transverse lines on the forewings fail completely."

To *l.c.*, add:
ab. *phaeophoba*, Schwrda., *Iris*, **55**. 13 (1942).
FIG.—plt. II, figs. 5, 6, 7.
ORIG. DESCRIP.—" Three specimens taken at Galtür, Tyrol, did not agree with the browner and smaller material of my collection and with the second good figure in Seitz. They are larger and dark grey without a trace of brown, well marked. A ♂ from Feuchten (Tyrol) belong to them. Osthelder mentions dark brown moths of this species. Probably it is an alpine form which I should like to distinguish as var. *phaeophoba*."

To *l.c.*, add:
ab. *pallida*, Lempke, *Tij. v. Ent.*, LXXXV, 420 (1942).
ORIG. DESCRIP.—" Ground colour of the forewings pale grey. Lempke remarks that Tutt " mentions in *Brit. Noct.*, I, 152-3 (1891), several pale forms which are either homonyms or indicate quite distinct species and which cannot be used therefore."

To pp. (74)-(76), *A. rumicis*, add:
ab. *nigerrima*, de Lat., *Zt. Wien. Entom. Gesell.*, XXV, 18 (1940).
ORIG. DESCRIP.—" In comparison with the blackish form *salicis*. Curt., it is a genuine melanistic form in which, up to the white inner marginal spots, the whole of the forewing is uniformly rusty-black; all the markings are obliterated. On the hindwing the dark marginal band is somewhat widened." Near Berlin.

To pp. (60)-(61), *A. strigosa*, add:
ab. *destrigata*, de Lall., *Zt. Wien. Entomol. Gesell.*, XXV, 17 (1940).
ORIG. DESCRIP.—" This form is distinguished from typical specimens by the complete absence of the black longitudinal streaks beyond the inner margin of the discal area. Also the area below the black sagittate stigma towards the base is strongly darkened." ♀. Regensburg.

To pp. (69)-(76), *A. menyanthidis*, add:
subsp. *fennica*, de Latt., *Zt. Wien. Entomolog. Gesell.*, XXV, 17 (1940).
ORIG. DESCRIP.—" A short Finnish series which I obtained from Staudinger is well distinguished from those of Central Europe. It is

distinct from all those with dark blue ashy-grey tone of forewing ground colour and the equally strong black-grey much darkened ground colour of the hindwings. All the markings of the forewings are clear, and the white marked distal transverse lines contrast strongly with the dark underground; the stigmata are clearly black margined. Hindwing with a very obsolescent discal mark. Underside strongly blackish suffused, especially in the costal half of the wing. Forewing fringes checkered also those in the apical third of the hindwing were very distinct on the underside. Head and thorax of the same colour as the forewings.

To pp. (34)-(37), *B. perla*, add:

subsp. *aetnaea*, Schwing., *Zt. Wien. Entomolog. Gesell.*, XXVII, 184 (1942).

Orig. Descrip.—"On the first night at Aetna there came to the light at the entrance of the hotel, a *perla* form, the whole of which is suffused with a dark lava colour, most of the lighter specimens were very much worn. Small, frail and narrow-winged rusty black-grey, indistinctly marked, hindwings throughout black-grey, the discal mark indistinctly visible."

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Note.—We understand that the Continental Entomological magazines were published as usual during the early years of the war until about 1944. From those we have seen, so far, many new forms and species have been described. But it may be long before these can be generally known in general entomological circles.—Hy. J. T.

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## APPENDIX (2) TO VOLUME II. 1835-1940.

To pp. (1)-(3), *R. umbratica*, add:

ab. *albescens*, Ckyn., *Ent. Record.*, LVIII, 74 (1946).

Orig. Descrip.—" The forewings, thorax, antennae, legs, and abdomen are bone coloured, the colour of the palest form of *Rhizedra lutosa*, Hbn., and there are no markings whatever. The hindwings are whitish with a faint brown tinge."

Type: ♂, Woolmer Forest, Hants., 23.vi.1914; J. E. Eastwood.

To pp. (21)-(24), *A. trux* (ssp. *lunigera*, Steph.), add:

ab. *asticta*, Ckyn., *Ent. Record* LVIII, 73 (1946). (Pl. 1, fig. 1.)

Orig. Descrip.—" The black ring around the orbicular stigma is absent and there is no trace of the claviform stigma; in other respects it is normal."

Type: ♂, Freshwater, I. of Wight, 1903; Dewar.

To. pp. (36)-(39), *A. nigricans*, add:

ab. *juncta*, Foltin., *Zts. Oestr. Ent. Ver.*, XXIII, 125 (1938).

Orig. Descrip.—" Orbicular and reniform stigmata are united." Kefermarkt, Austria.

To pp. (133)-(137), *T. comes*, add:

ab. *immaculata*, Hackray, *Lamb.*, 66 (1945).

Orig. Descrip.—" Complete absence of the black discocellular spot on the hindwings." Nothing but a synonym of *connuba*, Hb.

To *l.c.*, add:

ab. *undulata*, Hackray, *l.c.*

Orig. Descrip.—" On the hindwings the black marginal band on its inner side over the whole length is festooned, a character which modifies the aspect of the insect considerably.

To *l.c.*, add:

ab. *albocostata*, Heydemann, *Ent. Zt.*, LII, 23 (1938), pl. 1, fig. 12.

Descrip.—" The costa of the forewings shows a narrow but sharp line of white colour, which is interrupted at the indications of the transverse lines and which strikes one at once." South-west Holstein.

To *l.c.*, add:

*ab. albocostata*, Heyd., *Ent. Zt.*, LII, 23, Plt. 1, 12 (1938).

Orig. Descrip.—" The forewing red-brown with a brown reniform spot. The lower-wing orange-yellow with black margin and black spot (discal) is the type."

" A markingless form. A light costa on forewing; absence of apical spot and obscurity of reniform, and of discal spot of hindwing."

To p. (21), *A. trux*, add:

ab. *lineata*, Schwinghs, *Zeit. Ent. Wien. Gesell.*, 183 (1942).

Orig. Descrip.—" In the neighbourhood of Petralis (Aetna) five ♂♂, very variable, were taken, and at Mezzeruso (Aetna) about 1200 m. One ♂ is so striking that one takes it for another species. Forewing very pale, whitish-grey, with a deep black, toothed inner and a similar outer transverse line, a dot-like orbicular and a deep black reniform stigma, and a distinctly brown discal area. *Trux* varies very much in colour and marking, but I have no example with such outstanding transverse lines." I name this form *lineata*. Sicily.

To *l.c.*, add:

ab. *astricta*, Ckyne., ssp. *lunigera*, Steph., *Ent. Rec.*, LVIII, 73 (1946). (Pl. 1, fig. 1.)

Orig. Descrip.—The black ring around the orbicular stigma is absent and there is no trace of the claviform stigma; in other respects it is normal.

Type: ♂, Freshwater, I. of Wight, 1903; Dewar.

To p. (50), *A. nigrescens*, add:

ab. *uniformis*, Rougemat., *Bull. Soc. Neuchatel, Sc. Nat.*, **29**, 343 (1901): **31**, plt. I, 6 (1903).

