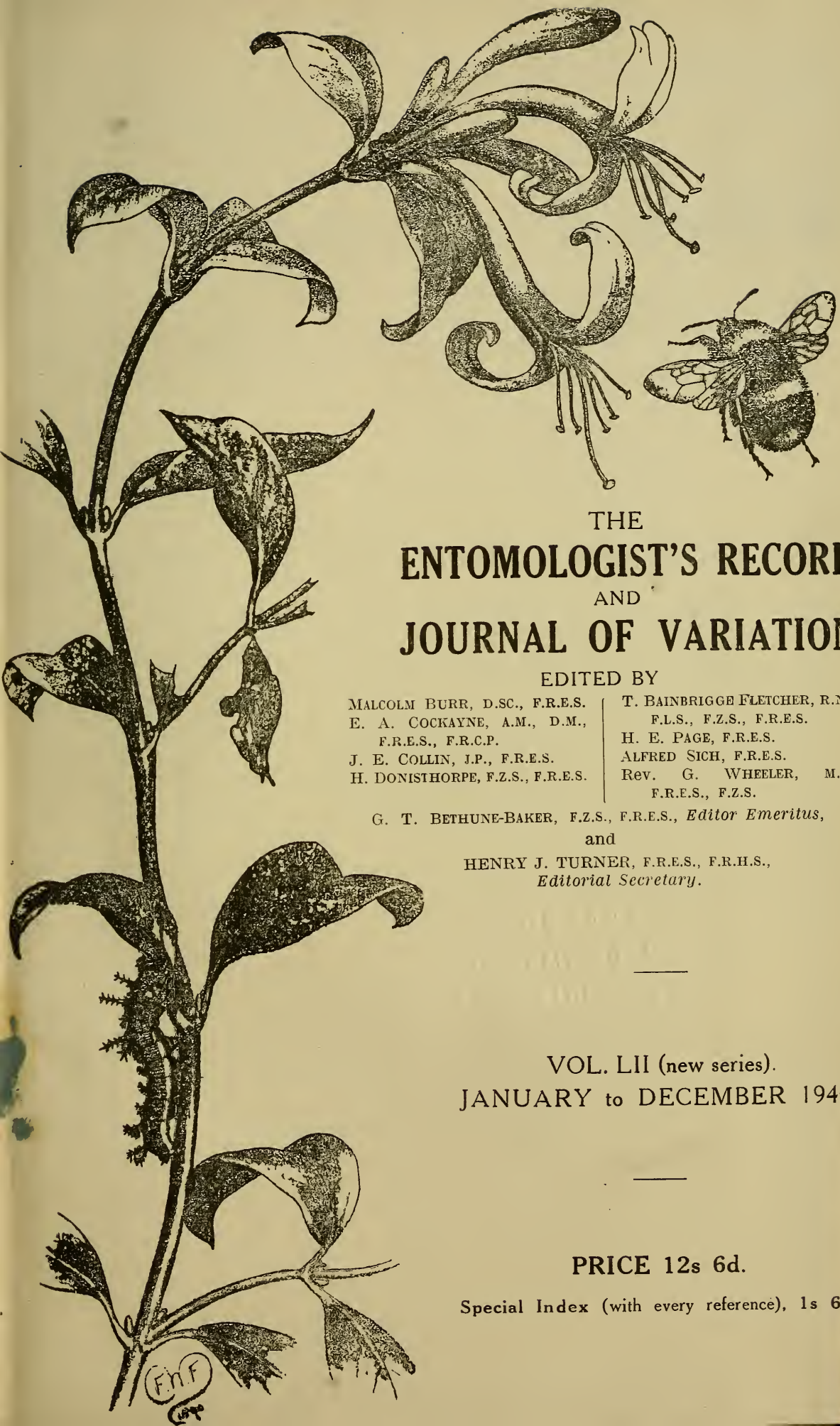


THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

EDITED BY

VOL. LII (new series).
JANUARY to DECEMBER 1940.

PRICE 12s 6d.

Special Index (with every reference), **1s 6d**

Subscriptions for Vol. 52 (1940) are now due.

Vol. LII.

No. 1

JANUARY 1940.

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

CONTENTS.

Subscription for Complete Volume, post free
TEN SHILLINGS,
to *The Hon. Treasurer*, H. W. ANDREWS, F.R.E.S.,
6 Footscray Road, Eltham, S.E.9.

This number, Price TWO SHILLINGS (net).

The Entomologist's Record

AND

13,820 Journal of Variation.

VOL. LII. JANUARY 15, 1940. No. 1

LEPIDOPTERA AT NEVACHE, HAUTES-ALPES, FROM JULY 28-SEPTEMBER 4, 1938.

By Wm. Fassnidge, M.A., F.R.E.S.

In the *Entomologist's Record*, Vol. 36, pp. 55 et seq., 1924, will be found an account of my first entomological visit to the French Alps, and indeed my first visit to a high alpine locality. The present short article is intended to add to, or correct, those early notes and impressions, which have also been added to by a well-known French entomologist in an article entitled "Seconde étude sur Névache (Hautes-Alpes)" by G. Praviel in *L'Amateur de Papillons*, Vol. VI, pp. 222 et seq. (1933). It should be stated at the outset that according to all reports 1938 was a very bad season for Lepidoptera both in England and France, where abnormal weather caused unusual scarcity and closed the season much earlier than usual. Fresh snow lay on the higher mountains at the end of August and a heavy fall was reported in the village itself in mid-September. Cold rain and wind ended all insect activity on the high pastures by the third week in August, while in the valley at 5000 feet the nights were too cold for lamping, and by day, even when the sun shone, comparatively few insects were to be seen. The difference between this season's scarcity and the wonderful abundance of 1923 was very marked, especially among the butterflies, but there was enough work to be done among the Micros, so that we were kept fully occupied and brought home nearly 1600 set insects.

One of the best hunting grounds in the neighbourhood is the Col des Thures (7000 feet), which is now a national park and nature reserve, where chamois may frequently be seen. Here during the first fortnight in August insects were really abundant, among them *Heodes virgaureae*, L., *H. chryseis*, Berg., var. *eurybia*, Ochs., *Erebia mnestra*, Hb., *Melitaea varia*, Meyer-Durr, *Psodos quadrifasciaria*, Sulz., *Omia cymbalariae*, Hb., *Plusia hochenwarthi*, Hoch., *Pyrausta aerealis*, Hb., *P. uliginosalis*, Steph., *P. alpinalis*, Schiff., *Titanio schrankiana*, Hoch., *T. phrygialis*, Hb. Beside the steep track leading up the gorge to the Col, in the shade of huge pines, were found mines of a *Leucoptera* species plentiful in the lower leaves of *Onobrychis sativum*. They produced in the Spring of this year *L. onobrychidella*, Klimesch, new to France and very recently discovered by Herr Klimesch in Austria. (See *Zeitschrift des Oesterreichischen Entomologen-Vereines*, Wien, 22 Jahrgang 1937, pp. 4-6.) On the slanting track across the screes leading to the Italian frontier *Erebia scipio*, Boisd., flew freely, but as usual in my experience, it was very hard to catch. Along the same track were plenty of *Heliothela praegalliensis*, Frey, very hard to see and still harder to net. Some confusion exists as to the distinction between this insect and *H. atralis*,

Hb., but Mr W. Parkinson Curtis, who has examined Frey's insect in the British Museum, states that our specimens from the High Alps correspond to *H. praegalliensis*, Frey, while he refers the dingier insect taken rarely at much lower levels to *H. atralis*, Hb. On the other hand, Monsieur Leon Lhomme refers both forms to *H. atralis*, Hb. The food plant appears to be still unknown, but from observations made in this locality the insect seems to be attached to dwarf goldenrod, and could not be found except in close proximity to that plant.

The meadows along the Clarée up to and beyond the Chalets de Laval, 8.5 kms. from Névache, are also an excellent hunting ground. *Erebia pharte*, Hb., was rare there this year and so was *Coenonympha philea*, Hb., var. *satyrion*, Esp., but other common species were in fair numbers and one rare *Crambus*, viz., *C. rostellus*, de la Harpe, occurred there very locally, at about 6000 feet. This species was also taken in another restricted locality up to the Col du Vallon at about 6500 feet, among a grass identified by Monsieur Leon Lhomme as *Nardus stricta*, L. Unfortunately the whole of the upper part of the Col du Vallon is now given over to sheep and there were literally no Lepidoptera left there. We could and did hunt for miles without seeing more than one Lepidopteron per acre where in former years there flew in more or less abundance *Melitaea cynthia*, Hb., *Oeneis aello*, Hb., *Plebeius pheretes*, Hb., and many other high mountain species.

As is well known, the Italian frontier has not been easy of access for some time. It is a pleasant walk from Névache to the frontier blockhouse guarding the Col de l'Echelle, and there is good hunting on the French side. We only once passed the frontier after some formalities, and looked down into the deep Vallée Etroite towards Bardonnèche. Two affable frontier guards accompanied us through the tangle of barbed wire, past the extensive works, where large numbers of men were busy, and brought us safely back to the French side. Soon after this the frontier was closed to the French and Italians and we did not bother to go over again, though on several occasions we went over the frontier in other places without seeing any guards, in spite of the lurid stories we heard of their activities. The state of affairs on the frontier was a sad contrast with the easy freedom of 1923, when we passed and repassed with no more than a nod to the corporal of Bersaglieri, and never saw another soul. Here may be taken *Zygaena hilaris*, Ochs., and *Z. purpuralis*, Brünnich, among other insects.

Another good hunting ground close to the village lies on either side of the Clarée as far as the cascade, where further progress along the torrent is blocked. Here on thistles among the corn were countless *Heodes virgaureae*, L., with occasional nicely marked females, *E. neoridas*, Boisd., *Plusia ain*, Hoch., and *P. bractea*, S. V., rarely. On a low growing shrub of some *Prunus* species were found innumerable mines of a *Leucoptera* species, since bred and found to be *L. scitella*, Zell., together with small larvae of *Aporia crataegi*, L., while the bushes of *Viburnum lantana* yielded pupae of *Peronea logiana*, Schiff., the imagines from which are much larger and brighter than English specimens. On the right bank of the Clarée the wet pastures yielded *Argynnis amathusia*, Esp., and *A. ino*, Rott., and the seed heads of *Veratrum alba* were many of them full of larvae of *Eupithecia veratraria*, H.S., and *E. fenestrata*, Mill., with an odd larva of some other pug.

Perhaps the best locality within easy walk of the village lies down stream on the right bank, under the Fort de l'Olive, between Névache and Plampinet, where there are clearings among the pines and aspens with flowers innumerable. *Thecla betulae*, L., flies here in plenty, and we took occasionally *Melasina lugubris*, Hb. In the willows by the torrent were found in plenty the larvae of *Earias chlorana*, L., and less commonly those of *Peronea hastiana*, L., which latter yielded forms larger and more striking than southern English ones. Here we found in real abundance on 18th August a *Crambus* that I did not recognise, flying freely in the afternoon among long grass in rough dry fields and open spaces. By good fortune M. Leon Lhomme, to whom some were sent, was able to identify it at once as *C. poliellus*, Tr., included doubtfully in the French list on the strength of a single capture recorded by Sand from Saint-Florent (Cher). The females are very distinct from the males, yet we found them hard to get and not easy to distinguish in the field. However, by sweeping among the long grass we found that the males would all fly out of the open net while the females would sit quietly on the gauze to be boxed with ease. The species was so abundant that my wife and I were able to catch and box one hundred and four specimens in thirty minutes. Later in the month males came freely to light on the slopes above the village and even into our bedroom. Among the shrubby aspens in this locality the mines of *Lithocolletis tremulae*, Zell., occurred commonly on the very lowest leaves and in very sheltered spots.

The slopes behind the village facing south were also very productive. Here flew in numbers the second brood of *M. didyma*, Ochs., with many females very much suffused darker, but no aberrations that we could find. In fact, the only aberration seen of any species was a streaked underside of *Polyommatus eros*, Ochs., found stuck on the mud at a weep by the roadside. *Z. fausta*, L., and *Z. carniolica*, Scop., were very abundant on these slopes, and towards the late afternoon there flew freely *Epischnia ampliatella*, Hein., *Selagia spadicella*, Hb., and *Crambus lithargyrella*, Hb. Here, too, among the seeds of *Verbascum* were found the larvae of *Pyrausta repandalis*, Schiff., which for the first time I succeeded in rearing through the winter. The larvae are said to feed again in the Spring after hibernation, but I have never observed this. My larvae of this species have always remained unchanged in their cocoons throughout the winter, pupating in May or June. *Orobena sophialis*, Fb., was also common here, but as usual we found it difficult to get specimens in good condition. There are masses of red Valerian on the slopes, and many species of day-flying Lepidoptera frequent the flowers, which after dark are even more attractive to many *Noctuidae*, especially of the genus *Plusia*.

The weather this season in the mountains was unusually unfavourable for lamping, being on the whole cold, windy and rainy. Very few even moderately good nights were experienced, and the moon spoiled some of these. Geometers were plentiful, as also were Micros, but *Noctuidae* were very scarce indeed. Among the species taken at light were *Ilema lutarella*, L., *Phragmatobia maculosa*, Gerning, *Euxoa grisescens*, Fb., *E. simplonia*, Geyer, *E. denticulosa*, Esp., *E. vitta*, Esp., *E. signifera*, Schiff., *E. celsicola*, Bell., *Agrotis rectangula*, var. *andereggi*, Boisd., *A. renigera*, Hb., *Miselia tephroleuca*, Boisd., *Bryo-*

phila galathea, Mill., *Athetis terrea*, Frr., *Calamia virens*, L., *Phytometra festucae*, L., *P. v. argenteum*, Esp., *P. bractea*, Schiff., and *P. deaurata*, Esp.

This unfavourable weather, together with a frontier mobilisation, drove us home to England some few days before we had intended. Difficulties of identification have made it impossible to do more than lay the foundations of a list of the Microlepidoptera of Névache, but it is hoped that in due course all the records will be published in the Second Part of Monsieur Lhomme's " Catalogue des Lépidoptères de France et de Belgique," now in course of preparation. At any rate we spent a very pleasant holiday, for the village grows every year more civilised, and we hope that when peace returns again to western Europe we may spend the yet richer months of June and July among these well-remembered mountains, so rich in rare plants and insects.

4 Bassett Crescent West, Southampton.

A NOTE ON SATURNIA PAVONIA, L.

By P. B. M. Allan.

A few summers ago I reared some two dozen larvae of *Saturnia pavonia*, L., from the egg, and on the following 1st February I brought a dozen cocoons into a room in which the temperature was usually about 58° F. by day, falling to 50° F. at night.

On 25th February the first moth, a female, emerged at 11.50 p.m., and moths continued to emerge until 6th March. It took this female six minutes to get out of her cocoon, from the time when her head appeared until she was free. She did not pull herself out but held on to a stalk, her body working itself upwards and out of the neck of the cocoon by peristaltic contractions of the abdominal somites, the moth resting for a moment or two after each " wave " of contractions. When free she crawled rapidly to the top of the stalk to which her cocoon was attached, waved her legs about for a few moments as though she would climb higher, and after one minute came to rest. Four minutes later her wings began to expand, and after 55 minutes they were fully expanded. During wing expansion there was no perceptible movement of the body: so far as I could see, watching through a lens, the insect was absolutely motionless. The forewings began to expand first.

The next moth which emerged, a male, did things much more quickly. He was free of the cocoon at 11.53 p.m., and by 12.5 a.m. [0.5 a.m.] his wings were fully expanded.

On the last day of February there were snowstorms, with a hard frost in the night of 28th February-1st March. Three moths emerged on the 28th (2 ♂♂ at 11.30 a.m. and noon; 1 ♀ at 4 p.m.), and towards midnight another male began to emerge; but the temperature of the room falling sharply to 40° F. when an electric stove was switched off, he stuck in the neck of his cocoon. Next morning I cut him out and put him on the mantelpiece; he was very feeble and covered with meconium; but the following evening, being nearly baked over the electric fire, he became vigorously active at 11 p.m.; though of course it was then too late for him to expand his wings.

By the way, a number of the males which emerged in my room became active late at night. In a state of nature, do male *S. pavonia* fly by night as well as by day? On the 5th June 1937 my friend, Mr Clifford Craufurd, caught at midnight a male Fox Moth which flew to his lamp. Other entomologists may have had the same experience, but neither he nor I have seen it recorded in print. Barrett makes no mention of the male *pavonia* flying by night, and of *M. rubi* he remarks "the male appears to fly only in the daytime." If any readers of this paper have taken male *pavonia* during the hours of darkness I shall be grateful if they will let me know.

It was easy to show that with *S. pavonia* temperature controls (1) eclosion from the pupa case, (2) emergence from the cocoon, (3) the vascular pressure on the blood which brings about wing expansion. I found that by altering the temperature sharply it was possible to produce partial crippling, and that this artificial crippling invariably affected the hindwings.

Everyone who has bred *S. pavonia* under observation will have noticed that eclosion is always preceded by a certain "rattling about" of the pupa in the cocoon (though this "rattling" does not always prognosticate immediately impending emergence; for example, some of my pupae which "rattled" on 14th February did not emerge until the 26th, and they were silent between the 15th and the 25th). What is the significance of this rattling about of the pupa in the cocoon? While some of them rattled a week and more before the moths emerged, all of them—so far as I could tell—rattled at one time or another before they emerged. A few never rattled at all, and these pupae were found later to be dead. Is the movement essential to eclosion? If so, its performance some days before eclosion took place with my pupae might possibly have been due to the fact that these particular specimens were ready to emerge but that the temperature was too low, or that some essential factor was lacking.

In an attempt to solve this problem, on March 20th (no emergences having occurred since March 6th) I cut the tops off six of the cocoons, to see whether this would have any effect on the movements of the pupae or of eclosion. The pupae in these cocoons were lively.

On the same date (March 20th) I brought into my room the second dozen cocoons. Moths began to emerge from this second batch on April 5th, and the last two left their cocoons on April 22nd.

None of the six pupae in cocoons with the tops sliced off ever gave rise to a moth. On September 5th (they being then 12½ months old) they were all alive; but by November 12th one had died. On the 1st March following (they being then about 18½ months old) they were still alive; but on March 12th all were dead except one. This was obviously due to my mismanagement, as they had been in a warm room for more than a year and were dried up.

On March 12th I found in a larva cage an unopened cocoon containing a dead pupa. So I sliced the cocoon in half transversely with a razor, removed the dead pupa, put my surviving pupa inside the cocoon, and glued the two halves of the latter together.

The following evening, the temperature in the room rising to 62° F., the pupa started to "rattle." Next afternoon (March 13th) it rattled for an hour; but thereafter it was silent, and a week later I cut the

cocoon open again and found that the moth, a female, had freed her abdomen of the pupa case but had been unable to push off the fused thoracic appendanges and had died.

Now, although I had failed to find out why the pupa "rattled," I obtained what may possibly be a clue by watching the six pupae when they "rattled" in their truncated cocoons. I noticed that the movement was not a lateral one, *i.e.*, from one side of the cocoon to the other, but a "jump" upwards and a fall back. This "jump" was apparently effected by flexing the abdominal somites and then extending them sharply. But further observation showed that there was more in it than that. The cremaster of *S. pavonia* is interesting. It consists of about 30 bristles, varying slightly in length and thickness, which are spread out roughly fanwise. The inside of the cocoon is extremely hard and so glossy as to have the appearance of being varnished. But although slippery it is not smooth in the sense of being flat: its surface is uneven and irregular. So that if the pupa curved its abdominal segments until the cremaster was "spiked against" the side of the cocoon (the unevenness giving the cremaster a purchase), with the dorsal surface of the thorax resting against the opposite wall, then straightened itself out sharply, the pupa would be forced upwards on the glossy surface of the cocoon. This, so far as I have been able to observe, is what actually happens when the pupa "rattles" in its cocoon.

But what have these movements to do with eclosion? Moreover, the pupa is able to make them whether its cocoon be intact or truncated. The only solution I can suggest is this—and do please bear in mind that it is no more than a suggestion:—

When the pupa "jumps" upwards its anterior end is momentarily wedged in the bottle-necked upper part of the cocoon. This momentary wedging enables the imago to obtain some kind of purchase for the making of a muscular effort which splits the pupa case along two lines of cleavage, a transverse one between the 3rd thoracic and 1st abdominal segments, continued posteriorly and ventrally along the inner margins of the wings, and a longitudinal one along the middle of the three thoracic segments. Then, as the pupa falls back to the wider bottom of the cocoon, the moth pushes from itself the fused appendages and thoracic segments, and emerges. If the top of the cocoon be sliced off, the pupa is unable to obtain that momentary wedging which enables the imago to split the case.