Orig. Descrip.—" The whole exterior is more delicate, the general tint is dust-grey, feebly ruddy. The visible markings are the two usual, the orbicular round, the reniform a little oblique narrow, both indicated by a pale yellowish central spot. The subterminal line very near the fringe is reduced to a series of small spots which are also yellowish."

To p. (77), *A. ripae*, add:

ab. *signata*, Ckyne., *Ent. Record*, LVIII, 73 (1946). (Pl. 1, fig. 2.)

Orig. Descrip.—" Forewing—The ground colour of the median area is pale grey with a faint rufous tinge and that of the marginal area is pale grey; the stigmata are outlined with brown; the submarginal line is bordered internally with dark brown. Hindwing—Whitish with distinct grey-brown submarginal shading. The dark submarginal shading in both wings distinguishes it from other forms."

Type: ♂, Pendine, Carmarthen, 1910; Dewar.

To p.p. (129)-(131), *T. orbona*, add:

ab. *pronubina*, de Graaf., *Sepp's Ned. Ins.*, VII, 139 (1843-55).

Orig. Descrip.—" Forewings of a greyish-olive colour, markings less clear. Hindwings without the black lunule."

To pp. (130)-(133), *T. pronuba*, add:

ab. *fumata*, Ckyne., *Ent. Record*, LVIII, 74 (1946).

Orig. Descrip.—" The ground colour of the forewing is a deep blackish-brown with black markings; hindwing suffused with brown becoming yellower towards the base and inner margin."

Type: ♂, Wallasey, 1910; H. Massey.

To pp. (133)-(136), *T. comes*, add:

ab. *grisea-fusca*, Prout, *Ent. Record*, XIII, 4 (1904).

Orig. Descrip.—(In a footnote) Adkin (pro parte) nec Harker then

ab. *grisea*, Tutt." Forewings almost as in *Ent.*, XVI, plt. 6, fig. D2. (ab. *nigrescens*, Tutt, pro parte) hindwings not infuscated. This form appears very occasionally in the South of England and is the darkest, so far as I know which is here obtainable. There is no suggestion of red in the coloration, and I am inclined to agree with Mr Adkin when he says of a similar even slightly more extreme form, that it is "traceable, downwards, through varying shades of *grisea* type," whereas the true *curticii* series is rather derived " through the reds from a light red type."

To *l.c.*, add:

ab. *sagittifer*, Ckyne., *Ent. Record*, LVIII, 73 (1946). (Pl. 1, fig. 8.)

Orig. Descrip.—" Forewing—Ground colour pale brownish-grey; basal, antemedian, and post-median lines blackish brown, the postmedian united to the series of dots lying between it and the submarginal line so as to form a series of marks like arrow-heads; the antemedian is united to the black mark on the costa and to the black dots on the median nervure and nervure 2 so as to form three loops; the orbicular and reniform are filled in with blackish brown."

Type: ♂, F. Bond Coll., Baron Bouck Coll.

I have seen specimens of this aberration from the Hebrides.

To *l.c.*, add:

ab. *pronubina*, de Graaf, *Sepp's Neder. Ins.*, **7**, 139 (1843).

Orig. *Descrip.*—" Forewings of a greyish-olive colour; markings less clear. Hindwings of ground colour of forewings, without the black lunule." (Syn. of *connuba*, Hb.).

To *l.c.*, add:

ab. *rubra*, *Gauckler*, *Ent. Jahrb.*, XIV, 118 (1905).

Orig. Descrip.—" The large red form."

To *l.c.*, add:

ab. *niger*, Gauckler, *l.c.*, 119 (1905) = *nigra*, Tutt, " both forms are not identical."

To *l.c.*, add:

ab. *grisea*, Gauckler, *Ent. Jahrb.*, XIV, 118 (1905).

Orig. Descrip.—Forewings pale grey. Almost all specimens of this type are sharply marked with two distinct white dashes on the costa of the fore-wings, outside of the reniform stigma and inwards of the orbicular. The two stigmata are filled with darker colour than the ground colour. The dusting below the apex of the outer margin of the costal region of the forewings and of the wide inner margin of the hindwings, which is, as a rule, strongly red-brown is more grey-brown to pale yellow-grey.

To *l.c.*, add:

ab. *niger*, Gauckler, *Ent. Jahrb.*, XI, 195 (1902).

Orig. Descrip.—The ground colour of the forewings is a deep black-brown with dark violet sheen, with only the feebly indicated reniform stigma: no trace of the typical *comes* marking is present so that the forewings are almost unicolorous. More interesting and more remarkable is the colour of the hindwings. They are no longer yellow but

smoky-grey with feeble yellowish and cream. The black outer band appears a little darker; the lunular spot in the middle of the wing is hardly visible. Thorax and abdomen black-brown. The underside of all the wings is in agreement with the upperside also strongly darkened black-grey."

To pp. (133)-(137), *T. comes*, add:
ab. *undulata*, Hckry., *Lamb.*, XLV, 66 (1945).
ORIG. DESCRIP.—" On the hindwings the black marginal band is festooned on the inner side the whole length, a character modifying the appearance of the insect considerably." Borsu (Condroz), Belgium.

To *l.c.*, add:
ab. *albocostata*, Heydm., *Ent. Zt.*, LII, 23 (1938).
FIGURE—plt. I, fig. 12 (not clear costa).
ORIG. DESCRIP.—" I caught two similar specimens with a fair number of the markingless form *rufescens*, Tutt. As is well shown in the good figure with a narrow but clearly produced line of unbroken white colour; by chance ♂ and ♀." S.E. Holstein.

To *l.c.*, add:
ab. *immaculata*, Hckry., *Lmb.*, XLV, 66 (1945).
ORIG. DESCRIP.—" Total absence of the discoidal black spot of the hindwings." Borsu (Condroz), Belgium.

To *l.c.*, add:
ab. *fumata*, Ckyne., *Ent. Record*, LVIII, 76 (1946).
ORIG. DESCRIP.—The ground colour of the forewing is a deep blackish-brown with black markings; hindwing suffused with brown becoming yellower towards the base and inner margin.
Type: ♂, Wallasey, 1910; H. Massey.

To *l.c.*, add:
ab. *grisea-ochrea*, Hormuzaki, *Verh. z.-b. Ges. Wien.*, LXVI, 411 (1916).
ORIG. DESCRIP.—" Forewings very pale unicolorous clay-yellow with very pale bluish-white costa. Characteristic form for Bukowina."

To *l.c.*, add:
ab. *nigra*, Krausse, *Arch. f. Nat. Ges.*, **78**, A. Heft 7, p. 168 (1912).
ORIG. DESCRIP.—" Between Sargono and Atrara I caught specimens which are coloured as follows: front margin of the thorax with narrow pale band, the rest of the thorax and the forewings completely black. Only the two stigmata of the forewings are indicated by paler colour. Abdomen on the upper surface dark brown." Sardinia.