On the other hand, since a violent muscular effort by an insect is usually followed by a period of rest, it may be that the "jumping" effects the rupture of the pupa case along the line of one cleavage only, the second rupture being made some time later while the insect is lying at the bottom of the cocoon. If the temperature fell immediately after the first rupture was made, the insect might lie inert until the requisite degree of warmth urged it to effect the second rupture, which is made immediately prior to emergence from the cocoon. This part of the problem could be solved by opening a cocoon immediately after the first "rattling" has been heard, and examining the pupa.

S. pavonia is not common in my district and I have no more pupae with which to experiment further. Will some reader of this paper continue these observations? The simplest way would be to watch the pupa closely in its cocoon, by the expedient of cutting windows in opposite

sides of a *pavonia* cocoon with a razor and glueing cellophane over the apertures. It would also be interesting to see whether any emergences took place among a dozen or more pupae after their cremasters had been snipped off, the pupae being replaced in the opened cocoons and these sealed again.

Does anybody know whether the double spiked cremaster of certain species which pupate in the ground plays a part in eclosion?

TWO NEW ABERRATIONS OF BRITISH BEETLES.

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

Cryptophagus dentatus, Hbst., ab. **flavus-clavatus,** n. ab.

This specimen agrees very well in size, structure, puncturation, and pubescence with the typical form, but the three-jointed club on both antennae is clear yellow in colour.

It came out of a piece of hawthorn stump from a hedge at Heston, Middlesex, on 7th May 1939. I kept pieces of the wood (and have still got them at the Museum), but no further specimens emerged; but a specimen of *Agriotes sobrinus*, Hbst., did so and larvae of *Hedobia imperialis*, L., are present (teste Blair). As it is such a striking looking insect and as the antennae are absolutely uniform, it seems to be worthy of a name. Type in coll. Donisthorpe in B.M.

Hydraena nigrita, Germ., ab. **pallida,** n. ab.

In the typical form the insect is jet black with red legs; but in *pallida* it is lighter or darker brown, the head being darker. Some specimens have the thorax lighter; but no black forms were found with *pallida*. *H. nigrita* is common in various streams in the Windsor Forest area, but the ab. only occurred in one stream. It was taken on 20th and 27th July and 1st August 1939, some 30 specimens having been taken. I thought at first it might be a different species as the puncturation of the head and thorax is perhaps a little more sparse, but Mr Balfour-Browne, junior, who kindly dissected a male, tells me that the genitalia of the two forms are identical. Type and cotypes in coll. Donisthorpe in B.M.

SOME ACULEATA OF EASTON.

T. Fred Marriner.

Though I have not devoted much time to the especial search for Bees, etc., I find I have accumulated a fairly representative collection of the Order in this Easton area of Cumberland, and these may prove of interest in adding new localities for most of the species observed, and taken. Of the *Vespidae*, *Vespa vulgaris*, L., is too common in some parts but varies, and has been seldom seen in others. *V. germanica*, F., I have only come across once. *V. sylvestris*, Scop., is fairly common in every portion of the area, while *V. rufa*, L., like *V. germanica*, is scarce around Easton. I got two specimens of *Odynerus* (*Ancistrocerus*) *parietum*, L., in my garden in 1936, the only ones I have seen. *Halictus rubicundus*, Chr., has not been uncommon on some of our hedgebanks.

It was especially common in September 1939 and along with it I got *Sphecodes monilicornis*, Kirby. *Sphecodes ferruginatus*, Schk., seems a scarce item here. *Halictus calceatus*, Scop., was plentiful in June 1936 and again in 1939. *H. tumulorum*, L., was fairly common on various flower heads on the road verges in August 1939.

I have got five species of *Andrena*, of which *A. albicans*, Kirby, has been the commonest. *A. jacobi*, Perk., is fairly common in the early summer. *A. clarkella*, Kirby, was not uncommon in May 1939, and occasionally with it *Nomada borealis*, Zett. I got a single specimen of *A. nigriceps*, Kirby, a ♀, on ragwort in August 1936. *A. albicrus*, Kirby, was fairly common in my garden in July 1939, and *Nomada marshamella*, Kirby, was not rare.

Of the *Apidae*, *Osmia rufa*, L., was not uncommon in June 1939. *Megachile willughbiella*, Kirby, appears on my rose bushes each year, usually in numbers in August. I took a single specimen of *Psithyrus vestalis*, Fourc., near Longtown in August 1935.

There are, so far, nine species of *Bombus*. *B. muscorum*, L., is fairly common everywhere I have collected here. *B. agrorum*, F., has often occurred in my garden. *B. hortorum*, L., has not been commonly noted until August and September 1939, when it turned up in great numbers on a Chinese plant, *Senecio tangeticus*, in my garden. *B. jonellus*, Kirby. This small *Bombus* has always been considered rare in Cumberland, and I was surprised to find it in numbers in my garden here in 1936 and in 1939. *B. pratorum* not uncommon on bramble and wild raspsberry on my hen run here. *B. lapponicus*, F., has only twice occurred to me near Easton. *B. ruderarius*, Müll., I have seen rarely and only in Bolton Fell and Bewcastle areas. *B. lapidarius*, L., usually fairly plentiful. *B. lucorum*, L., quite common. *Apis mellifica*, L., not wild here but as there are a number of beekeepers, their stocks invade the whole area.

Of the *Formicidae* I have taken the following, and a special search will probably add to the number. *Formica fusca*, L., is common among the rotting tree stumps on my hen run, the remains of a wood cut down long ago. *Donisthorpea nigra*, L., is not uncommon.

Myrmicidae. *Leptothorax acervorum*, F., common under stones on some wide road verges.

COLLECTING NOTES.

CALOPTILIA PYRENAEELLA, CHRETIEN 1908.—In the *Entomologist*, LXVI, 230 (X. 1933) Mr L. T. Ford recorded that he bred specimens of this species from " cones " on maple-leaves collected in the Isle of Wight on 9.vi.1933, the moths emerging 2-4.vii. When this note appeared, I was unable to trace any description of this species in Rebel's *Cat. Pal. Lep.*, Meyrick's *Cat. Gracil.* or *Wytsm. Gen. Ins.* or in the *Zoological Record* and it was only when going over Chrétien's papers in *Le Naturaliste* that I came across it. Chrétien described this species as *Gracilaria pyrenacella* in *Le Naturaliste*, XXX [(2) XXII], p. 246 (1.xi.1908), and, as his description of it is not readily accessible to English Entomologists, it may be useful to give a translation, as follows:—

Expanse 10.5 mm. Forewing purplish-brown, dark violet or even dark-blue, especially at ⅓ of the wing and beyond middle. The base near dorsum is purplish-yellow; in the middle of the wing is a large broad costal blotch of a beautiful clear golden-yellow, or egg-yellow, brighter than in *G. alchimiella*. This blotch is clearly outlined on each side; sometimes its lower extremity stops at the fold, sometimes it crosses the fold, occasionally extending to dorsum. When it stops at the fold, the blotch is trapeziform; when it extends across the fold, which it does very rarely, it forms an obtuse angle, it is triangular; costally it is devoid of small black striae. Cilia purple-brown anteriorly, twice cut by a darker line towards their extremity which is blackish, and brown in their posterior part.

Hindwing dark brown, as well as the cilia.

Head and thorax grey or purplish-yellowish; face pale golden yellow or gilded citron-yellow; antennae ringed with yellowish-brown and dark purplish-brown; palpi yellowish, tinged purple beneath; abdomen dark brown above, pale golden-yellow beneath; legs yellowish-grey.

Larva fusiform, elongated, very attenuated posteriorly; segmental incisions well marked; white; warts indistinct; head small, white; mouthparts ferruginous, ocelli indistinct; thoracic legs white; three pairs of ventral prolegs.

It lives in May and June on *Acer campestre* [Common Maple] in the same way as other *Gracilaria* larvae, mining at first, later on making cones [and] twists, rolling the lobes of the leaves of which it eats out the interior as far as the epidermis. It emerges from these cones by a hole in the side and places its cocoon in a fold of the leaf, near the base of the last cone in which it has lived. This cocoon is elongated, keeled above and of white silk, firm.

Pupa yellowish-brown, very attenuated posteriorly; extremity of sheaths free, as long as caudal spine; surface smooth on thorax, rough on abdomen; nervures of wing-cases indistinct; spiracles sunken [" en dépression "]; warts indistinct, [with] long pale hairs; posterior extremity of abdominal segments very slightly swollen [" en bourrelet faible "]; caudal spine short, broad, subcylindrical, naked, hardly caruncalated at tip.

The moth emerges in late June and July, doubtless the first brood; its second brood has not been observed. It occurs in the Basses-Pyrénées.

This new *Gracilaria* is near *G. onustella*, Hb., and *oneratella*, Zell.; as regards the shape of the yellow costal blotch it agrees with both, since this blotch is sometimes triangular, sometimes quadrangular; but its colour is of a brighter purer yellow.

Note.—As he states that its larva feeds on *Humulus lupulus*, it is evident that Chrétien's " *onustella* " was the first brood of *fidella*, Reutti, which has until recently been confused with the true *onustella*, Hb.: this latter is a rare species, apparently confined to Austria. See Hering, *Schmett. Mitteleurop.*, p. 62 (1932).—T. B. F.]

T. Bainbrigge Fletcher, Rodborough., Glos.; 14.xi.1939.

Drepana binaria: Partial Second and Third Generations.—Five pupae of this species were obtained from ova laid by a female I obtained in May. Two moths emerged in August. The remaining pupae I placed

in a glass topped tin in September for the winter near an ever open window in a room without a fire facing north-east. On November 2nd I happened to look at the tin and was surprised to see the wing cases of one of the pupae had turned black; a moth hatched the following day, the two last on November 9th.

Pupae I keep in this room almost always hatch at least a fortnight later than those in a wild state, so the appearance of the moths could not have been due to the warmth of the house.

October for the most part was unusually cold, the thermometer frequently falling to 43°, but at the end of that month and in the beginning of November a mild spell set in and it often registered 55°. All five moths were as large as the spring brood.—(Capt.) C. Q. Parsons, Torquay.

Psychoda compar, Eaton, at Heston, Middlesex.—For several years past I have observed a small Dipteron in my bathroom at Heston, where it always haunts the washing basin, sitting on the wall above and in the basin itself. I captured a few a year or so ago, and pinned them (which I did not find an easy thing to do with these small and delicate flies), but Dr Edwards told me it was not possible to name dried specimens. Recently I collected specimens in spirit, and he tells me it is *Psychoda compar*, Eaton; not a common species. My house is a small modern one, the walls of the bathroom being covered with tiles, the wash basin, bath, etc., being porcelain, and the taps chromium plated, and I could not think where the fly came from. It appears, however, that their larvae breed in soap residue, etc., in the pipes. I understand that a new species has recently been taken in Australia and that the metamorphosis only takes four days from the egg to the imago! These creatures will remain in one spot for some time. I have found one in the morning exactly where it was the night before. When in the basin and a tap is turned on, as soon as the water touches the fly it floats on the surface of the water and takes wing from it. Also if gently submerged under the water it extricates itself and after flapping the wings takes to flight.—Horace Donisthorpe.

Some Notes on the Larva of Trichoptilus paludum, Zell.—Few of our resident Lepidoptera have their early stages less known than that of *Trichoptilus paludum*, Zell. The moth is widely distributed and not uncommon on boggy heaths, where its food-plant, *Drosera*, grows. On account of the extremely small size of both the larva and its food-plant and the difficulty of examining a peat-bog on one's hands and knees, the early stages are seldom looked for. The following notes on the breeding of the larvae have been made in the hope that they may be of some interest and help to those entomologists who would like to study the larval habits of this very interesting little species.

During August 1937 I came across a small, isolated peat bog that had become separated from the main heath at Parley, Dorset, by a metalled road.

Several specimens of the "plume" were flitting about over the sphagnum, and it occurred to me that a close examination of the *Drosera* in the Spring should produce some larvae. A visit to the spot in early May found everything very wet and little sign of growth amongst the

Drosera. I did not make a further search until the 15th of the month, when I found the plants fully grown, and throwing up flowering spikes. An examination of the *Drosera* soon showed that larvae had been at work. A few of the smaller plants were dead, the heart of the plants being eaten right out, and little piles of frass left in its place. Other plants showed that pieces had been eaten out of the leaves, especially along the stalk. The little green larvae with reddish tubercles exactly matched the green leaves with their red tipped "hairs," and if it were not for the piles of green frass it would be extremely difficult to detect the larvae. The favourite position of rest seemed to be along the stalk of a leaf, which in many cases was about the width of a full-grown larva. Others were found in-between the " hairs " on the surface of the leaf.

The first larva pupated on the 21st. Any dry upright object seems to be suitable to the larvae for the purposes of pupation. Last year's dead flower stalk, a piece of paper, or the sides of the flower pot in which they were reared, were the positions chosen by the larvae that I kept.—S. C. S. Brown.

[Ref.—Chapman, Dr T. A., *Trans. Ent. Soc. Lond.*, 1906, p. 133, plt. vii.—Eds.]

Coleoptera of Easton.—In my notes of the Coleoptera of this Easton area in the *Entom. Record* of September 1939 I expressed the hope that I might find two further species of *Carabus*. Though I have not personally succeeded in this, one of my farming friends, interested in my efforts, brought to me a fine ♂ *Carabus nitens* which he had come across in the Pennine area some three miles north of Bewcastle. Day of Carlisle tells me he has taken the insect at Bewcastle, and I believe the new find will be its furthest north in England. Sir T. Hudson Beare took it at Moffat across the Border.—T. F. Marriner, Easton, Longtown.

Spilosoma urticae, Esper., in Cumberland.—An evacuee here brought me the caterpillar of this species with a piece of the plant, a kind of bogmint, on which he found it, in August 1939. He called it a " red-headed woolly bear." This insect has only been recorded doubtfully for Cumberland previously and very rare in Scotland. I visited the boggy patch from which it came but found no further examples.—T. F. Marriner, Easton, Longtown.

CURRENT NOTES.

In the *Ent. Rund.*, vols. 55 and 56 (1938-9), Frhr. v. d. Goltz of Coblentz has communicated a long article on the Genus *Callerebia*, a group of species very closely related to those of the genus *Erebia*. The species are more eastern in their distribution than those of that genus. Incidentally, we are informed by the writer that during the last few years Dr Hone and his collectors have sent to the Royal Museum at Bonn no less than 600,000 lepidoptera from the Thibet and Chinese areas. There are about 1500 examples of *Erebia* and *Callerebia*, of which only 60 are *Erebia*. A plate illustrating several new forms is included.

Evening and night collecting, doubtless for a long period, will be curtailed largely, if not completely. May we urge active entomologists to turn their attention to breeding for varieties. A generation or two even ago a few entomologists devoted a deal of attention to such work. Species like *Arctia caja*, *Spilosoma lutea* (*lubricipeda* in part), *Abraxas grossulariata* were especial favourites, and many striking forms were produced by selective breeding, carefully arranged pairing and continuous breeding with strengthening pairings at intervals. *A. caja* was an early subject and as far back as 1790 many striking forms had been bred and figured (see Ernst & Engramelle, " Papillons d'Europe "). But records of the method of obtaining results and the numerical and detailed reports of such breeding are few and far between. Of the wonderful and marvellous results of Rayner's work with *A. grossulariata* we have no records whatever, so that the true history of the origin of any specimen is a complete blank. In the case of *S. lutea* we have some imperfect records, but not sufficient by far. Our pages during the past year have contained some excellent articles on "Continuous Breeding," by Dr B. D. Kettlewell, where many useful practical hints may be found. The Geometers as a whole lend themselves for such experimental work and many species are quite easy to breed. A perusal of our " List of British Geometers " (see the cover of this magazine) will afford, by the number of named forms attached to each species, good subjects for a commencement. But, above all, careful, dated and detailed records should be kept.

At last the S. London Entomological Society has found suitable accommodation quite close to their old quarters near London Bridge, in the Chapter House of Southwark Cathedral, St Thomas St., Borough. In the early days of December, a few of the members were very active in the " moving in." Cabinets and bookcases were placed so that the hall for the ordinary meeting looked quite homely to the members when they met on Saturday afternoon, 16th December, at 2.30 p.m. As it will not be convenient for meetings to be held on Thursdays as before, the next three will be on the second Saturday in January, February and March, after which further arrangements will be made by the Council.

The issue of *Lambillionea* for October and November contains an article with 3 plates on the " Relation between aberrant ocelli in the *Saturniidae* and the aberrant neuration," by M. F. Bryk. The subjects are *Eudia* (*Saturnia*) *pavonia* and *Eriogyna pyretorum*.

In the same issue, Mr B. J. Lempke in reference to the recent statement that as many as nine generations of *Pieris rapae* occur in S. Italy in one season points out that this species is protandrous, that is that the ♂s appear before the females and are quite ready to pair with the ♀s of a previous generation, and hence it is difficult to determine a generation.

Skat Hoffmeyer has sent a copy of the article on the variation of *Cidaria* (*Hydriomena*) *ruberata* written jointly with K. Groth. The Danish language will be a stumbling block to many, but the coloured plate of 30 figures with the 5 text figures and the references in the text will give a deal of information to most.

Brahm in Scriba's *Beitrage*, III, 252, plt. 18, 1 (1793), redescribed this species and gave a figure much too large, stigmata much too prominent and glaring, but recognisable.

Hübner, *Saml. Noct.*, 411 (1808), gave a figure in which the often slightly lighter area (band) between the waved elbow line and the black submarginal is prominently light with a pinkish tinge. I have never seen a specimen like it or approaching it. It must be very rare.

Hb., *l.c.*, 572 (1809-18), is of a much darker obscured red, more like our average British examples.

Treit. said, *Schm.*, V (2), 119 (1825), that the figure of Esper, *Abbild.*, IV, 491, plt. 150, 5, as he, Esper, himself suggested was not the insect of Borkhausen and Brahm, but was indeed a variety of *suasa*. Therefore it is possible that he (Esper), under his *radica*, plt. 151, has a true *leucographa* (unless it be the following species, *bella*). In some ways this *radica* shows the characteristics of *leucographa*, but is somewhat too small. H.-S. called it *bella*. Werneburg called it *xanthographa*, which in shape and size it is more like.

Dup., *Hist. Nat. Sup.*, III, 440, plt. 39, 1 (1836), gave a figure incorrect in colour and marking with antennae extremely pectinated. ♂.

Freyer, *Neu. Beitr.*, VI, 5, plt. 483 (1845), gave a variegated figure in which all usual features were exaggerated. He stated that Hüb., 411, was quite incorrect, but 572 was good, and Esper's figure, plt. 150, has only the name which is this species.

Gn., *Hist. Nat.*, V, 349 (1852), considered *amicta*, Donz. as in all probability a ♀ of *leucographa*. Stdgr., *Cat.*, III ed., 153 (1901), listed it as "ab. ♀ *obscura*?" He placed *leucographa* and *rubricosa* in *Taeniocampa* (1852).

Aurivillius removed all the species, *carnea*, *hyperborea*, and *tecta* (*carnica*), for which the genus *Pachnobia* was established by Gn. (1852).

Splr., *Schm. Eur.*, I, 165, plt. 45, 12 (1905), gave a figure with area between the waved line and the submargin well indicated by a different shade of the reddish ground colour but not light pinkish as in Hübner's fig. 411. He used the genus *Sora*, Heine.

South, *M.B.I.*, I, 325, plt. 155, 4 (1907), gave a rather washed out figure, presumably of a very worn specimen.

There is a good figure in *Berge-Rebel*, plt. 34, 9 (1909), except that the second transverse line and the submarginal are emphasised too strongly in white.

Warr.-Stz., *Pal. Noct.*, III, 60 (1909), recognised 3 forms only—*lepititii*, Bdv., *suffusa*, Tutt, and *rufa*, Tutt. This figure is featureless and poor, plt. 14b.

Culot, *N. et G.*, I (1), 94, plt. 15, f. 18 (1911), gave an excellent average figure.

Of the Variation Barrett says, *l.c.*, V, 225 (1899):—

"Not very conspicuously variable, but isolated specimens show a tendency to representations of the usually absent portions of the ordinary pattern of markings; one in my own collection has a partial but distinct dull yellow basal line, and a more complete perpendicular and indented first line composed of dusting of the same colour, but the reniform stigma is only indicated by a yellowish margin; in other examples there

is a yellow dot indicating the basal line, or the claviform stigma is faintly suggested in the same colour. Among specimens reared at Hereford are some in which the purple-red colour is very much blackened especially in the middle of the wings, with the stigmata either bright yellow or very obscure; and one in which the forewings are pale brownish-pink with the stigmata yellowish white and the hindwings white."

He reports specimens from Durham " very dark purple-red with the stigmata obscure."

And one " of a dark red-brown without a trace of the stigmata."

The Names and Forms to be considered are:—

leucographa, Schiff., *Verz.*, 83 (1775).
[*leucographa*, Hb., *Samml. Noct.*, 411 (1808): 572 (1809-18).]
f. *lepetitii*, Bdv., *Icones*, plt. 83, 2 (1832).
ab. *amicta*, Dnz., *Ann. Soc. Ent. Fr.*, VIII, 527, plt. 8, 3 (1847).
ab. *suffusa*, Tutt, *Brit. Noct.* II, 130 (1892).
ab. *rufa*, Tutt, *l.c.*
ab. *tenebricosa*, Reb., *Berge Schm.-buch.*, 176 (1909).

Tutt dealt with (1) the *leucographa*, Hb., 411, the type form; (2) f. *lepetitii*, Bdv., the red-brown form, with no trace of ochreous in the stigmata; (3) ab. *suffusa*, the spread of the dark central shade over the whole wing, a deep blackish-red; (4) ab. *rufa*, ground a bright red, paler than the type, pale ochreous red.

ab. *amicta*, Donz., *Ann. Soc. Ent. Fr.* (1847), 527.

Fig.—plt. 8, f. 3.

Orig. Descrip.—" Alis anticis fuscis, nitidis; maculis ordinariis subnotatis. Posticis cinereo-infuscatis. Thorax fusco; capite collareque griseis."

" The forewings are of a smoky brown. The ordinary stigmata are scarcely perceptible; the orbicular is lighter than the ground colour, and the reniform more dark. The transverse lines are not apparent, except the fourth, which is parallel to the terminal margin. On the costa above the reniform is a somewhat large white spot, and towards the apex three other smaller ones. The fringe is of a brownish red. The lower wings are of a smoky reddish grey. The fringe is of the same colour but lighter. Below, all the wings are of a smoky reddish. The reniform is shown, and the hindwings have the discoidal well marked. The head and collar are grey and the thorax brown." Hyéres.

ab. *tenebricosa*, Rebel., *Berge Schm.-buch.*, 176 (1909).

Orig. Descrip.—" Deep red-brown with almost markingless forewings and very dark hindwings."

Taeniocampa, Gn. (1839)? (1852) Barr., Stdgr., Splr., South, Culot, etc. [*Orthosia*, Hb. (1821) Tr., Steph.; *Monima*, Hb. (1821) Meyr., Hamp., Warr., Meyr.] *munda*, Schiff.

Hübner, *Verz.*, 228 (1821), established the genus *Orthosia* for the species *instabilis*, Schiff. (*donasa*, Esp.); *firma*, Hb.; *lota*, L. (*munda*, Hb.); *munda*, Schiff. (*lota*, Hb.); *macilenta*, Hb.; *gracilis*, Schiff. (*lepida*, Bork.).

He also, *l.c.*, 229, established the genus *Monima* for the species *miniosa*, Schiff.; and *ambigua*, Schiff. (*pulverulenta*, Esp.).

Steph., in his *Sys. Cat.*, 1829, II, 70, dropped the latter genus and included the two species in *Orthosia*. In his *Ill.*, II, 139, this author divided *Orthosia* into two sections, the first including *munda* being vernal species, the other section autumnal species.

Gn., the next reviser, *Hist. Nat. Noct.*, I (V), 346 (1852), revised *Orthosia*, retaining *lota* and *macilenta* of the original species and adding others. He established the genus *Taeniocampa*, including *gothica*, *instabilis*, *munda*, etc., and the two species *miniosa* and *pulverulenta* (the original contents of *Monima*, Hb.).

Thus the genus *Monima*, having lost its original species content, drops out of use as no longer a valid genus.

Tutt gave Esp., *Abbild.*, III, 264, plt. 52, figs. 5 and 6, *Bombyx munda* (1785) as the type, but omitted to trace back the name to Schiff., *Verz.*, L, 7, p. 76 (1775), "The garden pear noctua."

Tutt, *Brit. Noct.*, II, 134 (1892); Meyrick, *Hand.*, 74 (1895); Barrett, *Lep. Br. Is.*, V, 217, plt. 212, 2 (1899); Stdgr., *Cat.*, III ed., 202 (1901); Hamp., *Lep. Phal.*, V, 416 (1905); Splr., *Schm. Eur.*, I, 241, plt. 45, 10 (1906); South, *M.B.I.*, I, 330, plt. 158, 11-12 (1907); Warr.-Stz., *Pal. Noct.*, III, 90, plt. 22c (1910); Culot, *N. et. G.*, I (2), 67, plt. 50, 14-15 (1913); Meyr. *Rev. Hand.*, 145 (1928).

Ernst. & Engr., *Pap. d'Eur.*, VII, 1, fig. 396 (1790), gave very good figures. 396c has an unusual feature in the large, staring orbicular and reniform stigmata of a light grey.

Esper, *Abbild.*, III, 264, plt. 52, f. 5-6 (1785), gave two recognisable but crude figures of *munda*, included among the Bombycid section.

Esper's text to his plate 52, f. 6. described *munda* with two black spots, but his figure showed six spots in pairs, a form which was subsequently named *geminatus* by Haw. It will be noted that Bork., *Naturg.*, IV, 705 (1798), renamed the *munda*, Esp. the two-spotted form, the type form, as *gemina*. This must not be confused with *geminatus*, Haw., which is six-spotted.

Bork., *Naturg. Schm.*, IV, 705, described an insect under the name *gemina*, which is an undoubted *munda*. "The forewings dull red-yellow, powdered with numberless brown atoms and without marking; only two deep black spots stand not far from the hind-margin arranged as a colon."

Hüb., *Samml. Noct.*, 166 (1802), gave a good figure of the *geminatus* form of *munda* under the name *lota*, an error, as 167 on the same plate, an example of *munda*, was named *lota*. This Hb. corrected in his text.

Haw., *Lep. Brit.*, 121 (1803), described two forms, *geminatus* and *bimaculatus*, as two species of *Bombyx*. Most of the early authors placed *munda* in *Bombyx*, following continental authorities.

Laspeyres, *Ill. Mag.*, II, 93 (1803), said that Borkhausen had described a form of *munda* under the name *gemina* on p. 705.

Treit. said, *Schm.*, V (2), 210 (1825), that the Borkhausen *gemina* was, without doubt, a variety of *munda*.

Dup., *Hist. Nat.*, VI, III, plt. 80, f. 3 (1826), under the name *lota* gave a good figure of the grey dove-coloured form of *munda*, an error copied from Hübner's plate.

Freyer, *Neu. Beitr.*, IV, 63, plt. 328 (1842), gave a good figure of the *geminatus* form with two pairs of spots.

Spuler, *Schm. Eur.*, I, 241, plt. 45, 10 (1906), gave a very large but good figure.

South, *M.B.I.*, I, 330, plt. 158, figs. 11-12 (1907), gave two very fair figures, the form *geminatus*, Haw., with three pairs of spots, and *immaculata*, Stdgr., without the twin spots.

Warr.-Stz., *Pal. Noct.*, III, 90, plt. 22c (1910), gave six figures quite good; typical ♂ and ♀, ab. *pallida*, ab. *immaculata*, ab. *grisea*, and ab. *rufa*. They treated *gemina*, *geminatus*, *bimaculatus*, and *lota* as synonyms.

Culot, *N. et G.*, I (2), 67, plt. 50, figs. 14-15 (1913), gave two excellent figures, 14 the six-spotted reddish *geminatus*, 15 *bimaculatus*.

Of the Variation Barrett says:—

" Its range of variation is not extensive. In ground colour from the palest drab to reddish-drab, reddish-buff, smoky drab, and brownish-drab; in some of the palest examples a dull brown or purplish-brown angulated central shade is distinctly noticeable, while this marking—usually absent—is more faintly visible, as a reddish shade, in some of the more warmly coloured examples; the cloudy spot in the lower half of the reniform stigma, often quite obliterated, exists much more frequently of dull brown or leaden-brown to black, and occasionally is supplemented by another spot, more squared but of the same size, between the stigmata; but the most considerable variation is in the spots which lie at the back of the subterminal line—the twin black spots, by which the species is so readily recognised are occasionally not black but purplish brown, as also is the costal streak above them, and may be found in various paler shades till they become quite obliterated; in the opposite direction, where these twin spots are deep black, there occur, especially in western districts, examples in which one or two additional pairs, smaller but usually deep black, are placed in the same line. He reports one ' Very beautiful silvery drab specimen, with visible transverse lines and reddish shading, which has four pairs of dots; from Pembroke.' "

Another " Of unusual size, although without additional subterminal dots, is of a rich red buff approaching reddish-brown, with first and second lines complete and rather broad, and, with a considerable central shade, red-brown."

Another " Equally strongly marked example has the first line brown and conspicuous, the second composed of brown dashes, and the central shade dark brown."

An Irish specimen " Has the spaces in the discal cell, before and between the stigmata, black, the latter united to the spot in the reniform which is also black, also a black spot at the base of the wing, but the twin spots red-brown."

Another from the New Forest " is red-buff with deeper red transverse lines, but no other markings."

Another " is of a rich yellowish-chestnut slightly clouded with grey."

SPECIAL INDEX.

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

VOL. LI. (new series), 1939.

The Entomologist's Record & Journal of Variation.

Coleoptera arranged in order of Genera. The other Orders arranged by Species. Genera, Species, etc., new to Britain are marked with an asterisk, those new to Science with two asterisks.

COLEOPTERA.

DIPTERA.

HYMENOPTERA.

LEPIDOPTERA.

ORTHOPTERA.

RHYNCOTA.

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.

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

Articles that require ILLUSTRATIONS are inserted on condition that the AUTHOR defrays the cost of the illustrations.

TO OUR READERS.—Short Collecting Notes and Current Notes. Please, Early.—Eds.

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.

Urgently Wanted for Experimental Purposes.—Pupae of *hirtaria* and *lapponaria*. I can offer duplicates of very many species in return.—*Harold B. Williams, Croft Point, Bramley, Surrey.*

Duplicates.—Very fine Kent Argus (Aegon), race now extinct. *Desiderata.*—Many and various British Butterflies in perfect condition with date.—*J. Antony Thompson, F.R.E.S., Thos School, Colwyn Bay.*

Duplicates.—Erebia manto ssp. constans f. gnathene. Mostly ♂♂, Mont Dore, Central France. *Desiderata.*—Erebia manto, Austrian. Erebia lefebrei, L. or Scandinavian Erebiae.—*H. G. Harris, 5 Archer's Road, Southampton.*

Duplicates.—Exotic—Ornithoptera trojana ♂, var. regis ♂♀, brookianus ♂♀. joiceyi ♂; Papilio ulysses, var. telegonus, hoppo, tobori, homerus, antenor, triopas ♂♀. *Desiderata.*—Ornithoptera tithonus, Clotildae cubana, Argynnis diana ♂♀, Papilio schmeltzi ♂♀. British Gros. v. varleyata, Pub. and other vars. Diurnals. Callithaea degaddii. Santarem from Amazon River. —*W. Dannatt, 96 Guibal Road, Burnt Ash, London, S.E.12.*

Duplicates.—Several thousand British Macro-Lepidoptera in perfect condition; full data. *Desiderata.*—British Micro-Lepidoptera in similar condition.—*S. C. S. Brown, Kingsholme, 454 Christchurch Road, Boscombe, Bournemouth.*

Duplicates.—P. brassicae,* Rapae,* Sinapis (Irish), Croceus, Rhamni, Argiolus, Coridon, Bellargus, Paphia, Aglaia, Cardui, Atalanta,* Io,* Galathea, Semele, Tages, Malvae, Sylvestris, Venata, Vinula,* Bucephala,* Similis,* Perla, Muralis, Ochroleuca, Flavicincta, Bipunctaria, Ochrearia,, etc. *Desiderata.*—Numerous, black pins, data.—*L. H. Bonaparte Wyse, 53 Victoria Road, Shoreham-by-Sea.*

MEETINGS OF SOCIETIES.

WAR-TIME ARRANGEMENTS.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON : 41 Queen's Gate, S.W.7. —6th December, 5 p.m.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. —Second Saturday of each month (up to March 1940) at Chapter House Hall, St Thomas Street, S.E.1, at 2 p.m. for 2.30. *Hon. Sec., S. N. A. Jacobs*, Ditchling, Hayes Lane, Bromley, Kent.

THE LONDON NATURAL HISTORY SOCIETY.—Fixtures as printed in current syllabus cancelled. Members will be notified of further arrangements by the end of the year. *Hon. Sec., A. B. Hornblower*, 91 Queen's Road, Buckhurst Hill, Essex.

ENTOMOLOGICAL SECTION, BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—Details not yet received. *Hon. Sec., P. Siviter-Smith*, " Squirrels," Little Aston Park, Streetly, Staffs.

SOCIETY FOR BRITISH ENTOMOLOGY.—All meetings suspended till further notice. *Hon. Sec., E. Rivenhall Goffe*, 102 High Street, Southampton.

Communications have been received from or have been promised by T. Bainbrigge Fletcher, A. J. Wightman, W. P. Curtis, Dr M. Burr, H. Willoughby-Ellis, Wm. Fassnidge, E. Ernest Green, A. J. Bowes (plate), Dr H. G. Harris (plate), A. H. Hamm, M. Niblett, E. P. Wiltshire.

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

Printed by T. Buncle & Co. Ltd., Arbroath.

Subscriptions for Vol. 52 (1940) are now due.

Vol. LII.

No. 2

FEBRUARY 1940.

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

CONTENTS.

Subscription for Complete Volume, post free
TEN SHILLINGS,
to *The Hon. Treasurer*, H. W. ANDREWS, F.R.E.S.,
6 Footscray Road, Eltham, S.E.9.

This number, Price ONE SHILLING AND SIXPENCE (net).

GALL-CAUSING TRYPETIDAE.

By M. Niblett.

The *Trypetidae* are a family of Acalyptrate Muscids of which there are about 300 species known to occur in the Palaearctic Region. Of these a comparatively small number are responsible for the production of plant-galls. The galls are to be found in the flower-heads, the stems, and upon the roots or root-stocks of plants of the *Compositae*, and I propose to deal with them in that order, referring firstly to species definitely known to occur in Britain, following with some remarks on doubtful British species and species unrecorded here, which may possibly occur owing to their host-plants being indigenous.

Taking first the species causing galls in the flower-heads of Thistles, we have *Euribia stylata*, Fab., and *E. solstitialis*, L., and perhaps I had better at this point try and explain the great confusion which has arisen in connection with the host-plant of the latter species, and others with which it has been confounded. *Euribia solstitialis* is the causer of hard woody galls in the flower-heads of *Cnicus lanceolatus*, Willd., and of those of *Carduus nutans*, L. The species which has for many years been known in this country and on the Continent as *solstitialis* and which makes galls in the flower-heads of *Centaurea nigra*, L., is *Euribia jaceana*, Hering. Another species with which it has also been confused, but perhaps in a lesser degree, is *Euribia cuspidata*, Mg., also a *Centaurea* species. It is also probable that *E. stylata* has been mistaken for it at times. There is not a shadow of doubt that all records of *solstitialis* from *Centaurea* species are definitely wrong, whether made in this country or on the Continent, it being confined to Thistles.

E. solstitialis is apparently not uncommon in the Oxford district, and a few odd specimens have been recorded from Cambridgeshire and Hampshire; I have collected galled Thistle-heads from many localities in Surrey, Kent, Hampshire, and the Isle of Wight, but none have yet yielded this insect.

E. stylata galls may be found in the flower-heads of *Carduus nutans*, *Cnicus lanceolatus*, and more rarely in those of *Cnicus arvensis*, Hoffm. They may be found from late summer onwards, the fly emerging from the beginning of June until early July; 2nd June and 11th July are the earliest and latest dates I have had this insect emerge. Parasites do not seem to attack this species to any great extent. I have bred in all 264 specimens of *stylata* and only 26 Chalcids. In addition I bred this year (1939), for the first time, Braconids from *stylata* galls. The wing-markings of *stylata* are not very intense but show a considerable amount of variation; Mr H. W. Andrews (1) has pointed out some of the more constant types.

The larvae of *Euribia cuspidata*, Mg., inhabit hard galls in the flower-heads of *Centaurea scabiosa*, L., which may be looked for from August onwards. The only recorded locality for this species as far as I have been able to ascertain is the Devil's Ditch near Newmarket, and from galled heads kindly collected there for me by Mr J. E. Collin I had the fly emerge from 23rd June to 9th July. The percentage was very low. I had about 100 galls and from these I only bred 30 specimens of *cuspidata*; Chalcids emerged to the number of 131, and

Braconids 3. I have had thousands of flower-heads of *C. scabiosa* through my hands during the past few years from numerous localities in Surrey, several in Kent and the Isle of Wight, but not one of them has yielded this gall, but in August this year (1939) I was fortunate in discovering a few galled flower-heads near Beachy Head, Eastbourne, Sussex.

The galls of *Euribia jaceana*, Hering, occur in the flower-heads of *Centaurea nigra*, L.; on the Continent *Centaurea jacea*, L., is, I believe, the more usual host plant. It is of very common occurrence in the southern half of England, it is fairly plentiful in Ireland, not quite so plentiful in Wales, but of its distribution in northern England and Scotland I have no definite knowledge. The gall is very hard when mature and varies in size according to the number of larvae occupying the flower-head. There appears to be some difference between the insects occurring here and those on the Continent, but it is rather variable, and it would be necessary to compare long series from here and abroad before one could decide whether there were definite and permanent differences. The galls may be found from August onwards, the majority of the flies emerging in the following June. I have had a few emerge in May on several occasions and also at times as late as 21st July. The larvae are frequently heavily parasitized by Chalcids, one species, *Eurytoma curta*, Wlk., being the cause of premature pupation of the larva. I have bred in all 560 specimens of *E. jaceana* during the past eleven years and from the same galls 260 Chalcids emerged.

Myopites blotii, Breb., causes the formation of hard galls in the flower-heads of *Pulicaria dysenterica*, L. There are Continental records of it occurring on several species of *Inula*, but as far as I know there are no British records of it on *Inula*. It appears to be confined to coastal districts. I have searched large areas of Fleabane in Surrey, Kent, and Hampshire, but have failed to find any galls. It occurs in various parts of the Isle of Wight; I have had galls from Sandown, Shalfleet, Yarmouth and Ningwood; they may be found from August onwards, the flies emerging from the beginning of July to the beginning of August.

The larvae of this species are attacked by Chalcids, but I have found the number of *blotii* emerging far in excess of that of the parasites. From galled flower-heads of *Inula crithmoides*, L., I bred a number of Trypetids which were thought to be *Myopites longirostris*, Lw. I sent some of the flies to Dr Hering, who very kindly compared them with the Loew type of *longirostris* in the Berlin Zoological Museum; they proved not to be this species, but *Myopites exima*, Séguy.

Dr Hering stated: "The true *longirostris* has very narrow fasciae; the last fasciae at the apex of the wing are much narrower than the hyaline interspaces."

Séguy's description of this species is as follows:—Near (excepting in the wings) to *Myopites longirostris*, it differs in the scutellum being widely blackened at the base, in the mesopleura with black region more extended, in the abdomen with the black lateral bands wider, projecting over the tergite, etc.—Length 3 mm.

From the galled flower-heads collected in early August the flies emerged from 18th August to 16th September accompanied by a few

Chalcids. On 30th June and 24th July of the following year another series of the flies emerged from the same galls.

Several Ichneumons emerged from these flower-heads in August, but as there were also Lepidopterous larvae in them it is probable that these were the hosts.

Myopites longirostris, Lw. (*fraxenfeldi*, Sch.) has been recorded as British; its larvae inhabit similar galls formed in the receptacle of the flowers of *Inula crithmoides* and *Pulicaria dysenterica*. It may prove that many specimens which have been recorded as *longirostris* may turn out to be *exima*. Séguy refers to *longirostris* as a Southern European species.

Sphenella marginata, Fall., causes a swelling of the flower-heads of various species of *Senecio*, without producing a woody gall as in the species previously mentioned. I have found these galls on *Senecio aquaticus*, Hill., *S. erucifolius*, L., *S. jacobaea*, L., and *S. vulgaris*, L. The swelling is more pronounced on the last mentioned species, or perhaps more noticeable. The galled heads may be found in July, August, and September. My experience is that the majority of the flies emerge in August or early September, but I have had them emerge as late as 1st October. I do not think that there is a second brood, although there is that possibility in a favourable season. They hibernate in the adult stage.

I have found this to be a rather local species, but usually plentiful where it does occur. I have found its galls in 14 localities in Surrey, including Woldingham, Boxhill, Epsom Downs, Bookham and Abrook Commons; also in the Isle of Wight.

I have bred few Chalcids from this species, but the Braconid *Microbracon variator*, Nees., has emerged in some numbers.