To *l.c.*, add:
*nigra*, Lempke = a synonym.
f. ♀ *cinerea*, Lempke, *Zeits. Wien. Ent. Gess.*, **28**, 11 (1943).
ORIG. DESCRIP.—" Forewings almost unicolorously pale grey without yellowish or bluish tint." [" This is *pronuba*, Tutt, not L. *pronuba*, L., is *distincta-caerulescens*, Tutt—Lempke."]

To p. (163), *N. c-nigrum*, add:

ssp. *kuriles*, Bryk., *Iris*, LVII, 38 (1942).

Orig. Descrip.—" More copper-brown than ssp. *degenerata*, Stdgr., about as the typical form, but at once to be distinguished from this by the interspace between the reniform stigma and the orbicular stigma, which is very strongly hooked, because it thereby touches the discus arm in front under a sharp hook. Hindwings more feebly marked at the apex." Kuriles.

To p. (165), *N. detrapezium*, add:

f. *atropurpurea*, Hormosak., *Verh. z.-b. Ges. Wien*, **66**, 411 (1916).

Orig. Descrip.—" The form with dark purplish-brown and therefore with very unicolorous forewings."

To *l.c.*, add:

f. *nigrescens*, Wehrli, *Mitt. Thurgar. Nat. Gessell.*, Heft XX, 247 (1913).

Orig. Descrip.—" With purplish black forewings and sharp markings."

To p. (175), *N. brunneata*, add:

ssp. *distinctissima*, Bryk., *Iris*, LVI, 38 (1942).

Orig. Descrip.—" Not so reddish as the typical form, hindwings more tinted with greyish. The oblique reniform stigma with outline not so pale, its distal circumscription not broken in but almost straight. Orbicular not rounded in front. Underside as in the typical form." Kuriles.

To p. (178), *N. rubi*, add:

ab. *grisea*, Hormuz., *Verh. z.-b. Ges. Wien.*, **66**, 412 (1916).

Orig. Descrip.—" Clearly pure dark ashy-grey (about the colour of *Mesogona oxalina*."

To *l.c.*, add:

ab. *ochrea*, Hormuz., *l.c.*

Orig. *Descrip.*—" Pale ochre-yellow (about as *Caradrina alsines*)."

To p. (182), *N. festiva*, add:

ab. *cingulata*, Ckyne., *Ent. Record*, LVIII, 76, pl. 1, fig. 4 (1946).

Orig. Descrip.—" Forewing—Ground colour pale yellowish-grey; a broad blackish band due to a thick sprinkling of black scales runs across the middle of the wing extending from the external border of the orbicular to the post-median line; the submarginal line is present, but faint."

Type: ♂, Woolmer Forest, Hants., 28.vi.1914; J. E. Eastwood.

To *l.c.*, add:

ab. *pallida*, Gauckler, *Ent. Jahrb.*, **10**, 154 (1901).

Orig. Descrip.—" In the Island of Sicily a large fine very pale local form of the var. *cohesa* is found. The forewings are broad and pale yellow-grey; the reniform stigma with blackish circumscription; at the lower end is filled with blackish. Between the nervures close to the outer margin of the forewings are rather strongly marked lunular dark spots. The row of points before the outer margin is distinct and sharp, invariable as a rule, is still a second submarginal line of points. These

points coalesce towards the inner margin in the shape of a band of dots. Hind wings grey. Thorax the colour of the forewings. Abdomen pale grey."

To. pp. (190)-(192), *N. xanthographa*, add:
ab. *pallidior*, Ckyne., *Ent. Rec.*, LVII, 73, pl. 1, fig. 3 (1946).
Orig. Descrip.—" Forewing very pale brownish-white with the usual markings faintly visible, hindwing whitish with the marginal shade just visible."
Type: ♂, North Shoebury, Essex, viii.1891; F. J. Hanbury.
Paratypes: 1 ♂, Shoeburyness, Essex, viii.1891; F. J. Hanbury. 1 ♂, Bruckley, Morley Coll., Tolson Memorial Museum, Huddersfield.

To pp. (196)-(198), *N. plecta*, add:
ssp. *urupplecta*, Bryk., *Iris.*, LV, 39 (1942).
Orig. Descrip.—" Paler, still less contrasting, the stigmata almost of the same colour as the ground colour. A ♂ underside with distinctly rounded line through the middle of the hindwings. A ♀ with white hindwings as the typical form. ♂ abdominal tuft as the form compared with." Kuriles.

To pp. (201)-(204), *P. piniperda*, add:
ab. *insulata*, Brundin, *Ent. Tidskr.*, XLVI, 36, fig. 1 (1925).
Orig. Descrip.—" En ♂, tagen vid Växjö 3/5 18, avviker därigenom att ringfläcken är inå atdrageni en spets samt förenad med njurflächen både framtill och baktill."

To *l.c.* add:
ab. *flavescens*, Lempke, *Tijd. v. Ent.*, 284 (1940).
Orig. Descrip.—" Ground colour of the forewings yellowish-brown, without red."

To *l.c.* add:
ab. *reducta*, Lempke, *Tijd. v. Ent.*, 285 (1940).
Orig. Descrip.—" The orbicular stigma absent."

To pp. (206)-(208), *T. munda*, add:
ab. *rufomaculata*, Lempke, *Tijd. v. Ent.*, 293 (1940).
Orig. Descrip.—" The dots on the submarginal line not black, but brownish or reddish."

To *l.c.*, add:
ab. *semiconfluens*, Lempke, *l.c.*

To pp. (204)-(206), *P. leucographa*, add:
ab. *rufomaculata*, Lempke, *Tijd. v. Ent.*, 293 (1940).
Orig. Descrip.—" The reddish-brown ground colour is replaced by a grey-brown colour." Oberdonau.

To *l.c.*, add:
ab. *cruda*, Foltin., *Zts. Oestr. Ent. Ver.*, XXIII, 126 (1938).
Orig. Descrip.—" With the transverse lines in the discal area standing out clear and dark as in the corresponding form of *stabilis*." Vöcklabruck, Austria.

To. pp. (210)-(211), *T. incerta*, add:
ab. *dentatolineata*, Lempke, *Tijd. v. Ent.*, 287 (1946).
ORIG. DESCRIP.—" Submarginal line sharply dentated with two clear Ws.

To *l.c.*, add:
ab. *confluens*, Lempke, *l.c.*

To *l.c.*, add:
ab. *semiconfluens*, Lempke, *l.c.*

To *l.c.*, add:
ab. *sinelinea*, Lempke, *Tijd. v. Ent.*, 287 (1900).
ORIG. DESCRIP.—" Submarginal line fails completely."

To *l.c.*, add:
ab. *juncta*, Foltin., *Zts. Oestr. Ent. Ver.*, XXIII, 126 (1938).
ORIG. DESCRIP.—" In which the orbicular and reniform stigmata are united." Vöcklabruck, Austria.

To *l.c.*, add:
ab. *flavilinea*, Lempke, *Tijd. v. Ent.*, 287 (1900).
ORIG. DESCRIP.—" Submarginal line clearly enlarged pale yellow, sharply contrasting."