Noeéta pupillata, Fäll., causes a considerable swelling of the flower-heads of *Hieracium* spp. This again is a rather local species; I have found it in 7 localities in Surrey, and also in some numbers at Setley Plain and Brockenhurst in Hampshire. The life-history of this species is rather peculiar and requires more study to work it out fully. I have collected galls in July with larvae only in them from which the flies have emerged later in the month; others in August, the flies emerging in September and the following May; again in September from which they emerged in April; from October galls the flies emerged in November and May; and some found in November gave the flies in May. I have found galls in August and October containing empty puparia, and larvae, from which the insects emerged in May. Also galls with both larvae and pupae in them; from those found in July the flies came out later in the month, while from those found in August they emerged in August, September, and the following May. It would appear that at times eggs are deposited in flowers already containing larvae, though why this should be when there were plenty of untenanted flowers available I fail to understand. I certainly think this species is double-brooded, but the rather peculiar times of its emergences as I have just described are, to say the least, curious. I have bred very few parasites from *pupillata* galls; I have had 166 flies emerge, with 6 Chalcids and 1 Braconid, *Microbracon variator*.

Of the stem-galling species *Euribia cardui*, L., is undoubtedly the most well known, its galls upon the stems of *Cnicus arvensis*, Hoffm.,

being a comparatively common object in Surrey, and no doubt in many other districts, although correspondents in the Midlands have told me that they have been unable to find this gall. There is an old Continental record of it occurring on the stem of *C. lanceolatus*. This may be true but I fancy unique; I have searched regularly for years in localities where the galls are plentiful and both species of Thistles grow in close proximity, but *arvensis* was the only species ever found with galls on it. I have found these galls in some twenty odd localities but it appears that Thistles growing in moist situations are more subject to attack than those in drier. The flies emerge in May, June, and July, the majority in June. I have not bred a great number of these flies and Chalcids have emerged in about equal numbers. The galls may be found from July onwards and when mature become very hard.

Campiglossa grandinata, Rond., causes a swelling of the stem of *Solidago virga-aurea*, L. I have not yet succeeded in finding it and know of no recent records of the insect having been taken.

Oxyna parietina, L., another stem-galling species, has not as far as I am aware been recorded of recent years; the galls are recorded as occuring upon the stems of *Artemisia absinthium*, L., *A. campestris*, L., and *A. vulgaris*, L. The fly was recorded as having been taken by Mr H. Audcent (2) in the Bristol district, also at Brockley Combe in June 1921, and at Berrow in August 1924. Both the latter localities are in Somerset.

There are three species of Trypetids recorded for Britain, which cause galls on the roots or root-stock; none of these appear to be common.

The galls of *Oxyna flavipennis*, Lw., are more or less round in shape, about 12 mm. in diameter and of the consistency of a potato. They occur upon the roots of *Achillea millefolium*, L. I have found a few during the past few years in the Epsom district, and Mr H. J. Burkill has found them at Fetcham and Limpsfield. The fly was recorded as occurring at St Merryn in Cornwall (3) in 1904 and 1911 in considerable numbers; also at Hallen in Gloucestershire in 1929, and Moreton in Somerset in 1933, in June and July respectively (2). I have had no success in breeding this insect from the few galls I have found, the only emergence being a Chalcid in June. I am rather puzzled about the emergence time of this insect. Several galls I found in November, which had every appearance of being fresh galls of the year, had emergence holes in them and empty puparia inside, which makes it look as though the fly emerged in the autumn and hibernated as an adult.

Oxyna nebulosa, Wied., I have never found, nor do I know of any record of its galls. These occur upon the root-stock of *Chrysanthemum leucanthemum*, L. Mr Audcent (2) records the fly as having been taken at Wells, in Somerset.

Ditricha guttularis, Mg., is another very elusive species. The gall occurs upon the root or stem-base of *Achillea millefolium*, L. I found upon one occasion what I thought was probably a gall of this species, but no insect emerged from it. The fly has been recorded from several localities in Somerset and Gloucestershire from 1921 to 1929 (2).

Tephritis formosa, Lw., has been recorded as a British species, but I know of no recent record. The larvae inhabit slightly swollen flowers of *Sonchus oleraceus*, L.

Tephritis conura, Lw., is another species of which I think there are no recent records. It causes a gall in the flower-heads of *Cnicus palustris* and *C. lanceolatus*.

There are several species of gall-causing *Trypetidae* found on the Continent whose larvae inhabit plants indigenous to Britain, which may occur here and have perhaps been overlooked.

Euribia eriolepidis, Lw., is the cause of a hard gall in the flower-head of *Cnicus eriophorus*, Roth.

Euribia stigma, Lw., is recorded as galling the flower-heads of *Anthemis cotula*, L., *A. arvensis*, L., and *Chrysanthemum leucanthemum*, L.

Tephritis dilacerata, Lw., causes a slight swelling of the flower-head of *Sonchus oleraceus*, L.

Tephritis ruralis, Lw., is the cause of a hard gall in the flower-head of *Hieracium pilosella*, L.

It is not a difficult matter to breed Trypetids from their galls; it is of course advisable to take the galls when the larvae are well-grown, if possible. Stem and root-galls should not be allowed to dry out entirely, but with flower-head galls it does not seem to matter how dry and hard they get; if the latter when collected are green or wet, it is advisable to place them in a cardboard box or a paper bag, rather than a tin or jar, for a time at least, otherwise there is a probability that mildew will become a nuisance.

REFERENCES.

(1) Andrews, H. W. 1938. *Entomologist's Record.*
(2) Audcent, H. 1933. *Proc. Bristol Nat. Soc.*
(3) Collin, J. E. 1915. *Entomologist's Record.*

NEW GENERIC NAMES FOR MICROLEPIDOPTERA.

By T. Bainbrigge Fletcher, R.N., F.R.E.S., F.L.S., F.Z.S.

The publication of Dr Neave's *Nomenclator Zoologicus* has brought into prominence the cases of several Microlepidopterous genonyms, which are invalid as being homonyms and some of which I had already noted for execution. New generic names are required and are now given, as follows:—

Cartericella (Gelechiadae) for *Carterica*, Meyrick, Wytsm. Gen. Ins., fasc. 184, p. 223 (1926), type *phthoneropa*, Meyr., nec *Carterica*, Thomson, Essai Class. Cerambyc., p. 19 (1860) (Coleoptera).

Clysiana (Phaloniadae) for *Clysia*, Hübner, Verz., p. 409 (1826), type *ambiguella*, Hb., nec *Clysia*, Leach, Journ. de Phys., lxxxv, 69 (1817) (Crustacea).

Coloptilia (Gelechiadae) for *Colopteryx*, Hofmann, Iris, x, 239 (1897), type *conchylidella*, Hofmann, nec *Colopteryx*, Ridgeway, Proc. U.S. Nat. Mus., x, 519 (1888) (Aves).

Cophomantella (Gelechiadae) for *Cophomantis*, Meyrick, Wytsm. Gen. Ins., fasc. 184, p. 242 (1926), type *elaphopis*, Meyr., nec *Cophomantis*, Peters, Monats. Ber. Akad. Wiss. Berlin, 1870, p. 650 (Amphibia).

Cymatoplicella (Gelechiadae) for *Cymatoplex*, Meyrick, Wytsm. Gen. Ins., fasc. 184, p. 223 (1926), type *aestuosa*, Meyr., nec *Cymatoplex*, Turner, Proc. Linn. Soc. N.S.W., xxxv, pp. 561, 576 (1910) (Lep. Geom.).

Dactylethrella (Gelechiadae) for *Dactylethra*, Meyrick, Bombay N.H. Soc. Jl., xvii, 153 (1906), type *candida*, Stainton, nec *Dactylethra*, Brandt, Prodr. Anim. Mertens, i, 45 (1835) (Echin.).

Dolophrosynella (Schreckensteiniadae) for *Dolophrosyne*, Durrant, Novit. Zool., xxvi, 120-121 (1919), type *balteata*, Durrant, nec *Dolophrosyne*, Prout, Novit. Zool., xxv, 403 (1918) (Lep. Dioptidae).

Eupolella (Gelechiadae) for *Eupolis*, Meyrick, Exot. Micr., ii, 625 (1923), type *stagnota*, Wlsm., nec *Eupolis*, Cambridge, Proc. Dorset Field Club, xxi, 26 (1900) (Arachn.).

Glaucostolella (Tineidae) for *Glaucostola*, Meyrick, Ann. S. Afr. Mus., xxiii, 344 (1926), type *oxyteles*, Meyr., nec *Glaucostola*, Hampson, Cat. Phal., iii, 87 (1901) (Lep. Arctiadae).

Hyperdasysella (Diplosaridae) for *Hyperdasys*, Walsingham, Faun. Hawaii, i, 640 (1907), type *cryptogamiellus*, Wlsm., nec *Hyperdasys*, Butler, A.M.N.H. (6), viii, pp. 71, 74 (1891) (Lep. Noctuidae).

Leucogoniella (Gelechiadae) for *Leucogonia*, Meyrick, Exot. Micr., iii, 504 (1929), type *subsimella*, Clemens, nec *Leucogonia*, Hampson, Cat. Phal., ix, 446 (1910) (Lep. Phalaenoididae).

Nastocerella (Gelechiadae) for *Nastoceras*, Chrétien, Oberth. Et. Lep. comp., xix, 364, figs. (1922), type *colluellum*, Chrétien, nec *Nastoceras*, Fairmaire, Ann. S.E. Belg., xli, 391 (1897) (Coleoptera).

Nesophylacella (Tineidae) for *Nesophylax*, Meyrick, Exot. Micr., iii, 320 (1926), type *xanthoschema*, Meyr., nec *Nesophylax*, Murphy, Amer. Mus. Novit., No. 124, p. 5 (1924) (Aves).

Ocnophilella (Tineidae) for *Ocnophila*, Meyrick, Ann. S. Afr. Mus., xxiii, 345 (1926), type *autocrypta*, Meyrick, nec *Ocnophila*, Brunner, in Brunner and Redtenbacher, Ins.-Fam. Phasm., pp. 303, 309 (1907) (Phasmoida).

Orthochthella (Lyonetiadae) for *Orthochtha*, Meyrick, Exot. Micr., iii, 399 (1928), type *hermatias*, Meyrick, nec *Orthochtha*, Karsch, Berlin Ent. Zts., xxxvi, 177 (note) (1891) (Orthoptera: Acrid.).

Palaeomystella (Cosmopterygidae) for *Palaeomystis*, Meyrick, Exot. Micr., iv, 55 (1931), type *chalcopeda*, Meyrick, nec *Palaeomystis*, Warren, Novit. Zool., i, 379-380 (1894) (Lep. Geometr.).

Temeluchella (Epermeniadae) for *Temelucha*, Meyrick, Ann. Transv. Mus., ii, 25 (1909), type *xeropa*, Meyr., nec *Temelucha*, Förster, Verh. Ver. Rheinlande, xxv, 148 (1868) (Hym. Ichneumon.).

Thalamarchella (Cryptophasidae) for *Thalamarchis*, Meyrick, Proc. Linn. Soc. N.S.W., xxix, 435 (1904), type *alveola*, Felder, nec *Thalamarchis*, Meyrick, T.E.S., 1897, 80-81 (1897) (Lep. Crambidae).

†**Tineitella** (Tineidae?) for *Tineites*, Kawall, Bull. Soc. Mosc., li, ii, 171-172 (1876), type *crystalli*, Kawall, fossil " in Bergkrystall," nec *Tineites*, Germar, in Münster, Beitr. Petref., v, 88 (1842) (Ephemeroptera: *Note.*—Sherborn (*Index Anim.*) has this as " Lep.").

I note that *Gaphara* (?Gelechiadae), Walker, Cat., xxix, 794 (1864), type *recitatella*, Wlk., was praeoccupied by *Gaphara*, Walker, T.E.S. (3), i, 96 (1862) (Noctuidae); but, as *Gaphara recitatella* remains undetermined, it seems premature to rename *Gaphara*, Wlk. 1864, as this may prove to be a mere synonym.

Several other praeoccupied genonyms do not require to be renamed, having already been sunk as synonyms of other names, and until such are removed from synonymy it seems unnecessary to consider neonyms for them: our lists are already over-full of unnecessary synonyms given to replace invalid but unwanted names.

Other invalid names, bestowed by living authors, will doubtless be renamed by them. Dr H. G. Amsel has informed me (*in litt.*, 17.viii.39) that he has renamed (?has published) as *Chionellidea* his genonym *Chionella*, Amsel 1935, nec Jeffreys 1840.

In the above new names I have deliberately chosen names near to those replaced and usually only differing in the termination—*ella* in the case of Tineina, not to save myself trouble but to avoid unnecessary cross-references to future workers.

Whilst every author has an undoubted right to bestow any name that he pleases, I would suggest to the consideration of future workers that it is undesirable to employ combinations, containing well-known names, in groups other than those to which such well-known names belong. *Cophomantis* (doubly employed in Amphibia and Lepidoptera), *Hieromantis* and *Cuphomantis* might be expected to belong to the Mantodea, and *Callicopris*, already used in Microlepidoptera, might well have been left for Coleoptera (Coprinae). Some other such names in Microlepidoptera are *Callicerastis*, *Syncerastis*, *Antipolistes*, *Leucophasma*, *Microlimax* and perhaps *Argyrocorys* and *Lepidechidna*.

COLLECTING NOTES.

Notes from Hastings, 1939.—I again spent my holiday at Hastings (August 19-September 3) and as usual, owing to my indisposition, White Rock Gardens' Bowls Tournament was my daily venue. The weather was all that could be desired, bright and warm. Instead of the abundance of *Colias croceus* of 1938, not one was seen the whole of the time; instead, another immigrant, *P. cardui*, was extremely abundant visiting the various patches of purple Statices. It was not unusual to count over a dozen at one time on a single patch about 2 feet square. There were perhaps a score of such patches, so it can be judged the numbers present. Only one *P. atalanta* was seen, a fair number of *V. urticae* and Pierids. The other colour varieties of Statices were very little visited; the purple var. was the chief attraction.—A. H. Hamm, 22 Southfield Road, Oxford.

Miana versicolor, Bkh., in the Inner Hebrides.—I have just noticed with some interest that Dr E. A. Cockayne has exhibited a Forest of Dean specimen of *Miana versicolor* at the July meeting of the South London Entomological and Natural History Society. In July 1936, as already recorded in the Proceedings of the University of Durham Philosophical Society (Vol. x, page 314), I was fortunate enough to

capture three specimens of the form *pseudolatruncula*, Heyd., at rush flowers amongst scattered pines lying along the Arish Burn just east of Inverarish, Isle of Raasay. Mr brother, Dr G. Heslop Harrison, was good enough to make the preparations of the genitalia required for these determinations. Odd examples of the same species have turned up since on Raasay, but on other islands, both in the Inner and Outer Hebrides, I have failed to detect the insect. It should, however, be added that even the common *M. strigilis* has been markedly scarcer of recent years.—Jack Heslop Harrison, Gavarnie, Birtley, Co. Durham.

Eumenis semele, L., and Maniola jurtina on the Isles of Coll and Gunna, Inner Hebrides.—During the summer of last year, to assist the researches connected with the Flora of the Inner and Outer Hebrides now in preparation by the Department of Botany, King's College, University of Durham, I camped for some time on Coll and Gunna, the latter an island about a mile long lying between Tiree and Coll. *Eumenis semele* abounded on sand dunes, heaths and machair in both, but slight differences were observable in the facies of the forms. On Coll, the insect appeared in the sharply marked, bright-looking, somewhat large guise found on Barra, Vatersay, etc., whilst on Gunna, although the colouration was much the same as in the Coll specimens, the insects were distinctly smaller. On both islands they were accompanied by crowds of *Maniola jurtina* belonging to the var. *splendida*, B.-Wht.—Jack Heslop Harrison, Gavarnie, Birtley, Co. Durham.

New Outer Hebridean Localities for Nyssia zonaria, Schiff. on the Isles of Lewis, Great Bernera, Little Bernera, Pabbay and Berneray.—My father, Professor J. W. Heslop Harrison, and brother have already reported various stations for this species on a series of islands in the Inner and Outer Hebrides. This season therefore saw me keen to emulate their success when I spent early July on Lewis and Harris and several small islands adjoining them. Of those visited, Great Bernera and Little Bernera lie west of Lewis, whilst Berneray and Pabbay may be seen on the map between Harris and North Uist. My brother has already reported *Nyssia zonaria* from Toe Head and Luskentyre sand dunes, Harris, and from North Uist. I captured larvae on all the islands named above on sand dunes and machair land. On Lewis, the insect was very common on the dunes at Valtos and Uig as well as in similar stations on Great Bernera, Little Bernera, Berneray and Pabbay, these colonies being the most northerly observed up to the present in the British Isles and in Europe. It should be noted that up to the present the whole of the Hebridean examples captured have belonged to the very small, peculiarly marked race named *atlantica* by my father. The present is a convenient occasion for stating that the records for this visit for the Isle of Scalpay should be deleted.—Jack Heslop Harrison, Gavarnie, Birtley, Co. Durham.

The Occurrence of Acronicta euphorbiae, Fab., on the Isle of Coll.—Late in August, whilst working Loch-a-Mhill Aird and its neighbours on Coll for that rare American plant, the Pipe Wort, *Eriocaulon septangulare*, I found larvae of the present species on heather on the moorlands not far away. This is the first record of the species from the Mid-Ebudes, although I have collected larvae on the Islands of

Raasay and South Rona.—Jack Heslop Harrison, Gavarnie, Birtley, Co. Durham.

Colias croceus in Hampshire, August 1939.—Three ♂♂ were seen by me at Winchester at the end of August, and twelve by Major Bridges at Southsea, including one var. *helice*. Forty fertile ova obtained from ♀♀ brought over from France failed to reach the pupa stage despite the glorious weather in September.—H. G. Harris.

A Few Notes on a Melanic Form of Thecla w-album in Essex.—Bradwell-on-Sea is a small village situated on a point between the mouth of the river Blackwater and the sea, and is noted for the Anglo-Saxon church of St Peter's-on-the-Wall, built on the site of the Roman fort of Athona by Bishop Cedd, about 650-60 A.D. In the summer of 1929, after the severe winter a few months before, while walking along the sea wall near St Peter's Church, we saw the tragic sight of hundreds of skeletons of water fowl, and other birds of many different kinds, which the spring tide had washed up to the bottom of the sea wall. These birds had starved to death during the severe weather, owing to the surf freezing over so that they could not obtain any food. The family who lived in the only cottage on that lonely coast told us that they went out several times and broke the ice for the birds, but it was of no use, for the water froze over again too quickly. As in the case of other parts of the Essex coast, there is a wide stretch of mud, intersected by channels of water between the shore and the sea, and here the birds feed.

Several years ago, in 1935, while visiting Bradwell, I saw a small dark butterfly fly past me very quickly, and then another, and, having no net with me, could not catch one to see to what species they belonged, but a little later I saw several at rest upon thistles, etc., and they proved to be *T. w-album*, but rather smaller and much darker than the specimens which I have in my cabinet from Hazeleigh, Essex, bred by the late Rev. G. H. Raynor, and also some specimens from Lincolnshire. The next year, 1936, I did not visit the spot, but in 1937 I did so, and saw them in abundance, some in good condition, and some rather worn. At one sweep of the net I took five specimens, and all these were dark in colour as in the first year. In 1938 (a very erratic season regarding weather) they were very scarce; I only saw three or four, but these were all dark in colour as before. Last year, 1939, they were rather more plentiful, but still somewhat scarce, and all were dark ones. For four years (five years since the first one was seen) I have been watching them, and have come to the conclusion that they are a colony of very dark colour, almost black, instead of the usual olive brown. It is very interesting, because it seems to illustrate the late Mr J. W. Tutt's theory in his " Melanism and Melanochroism in British Lepidoptera " that a humid atmosphere is chiefly the cause of melanism in lepidoptera. The position where these insects exist is a very bleak one, and fully exposed to the N.E. and E. winds, and the sea lies on one side, East, and a wide river runs inland along the North side. People who live there say that they have a lot of fogs and it is very cold in winter, yet these little butterflies may have existed there for a very long time for them to have established such a change in colour. I have never yet seen a

specimen of the olive brown colour there. All are dark, almost black, with the usual markings, but rather smaller in size.—(Miss) M. E. Miller, " The Croft," Ramsford Lane, Chelmsford.

Notes on the Eclosion of Agrotis ripae from the Pupa-case.—The following remarks on *A. ripae* may tend to confirm Mr Allan's suggestion of the use of the bottle-neck in the cocoon of *Saturnia pavonia* in splitting the pupa-case, if anyone thinks confirmation is necessary. Early in May I have been unable to suppress my curiosity to see how my larvae of *A. ripae* have fared, and so removed the sand, placing the pupae on the surface. A large number of the moths were cripples. Sometimes I would see a moth, which had managed to shake the pupa-case off its legs and body, but could not remove the parts adhering to its wings and thorax, when I would try to assist it with a pin or forceps but always with fatal results. One day a bright idea occurred to me, whereupon I lightly grasped a *ripae* in this predicament, between finger and thumb, and hastily placed it in a hole in the sand about three inches deep, covered it over and pressed down the sand. In about two minutes the moth emerged free of its pupa-case and finally developed its wings. At one time I used to give the larvae about four or five inches of sand, when the majority came to the surface in the Spring, shrivelled up and died. Now they are given ten inches and left undisturbed. In Tutt's " Practical Hints," Vol. II, p. 68, it says:—" Never remove *A. ridens* from its cocoon." Perhaps someone could say why. Does the pupa require assistance to help eclosion? I have removed *P. flavicornis* from its cocoon and obtained a perfect imago after two winters.—C. Q. Parsons (Capt.), Seaway Lane, Torquay.

New Records of Odonata.—Miss Longfield, in her book, " The Dragonflies of the British Isles," notes three species, *Aeshna juncea*, *Sympetrum danae*, and *Enallagma cyathigerum*, as occurring in Caithness. The second of these has been very common here during the last two years, but I have no definite records of the others, though I have seen some very large dragonflies and also small blue ones. I have caught two other species, *Libellula quadrimaculata* and *Pyrrhosoma nymphula*. The former, of which I caught a specimen on 12th June 1938, occurs occasionally on Keiss Moors. *P. nymphula*, on the other hand, occurs in abundance every year. In April 1939 I found larvae, probably of this species, in considerable numbers in pools on the moors.—Sinclair Swanson, Keiss Village, Wick, Caithness.

Pairing of Odynerus parietum.—On 9th June of last year I found several cells of this Mason Wasp and, on opening these, I found fully developed imagines inside. The following day I placed two ♀♀ and a ♂ on a window-pane. The ♂ ran around eagerly and, on finding one of the ♀♀, paired with it. The pairing lasted less than two minutes and about a minute afterwards the ♂ paired with the second ♀. This pairing lasted a similar period. Unfortunately, I had no more ♀♀ available, or I would have continued the experiment.—Sinclair Swanson, Keiss Village, Wick, Caithness.

Sirex gigas in Caithness.—The county of Ross has been considered as the Northern limit of this Wood Wasp, but there are several records

of its occurrence in Caithness. My mother caught one inside our house on 25th July 1938, and the year before two others were caught at Keiss. There are also a good number of records of its capture in other parts of the county.—Sinclair Swanson, Keiss Village, Wick, Caithness.

CURRENT NOTES.

Early Notes Wanted.—It would be interesting if readers will report on emergences of common beasties after the severe weather we have had this winter. In Cheam, for instance, I understand that 25 degrees of frost were recorded, the lowest ever known in this district. Not only the date after the break-up of the frost but the effect on the abundance or scarcity of many species is interesting to know. One correspondent writes wondering how the bad weather will affect things like *w-album*. What will tree-trunk search give us in these early weeks after the thaw? Emergences will doubtless be sudden and of brief duration and not spread over weeks as it often does in ordinary years with normal variation in temperature.

The second volume of the Proceedings of the VIIth Congress for Entomology held in Berlin in 1938 has just come to hand. Some months ago the first volume was referred to in this magazine and one or two papers therein were noticed. This volume consisted of 617 pp., 29 plts., and 163 text figures. The present volume consists of 807 pp., 133 plts., and 190 text figures. Some of the plates are coloured. But these volumes do not complete the record of the Congress for there are three further volumes to be issued, one of which is, we understand, already in type. This is really colossal. In the first volume 50 papers presented to the Congress were printed and in the second volume 70 papers were printed. Systematics had 37 papers; Nomenclature and Bibliography had 13 papers; Morphology, Physiology and Embryology had 35 papers; Genetics had 2 papers; Oecology had 30 papers; and 3 additional papers on Systematics. Probably some of our readers may briefly summarize papers in which they may be interested. It will be remembered that Dr Burr has already dealt shortly with one or two of those papers relating to Orthoptera in the first volume.

While listening to the Address at the Annual Meeting of the South London Entomological Society given by its retiring President in January, we were impressed by the very strong evidence that there was still a deal of study and observation to be carried on, even when dealing with the well-worked Order, the Lepidoptera. Dr Williams' subject was "The Genus Gonepteryx," simple enough subject it was thought, but it was soon shown that it was not so, and that our knowledge of it was very superficial. Having made a large number of figures illustrating the principal species and forms, of which he had listed some 80, the President dealt with each in turn, and emphasised the difficulty of correct identification. His remarks on the nomenclature were very caustic and he strongly doubted the evidence, if any, of second and third broods in the genus. There was a considerable exhibit of specimens from the collections of himself and his friends.

A point of nomenclature mentioned in the Annual Address to the South London Entomological Society was the application of the words *secunda*, *tertia*, etc., as varietal names to 2nd and 3rd broods, etc. The President would have all such to be invalid. It seems that to apply names in such cases only increases the burden for the memory. It would be much more suitable and informative to put an indication such as " gen. I," " gen. II," etc., rather than an aberrational name or even a numerical name. We already use " aest. gen.," etc., although frequently add an aberrational name; in such case, only a duplication and quite unnecessary.

The chair of the Royal Entomological Society will be held for the next two years by Dr K. G. Blair. A good choice for the Society and we congratulate both the President and the Society.

The South London Entomological and Nat. Hist. Society has chosen our colleague on the *Ent. Record* panel, Dr E. A. Cockayne, D.M., F.R.E.S., F.R.C.P., as its President for the ensuing year. Here again we offer our hearty congratulations to both the Society and the new President.

The Royal Entomological Society has issued Part 6 of " Generic Names of British Insects " prepared by the Committee on Nomenclature. " The Generic Names of British *Carabidae* with a check list of the British species." There is an interesting note on the List from Mr H. E. Andrewes, F.R.E.S., the well-known specialist on this family.

The Society for British Entomology coutinues the regularity of its issues. Part 1 of Vol. II of the Journal appeared in November and consisted of 44 pp. with 4 plates. It contains 27 separate notes in all Orders and includes a short but very interesting obituary of the late Com. J. J. Walker, by Dr Hobby. Parts 5, 6 and 7 of Vol. VI of the Transactions were issued at the same time. Part 5: " Insects associated with cultivated forms of *Rubus*," by G. H. L. Dicker, of E. Malling. Part 6: " The occurrence of Spermatophores and their measurements in some British Lepidoptera," by J. L. Williams. Part 7: " An Ecological Survey of Water-bugs of the British Isles," by Rev. E. J. Pearce and G. A. Walton.

The Entomological Society of Ontario has recently published the " General Index to the 38 (1900-37) Annual Reports of the Society," prepared by C. E. Petch, of the Dominion Entomological Laboratory. This was a big, but necessary, task.

We have received a sample copy of a new series of low-priced pamphlets entitled " Simple Science in Simple Language," published by the Oxford University Press, " The Plague of Locusts," by Malcolm Burr, D.Sc., F.R.E.S. It consists of 52 pp. with a considerable number of small illustrations. The name of the author is sufficient to guarantee that the matter is correct and to the point. The price is eightpence.

The Names and Forms to be considered:—

munda, Schiff. (1775), *Verz.*, 76.
munda, Esp. (1781?), *Abbild.*, III, 264, plt. 52, 5-6. *Bombyc.* IV, 705.
munda, Fab., *Mant.*, II, 147 (1787).
gemina, Bork. (1792), *Naturg.*, IV, 705 (*gem.*), 603 (*munda*).
lota, Hb. (1802), *Samml. Noct.*, 166 (in error for *munda*).
ab. *geminatus* (1803), *Lep. Brit.*, 121.
ab. *bimaculatus* (1803), *l.c.*
lota, Dup. (1826), *Hist. Nat.* (error copied from Hb.), VI, iii, plt. 80, 3 (*munda*).
ab. *immaculata*, Stdgr. (1871), *Cat.*, II ed., 114.
ab. *pallida*, Tutt (1892), *Brit. Noct.*, II, 135.
ab. *grisea*, Tutt (1892), *l.c.*
ab. *rufa*, Tutt (1892), *l.c.*
ab. *striata*, Tutt (1892), *l.c.*
ab. *immaculata-pallida*, Tutt (1892), *l.c.*
ab. *bimaculatus-pallida*, Tutt (1892), *l.c.*
ab. *geminatus-pallida*, Tutt (1892), *l.c.*
ab. *immaculata-grisea*, Tutt (1892), *l.c.*
ab. *bimaculatus-grisea*, Tutt (1892), *l.c.*
ab. *geminatus-grisea*, Tutt (1892), *l.c.*
ab. *immaculata-rufa*, Tutt (1892), *l.c.*
ab. *bimaculatus-rufa*, Tutt (1892), *l.c.*
ab. *geminatus-rufa*, Tutt (1892), *l.c.*
ab. *vittata*, Splr. (1908), *Schm. Eur.*, I, 241.
f. or ssp. *picata*, Bng.-H. (1922), *Iris.*, XXVI, 156.
ab. *kammeli*, Rbl. (1922), *Verh. z. b. Ver. Wien.*, LXXII (96).
ab. *obscura*, Lenz. (1927), *Ostheld. Schm. Sudbay.*, II (2), 332.
ab. *fasciata*, Lenz. (1927), *l.c.*
ab. *obsolescens*, Lenz. (1927), *l.c.*

Tutt dealt with (1) Esper's figure as the type, (2) the *bimaculatus* of Haw. with two dots and indistinct transverse lines, (3) *geminatus*, Haw. with 2 or more twin dots with distinct transverse lines, (4) *immaculata*, Stdgr., (5) ab. *pallida*, (6) ab. *grisea*, (7) ab. *rufa*, (8) (9) (10)-(11) (12) (13)-(14) (15) (16) combinations of above, (17) ab. *striata*.

ab. *vittata*, Splr., *Schm. Eur.*, I, 241.

Orig. Descrip.—" Very rarely are the marginal spots developed into wedges."

ab. *kammeli*, Rebel., *Verh. z.-b.-Ver. Wien*, LXXII (96) (1922).

Orig. Descrip.—"The ground of the forewing is strongly suffused with blackish-brown, the markings, viz., the orbicular and reniform defined by ochre-yellow, the two black spots in the marginal area very strong, the transverse lines obsolescent, the central shading quite distinct, but the fringes strongly powdered grey, with much sharper defined clear basal line. The hindwing blackish-grey, much darker than in the normal form, but the middle portion of the fringe dark grey. The hairs of the head thorax as well as the abdomen are dark grey. The underside of all the wings deep black with light brownish fringes." Near Innsbruck.

This stands near to *grisea*, Tutt, but differs in the blackish general coloration. Tutt does not mention the emphasised dark colour of the body and of the underside.

ab. *obscura*, Lenz., *Osth. Schm. Sudbay.*, II (2), 332 (1927).

Orig. Descrip.—" Dark grey." Subsp.?

ab. *fasciata*, Lenz., *Osth. Schm. Sudbay.*, II (2), 317 (1927).

Orig. Descrip.—" With the middle band and also the reniform stigma filled in dark."

ab. *obsolescens*, Lenz., *Osth. Schm. Sudbay.*, II (2), 317 (1927).

Orig. Descrip.—" All the markings more or less suppressed in the ground colour."

Taeniocampa, Gn. (1839?) (1852). Most authors [*Orthosia*, Hb. (1821), Tr., Steph.: *Monima*, Hb. (1821), Meyr., Hamp., Warr., Meyr.] *instabilis*, Fab. (1794) = *incerta*, Hufn. (1766).

Tutt correctly said that Hufnagel " really gives no description of this variable species " in the *Berlin. Mag.*, III, 298 and 424 (1766), but quotes Hufnagel's name *incerta* in brackets after Fabricius' name *instabilis*, which he used with its accompanying description (1794).

However, Rottemburg, in *Naturf.*, IX, 119 (1766), in his revision of Hufnagel, simply refers to Rosel., *Ins.-belust.*, I, 2nd Class, plt. 53 (1746-), which is a figure of *incerta* = *instabilis* undoubtedly. Thus we have *incerta*, Hufn. (1766), the prior name, in place of *instabilis*, Schiff. 1775, Fab. (1794).

Tutt, *Brit. Noct.*, II, 136 (1892): Meyr., *Handb.*, 72 (1895): Barr., *Lep. Br. Is.*, V, 209, plts. 211, 212 (1) (1899): Hamps., *Lep. Phal.*, V, 425, fig. 114 (1905): Splr., *Schm. Eur.*, I, 240, plt. 45, f. 8 ab. (1906): South, *M.B.I.*, 1, 330, plt. 157, 1-6 (1907): Warr.-Stz., *Pal. Noct.*, III, 91, plt. 22 hi. (1910): Culot, *N. et G.*, I (2), 65, plt. 50, f. 8-11 (1914): Meyr., *Rev. Hand.*, 143 (1928).

Ernst. & Engr., *Pap. d'Eur.*, VII, p. 14, f. 414 (1790), gave five figures, all good and showing different forms. 414k is perhaps the most striking; the basal half of the forewing grey with darker grey markings followed by a reddish brown band between the stigmata and completely enclosing the reniform followed by a somewhat darker grey area in which markings are more apparent. The hindwing has an extremely well-defined dark clay-coloured broad marginal band. The text admits the strong peculiarity suggesting a true species, but that the form occurs in both sexes near Frankfort.

Esper, *Abbild.*, IV, 474, plt. 147, 4 (1788?), gave a figure, which he labelled *trigutta*, but which in the text he called *instabilis*. On plate, *l.c.*, 151, fig. 2, he called *contacta* with two white lines joining the ends of the two stigmata, and fig. 3 he labelled *instabilis*: both are *instabilis*; but all three are very poor representations.

Bork., *Naturg.*, IV, 591 (1792), said that Esper's *trigutta*, *turbida* and *contacta* were *instabilis* and that he was unable to identify the figure, *Bombyx donasa*, in Esper, Vol. III, plt. 52, fig. 7, as other than a variety of *instabilis*.

Haw., *Lep. Brit.*, 120-122 (1803), gave descriptions of four forms as distinct species. The reddish tinted *nebulosus* with dark central band; the less red form with obsolescent band, *subsetaceus*, the dark reddish black, *angusta*; and the blackish hepatic brown form with markings obsolescent, *fuscatus*.

Hb., *Saml. Noct.*, fig. 165 (1803), at first glance may be taken for a *festiva* form on account of the very light basal shade.

Treit., *Schm.*, V (2), 204 (1825), noted that Esper in his text said *trigutta* was *instabilis*, as also was *cont(r)acta*. (See Esper, IV (2), 474 and 496 respectively.

Dup., *Hist. Nat.*, VI, 130, plt. 81, f. 3 (1826), gave a good figure of a dark grey form.

Steph., *Ill.*, II, 140 (1829), gave a somewhat lengthy account of the variation, but only made a slight reference to any red coloration.

Werneburg, *Beitr.*, II, 30 (1864), commented at length on the identification of Esper's *donasa*, Vol. III, Bombyces, p. 264, plt. 52, f. 7 (1785). He said that both Treit. and H.-S. cited *donasa* to *populeti*, but that that was inadmissible for (1) the presence of a row of distinct black spots on the forewing hind-margin, not present in *populeti*. (2) On the underside of the hindwing there is a row of marginal black dots, not seen in *populeti*. (3) The comparison made in the description to *munda* does not point to *populeti* but wholly to *instabilis*. (4) Finally, the figure 414 in *Pap. d'Eur.* Ernst. & Engr. have figured the same species as that of Esper, plt. 52, f. 7, and is *instabilis*. But Treit. cites fig. 414 of Ernst. & Engr. to *gracilis*, which comparison does not lean to *populeti*. The figure itself is rough and bad, but the description of this insect, " ashy-grey with reddish suffusion with obsolescent red-brown marking on the forewing, and with a row of black dots," points rather to *instabilis* than to *populeti*.

Frr., *Neu. Beitr.*, IV, p. 42, plt. 315 (1842), gave a moderately good figure. He said that Esper gave three figures of this species, named *trigutta*, *cont(r)acta*, and *instabilis* respectively, but not one was good and recognisable. He refers to the extreme variability from the palest ashy-grey to dark red-brown.

I note that Frr. spells the name *cont(r)acta*, whereas Esper labelled his figure *contacta* on the plate; the text was not published until long after the plate. Werneburg spells it *contacta*, but Hampson copied it as *contracta*. Treit. has *contracta*.

Gn., *Hist. Nat. Noct.*, V, 352 (1852), described a N. American Noctuid under the name *alia*, which he said was very near *instabilis* from which it was distinguished by its unicolorous palpi, the reddish border of the lower wings, the absence of the central shade and the more reddish tinge of all the wings. Recent authors have treated it as a good species. Holland, *Moth Book*, plt. 25, f. 3, under *Graphiphora* gave a figure certainly not *instabilis*, Hampson also gave a figure, *Lep. Phal.*, V, plt. 90, f. 29, very poor, not good enough to identify with anything.

Gn., *l.c.*, 355, described a figure of Abbot under the name *hibisci*, and placed it in the same genus, but it has been considered by more recent

authors as the same species as *alia*. Gn. said that it was very near *stabilis*.

Newman, *Brit. Moths*, 358 (1868), gave five b. and w. figures, well illustrating the extent of the variation from light to dark.

Hamp., *Lep. Phal.*, V, 427, f. 114 (1905), gave the strongly suffused rufous form with the ill-defined central band as the typical.

Splr., *Schm. Eur.*, I, 240, plt. 45, 8a, 8b (1906), gave two figures, 8a being that of the form *fuscata* of a deep tolerably glossy dark brown, more or less unicolorous with a pale outer line.

South, *M.B.I.*, I, 330, plt. 157, 1-6 (1907), summarised the variation thus: " The general colour of the forewings ranges from pale greyish brown, through various shades of greyish brown, or purplish brown; the darker greys range through slatey grey to purplish black." His figures were poorly coloured, no grey form among them. His dark red-brown is without the central shade nor has it the conspicuous pale base of the forewings of Hübner's typical (?) figure.

Warr.-Stz., *Pal. Noct.*, III, 91, plt. 22 hi (1910), gave ten good figures including figures of two newly described forms, *subcarnea* and *olivacea*, ♂ and ♀, and treated *trigutta*, Esp., and *nebulosus*, Haw., as synomyns of *incerta*.

Culot, *N. et G.*, II (1), 65, plt. 50, figs. 8-11 (1914), gave four excellent figures, but on account of the unstable variation would not identify them with any named form. Two, 8 and 9, were grey specimens, the one without and the other with the narrow dark central band and shading, the other two, 9 and 10, were red-brown forms, the last the darker of more uniform tint and might be called *fuscatus*.

Barrett describes the Variation in this species as:—

" So great and so constant that even the choice of its names or synonyms has been governed thereby! With us the very dark forms are by far the most abundant. They range from brown-black or grey-black, with or without a slaty or bluish flush through various shades of purple-brown and red-brown to deep liver colour; some almost unicolorous, in other cases having the central shade distinct and the markings tolerably definite; also every intermediate stage. These are nearly always glossy. The paler and usually scarcer forms are more divergent, but seldom glossy; grey-brown, grey-drab, reddish drab, pale drab, pale slate, even pale liver colour; sometimes as before almost unicolorous, often with a dark and conspicuous angulated central shade, often also with pretty dark streaks or spots at the back of the subterminal line, or with dark dots or streaks or lines on the nervures, or the first and second lines prettily dotted out or more distinctly shown in red-brown lines, or a leaden black spot occupies the basal half of the reniform stigma, indeed, all these characters are intermingled in every possible way."

He reports: " One specimen from S. London is yellow-brown clouded with red, all the nervures broadly dotted with black; a red-brown cloud along the costa and a smoky black one along the dorsal margin."

Also " A series of specimens from Oxford of a lovely grey colour with a delicate hoary bloom. Some of the most striking forms are from Scotland."

(1) "From Hawick of a peculiarly pale smoky-purplish-brown with the transverse lines conspicuously darker."

(2) From Dumbarton, "Of a singular dark liver-brown."

(3) From Sutherland, "Of a curious light red or pale purplish-red, with the stigmata dark, and a conspicuous pale yellow blotch before the orbicular."

(4) Another, "Neat pale grey with the transverse lines most distinctly dark grey and much toothed, the central shade being slender and reddish."

(5) Others, "Pale yellow-brown or buff, mottled with dark grey atoms, the transverse lines broad and mixed up with the mottling."

(6) Others, "Pale reddish ochreous the colour of *T. munda*."

(7) Others, "Putty coloured with a dusting of grey."

(8) From Rannoch, "One of a deep, dark, dull mouse colour."

(9) An example from the same district, "Is pale greyish-buff with the first line and central shade both conspicuously deep purple-brown, with similar blotches along the subterminal line."

(10) Another from Forres, "Is of a unicolorous pale drab with the angulated central shade intensified into a bent, thick dark purple-brown bar."

(11) One, "In which this bar is rich purple-red, almost crimson, another in which it is even more conspicuously black, and a third in which it is deep chocolate on a rich brown ground colour."

(12) Another, "Of a very pale yellow-brown with the markings hardly darker."