To pp. (216)-(218), *T. opima*, add:
ab. *nigra*, Lempke, *Tijd. v. Ent.*, 291 (1940).
ORIG. DESCRIP.—" Forewings blackish, circumscription of the stigmata and of the submarginal pale."

To pp. (218)-(220), *T. gracilis*, add:
ab. *rufannulata*, Lempke, *Tijd. v. Ent.*, 290 (1940).
ORIG. DESCRIP.—" The circumscription of the stigmata and the submarginal line reddish."

To *l.c.*, add:
ab. *flavilinea*, Lempke, *Tijd. v. Ent.*, 290 (1940).
ORIG. DESCRIP.—" Submarginal line yellow, without dark inner edge."

To *l.c.*, add:
ab. *sinelinea*, Lempke, *Tijd. v. Ent.*, 290 (1940).
ORIG. DESCRIP.—" Submarginal line fails."

To *l.c.*, add:
ab. *juncta*, Lempke, *l.c.*

To pp. (225)-(227), *T. populeti*, add:
ab. *rufomaculata*, Lempke, Tijd. *v. Ent.*, 294 (1940).
ORIG. DESCRIP.—" The dots on the submarginal line not black but reddish or brownish."

To *l.c.*, add:
ab. *immaculata*, Lempke, *Tijd. v. Ent.*, 294 (1940).
ORIG. DESCRIP.—" The dots on the submarginal line fail completely, marking for the rest clear."

ab. *cruda*, Lempke, *Tijd. v. Ent.*, 295 (1940).

Orig. Descrip.—" Forewings with blackish sharply contrasting transverse lines."

To pp. (227)-(229), *T. gothica*, add:

ab. *separata*, Frémont, *Proc. Linn. Soc. Bordeaux*, **81**, 136 (1929).

Orig. Descrip.—" The characteristic black mark is divided into two parts."

To *l.c.*, add:

ssp. *yeterufica*, Bryk., *Iris*, LVI, 42 (1942).

Orig. Descrip.—" Much paler than the typical form, grey-yellow, the dark markings therefore showing out much more conspicuously. The other thin markings also more distinct especially the marginal band which run in umber-grey colour between the paler marginal line and the ground colour. The delicate internervular spots in the marginal line quite visible. The connecting line between the black cell markings on the hindmost extension of the disc is much more feeble or even absent. Transverse line before the reniform stigma showing delicately, but is darker in colour. Hindwings paler, with bowel central line, which is xanthic dark and feebly marked. Antennae paler, more ochre-yellow-grey, like thorax and abdomen. Underside paler, the transverse line and the disco-cellular spot on both wings much more strikingly contrasting. As of the three examples two ♂s show cell-markings and stripe-spot dark like typical *M. gothica*, choose this form as type of my new subspecies. The third specimen which is in first-class condition shows the *gothicina*-character; it is rather reddish, the spots more cherry-wood-red-grey, the stripe-spot in the middle of the wing, shorter than in the typical form; the Kurile-form connection between the two cell-spots interrupted." Kuriles, 3 ♂s.

To *l.c.*, add:

ab. *conjuncta*, Lempke, *Tijd. v. Ent.*, 296 (1940).

Orig. Descrip.—" The dark streak on the outer line unites this line with the inner one. So the claviform stigma fails.

To *l.c.*, add:

ab. *extricata*, Lempke, *Tijd. v. Ent.*, 296 (1940).

Orig. Descrip.—" The dark streak on the outer line fails completely."

To *l.c.*, add:

ab. *cruda*, Lempke, *Tijd. v. Ent.*, 294 (1940).

Orig. Descrip.—" The inner and outer lines black, sharply contrasted."

To *l.c.*, add:

ab. *clausa*, Lempke, *l.c.*

To pp. (247)-(249), *O. lota*, add:

ab. *bipuncta*, Wehrli, *l.c.*, 255.

Orig. Descrip.—" With a second black-brown spot which lies on the basal line, between the two maculae. The border unites the maculae."

To pp. (237)-(239), *T. cruda*, add:
ab. *nictitans*, Lempke, *Tijd. v. Ent.*, 292 (1940).
ORIG. DESCRIP.—" Orbicular and reniform stigmata filled with dark; with sharp pale circumscription."

To *l.c.*, add:
ab. *obsolescens*, Lempke, *Tijd. v. Ent.*, 292 (1940).
ORIG. DESCRIP.—" Markings very indistinct, hardly visible."

To *l.c.*, add:
ab. *nudilinea*, Lempke, *Tijd. v. Ent.*, 346 (1941).
ORIG. DESCRIP.—" The yellow subterminal line without the red internal edging."

To pp. (249)-(250), *O. macilenta*, add:
ab. *rufa*, Hofmayer, *Ent. Zt.*, L., 359 (1936).
ORIG. DESCRIP.—" In this form the ground colour completely covers up the brownish median and marginal lines, while the yellow line following the marginal band stands out strongly." This form seems to be suitably named as ab. *rufa*.

To pp. (251)-(252), *A. helvola*, add:
ab. *nictitans*, Lempke, *Tijd. v. Ent.*, 338-9 (1941).
ORIG. DESCRIP.—" Orbicular and reniform stigmata with very distinct pale circumscription, so that they sharply contrast."

To *l.c.*, add:
ab. *semiconfluens*, Lempke, *l.c.*

To pp. (254)-(255), *A. lychnidis*, add:
ab. *nigrorubida*, Lempke, *Tijd. v. Ent.*, 343 (1941).
ORIG. DESCRIP.—" Ground colour of the forewings dark red, dusted with black, nervures and transverse lines red."
Hamps., *Lep. Phal.*, p. 218, has a very poor b. and w. figure; he gives *autumnalis*, Curt., as a synonym.

To. pp. (259)-(260), *A. lunosa*, add:
ab. *intensa*, H. Turner, *Ent. Rec.*, L, 22 (1938).
ORIG. DESCRIP.—" A very dark, almost blackish, red-brown f.-w. without the light outer marginal band, with stigmata black, but almost obsolescent on account of the dark ground colour, and without conspicuous veining as in *agrotoides*, and the h.-w. evenly dark blackish suffused." Chelston, Devon; bred.

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NOTE.—It is apparent to me that of many species the concept of the typical form on the continent is different from that recognized in Britain. Among the species thus referred to are *strigilis*, *versicolor*, *furuncula*, *fasciuncula*, *latruncula*, *nictitans*, *lucens*, *clavipalpis*, etc.

## THE BRITISH NOCTUAE AND THEIR VARIETIES (J. W. TUTT).

### SUPPLEMENTARY NOTES. IV.

By Hy. J. Turner, F.R.E.S., F.R.H.S.

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Class Noctuae Linn.

*Agrophila*, Bdv. (=*Emmelia*, Hb.) *trabealis*, Scop.

*Agrophila*, Bdv. (1840), Dup., H.-S., Tutt, Barr. [*Pyralis*, L. (1767)]: *Emmelia*, Hb. (1822), Meyr., Meyr., Sth., Stdgr., Warr.-Stz., Drdt., Stz., etc.: *Erastria*, Treit. (1826), Steph., Hamp., Culot: *Acontia*, Treit. (1826), Gn.

Tutt, *Brit. Noctuae*, IV, 1 (1892): Meyr., *Handb.* (1895): Barr., *Lep. Br. Is.*, VI, 188, plt. 248, 1 (1800): Stgr., *Cat.*, Ed.III, 153 (1901): Splr., *Schmett. Eur.*, I, 296, plt. 51, 40 (1901): South, *M.B.I.*, II, 62, plt. 21, 12 (1908): Hamps., *Phal. Noct.*, X, 660, fig. 150 (1910): Warr.-Stz., *Pal. Noct.*, III, 283, plt. 52g (1912): Culot, *N. et G.*, I (2), 111, plt. 69, 13-16 (1913): Drdt.-Stz., *Pal. Noct. Supp.*, III, 209 (193 ).

Scopoli, *Ent. Carniolica*, p. 240 (1763), was the first to describe this insect under the name *Phalaena trabealis*.

Hufn., *Berlin Mag.*, III, p. 493, No. 98 (1766), described the same species under the name *arabica*, and Rottemberg, *Naturforscher*, Vol. IX, p. 139 (1776), commented on the life-history.

Linn., *Syst. Nat.*, Ed.XII, 88 (1767), also described this species but called it *Pyralis sulphuralis*.

Schiff., *Verz.*, p. 93, *Noct.*, Z. 6 (1775), does not describe it, but indicates it under the name *sulphurea*, the larva feeding on *Convolvulus arvensis*. In a note he said it was the *Pyralis sulphuralis*, L.

Illiger, *Verz.*, Ed.II, pt. 1, p. 351 (1801), treated it under the name *sulphurea*, Esp., but cited *sulphuralis*, L., *lugubris*, Fab., *sulphurea*, Esp.

Fab., *Genera Insectorum*, 279 (1775) ? (1777), described this species under *Bombyx sulphurea*.

"Alis deflexis flavissimis: strigis duabus obliquis obscurioribus. Corpus totum flavissimum. Alae anticae indem. flavae strigis duabus, quarum anterior a medis marginis crassioris versus basin marginis tenuioris-posterior nonemedium marginis crassioris ad angulum ani ducitor. Alae posticae immaculatae.

Esper, *Abbild. Noct.*, IV, 576, plt. 164, f. 6 (1789+?), gave a good fig. under the name *sulphurea*.

Bork., in *Scriba Mag.*, II, 153, plt. 10, f. 8 (1792), gave a very good description and fig. of this species under the name *trabeata*, as a Noctuid, altering Scopoli's name *trabealis*, which had a Pyralid ending. He cited 9 authors. In his *Naturg. Noct.*, IV, 806 (1792), he described the species under the name *sulphuralis*, L., and cited *sulphuralis*, L., and *trabealis*, de Vill.; *lugubris*, Fb.; *sulphurea*, Schiff. All these are undoubtedly synonyms of *trabealis*, Scop. He treated *arabica*, Hufn., as a different species.

Ernst & Engr., *Pap. d'Eur.*, VIII, 140, fig. 598a, b, c, d, e (1793), gave five good figures. a, the usual form met with; b, an underside with practically all the sulphur ground around the forewings and the darker black markings heaped together in the centre of the wing; c, all the black lines thickened and dots amalgamated with them; d, appears as if the ground is black with the sulphur showing through in small spots and lines; e, another " black ground " form with some of the usual yellow ground showing through more normal in position and shape. They cite Linné, *Sys. Nat.*, ed.XII, for *sulphuralis*; Hufn., *Berlin Mag.*, III, for *arabica*; Fab., *Sps. Ins.*, II, for *Bombyx lugubris*; Lang., *Cat.*, for *sulphurea*; Scop., *Fn. Cam.*, for *trabealis*; and most of the previous authors (22).

Hb., *Saml.*, 291 (1880-3), gave an excellent figure under the name *sulphuralis*.

Steph., *Ill. Noct.*, III, 117 (1830), described it as " a beautiful species (Battersea and Kent) named *sulphurea*."

Treit., *Schm. Eur. Noct.*, V (3), 251 (1826), described this species under the name *sulphurea* and cited 22 earlier authors. Some of these had placed it in the Bombyces, some in the Pyrales, and others in the Noctuidae. Hb. placed the larva in the Semigeometrid section in his *Saml. Larvae*.

Dup., *Hist Nat.*, VII, 376, plt. 123, 3 (1827), gave an excellent figure under the name *sulphurea*. He cited *arabica*, Hufn.; *sulphuralis*, L.; *trabealis*, Scop.; *lugubris*, Fab.; *sulphurea*, Tr.

Freyer, *Neu. Beitr.*, V, fig. 552 (18 ), gave a good figure of *sulphuralis*.

H.-S., *Sys. Bearb.*, II, 427 (1851), described it as *sulphurea*, Schiff., with no figure. He cited *arabica*, Bork.; *Bombyx lugubris*, F.; *Pyralis sulphuralis*, L.; *Pyralis trabealis*, Vill.

Gn., *Hist. Nat.*, VI, 206 (1852), described it as *sulphuralis* and also as var. a., the suffused form, black with some yellow spots, figured by Engram, 598e. He cited *lugubris*, Fb.; *trabealis*, Scop.; *trabeata*, Scriba (Bork.); *arabica*, Hufn., etc. He also, in *l.c.*, p. 220, described under the name *viridisquama* a species which has since been associated by authors with *trabealis*, Scop.

Meyr., *Handb.*, 167 (1895), described *trabealis*, Scop. (*sulphuralis*, L.) and genus *Emmelia* among the *Plusiidae*. In the *Rev. Handb.* (1928) he used the same generic name.

Stdgr., *Cat.*, 133 (1901), listed *trabealis*, Scop., genus *Emmelia*, Hb. He listed ab. *nigra*, Ersch.; ab. *algira*, Obthr. (al. ant. multo minus nigro-signatis); ab. *flavonitens*, Aust. (al. ant. fore totis flavescentibus, al. post. pallioribus, subt. unicolor stramineis). He treats *sulphuralis* and *sulphurea* as Synonyms.

Hamps., *Phal. Noct.*, X, 660, fig. 180 (1910), described *trabealis*, Scop., with a good b. and w. fig. The only aberration he recognized was ab. *nigra*, *Ersch.* " Forewing almost entirely or wholly fuscous black." He cited the usual names as synonyms including *pardalius*, Walker, *Cat.*, XXVIII, 794 (1865). Hamps. treated *deleta*, Stdgr., with ab. *flavonitens*, and his own *fasciata* with ab. from India, as separate species.

Splr., *Schm. Eur.*, I, 296, plt. 51, fig. (1906), gave a very good figure and described it under the name *trabealis*, Scop. He included abs. *nigra*, *algira* and *flavonitens*.

South, *M.B.I.*, II, 62, plt. 21, 12 (1908), gave an excellent figure of *trabealis*, Scop.