(13) One, "Pale yellow-grey with the nervures and markings dark grey and the subterminal line yellow."

(14) And another, "Pale yellow-brown with the hindwings quite white."

In all these almost endless modifications the peculiar broken form of the subterminal line is visible, and, but for it, there would sometimes be great difficulty in determining the species."

The Forms and Names to be considered are:—

incerta, Hufn. (1766), *Berl. Mag.*, III, 298, 424.
instabilis, Schiff. (1775), *Verz.*, 76.
instabilis, Fb. (1787), Mant., II, 146.
trigutta, Esp. (1788+), *Abbild.*, IV (2), 474, plt. 147, 4, called *instabilis* in text (1792-).
f. *contacta*, Esp., *l.c.*, p. 496, plt. 151, 2 (quoted in error as *contracta*).
instabilis, Esp., *l.c.*
instabilis, Fb. (1794), *Ent. Sys. auct.*, III (2), 44.
var. *instabilis*, Hb. (1800-3), *Samml. Noct.*, 165.
r. *nebulosus*, Haw. (1803), *Lep. Brit.*, 120.
f. *subsetaceus*, Haw., *l.c.*,=Gn. var. C., *Hist. Nat. Noct.*, I=V, 352 (1852).
f. *angustus*, Haw., *l.c.*, 122.
ab. *fuscatus*, Haw., *l.c.*
ab. *pallida*, Lampa. (1858), *Ent. Tidskr.*, 72.
ssp. *evanida*, Btlr. (1879), *A.M.N.H.*, 5 (IV), 362.
ssp. *pallida*, Stdgr. (1888), *Stett. e. Ztg.*, 32.
ab. *caerulescens*, Tutt (1892), *Br. Noct.*, II, 139 = Gn. var. B., *l.c.*

ab. *rufo-grisea*, Tutt, *l.c.*, p. 140.
ab. *unicolor-brunnea*, Tutt, *l.c.*
ab. *virgata-brunnea*, Tutt, *l.c.*
ab. *atra*, Tutt, *l.c.*, 142.
ab. *rufa*, Tutt, *l.c.*
ab. *grisea-fuscata*, Tutt, *l.c.*
ssp. *pallidior*, Stdgr. (1901), *Cat.*, IIIed., 201, to replace *pallida*, Stdgr. (1888).
r. *hibisci*, Hamp. (1905), *Lep. Phal.*, V, 431 = *alia*, Gn., an American sp.
ab. *subcarnea*, Warr. (Stz.) (1910), *Pal. Noct.*, III, 91.
ab. *olivacea*, Warr. (Stz.) (1910), *Pal. Noct.*, III, 92.
ab. *picata*, Bng. Hs. (1912), *Iris*, XXVI, 156.
ab. *fasciata*, Lenz. (1927), *Osth. Schm. Sudbay.*, II (2), 315.
ab. *melaleuca*, Lenz., *l.c.*
ab. *obscura*, Lenz., *l.c.*

Tutt dealt with (1) *instabilis*, Fab., pale whitish grey with central band. (2) *instabilis*, Hb., dark shiny red-brown, with central band still darker. (3) *instabilis*, Esp., unicolorous dark red-brown. (4) ab. *pallida*, Lampa., pale whitish grey, without the band. (5) *caerulescens*, Tutt, pale slaty-grey, with central band. (6) *nebulosus*, Haw., dark slaty-grey with reddish tint and central band. (7) *subsetaceous*, Haw., ditto, almost unicolorous. (8) *trigutta*, Esp., pale brownish or reddish-grey, with central band. (9) *rufo-grisea*, Tutt, ditto, unicolorous. (10) *virgata-brunnea*, Tutt, dark brown-grey with central band. (11) *unicolor-brunnea*, Tutt, ditto, without band. (12) *contacta*, Esp., (*contracta* in error), dull red-brown. (13) *angustus*, Haw., reddish-black, unicolorous. (14) *fuscatus*, Haw., shiny black, unicolorous. (15) *atra*, Tutt, dull sooty black, unicolorous. (16) *rufa*, Tutt. bright red, unicolorous. (17) *grisea-fuscatus*, Tutt, the black colour dusted with grey. (18) *incerta*, Hufn., referred to as the priority name.

incerta, Hufn., *Berl. Mag.*, III, 298 (1766) and 424.

Orig. Descrip.—" Either yellow-red, or ashy-grey, or red-brown with a dark white encircled reniform stigma."

" Very variable in its marking." The chameleon.

Schiff., *Verz.*, 76, Noct. L (1775). The almond tree Noctua. (Mandelbaume Eule).

Illiger, *Neu. Ausg. Verz.*, I, 229 (1801), referred 5 of Esper's figures to this species, viz., *instabilis*, plt. 151, f. 3; *trigutta*, plt. 147, f. 4; *contacta*, plt. 151, f. 2; *turbida*, plt. 151, 1; and *donasa*, Bomb., plt. 52, f. 7. He remarks that he has taken these determinations from Borkhausen, but as the figures in Esper are so bad, he is quite uncertain as to the correctness of them.

race *evanida*, Btlr., *A.M.N.H.*, (5) IV, 362 (1879).

Orig. Descrip.—" Sordid whitey brown; primaries crossed near the middle by two parallel straight dusky lines, terminating in the cell on each side of the orbicular spot; the latter is large and oblique, and touches the reniform spot, which is also large; the area enclosed between these spots is greyish brown, and the spots themselves are indicated by a dark brown outline; an indistinct zigzag discal line, beyond which

the ground colour is paler, a dark brown line edged with whitish, straight almost to the costa, and then slightly irregular, limiting the external area; a marginal series of black dots; secondaries with the disco-cellular spot and an oblique anal streak dusky; an incomplete series of blackish marginal dots; abdomen tinted with gravel yellow. Wings below whitish sericeous, irrorated with grey; primaries suffused with grey; secondaries with a black disco-cellular spot; body below testaceous." Japan. [Hamp., *Cat. Lep. Ph.*, V, 428 (1905). "Like *pallidior* but larger, the subterminal line strongly defined by rufous."]

ab. *pallida*, Stdgr. (nec Lampa.), *Stett. e. Zeit.*, 32 (1888).

Orig. Descrip.—"The Central Asiatic specimens of *incerta* are almost throughout so strikingly paler, that they are worth naming. The forewings are light grey, without all reddish or brown mixing; the darker markings are mostly more feeble than in the typical European form. The hindwings are also far lighter white-grey."

The pale specimens probably belong to the low (steppe) region.

This is *pallidior*. *pallida* is of Lampa.

ab. *pallida*, Stgr., *Stett. e. Z.*, 1888, 32 = *pallidior* (corrected).

"The forewings are light grey, without any reddish or brown suffusion; the darker markings for the most part appear more faint than in the European type form. The hindwings are also much lighter white grey."

"Much paler, forewings *albido-cinereis*, hindwings *albicantibus*" (Stgr., *Cat.*, Ed. 3, 1901, p. 201).

This name he gave apparently in ignorance of Lampa's *pallida* (1885). Subsequently in his *Cat.*, IIIed., p. 201 (1901), he redescribed and differentiated it under the name *pallidior*.

ab. *pallidior*, Stdgr., *Cat.*, IIIed., 201 (1901).

Orig. Descrip.—"Multo pallidior, al. ant. albido-cinereis, al. post. albicantibus."

ab. *subcarnea*, Warr.-Seitz, *Pal. G.-S. Noct.*, III, 91, plt. 21i.

Orig. Descrip.—"Greyish flesh colour with median and presubmarginal shades deep brown, the hindwings dull white with submarginal band and cell-spot dark."

ab. *olivacea*, Warr.-Seitz, *Pal. G.-S. Noct.*, III, 92, plt. 22i.

Orig. Descrip.—"Has the forewing ashy-grey with a strong olive flush; the median shade and the clouds before submarginal line also deeper olive; of two ♂♂ one is much more varied with olive fuscous and with the lines better marked than the other; the ♀ is wholly dark olive fuscous, with the edges of the stigmata and the submarginal line paler; in all three the reniform stigma is broader and less oblique than in typical *incerta*; the hindwing varies from pale to dark grey with an olive tinge, with dark cell-spot and whitish fringe. Hautes Pyrenees."

f. *picata*, Bng.-Hs., *Iris*, XXVI, 156 (1912).

Orig. Descrip.—"A number of specimens from the Karagai-tau diverged from the var. *pallidior*, Stdgr., so that they could not be placed under it; they are somewhat more pointed winged, not so yellowish-grey, but tolerably unicolorous pale brownish, very slightly variegated

and particularly the hindwings are clearer (somewhat as in var. *pallidior*) than in European examples."

ab. *fasciata*, Lenz., *Osth. Schm. Sudbay.*, II (2), 315 (1927).
FIG.—*l.c.*, plt. 16, 10.
ORIG. DESCRIP.—" With dark central band."

ab. *melaleuca*, Lenz., *Osth. Schm. Sudbay.*, II (2), 315 (1927).
FIG.—*l.c.*, plt. 16, 11.
ORIG. DESCRIP.—" Unicolorous brown-black with stigmata surrounded with a pale line and another paler before the margin."

ab. *obscura*, Lenz., *Osth. Schm. Sudbay.*, II (2), 315 (1927).
ORIG. DESCRIP.—" Unicolorous brown, not brown-black like *atra*."

Taeniocampa, Gn. (1839?) (1852), Barr., Stdgr., Splr., Sth., Culot, etc. [*Monima*, Hb. (1821), Meyr., Hamp., Warr., Meyr.] *opima*, Hb. (1808-9).

Tutt, *Brit. Noct.*, II, 142 (1892): Meyr., *Handb.*, 73 (1895): Barr., *Lep. Br. I.*, V, 208, plt. 210, f. 2 (1899): Hamp., *Lep. Phal.*, V, 42 (1905): Splr., *Schm. Eur.*, I, 241, plt. 45, f. 9 (1906): South, *M.B.I.*, I, 331, plt. 157, f. 9-10 (1907): Warr.-Stz., *Pal. Noct.*, III, 92, plt. 22k (1910): Culot, *N. et G.*, I (2), 66, plt. 50, f. 12 (1913): Meyr., *Rev. Handb.*, 143 (1928).

Ernst. & Engram, *Pap. d'Eur.*, VII, 15, fig. 414 g and h (1790), gave two figures quite passable, an upper and an underside: teste Wern., *Beitr.*, II, 115 (1864).

Hüb., *Samml. Noct.*, 424 (1808-9), gave a figure labelled *opima* which is really a bad representation. f. 676-7 (1818-22), labelled *firma*, is much better, but by no means good. It is recognisable as such. Gn. said neither were good (*Hist. Nat.*, V (1), 353).

H.-S., *Bearb.*, II, 205 (1849), said that the shape of Hb. 426 was wrong although colour and marking were moderately good: fig. 676, he said, was too pointed in forewings.

Gn., *Hist. Nat.*, V, 353 (1852), said *firma*, Hb., had been placed with *instabilis*, but that he considered it better here.

Newman, *Brit. Moths*, 359 (1868), gave 2 good b. and w. figures, the lighter and the darker forms.

Hamps., *Lep. Phal.*, V, 328 (1905), described 2 forms which later Strand named *griseor* and *rufo-fusca*.

Splr., *Schm. Eur.*, I, 241, plt. 45, 9 (1906), gave a very fair figure of an intermediate form.

South, *Moth. Br. I.*, I, 331, plt. 157, f. 9-10 (1907), gave two good figures, the more typical grey form and the fine form *brunnea*, Tutt.

Warr.-Stz., *Pal. Noct.*, III, 92, plt. 22k (1910), gave two figures of the pale grey form spoiled by the general ochreous brown of the plate. *Firma* and *mediolugens* were treated as synonyms.

Culot, *N. et G.*, I (2), 66, plt. 50, f. 12 (1914), gave an excellent figure of the grey, strongly banded form.

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.

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

Articles that require ILLUSTRATIONS are inserted on condition that the AUTHOR defrays the cost of the illustrations.

TO OUR READERS.—Short Collecting Notes and Current Notes. Please, Early.—EDS.

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.

Urgently Wanted for Experimental Purposes.—Pupae of *hirtaria* and *lapponaria*. I can offer duplicates of very many species in return.—*Harold B. Williams, Croft Point, Bramley, Surrey.*

Duplicates.—Very fine Kent Argus (Aegon), race now extinct. *Desiderata.*—Many and various British Butterflies in perfect condition with date.—*J. Antony Thompson, F.R.E.S., Thos School, Colwyn Bay.*

Duplicates.—Erebia manto ssp. constans f. gnathene. Mostly ♂♂, Mont Dore, Central France. *Desiderata.*—Erebia manto, Austrian. Erebia lefebrei, L. or Scandinavian Erebiae.—*H. G. Harris, 5 Archer's Road, Southampton.*

Duplicates.—Exotic—Ornithoptera trojana ♂, var. regis ♂♀, brookianus ♂♀, joiceyi ♂; Papilio ulysses, var. telegonus, hoppo, tobori, homerus, antenor, triopas ♂♀. *Desiderata.*—Ornithoptera tithonus, Clotildae cubana, Argynnis diana ♂♀, Papilio schmeltzi ♂♀. British Gros. v. varleyata, Pub. and other vars. Diurnals. Callithaea degaddii. Santarem from Amazon River. —*W. Dannatt, 96 Guibal Road, Burnt Ash, London, S.E.12.*

Duplicates.—Several thousand British Macro-Lepidoptera in perfect condition; full data. *Desiderata.*—British Micro-Lepidoptera in similar condition.—*S. C. S. Brown, Kingsholme, 454 Christchurch Road, Boscombe, Bournemouth.*

Duplicates.—P. brassicae,* Rapae,* Sinapis (Irish), Croceus, Rhamni, Argiolus, Coridon, Bellargus, Paphia, Aglaia, Cardui, Atalanta,* Io,* Galathea, Semele, Tages, Malvae, Sylvestris, Venata, Vinula,* Bucephala,* Similis,* Perla, Muralis, Ochroleuca, Flavicincta, Bipunctaria, Ochrearia,, etc. *Desiderata.*—Numerous, black pins, data.—*L. H. Bonaparte Wyse, 53 Victoria Road, Shoreham-by-Sea.*

MEETINGS OF SOCIETIES.

WAR-TIME ARRANGEMENTS.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON : 41 Queen's Gate, S.W.7. —As advised to Fellows.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. —Second Saturday of each month (up to March 1940) at Chapter House Hall, St Thomas Street, S.E.1, at 2 p.m. for 2.30. *Hon. Sec., S. N. A. Jacobs*, Ditchling, Hayes Lane, Bromley, Kent.

THE LONDON NATURAL HISTORY SOCIETY.—Fixtures as printed in current syllabus cancelled. Members will be notified of further arrangements by the end of the year. *Hon. Sec., A. B. Hornblower*, 91 Queen's Road, Buckhurst Hill, Essex.

ENTOMOLOGICAL SECTION, BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—Details not yet received. *Hon. Sec., P. Siviter-Smith*, " Squirrels," Little Aston Park, Streetly, Staffs.

SOCIETY FOR BRITISH ENTOMOLOGY.—All meetings suspended till further notice. *Hon. Sec., E. Rivenhall Goffe*, 102 High Street, Southampton.

Communications have been received from or have been promised by T. Bainbrigge Fletcher, A. J. Wightman, W. P. Curtis, Dr M. Burr, H. Willoughby-Ellis, Wm. Fassnidge, E. Ernest Green, A. J. Bowes (plate), Dr H. G. Harris (plate), A. H. Hamm, M. Niblett, E. P. Wiltshire.

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

Printed by T. Buncle & Co. Ltd., Arbroath.

Vol. LII.

No. 3

MARCH 1940.

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

CONTENTS.

Subscription for Complete Volume, post free
TEN SHILLINGS,
to *The Hon. Treasurer*, H. W. ANDREWS, F.R.E.S.,
6 Footscray Road, Eltham, S.E.9.

This number, Price ONE SHILLING AND SIXPENCE (net).

A NEW IRISH PLUME-MOTH (LEP., ALUCIT.),

By T. Bainbrigge Fletcher, R.N., F.L.S., F.R.E.S., F.Z.S.,

WITH A NOTE ON ITS GENITALIA,

By F. N. Pierce, F.R.E.S.

STENOPTILIA SAXIFRAGAE, n. sp.

♂. 19 mm. Head greyish irrorated with white which forms a stripe above eye to apex of moderate frontal cone.

Antenna dark fuscous, lined anteriorly with white on first few segments.

Labial Palpus about 1, pale ferruginous; second segment triangularly dilated with rough scales which are white on its upper margin; third segment short, also white above.

Collar grey-ferruginous.

Thorax pale grey irrorated with white, posteriorly paler and edged with pale ferruginous; underside pale ferruginous.

Abdomen pale ferruginous, with a white lateral stripe, broader basally and extending to apex of fourth segment, tips of segments 4-7 with small blackish dorso-lateral and sublateral patches and some white scales tending to edge these segments; underside from base to 3/5ths with an ill-defined white stripe, only evident on tips of posterior segments.

Foreleg: trochanter pale ferruginous; femur dark fuscous lined exteriorly with white; tibia dark fuscous, exteriorly white, slightly dilated towards apex; tarsus dark fuscous, first segment rather longer than segments 2-5 together, white exteriorly, segments 2-3 whitish exteriorly.

Midleg: tibia ferruginous-fuscous, lined white, apex slightly dilated and emitting two short blunt subequal black-tipped spurs; tarsus, first segment as long as segments 2-5 together, dark fuscous, lined white exteriorly, segments 2-5 fuscous, 2-4 whitish exteriorly.

Hindleg: femur short, pale dull ferruginous; tibia dull fuscous, proximal spurs at slightly beyond 2/3rds, outer spur 4/5ths of inner, spurs blunt-tipped, white with a few black scales and blackish tips, distal spurs from apex, outer spur slightly longer than inner, both whitish with blunt blackish tips; tarsus, first segment about 2/5ths of whole tarsus, pale fuscous, darker beneath, second segment 3/4ths of first, greyish, whitish above, blackish apically, third and fourth segments white, black apically, fifth segment blackish.

Forewing cleft from 3/4ths, costa fairly straight to middle of first segment, thence downcurved to apex, which is slightly produced, subfalcate; first segment rather narrow, its termen strongly oblique and slightly concave, lower angle not strong, its lower margin (within cleft) faintly concave; second segment rather narrow, its upper margin (within cleft) straight, its upper angle acute, its termen oblique (but less so than that of first segment), tornus evident but not well marked, situated below a point slightly beyond half of upper margin of second segment, dorsum fairly straight to below base of second segment, thence slightly downcurved; pale fuscous with a slight pale-ferruginous tint, irrorated with

whitish (especially on basal fourth) and a few blackish scales; costal area to 3/5ths more thickly irrorated with black scales, followed beneath (above upper edge of cell) by a line of white scales, dorsal area very pale dull ferruginous, a slight discal dot formed of scattered black scales at one-third, a large but ill-defined black fissural dot with scattered black scales on its inner (baseward) edge, a few scattered black scales tending to form a patch on fold at one-fourth; first segment with an elongate black streak along its central third and nearer to its lower margin than to costa, this streak preceded and followed by scattered whitish scales, these scales on apical third of segment tending to form an oblique white bar across the end of the black streak; second segment, slightly before half of segment, with scattered black scales tending to form two elongate streaks below one another, preceded and followed by scattered whitish scales tending to form elongate streaks below base of cleft, before tip of segment and obliquely across segment on outer edge of black scale-patches; cilia on costa pale fuscous, at apex dull fuscous-ferruginous with a very slight darker tuft of one or two scales, on termen of first segment white with a very slight (two scales) darker tuft at base just before lower angle, within cleft whitish with a few brownish hair-scales towards exterior ends of cleft, on tip of second segment with a small (three or four scales) black-tipped scale-tuft and another similar tuft just below this, on termen of second segment narrowly whitish at base, fuscous exteriorly, on dorsum pale fuscous with a slight ferruginous tinge. Underside of forewing dull pale brownish, with a slight reddish tinge, and coarsely irrorated with darker, especially at base of cleft; first segment at 2/3rds with an oblique whitish bar, most evident below vein 8.

Hindwing cleft from 3/5ths and from near base; first segment narrow-spatulate, its costa moderately straight to about half, thence gently downcurved to acute apex, termen oblique, slightly concave, lower angle distinct; second segment narrow, its foremargin very gently downcurved, its tip very acute, its termen very oblique (much more so than that of first segment) and slightly concave, its lower angle well marked; third segment about 3/5ths length of first, sublinear: dull reddish-brown, coarsely irrorated with dark, third segment paler: cilia pale ferruginous-fuscous, on dorsum moderately long, blackish, paler at bases. Underside of hindwing dull ferruginous-brown coarsely irrorated with darker, first segment mostly pale yellowish-white except a ferruginous-brown patch along termen, broader towards lower angle, third segment rendered paler by whitish scaling especially along its dorsal edge.