Warr.-Stz., *Pal. Noct.*, III, 283, plt. 52g (1912), gave four good figures: ♂ ♀ showing slight variation, ab. *nigra*, and a new ab. *confluens*, were figured. The latter was not described. *Sulphuralis*, *arabica*, *sulphurea*, *trabeata*, *lugubris* and *pardalina* were all quoted as synonyms. In addition they gave six other figures representing forms which they have treated as species: (I) *viridisquama*, Gn., 52h, with its ab. *obscura*, Warr.-Stz. (II) *deleta*, Stdgr., 52g, with its forms ab. *algira*, Obrth., 52h, and ab. *flavonitens*, Aust., 52g. (III) *fasciata*, Hamps., 52h, with its ab. *deflavata*, Warr.-Stz. Examination of the figures give one very strong evidence that the view is correct to consider the whole group as a single species with "satellite species" in the making. This view is strongly supported by the facts brought out by Culot (*Noct. et Geom.*, I (5)).

Culot, *Noct. et G.*, I (2), 161, plt. 60, figs. 13, 14, 15, 16 (1913), under the name *Emmelia trabealis*, Scop., described this species and referred to Stdgr.'s *Cat.*, where *algira* and *flavonitens* were both dealt with as forms of *trabealis*. The forms described by Oberthur in *Etude*, III, 45, V., p. 89, plt. 3, fig. 5, had been segregated as a true species *deleta* by Warren in Seitz, but Culot would not enter into a question of classification; with his inimitable skill Culot figured three of the original types of *algira* in the Oberthur collections, for the consideration of others.

Drdt.-Stz., *Pal. Noct. Sup.*, III, 209 (1935), accepted *pro tem.* the separate species views of Warren, but acted with great hesitation. He registers more aberrations: ab. *confluens*, Strd., is described; with ab. *crassistriga*, Strd.; ab. *sheljuzhkoi*, Stdr.; and *unculata*, Dnhl. To *delcta*, "probably a form of *trabealis*," they added the *paralella*, Roth, and the *olivina*, Roth. To *viridisquama*, Gn., they added *obscurior*, Warr.

Of the Variation Barrett said:

Variable in the shade of colour of the forewings, from bright to extremely pale yellow; and in the size of the marginal black dots, those near the hind-margin being occasionally almost obliterated. Mr Herbert Goss has one in which they are almost totally so. On the other hand, in some specimens the black stripes are broadened and joined by cross black bars, or their margins clouded considerably darkening the surface.

NOTE.—In *trabealis* we have a species which occurs over practically the whole of the Palaearctic Region. Europe North and South, Algeria, N. Africa to Biskra, Asia Minor, Turkistan, Mauritius, Afghanistan, Baluchistan, Central Asia, Amur, Japan, China, and in many areas it is common. Its natural surroundings must be very variable, and numerous variant forms have sprung up, and apparently grouped themselves into races or even subspecies. In fact we can actually see "species in the making," and authors have gone so far as to classify several of them as true species. We find Seitz's records *viridisquama*, Gn., *deleta*, Stdgr., and *fasciata*, Hamp., as species, and Walk. considered *lugubris*, Fb., another, making five in all, with the typical *trabealis*, L., *trabe-*

*alis* make five species or subspecies. Each of these five have recorded aberrations on their behalf. This is the order we shall deal with, this " combine " species *E. trabealis*.

The Names, Forms and Groups to be considered:

I. *trabealis*, Scop., ssp. *trabealis*, Scop., *Ent. Cam.*, 240 (1762).
ab. *nigra*, Ersch. (1874), *Fedtsch.*, 52, plt. 3, 50.
ab. *crassistriga*, Strnd. (1924), *Ent.* Anzr., IV, 110.
ab. *confluens*, Strnd. (1924), *l.c.*
ab. *sheljuzhkovi*, Strnd. (1924), *l.c.*
ab. *nigricostata*, Strnd. (1924), *l.c.*
ab. *unculata*, Strnd. (1924), *l.c.*

II. *trabealis*, Scop., ssp. *viridisquama*, Gn. (1852), *Hist. Nat.*, VI (2), 220.
ab. *obscurior*, Warr.-Stz. (1912), *Pal. Noct.*, III, 283.

III. *trabealis*, Scop., ssp. *deleta*, Stdgr. (1871).
ab. *algira*, Obthr. (1881), *Etudes*, VI, plt. 2, 2.
ab. *flavonitens*, Aust. (1880), *Nat.*, 156.
ab. *parallela*, Roth (1920), *Nov. Zool.*, XXVII.
ab. *olivina*, Roth (1920), *l.c.*

IV. *trabealis*, Scop., ssp. *fasciata*, Hamps. (1894), *Moths of India*, II, 315.
ab. *deflavata*, Hamps. (1895) (Warr.-Stz., *l.c.*).

V. Two, probably Synonyms of *trabealis*.
f. *lugubris*, Fab. (1777-6), *Gen. Ins.*, 280.
f. *pardalina*, Walk. (1865), *Cat.*, XXXIII, 794.

I. Subspecies *trabealis*, L., *trabealis*.

ab. *nigra*, Ersch., *Fedtsch.* (1874), LV.
FIG.—Plt. III, 50.
DESCRIP.—Warr.-Stz., *Pal. Noct.*, III, 284, Plt. 52g (1913), " is almost wholly black." W. Turkestan.

f. *crassistriga*, Strand, *Ent. Anz.*, IV, 110 (1924).
DESCRIP.—Drdt.-Stz., *Pal. Noct. Supp.*, III, 209 (1935), " The yellow streak between the two black longitudinal streaks is filled with black."

f. *nigricostata*, Strand, *Ent. Anz.*, IV, 110 (1924).
DESCRIP.—Drdt.-Stz., *Pal. Noct. Supp.*, III, 209 (1935), " Has a wide black costa."

ab. *confluens*, Strand, *Ent. Anz.*, IV, 110 (1924).
FIG.—*l.c.*, 52g.
DESCRIP.—Drdt.-Stz., *Pal. Noct. Supp.*, III, 209 (1933), " Has confluent yellow spots."

race *sheljuzhkovi*, Strand, *Ent. Anz.*, IV, 110 (1924).
DESCRIP.—Drdt.-Stz., *Pal. Noct. Supp.*, III, 209 (1935), " The dark markings are not black but grey-brown, all very delicate and narrow, the yellow a glossy straw-yellow. Hindwings as pale as in *flavonitens*. Aust."

ab. *unculata*, Dnnhl., *Ent. Zt.*, XL, 15 (1826).

Orig. Descrip.—" The Form which well illustrates a transition to the Turkestan ab. *nigra*, Ersch. I named *unculata*. (The remaining yellow of the ground colour shows mostly as small hooks=*uncula*.) ♂♂ and ♀♀ from Terlan and Sigmundskron, S. Tyrol.

II. Subspecies *trabealis*, ab. *viridisquama*, Gn.

ab. *viridisquama*, Gn., *Hist. Nat.*, VI (2), p. 220 (1852).

Orig. Descrip.—" Forewings brown-black with basal and median areas covered with long hairs and spaces of a clear green; the basal a little more yellowish but without distinct lines, which one sees only at their origin, and which form the three white spots on the costa. The reniform is indistinct, a little paler with a black mark in the centre. The subterminal line is indistinct composed of the same green scales. Fringes concolorous, with two large blotches of a whitish-green, before which one sees the green scales on the terminal border. Hindwings are rounded, of a uniform black, with fringes greenish-white; the upper surface having the fore half white with a central lunule, a line and a black border, the outer half black with a white spot between the 4th lower and the sub-median." Two specimens from Madrid. He did not connect it with *trabealis*, Scop.

ab. *obscurior*, Warr.-Stz., *Pal. Noct.*, III, 283 (1912).

Fig.—*l.c.*, plt. 52h. *l.c. Supp.*, III, plt. 230.

Orig. Descrip.—" A dark form of *viridisquama* in which the greenish scales are reduced to a few long yellow ones towards the base of wing."

III. Subspecies *trabealis*, ab. *deleta*, Stdgr.

ssp. (ab.) *deleta*, Stdgr., *Stett. e. Ztg.* (1871), 190.

Fig.—Warr.-Stz., *Pal. Noct.*, III, plt. 529 (1913).

Descrip.—" Forewings olive-ochreous; the markings faint interrupted brownish; lines represented by costal spots; orbicular and reniform stigmata small and round; more or less developed horizontal streaks from base below cell and above inner margin; hindwings ochreous with slight brown suffusion." Biskra, Algeria.

Roth, *Novit. Zool.*, XXVII, 74 (1920), " The black is reduced to one mark only."

ssp. (ab.) *algira*, Obthr., *Etudes*, VI, 90 (1881) [*Nov. Zool.*, XXVIII (1921)].

Fig.—*l.c.*, plt. II, 2.

Descrip.—Warr.-Stz., *Pal. Noct.*, III, 285, plt. 52h, " The dark markings are black and conspicuous, especially the outer line."

Roth reported it, " The black markings (of *deleta*) are reduced."

ab. *flavonitens*, Aust., *Nat.*, 156 (1880) [*Nov. Zool.*, XXVIII (1921)].

Descrip.—Warr.-Stz., *Pal. Noct.*, III, 285, plt. 52g = " on the other hand in this form the markings tend to become obsolete."

Roth reported it, " There is no black on the forewings."

ab. *parallela*, Roth, *Nov. Zool.*, XXVII, 74 (1920).

Orig. Descrip.—" The black practically the same as in Europe." Drdt.-Stz., *Pal. Noct. Supp.*, III, 209 = " extraordinarily like the European type of *trabealis*."

ab. *olivina*, Roth, *l.c.*

ORIG. DESCRIP.—" Stramineous olive markings replacing the black." Drdt.-Stz., *l.c.* = " in which the black is replaced by olive."

IV. Subspecies *trabealis*, (ab.) *fasciata*, Hamp.

ab. *fasciata*, Hamp., *Moths of India*, II, p. 315 (1894).

FIG.—plt. 168, 27.

ORIG. DESCRIP.—" Forewing dark reddish-brown; the costal area sulphur-yellow, sending a spur to beyond the lower angle of the cell; a sulphur fascia below the median nervure from base to beyond middle; a sulphur band on outer margin. Hindwing reddish-brown." ♀ dark ochreous-brown, forewing with slight grey suffusion; grey streaks at the two angles of the cell and a grey line on outer margin." India.

ab. *deflavata*, (Hamps.), Warr.-Stz., *l.c.* (1893).

ORIG. DESCRIP.—" Thorax and forewings without any yellow."

V. Two Probable Synonyms.

Fab., *Genera Insectorum*, 280 (1777 ? 1776), described this species under *Bombyx lugubris*.

" Alis deflexis flavis rivulis punctisque atris. Posticis fuscis. Alae anticae deflexae, flavescentes lineis duabus latis apicem haud attingentribus ad marginem tenuiorem, in medio puncta duo et ad marginem crassiorem tria, versus apicem dentique strigae duae al punctis concatens atris. Posticae fuscae marginae tenuissime albo. Subtus omnes variegatae."

race *pardalina*, Walk., *Cat.*, XXXIII, 794 (1865).

Whitish cinereous. Head with a brown band in front of the antennae. Palpi porrect slender, extending very little beyond the head: third joint conical, not more than one-fourth the length of the second. Thorax with a brown band on the fore-tegulae. Abdomen extending a little beyond the hindwings. Forewings with two brown stripes, extending from the base to an oblique brown band which is at two-thirds of the length; five brown spots in the space between the first stripe and the costa, one of these spots emitting a streak across the first stripe to the second, which is on the interior border; a submarginal band composed of four brown spots, which are more or less incompletely connected; fringe brown. Hindwings aeneous cinereous. Mauritius.

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*Acontia*, Tr., *luctuosa*, Esp.

*Acontia*, Treit. (1826), H.-S.; Tutt; Barr.; Stdgr.; Sth.; Warr.-Stz.; Culot: *Eustrotia*, Hb. (1821), Meyr.; Meyr.: *Tarache*, Hb. (1822). South, Warr.-Stz.: *Dysthymia*, Newm.

Hufn., *Berlin Mag.*, III, 30, No. 54 (1766), under the name *lucida* described an insect so indefinitely that it took in what was subsequently described under the name *luctuosa* by Esper (1786) when he adopted Schiff.'s name from the indication in the *Verz.*, W. 7 (1775) Rottemberg, *Naturfr.*, IX, 122 (1771) in his revision of Hufn.'s work called it a variety of *lucida*. Esper and others figured the "variety" as a species under the name *luctuosa*. Hamps. ignored this as a species and only dealt with *lucida* [*Phal. Noct.*, X., 786 (1910)].

De Geer, *Mem.*, II (1771-83), described a Noctuid from Italy more or less inadequately for identification, which he called " l'Italienne."

Several authors of later date gave it the name *italica*, which, of course, is invalid. In *Sp. Insect*, II, 218 (1781), Fab. called it *italica*; in the *Mant.*, II., he corrected this to *luctuosa*, p. 144 (1787).

Esper, *Abbild. Noctuae*, IV, p. 71, plt. 88, figs. 4, 5 (1786), gave recognizable figures. 4 a quite typical ♂ form both upper and underside. 5, a ♀ form in which the white characters of the hindwing are extended into a complete band. The ground colour of the wings is somewhat more grey than usual. Esper used the name *luctuosa* given to a larva which fed on *Plantago major* by Schiff. in his *Verz.* (1775) without any description.

Fuess., *Ins. Schweiz.*, 39 (1775), listed, under the name *leucomelas*, a Noctuid figured by Schaeff., *Icones*, I (2), plt. LI, 11-12 (1766), but no description. It was named *italica* by Panzer in 1804, *Sys. Nomen. Icones Ratisbon.*

Ernst & Engram., *Pap. d'Eur.*, VIII, 55, fig. 558 (1792), gave six figures (on 2 plts.), a, b, c, d, e, f; typical form *a*; underside *b*, with white patches near base of forewings; *c*, with square blotch on costa forewing ochreous: *d*, underside is ochreous at the base of the forewing; *e*, *f*, upper and underside of a specimen of a clear grey.