One male (Type) from Shankill, County Dublin, 16.vii.1939 (*Bryan P. Beirne*), placed in British Museum Collection.

Besides the Type I have before me (Cotypes) 17 males, 19 females and one with no abdomen, from Seapoint, Harold's Cross and Shankill (all in County Dublin), collected by Mr Bryan P. Beirne on various dates between 12th July and 6th September, but none were taken in August and only two in September (2.ix.37, 6.ix.37), all the others in the second half of July, which seems to be the normal time of emergence. In 1939 it was on the wing in the first half of July, rather earlier than normal. The species thus appears to be single-brooded.

These other specimens show that *S.* **saxifragae** is very variable. In the majority of the specimens, especially the females, the ground colour of the forewing is of a distinct reddish (almost a dull crimson) tinge, in the darker specimens only evident along the dorsal area, but it is sometimes an almost uniform dull-grey-fuscous, very slightly reddish on dorsal area only, or more rarely wholly fuscous or dull grey; the discal dot may be well-marked or reduced to a single black scale; the fissural dot is variable in development, sometimes a bold solid black blotch, sometimes diffused, rarely double, not always the same on both wings of the same specimen; between the discal dot and base of cleft white scales (sometimes with a few black scales intermixed) may form longitudinal rows or (more rarely) whiten this area; on the first segment of forewing the oblique white bar is sometimes sharply marked and the area above the black streak (including cilia) may be dark chocolate-brown; on the second segment of forewing the lower black streak may be prolonged to the termen and the white scales preceding and following the blackish streaks may form ill-defined oblique bars across the upper half of the segment; the whitish irroration on the forewing may be accentuated, especially on the praeterminal areas of both segments; the costal cilia of forewing may have a short white patch a little beyond the base of first segment; the hindwing (especially in the females) has a very strong red tinge, sometimes only evident on the third segment; on the underside of the thorax, abdomen and wings (except third segment of hindwing) there is a distinct reddish tinge, almost a dull crimson in the redder specimens, and this tinge is also very perceptible on the upperside of hindwing in most examples.

S. saxifragae is certainly distinct from *S. bipunctidactyla* by genitalia, foodplant and (apparently) by the former being single-brooded, the latter double-brooded, but both species are so variable that I can give no single external character for their separation after careful examination of these 38 examples of *saxifragae* and of a much larger number of *bipunctidactyla* from numerous localities in England, Ireland and the Continent.

The redder examples of *saxifragae* are readily recognisable as such, as these have the hindwing quite red, and even in the darkest specimens of *saxifragae* the hindwing always has a reddish tinge; in *bipunctidactyla* the hindwing may have a reddish tinge, but this is always dark rather than red; but there is no strict line of demarcation by this one character.

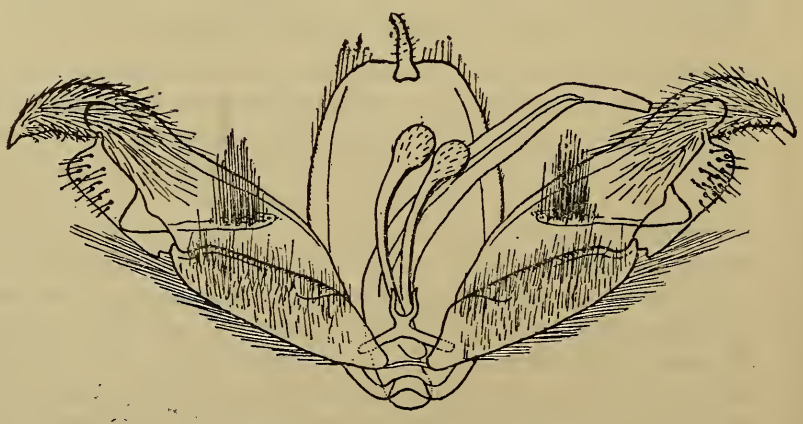
In doubtful cases *S. saxifragae* is best differentiated from *bipunctidactyla* by a combination of characters, as no one character is invariable. As compared with *bipunctidactyla*, in *saxifragae* the forewing segments are rather narrower, the underside of first segment of forewing has at least a trace of an oblique white bar, the underside of first segment of hindwing is whitish or dull ochreous, on underside of hindwing the third segment is paler than the second, the apex of forewing is rather more pointed and termen of first segment rather more oblique, the fissural dot always large, black and strongly marked, the second segment of hind tarsus whitish (usually greyish in English *bipunctidactyla*), in forewing the scale-tuft on the lower part of termen of first segment is usually slightly before the lower angle (on the lower angle in *bipunctidactyla*, but not invariably so) so that the scale-tuft on the

upper angle of the second segment usually lies inside a line drawn vertically from the lower scale-tuft on the first segment (in *bipunctidactyla* this scale-tuft usually lies outside, or more rarely on, such a line), the undersides of forewing and hindwing have a distinct reddish tinge, in average females of a bright foxy-red of a tint rarely seen in *bipunctidactyla*, and the undersides of thorax and abdomen have a tinge of dull crimson (rare in *bipunctidactyla* and not so strongly tinted crimson even when this does occur). If several of these characters are present, the specimen will presumably be *saxifragae*, but all these characters do not necessarily coexist in any one specimen.

S. pneumonanthes (with which *S. saxifragae* has been confused in previous records) has antefissural (not fissural) dots and dark bases to terminal cilia of forewing. I may note here that our English Marsh-Gentian species, usually referred to as *graphodactyla*, is not the true *graphodactyla*, Treits., which is a montane Continental species not yet found in England. Hering in his Key (*Schmett. Mitt. Eur.*, pp. 162-163, 1932) gives differential characters which I do not find to hold in my series of *pneumonanthes*. Of *graphodactyla* I have only one female from Poland, but (subject to examination of more extensive material) I should distinguish these two species by the white streak across the first segment of forewing being parallel to the dark basal line of the terminal cilia in *graphodactyla*, strongly oblique in *pneumonanthes*.

S. saxifragae has not yet been bred but is certainly attached to *Saxifraga* spp. Mr Beirne notes (*in litt.*, 3.viii.39) that " one female laid about 20 eggs in the box. When the larvae hatched out, about 23.vii, I put them on the tips of the Saxifrage leaves. They immediately went down the leaf and burrowed into it near its base, one or two larvae to each leaf. They are now eating their way upwards towards the tips of the leaves, forming brown blotches and galleries." Mr Beirne, to whom I am indebted for the material described, will doubtless succeed in completing its life-history. It is stated to be abundant in gardens in all parts of County Dublin.

On the Continent *S. pelidnodactyla*, Stein 1837, also feeds on Saxifrage but its genitalia are quite distinct from those of *saxifragae* (see Benander, *Ent. Medd.*, xix, 497-499, ff. 1b, 2d, 3h: 1937).



Ent. Record and Journ. of Variation. *Photo. J. H. Harris.*

A MONT DORE COLLECTING GROUND.

NOTE ON THE GENITALIA OF S. SAXIFRAGAE.

The Genitalia of the species of *Stenoptilia* are very similar in form and it is a little difficult to determine to which species a specimen may belong, but this new species differs from all the others in having from the anellus two long arms, clubbed at the end, which emit short spines; this character is not found in the other British species, in which the anellus is more delicate and differently shaped, usually narrower above, wider below. The structure below the pointed costa and the sacculus are also peculiar to *saxifragae*. The soft tegumen has not the squared loose skin found in *zophodactyla*, *coprodactyla* [not British] and *pneumonanthes*, but more resembles that of *pterodactyla* and *bipunctidactyla*.

The female agrees with the others of the genus in having two long signa. The ductus bursae is very weak (that in the figure is drawn too strong), is shorter and narrower than in *pneumonanthes*; in all the others it is strong, wide and longer. The connection of the ductus bursae and bursa is longer and denser than in the other species.

LE MONT DORE AND MONTAGNE DE LURE, 30th JULY-11th AUGUST 1939.

By H. G. Harris, M.D.

Plate I.

Having collected with the late Rev. E. B. Ashby at Mont Dore in 1935, I was anxious to pay it a return visit; so, leaving London on 29th July with my son, Mr J. H. Harris, we reached Mont Dore on the following day.

Unfortunately the season, as in England, was a very late one, and insects, which had been well-out on my previous visit, were hardly emerging on the 1st of August.

It seems surprising how few English entomologists have paid Mont Dore a visit; I only know of three who have done so. Quite apart from its entomological attractions, it is a very pleasant resort, having a Casino, and golf, etc., can be had in the vicinity. Most of the collecting grounds are easy of access, but to work the Vallee de Chaudefour a car is a necessity.

The Erebias are particularly well represented; *ligea*, *euryale*, *manto*, *tyndarus*, *oeme*, *stygne*, *aethiops*, and *epiphron* are in evidence, and probably *neoridas* also, as it is found in the near vicinity. *Erebia manto* ssp. *constans* f. *gnathene*, Fhrst., a very local insect at Mont Dore, was out in good numbers on the marsh below the Capucin, but I found evidence of another locality on the opposite side of the valley, where a few were flying. Contrary to my previous experience, this insect had not spread to the adjoining banks, and to catch it, wading ankle-deep in water was necessary. The males were out in the proportion of 10 males to 1 female.

As Mr Ashby did not give a description in his paper (*Ent. Rec.* Vol. xlviii), I append a brief one:—

Males. 36-43 mm. Velvety black above, usually without any markings on the upper wing, though some have a few rust-coloured spots non-pupilled. Lower wings plain black. Beneath brownish black without any gloss. A rusty spot at apex, sometimes spreading down the wing. Lower wing without markings.

Females. 40-46 mm. Above rusty black, with evidence of a rusty band. Beneath golden brown with sub-apical brown spot or band and two rusty spots on lower wing.

Thus it differs from the Pyreneean *constans* in its smaller size, and in the male having rusty spots at the top of the forewing under-surface.

The next most common *Erebia* was *euryale*, which must be referred to the ssp. *antevortes*, Vrty., "the *ocellaris* of the Pyrenees of many authors." Warren also states that "it shares with *ocellaris* an almost unlimited capacity for variation." The band on the front of the lower wings is broken up into brown black-pupilled spots—from five to one in 40 males examined—and there are never more than two russet brown spots on the hindwing under-surface.

Erebia ligea was well out on Rigolet; this must be its furthest western locality, it being seldom found west of the Rhone.

Another very disappointing emergence was *Adopoea lineola*, a small dark form averaging in size 24 mm., whereas the usual measurement is 26 mm. This little insect is much darker than typical *lineola*, with black nervules on the lower wings. Mr Ashby was told by some competent observer that it was *A. ludoviciae*, Mabille; others to whom I have shown it disagree, pointing out that the discoidal cell is not surrounded by a black nervule. On consulting Tutt's *British Butterflies*, Vol. I, I find that he has named it ab. *suffusa*, and he states that it is found in mountainous districts such as the Pyrenees. I have taken it at Sestrières, Chiusa, the Baths of Valdieri and le Lauteret; true *ludoviciae* is found at Murat and le Lioran, but an expert examination of the genital organs would be necessary to determine the exact relation of each.

For a List of Mont Dore insects Mr Ashby's synopsis in *Ent. Rec.*, Vol. xlviii, should be consulted.

After six days at Mont Dore we left for Avignon—where the Popes lived in exile from 1309 to 1377—for photographic purposes. Insects of the mosquito type were abundant, and we had a most unpleasant two nights in consequence.

Our last stopping-place was St Etienne les Orgues, reached by motor 'bus from Avignon to Forcalquier, a most uncomfortable journey of 3½ hours. The Hotel du Parc, at which we stopped, is a simple country inn, but it can be recommended. The weather was delightful. Our objective was the Montagne de Lure, 5944 feet, which can be reached on foot from Cruis, 5 km. distant from St Etienne, or by a motor road 12 km. due north of St Etienne.

I was out to catch *E. scipio* and *Satyrus* (*Melanargia*) *cleanthe*; Mr P. Haig-Thomas has fully described the first route in Vol. xxxvii of the *Ent. Rec.* *Scipio* was found by him in good numbers on 2nd August, and to show the potentialities of the district he took no less than 71 species of butterflies on that day. Brig.-Gen. Cooke tells me that he

followed the same route at the end of July 1928 but found *scipio* in a very restricted locality. Another observer, Gen. C. van Straubenzee, attacked the summit by the second route, starting from the " Hermitage," but on four occasions between 16th and 29th July 1936 he failed to find any *scipio*. I was equally unlucky. Of course, 10th August was a late date, but the only *Erebia* seen, *E. ligea*, was only just emerging. To my surprise I took a good number of *S.* (*M.*) (*japygia*) *cleanthe* in good condition, a late date for this insect.

Near " The Hermitage " a fine race of *Parnassius apollo* was flying, the largest I have ever seen—88 mm.—which should, I imagine, be referred to the race *provincialis*, Kheil. The specimens of *S.* (*M.*) *galathea* were all f. *procida*, some with yellowish ground colour on the upper surface. One my son took in 1936 at Cruis was certainly ab. *flava*, Tutt; one wonders whether this yellow coloration tends to disappear after emergence similar to *P. napi* f. *citronea*, which soon loses its yellow colour if kept alive in captivity.

On 9th August we walked up the gorge mentioned by Mr Haig-Thomas, and on entering it after a thunderstorm two ab. *leucomelas* were taken out of three *galathea* seen; curiously I saw no more considering the large number of *procida* flying, till my son caught one in cop. She was brought home, living for 33 days, and laid about 70 ova. I doubt whether the minute larvae will survive the winter in hibernation.

M. didyma. Two specimens were taken with the yellowish white band on the underside of the lower wings much increased in size. This seems to be the variety described by Mr Wheeler in *Butterflies of Switzerland*.

Adopaea lineola. A very small specimen only 20 mm. in expanse was taken, and also one *L. sinapis* ab. *erysimi*, and a single *P. egea* the only one seen.

S. cordula, which appears earlier than *S. actaea*, was flying at 5000 ft., whereas *actaea* had replaced it at Cruis, which is about 3000 ft. lower.

Seitz' nomenclature is followed in this paper except in the case of some of the Erebias when Warren's *Monograph of the Genus Erebia* has been quoted.

THE REPUTED APTEROUSNESS OF BIORRHIZA PALLIDA, OLIV. (CYNIPIDAE).

By H. J. Burkill, M.A., F.R.G.S.

Dr Malcolm Burr in his fascinating book, *The Insect Legion*, refers to the wingless condition of the females of this species. This statement naturally interests me as I have several times bred out the flies in the last forty years, and my experience is contrary to such an opinion.

Dr Adler in his work on the species (*Alternating Generations: A Study of Oak Galls and Gall Flies*. Translated by Dr Straton, Clarendon Press, Oxford, 1894) says, p. 76, " Since *Biorrhiza aptera*, Bosc., is wingless, it need cause no surprise that the *Teras terminalis*, Fab.

(*B. pallida*), generation is also deficient in wings, for we must remember that although the males are always provided with perfect wings, yet the females are either wingless or have short rudimentary wings only." This statement was apparently based on his own observations made in 1876 and 1878. On p. 74 he says " the females are wingless or with rudimentary wings only." p. 75 he says " the two generations are so remarkably alike," yet he gives 4 to 7 mm. as the length of *B. aptera*, and 3 mm. as the length of *B. pallida*. My experience is that the former are much darker in colour as well as much larger, and therefore I have failed to notice any remarkable resemblance. The two generations are different, especially in view of what I have to say below.

Cameron in *British Phytophagous Hymenoptera*, Vol. IV (Ray Society, 1893) says on p. 117:—" Sexual Form—The female agrees very closely with the agamic, but is usually winged." Later on he says, " It is noteworthy that the sexual female may have the wings rudimentary or wanting." He gives the length of the agamic as 3.5 to 7.5 mm. and that of the sexual at 3 mm.

On p. 119, he says " The male is always winged, but the female not infrequently has the wings rudimentary or entirely obsolete." He adds that the gall is commonly distributed in Europe.

I would like to ask those writers, who believe that winglessness is the normal condition, if the species could be widely spread if both the alternating generations were wingless. The male in the sexual generation cannot carry the female to a fresh host plant, and the larvae have no power of locomotion. If the females were wingless the species could not spread far and would be limited in its range instead of being " commonly distributed." This was pointed out in *The Entomologist*, October 1932, p. 233.

Thus it seems that if there is a general impression that apterousness is the usual condition for the females of *B. pallida* it is based on a statement made by Dr Adler on two experiments in 1876 and 1878 in which he obtained abnormal specimens. Either his galls were kept under conditions which did not produce normal results, or they were galls induced by a female *B. aptera* with a tendency to breed inferior progeny. I would rule out any suggestion of a local race as it would not be able to spread to fresh trees.

Cameron states that wingless females may occur. He does not say that apterousness is the normal condition.

It would be interesting to hear the opinions of other observers, not writers who have just taken Dr Adler's statement without checking it, but who have bred out the insects for themselves.

I have carried out observations for many years and results have been published from time to time in the *London Naturalist* (London Natural History Society, Plant Gall Records). There I see the following entries:

1932. " For the first time I bred wingless females of *B. pallida*, Oliv., as one gall provided me with 2 of these out of 30 females and 21 males. In other years all the specimens have been winged."

1936. " Flies from 3 galls: 31 males and 25 females, all of which were winged."

1937. " *B. pallida* was once more bred out in some numbers and all the imagines were fully winged."

Ent. Record and Journ. of Variation.

APOROPHYLA AUSTRALIS AND F. INGENUA, FREYER, AT SANDWICH, KENT.

1938. "*B. pallida* was plentiful and as usual gave rise only to winged males and females."

Thus in some 40 years I have only had 2 wingless females, a percentage so small that it seems to refute the statements made by various writers; so that one wonders what authority they can have had for making those statements. Or have my experiments been abnormal and is apterousness the prevailing condition in some localities?

APOROPHYLA AUSTRALIS, F. INGENUA, FREYER, AT SANDWICH, KENT.

By A. J. L. Bowes.

Plate II.

Fig. 3 of the plate represents a male *australis* which I took at sugar in Sandwich Bay, 12th September 1937, and which seems to be referable to f. *ingenua*, Freyer. Mr Turner, to whom I showed the photograph, writes: "I should place this specimen as f. *ingenua*, an intermediate between very dark (black) *orientalis* from Turkey, and the dark Continental form *scriptura*."

In the specimen illustrated, the pale ashy-grey of the normal British specimen is replaced by dark brownish-grey, while the usual lines and streaks remain visible but inconspicuous.

The occurrence of this form surprised me, as Sandwich examples as a whole show a pronounced tendency to paleness, the key to this tendency being the disappearance of the dark patch which normally (fig. 1) surrounds the stigmata, and its replacement by the grey of the general ground colour. Fig. 2, by no means an extreme example, shows both this tendency and an increase of size which is frequent in the same locality; many of my males from Sandwich exceed 40 mm. in expanse of wing, whereas the largest, which I can muster from elsewhere, does not exceed 37 mm.

A NEW SUBSPECIES OF NYSSIA ZONARIA, SCHIFF., AND A NEW ABERRATION OF POECILOPSIS LAPPONARIA, B.

By J. W. Heslop Harrison, D.Sc., F.R.S.

No species encountered in our Hebridean researches has interested us more than *Nyssia zonaria*, and no species has proved of greater importance from the zoogeographical standpoint. We have therefore devoted a very considerable amount of time and energy in studying its variation and distribution.

Very early, indeed, in our investigations we discovered that the form we were encountering was racially separable, not only from the form prevalent on the Continent, but also from that found in the English stations for the species. It is now proposed to describe it.

Nyssia zonaria, ssp. **atlantica** ssp. nov. This subspecies is characterised by the small wing expanse of the wild males, which average 26 mm. against the 32-36 mm. observed in English specimens in my possession. Curiously enough, in this respect, it approximates my Russian examples (ssp. *rossica*) from the steppes near the Ural Mountains. Further, this strikingly small size appears also in the females which have a volume little more than a quarter of that of Lancashire examples.

Although the race is readily distinguished from the Continental form, as well as from that taken in England, by its remarkably uniform small dimensions, the remaining differences are so intangible as to be difficult to put into words. In general, both the fore and the hindwings are a little longer in proportion. Moreover, although the insect varies in every respect except size, even in the palest specimens the blackish suffusions preceding the median line are always much more obvious than in the English insect. Further, the decisiveness of the markings in Continental specimens serves to differentiate insects of such an origin from Hebridean examples.

Again, the blackish bands preceding and succeeding the white subterminal line tend to be definitely weaker than in English specimens. In the hindwings, the subterminal line itself becomes very indistinct as do also the dark suffusions lying before and after it.

Except in size the females are very much alike in all the races I have studied. Nevertheless, in ssp. *atlantica*, the whitish vestiture of hairs seems a little longer relatively, when comparisons are made with specimens from other than Hebridean sources.