Hb., *Samml. Noct.*, 305-6 (1802), gave two good figures, the first quite typical, the other one with the forewing blotch ochreous and the hindwing band broken up into spots.

Dup., *Hist. Nat.*, VII, 350, plt. 121, figs. 3, 4 (1827), gave two illustrations, ♂ and ♀., both quite good. The ♂ was typical, rather dark with slight grey infusion and with light marginal shade; 4, the ♀, was very similar with wider submarginal scribbling. In his synonomy he included *astroites*, de Vill., and *leucomelas*, Fuessly.

Newman, *British Moths*, 443 (1869), dealt with this species at length and gave three figures, one typical, another with the forewing white square reduced to hardly more than a lunule, and the third figure in which this was reduced to a mere dot with the band on the hindwing much reduced. He called attention to the caterpillar having only six claspers and that this species could not be *Acontia*, and he proposed a new genus name for it, *Dysthymia*. Guenée had previously called attention to this fact, but did not think such action was desirable.

Freyer, *Beitr.*, IV, 99, plt. 346 (1842), gave a dark figure with typical marking.

Tutt, *Brit. Noct.*, IV, 2 (1892), referred to the white spot as being occasionally ochreous and named it *ochracea*. He quoted Gn., *Noct.*, VI, the remarks on the extreme variability from an irregular band to a complete band, or a succession of spots. He reported an example with the forewing character as reduced almost to a lunule figured by Newman.

Barrett did not comment on any variation.

Spuler, *Schmett. Europas*, I, 286, plt. LI, 14 (1907), gave a typical figure somewhat darker than usual.

South, *M.B.I.*, II, 54, plt. 19, fig. 10 (1908), gave a good typical form, under the genus *Acontia* (=*Tarache*).

Warr.-Stz., *Pal. Noct.*, III, 286, plt. 52k (1913), gave two figures, one typical and the other of ob. *angustifascia*, n. ab. The only other form he mentions is ab. *ochracea*, Tutt.

Culot, *N. et G.*, II, p. 144, plt. 66, f. 2 (1915), gave an excellent figure of a typical form. He stated that variation lay more or less in

the size of the pale band on the hindwing; in the clear blotch of the forewing which varied from white to rose-flesh colour; and from the tone of the brown which varied from the very clear depth of the typical form becoming clear reddish-brown in ab. *rosamans*, Obthr., beyond this there is very slight variation, and the species is easy of identification.

The Names and Species to be considered:—
*leucomelas*, Fuess. (1765), *Ins.* Schwerz., 58. Syn.
*italica*, Fab. (1781), *Sp. Insect.*, II, 218. Syn.
*luctuosa*, Esp., *Abbild. Noct.* (1786), IV, 71, plt. 88, 4-5.
*astroites*, de Vill. (1789), *Ent. Lim.*, II, 263. Syn.
ab. *ochracea*, Tutt (1892), *Brit. Noct.*, IV, 2.
*lineosa*, Splr. (1907), *Schm. Eur.*, I, 286.
*obscurosa*, Splr., *l.c.*
*angustifasciata*, Warr-Stz., *Pal. Noct.* (1913), III, 286.
*rosamans*, Obthr. (Culot) (1915), *N. et G.*, II, 144.
*latefascia*, Schaw. (1928), *Ent. Rund.*, LV, 554.

Tutt, *British Noct.*, IV, 2 (1892), dealt with (1) the typical form as figured by Esper and others, and (2) the form with the ochraceous square spot on the forewing he named *ochracea*.

*ab. lineosa* and ab. *obscurosa* were suggested by Spuler, *Schmett. Eur.*, I, 286 (1907), of which the following is a translation:—

"The light spot towards the edge of the obscure reniform white or reddish-whitish-yellow; the small white spots on the costal margin above it of varying breadth; the white band on the hindwings attached by a tooth projecting from the base, rarely broken. The dark fringe-band of varying breadth, often with a row of whitish antemarginal spots, bordered usually on the inside by a deep black thin line bordered by yellow; the whitish spot of the forewings and the white hindwing band may be very greatly reduced; if the forms are to be named, then the first is ab. *lineosa* (the many lined), the latter ab. *obscurosa* (the darkened)."

ab. *angustifascia*, Warr.-Stz., *Pal. Noct.*, III, 286 (1913).
FIGURE.—*l.c.*, plt. 52k.
ORIG. DESCRIP.—"Hindwing with a white median band of varying width; this band is greatly restricted and sometimes interrupts."

ab. *rosamans*, Obthr. (Culot), *N. et G.*, I (2), 144, recorded.
ORIG. DESCRIP.—"The square spot of the forewing being of a pale reddish-brown is ab. *rosamans*."

ab. *latefascia*, Schaw., *Ent. Rund.*, LV, 554 (1938).
ORIG. DESCRIP.—"The white middle band of the hindwing occupies more than a half of the wing. The black at the base by its diminution reduces the outer margin." Sardinia. Only two specimens were taken so there is not sufficient evidence to denote a geographical race or subspecies.

ab. *pallidior*, Stbrgnl., *Zt. Wien. Ent. Gesell.*, XXIX, 153 (1944).
ORIG. DESCRIP.—"In a male of this very common species the whole yellowish forewing is a light yellow-brown; and the wide border area of the hindwing is lighter." S. Dalmatia.

# SPECIAL INDEX.

## VOL. LIX., 1947.

## The Entomologist's Record and Journal of Variation.

The names in this Index are placed alphabetically under specific names.

The terms " var." and " ab." are used in Staudinger's sense, " f." (forma) indicating a form of which the exact status seems doubtful.

* indicates a new name.

** indicates an addition to the British List under an old name.

## HEMIPTERA.



## HYMENOPTERA.

## LEPIDOPTERA.

## ODONATA.



## ORTHOPTERA.



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## ERRATA (VOL. LIX).

p. 22, line 11 from bottom: for *cuculatella* read *cucullatella*.
p. 25, line 1: for *colutois* read *Colutois*.
p. 25, line 4: for *caeruleocephala* read *coeruleocephala*.
p. 35, line 2: for Kutala read Kuala.
p. 35, line 15: for *isabelae* read *isabellae*.
p. 69, par. 2, line 5: for Vol. read Vaughan.
p. 87, line 20 from bottom: for *plebia* read *plebeia*.
p. 87, line 15 from bottom: for *aevigata* read *laevigata*.
p. 114, line 2, and line 13 from bottom: for *Catocola* read *Catocala*.
p. 114, line 19: for *Momophila* read *Nomophila*.
p. 120 and Index: for E. C. H. Blathwayt read C. S. H. Blathwayt.
p. 132. *Coenonympha pamphilus*: for " Not common " read " Not uncommon."

## VOL. LII (1940).

p. 25: for " Foreleg: trochanter " read " Foreleg: cuoxa."