The types were captured on April 9th, 1938, in the Isle of Baleshare, Outer Hebrides, an island lying to the west of the Isle of North Uist; they are deposited in the University Museum, Oxford.

When placed alongside series from the Isles of Harris, North Uist and Coll, Baleshare insects appear definitely to be on the light side, although they agree fairly well amongst themselves. On the other hand, Harris, N. Uist and Coll specimens, in the majority of cases, are significantly on the dark side with well-emphasized markings; some, however, resemble our Baleshare captures. Nevertheless, in all instances, no matter what the origin, the hesitation in the subterminal line and its attendant suffusions, especially the terminal one in both wings, which often becomes obsolete or obsolescent, serves to show their essential relationship to insects from Baleshare.

Nyssia zonaria, ssp. *atlantica*, has been captured by us in Canna, Sanday, Rhum, Eigg, Muck, Coll and Tiree, all in the Inner Hebrides, and in Lewis, Great Bernera, Little Bernera, Harris, Pabbay (Sound of Harris), Berneray (Sound of Harris), North Uist, Baleshare, South Uist, Eriskay, Barra, Fuday, Vatersay, Uinessan, Sandray, Pabbay (Barra Isles) and Mingulay, all in the Outer Hebrides.

Of these, Coll and Tiree lie in the Watsonian vice-county 103, Canna, Sanday, Rhum, Eigg and Muck in v.-c. 104, and the remainder in v.-c. 110.

Poecilopsis lapponaria, ab. **fasciata** ab. nov.

Ground colour ochreous with the general scaling much more pronounced than is generally the case. The first or basal line is strengthened and extended, whilst similarly the median and second lines are

fused to form a solid black bar. Except for a faint darker terminal suffusion, the outer half of the wings appears of a uniform warm ochreous colour. Similarly, except for the central band, which is fainter than that of the forewings, the usual markings and suffusions on the hindwings are obsolescent.

Type: a wild male from Aviemore.

It should be noted that I have wild examples of *Poecilopsis lapponaria* captured by my son, Dr G. Heslop Harrison, at Aviemore, Dalwhinnie, and Dalnaspidal, in addition to others from the more ordinary Struan stations.

COLLECTING NOTES.

The Flashing of Fireflies.—The rhythmic flashing of fireflies must be a rare phenomenon, as authentic cases are so seldom recorded. It is worth while, I think, placing on record the following letter which I have recently received:—

"When reading your book to-day I came across your reference to spasmodic flashing of fireflies, and I feel I would like to tell you of an unforgettable instance of this, which I once saw at Khandala, in the Ghâts above Bombay.

"I was staying with friends; one evening after dinner we strolled out into the cool darkness of the Indian night. To our amazement a big clump of bamboos some 20 feet high seemed to be on fire, but the next second was in complete darkness. Again it flashed and again went out. One moment the lovely fronds of the bamboos being picked out by myriads of tiny stars against the violet sky and then—a complete blackout. It was as though some unseen conductor were counting, 'One... two...three!' the flash coming with unfailing regularity on the 'three.' And this went on indefinitely. I have seen many fireflies since, but never such an exhibition of amazing beauty.—(Mrs) E. A. Jacob, 19 West Mall, Clifton, Bristol."—Malcolm Burr.

Prolonged Emergence Period of Apocheima hispidaria in Gloucestershire, 1939.—The warm weather experienced early in 1939 resulted in a very extended emergence period for several of the early spring insects. In particular, *Apocheima hispidaria* was first noted on 8th February when two ♂♂ came to light in the Forest of Dean area. Thereafter it occurred regularly throughout February and March though never in great numbers, ten being the greatest number taken on one night—11th February. On that occasion Mr John Moore and I also saw upwards of thirty *Phigalia pedaria*, ab. *monacharia*, and some twenty *Erannis* (*Hybernia*) *leucophaearia*, ab. *merularia*. The commoner forms of both species appeared in clouds, along with *E.* (*H.*) *marginaria*, which did not seem so susceptible to light, but was found freely sitting on the trunks, and also the first specimen of *Biston strataria*.

Towards the end of March I concentrated on the sallows but heard that *A. hispidaria* was fairly plentiful and still in fresh condition over

the Easter period. I took my last specimen, a fresh male, on 8th May, along with *Notodonta ziczac*, *Polyploca nidens*, *Nola confusalis*, *Colocasia* (*Demas*) *coryli*, *Taeniocampa stabilis*, *Melanippe alternata* (*sociata*), *Lampropteryx suffumata*, *Selenia tetralunaria*, *Ectropis* (*Tephrosia*) *crepuscularia*, *T. consonaria*, and *Lithina chlorosata* (*Panagra petraria*)—a somewhat ill-assorted company.

The observed period thus extended exactly over three calendar months.—Austin Richardson, Beaudesert Park, Minchinhampton, Glos.

Strymon pruni in 1939.—*S. pruni* was very scarce in Monks Wood last year. No doubt the frost in May killed the larvae. I was lucky to get 3 female upperside aberrations, for they are very good. Mr Quibell, who has worked Monks Wood and other woods in Hants for years states he has never taken one.—H. A. Leeds, Wood Walton, Huntingdon. [See Supplement on Records.]

Effects of Extreme Wintry Weather on Lepidoptera.—In response to the note in the February number (lii, 2. p. 23), the following records might be interesting:—

21st February 1940 (a few days after the break of Arctic conditions)—At Wimbledon. *Erannis* (*Hybernia*) *leucophaearia*, Schiff., just emerging, most seen drying wings before mid-day, also a few *Phigalia* (*Apocheima*) *pedaria*, Fabr., at rest on tree trunks.

22nd February—Ashtead Woods. A fine and warm afternoon, not an insect seen.

23rd February—Richmond Park. *E.* (*H.*) *leucophaearia*, Schiff., at rest on tree trunks, also several *P.* (*A.*) *pedaria*, Schiff. A few *Erannis aescularia*, Schiff., also seen on old hawthorns.

25th February—Richmond Park. Very few insects on tree trunks, probably as sun was shining on lee side of trees, with a cold wind.

26th February—Wimbledon Common. A mild morning, but fewer insects than on the 21st.

So far there has been no sign of *Apocheima hispidaria*, Fabr., and that may still be scarce in its old haunts at Wimbledon and Richmond Park.

Of the other moths mentioned above there have been certainly more this year at the above localities than the last few years. This, however, does not apply to Ashtead Woods, only visited once up to the present.—F. D. Coote, 32 Wickham Avenue, Cheam, Surrey.

[My old diary note which is comparable with the present season may be of interest. " Richmond Park, 2nd March 1895. Cold, snow on ground, skating on the ponds; *E. leucophaearia*, dark form common, *T. rupicapraria*, *P. pedaria*, *O. brumata*, *E. aescularia*, and *E. marginaria* (*progemmaria*)." These were all observed a few days after the hardest frost for many years.—Hy. J. T.]

Dates for Apocheima hispidaria in Richmond Park.—Although I have bred this species from the second week in February onward, I have only once observed a full emergence in that month. In 1897 my diary note is 18th February " when it was well out." My other dates are: 9.iii.1889; 7.iii.1890; 4.iii.1893; 9.iii.1894; 17.ii.1897.—Hy. J. T.

RECORDS AND FULL DESCRIPTIONS OF VARIETIES AND ABERRATIONS,

which would have been exhibited at the Annual Exhibition of the S. London Entomological Society, which latter could not be held owing to Hibernia Chambers being closed for rebuilding, and the Society's activities suspended until new accommodation had been found.

Compiled by Mr S. G. Castle-Russell for publication in the *Entomologist's Record* and for the *Proceedings* of the Society.

Mr R. C. C. Lahey-Bean. *Argynnis paphia*, L., a gynandromorph, equally divided. R. side ♂, L. side ♀. New Forest.

Mr Percy M. Bright. *Polyommatus* (*Lysandra*) *coridon*, Poda, a fine example of ab. *ultraradiata* on a cream ground. ♂ underside. Sussex.

Col. V. R. Burkhart. *Aglais urticae*, L. A ♂ aberration with costal blotches on the forewings united into a band; discal spots absent as in ab. *ichnusa*, Bon. Hindwings normal. Salisbury. *Plebejus argus*, L. (*aegon*, Schiff.). A ♂ upperside with blue forewings and black hindwings: underside grey. *P.* (*L.*) *coridon*. A series of underside aberrations including ♂ and ♀ ab. *caeca* (*Mon. Aberrations of L. coridon*, ♂, p. 44, plt. 10, f. 14; ♀, p. 83, plt. 16, f. 13), on white and on brown ground colour; ab. *obsoleta*, Tutt; etc. An upperside ♂ of olive-green colour, ab. *ultra-viridescens* (*l.c.*, p. 10, plt. 1, f. 24) and ♂♂ ab. *fowleri*, South (*l.c.*, plts. 3, 5, 10, 11, 16). Wilts and Sussex.

Mr J. C. B. Craske. *P.* (*L.*) *coridon*. Aberrational forms including: an extreme form of the ♂ with 3/4ths of the wings suffused with black similar to ab. *melaina*, Tutt, but of different shades of colour (*l.c.*, p. 11); ♂ examples of ab. *pulla* (*l.c.*, p. 28); ♂ examples of ab. *cinnameus*, (*l.c.*, p. 11, plt. 1, fig. 5; plt. 3, fig. 15); other colour forms including an extreme of ab. *marginata*, Tutt (*l.c.*, p. 15, plt. 3, f. 3; plt. 5, f. 10), etc. Dorset and Sussex.

Mr J. C. Farwell. *Argynnis paphia*. Two of exactly halved gynandromorph examples. Both New Forest. L. side ♀ in each case.

Mr T. W. Jefferson. *P.* (*L.*) *coridon*. A series of upperside aberrations including ♂ ab. *melaina*, with 3/4ths of the wings black; a ♂ ab. *pulla*; a ♂ ab. *caeruleo*, Tutt; a ♂ of green-olive colouring, ab. *ultra-viridescens*; a form with long white stripes on the L. underside wing; an extreme example of ab. *inaequalis*, Tutt, L. side ♀ colour brown, R. side mostly of *syngrapha* blue colour with several dark streaks of normal brown on fore and hindwings, R. side wings slightly the smaller. Dorset and Sussex.

Mr E. E. Johnson. *Aglais urticae*, L. A very fine example of ab. *nigrocaria*, de Moff. On the upper side the costal blotches on the forewings are united, forming a heavy black bar; the central spots are present, but the two outer ones absent as in ab. *ichnusa*; on the apices are large areas of lilac and straw colouring. Hindwings entirely black except for a faint reddish tinge in the discal areas, and a basal border of prominent lilac blue spots. Under side normal except that the blue border-spots are unusually prominent. Wiltshire. *Thecla quercus*, L. An example of large size of ab. *bellus*, Gerh. (orange markings on

upper-side forewings on a blue ground). New Forest. *Aphantopus hyperantus*, L. A ♂ example of ab. *lanceolata*, Frohawk, and a ♀ with a number of small additional spots on underside of forewings.

Mr E. C. Joy. *Polyommatus icarus*, Rott. A remarkable ♀ form in which the upperside has large faint mauve lunules on a wholly brown ground, which is peppered all over with male blue scales, most prominently at apices and margins. There is an iridescent effect as in *Apatura iris*, L.

Captain C. G. Lipscombe. *Brenthis euphrosyne*, L. A ♂ example suffused with black on the upper-side forewings. Somerset. *P. icarus*, Rott. A series of ♂ and ♀ examples from the North Coast of Scotland showing them to be a race intermediate in appearance between the brilliant Irish single-brooded form and the normal English typical form. *P.* (*L.*) *coridon*. A series of aberrations including ab. *pulla*, f. *syngrapha*, and spotless underside forms. Wilts and Sussex.

Rev. J. N. Marcon. *Brenthis euphrosyne*, L. A ♂ of creamy ground colour; a ♀ with the basal blotch medium band thickened and placed further towards the margin than usual, with the intervening space obsolete save for one costal spot. A ♀ with outer spots united in pairs. Sussex and Surrey. *A. hyperantus*, 2 ♂♂ with a smoky suffusion over the undersides, tending to obscure the white dots and making the yellow rings blurred and indistinct; a ♂ upperside of a silky black instead of the usual shade, the L. hindwing underside has the area from the base extending two-thirds towards the outer margin jet black with nervures clearly marked in yellow, this area bounded by yellow border; the jet black displaces the yellow and black-ringed eye-spots, leaving only the white dots. These insects were taken in Surrey in July within 20 yards of each other, and the last is perhaps an example of melanism affecting the upperside and in this case " spreading through " to the underside. The fact that examples of ab. *caeca*, Fuch, are fairly common in the area would show how persistent are the white dots. More often than not ab. *obsoleta*, Tutt, is the result of keeping *caeca* in the cabinet for a long period, with consequent fading out of the obscure white dots. All from Surrey. *P.* (*L.*) *coridon*, a series of upper-sides including ♂♂ and ♀♀ of ab. *fowleri*, ab. *pulla*, ab. *glabra*, ab. *albomaculata*, ab. *ultra-viridescens* (olive-green); a series of under-sides including a ♀ of dull steel colour, uniform and obliterating the normal row of fulvous spots; a ♂ under-side *ultra-radiata*, on the forewings 5 stripes, the longest being the bottom one, and on the hindwings 8 stripes, on each uniform and symmetrical; the submedian spots on the hindwings are elongated giving a striking appearance to the insect; the outer border spots are so faint as to be almost obsolete; actually the only normal spots on the underside are the discoidal on the forewings. The example is of large size and was captured shortly after emergence. The ground colour is strongly whitish. (Mr Castle-Russell says that this remarkable specimen is one of the most extreme that he has seen exhibited or figured.) A truly halved gynandromorph, R. side ♂, L. side ♀, the body is also exactly halved; a gynandromorphic example, L. side ♂, R. side largely ♀, with a small streak extending half way along the costa of the forewing, and three streaks near the anal angle of the hindwing of male coloration; a ♀ underside of dull steel coloration, uniform and obliterating the normal row the fulvous spots.

Mr P. Nagle. *Brenthis euphrosyne*, L. A ♀ with the forewings spotless except spots in each discoidal area and confluent border spots. The hindwings are wholly black except for a basal border of straw-coloured spots. N. Forest; a ♂ specimen with the forewings heavily suffused with black, hindwings also black with yellow spotted basal border. N. Forest.

Mr L. W. Newman. *Gonepteryx rhamni*, L. A gynandromorph, R. side hindwings pure ♂, left side pure ♀. On both forewings the sexual coloration is mixed. Bred, Bexley. *P.* (*L.*) *bellargus*, Rott. A ♀ with forewings underside ab. *obsoleta*, Tutt, and hindwings ab. *striata*, Tutt; a ♂, underside white ground ab. *caeca*, Tutt. *Lasiocampa quercus*, L. A fine series of the ab. *olivescens*, form of the var. *callunae*, Palmr. race. *Pieris napi*, L. A short series of fine dark Caithness forms.

Mr G. B. Oliver. *Colias croceus*, Fourc. A bred ♀ upperside, forewings normal, hindwings purplish grey, much deeper than the darkest forms of *pallida*, Tutt, or *helice*, Hb., with the usual discal orange spots, fringes from yellow to red, margin typically black bordered with purplish grey. A remarkable form. *Argynnis cydippe*, L. (*adippe*, L.). An underside approaching form *cleodoxa*, Och., the metallic spots only partly and dully silvered. Sussex and Bucks.

Major-General A. L. Ransome. *B. euphrosyne*. A ♀ example with more or less spotless forewings, except for disconnected border spots, hindwings wholly black except for basal border of pale yellow spots. New Forest. *P.* (*L.*) *coridon*. A series of aberrations including ab. *caeca*, ab. *obsoleta*, ab. *fowleri*, etc.

Mr S. G. Castle-Russell. *B. euphrosyne*, L. A ♀ with unusually wide black borders to all four wings; Surrey. *A. cydippe* (*adippe*), a ♂ with the black markings on the forewings considerably extended and joined together; an underside with the marginal spots on the hindwings fulvous, instead of silver; a series of undersides with the spots on the forewings extended into streaks. *A. paphia*, a ♂ upperside with 2 large metallic spots on each hind wing in the inner margin. *Euphydryas* (*Melitaea*) *aurinia*, Rott. An extreme melanic ♀ upperside form in which both fore and hindwings are wholly black except for several small faint fulvous markings; on the underside the ground colour of all the wings is fulvous and without markings except for a broad band of blackish colour at the base of the hindwings, bred at Highcliffe, Hants; a melanic ♀ form in which the forewings are entirely black except for small fulvous areas in the disc; there is also an inner border of pale straw-coloured spots in close connection with a row of marginal outer red spots, the hindwings are also black with several small fulvous areas and a basal border of red spots; on the underside there are 3 large black blotches replacing the normal spotting; Highcliffe, Hants. A ♀ upperside with two rows of yellow spots connected together, forming long rays; Highcliffe. The above exceptionally extreme specimens were amongst the last dozen to emerge from some 1500 pupae. The entire brood was unusually healthy and free from disease and parasites; with the exception of those described the whole of the rest were severely typical. The larvae were kept continually in the open and subject to all weather conditions. *P.* (*L.*) *coridon*. A ♂ example of the very rare ab. *auronulla* (*l.c.*, p. 30, plt. 4, f. 10) in which the marginal spots on the underside are entirely devoid of colour. In addition, this example

has black chevrons above the marginal spots on the hindwings; another very rare ♂ form, *tri-I-nigrum* (*l.c.*, p. 36) with 3 elongate streaks beneath on the forewings; a curious example of ab. *caeca* with ♀ coloration but with distinctly ♂ body: possibly gynandromorphous; a short series of ab. *syngrapha*, Tutt, from Salisbury; a series of upperside ♂ forms, very pale forms, and ab. *cinnameus* (*l.c.*, p. 11, plts. 1, f. 5 and 3, f. 15). Sussex and Wilts. *Eumenis* (*Hipparchia*) *semele*, L. A ♂ upperside with 4 large spots on the forewings instead of the normal 2, and 3 on the hindwings in place of the typical one. Sussex.

Mr Harold Smith. *Plebejus argus* (*aegon*). A ♂ specimen in which all four wings are black, with grey underside; a gynandromorph, R. side ♀, L. side ♂. Surrey.

Mr Norman Watkins. *Aglais urticae*. A ♂ with wholly black hindwings; on forewings the costal blotches are united by greyish black smears, the typical central spots are absent; Wilts. *Brenthis selene*. A ♂ upperside, the outer borders on all four wings are elongated into streaks, with the exception of the discoidals, the central and basal areas are devoid of spots.

Mr Douglas Watson. *Argynnis cydippe* (*adippe*). A ♂ with connected and extended markings on the forewings upperside. New Forest.

Colonel L. Wood. *Vanessa* (*Polygonia*) *c-album*, L. A ♂ with coalesced markings on the forewings, the hindwings suffused with black and without basal spots. Wilts.

Mr N. G. Wykes. *Apatura iris*, L. A short series bred from Surrey larvae. *P. argus* (*aegon*). A series of the chalk form *cretacea*, Kent. *Aricia agestis*, Schiff. (*medon*, Esp.), (*astrarche*, Brgstr.). A form with underside marginal spots missing and tending towards a sagittate appearance; Aldershot. *P.* (*L.*) *coridon*. A series of aberrational forms including ab. *obsoleta*, forms of *syngrapha* with varying ground colour and width of marginal darkening; Cotswolds.

Mr H. A. Leeds captured at Wood Walton, Hants, a *Coenonympha pamphilus*, L. ♀ underside with one large and other small patches of fulvous on the R. hindwing = post-dex-homoeosis, 28.viii.39; also *Strymon pruni*, L. ♀ upperside with the forewings suffused inwardly with fulvous spreading from the large normal fulvous patches = *antifulvior*, Tutt.

Mr Hy. J. Turner. The second sample of common Rhopalocera sent to him from Manchuria, the centre of origin being the town of Harbin. Like the previous sample received, the predominance of the Palaearctic Fauna is quite obvious.

Papilio machaon, L., may be placed as f. *asiaticus*, Mén., in which the black pigment is stronger, the cell of the hindwing almost touches the hind marginal band and compared with British examples the ground is definitely deeper in colour. *Parnassius stubbendorfii*, Mén., a species without marking, comparable to *Aporia crataegi*, L. Far Eastern *P. nomion*, Fisch., has resemblance to *P. apollo*, L., but the texture of the wing surface is vitreous, the hindwings are much more marked and the border marking is broken into rough chevrons. An Eastern Himalayan species. *Aporia crataegi*, L., of good size, fairly common. *Pieris rapae*, L. The specimens were rather small but much dark suffusion spread from the base. Possibly a small example of f. *crucivora*, Btlr.,

which is a large form, or a small form of *orientalis*, Oberth., with less developed marking. *Pieris napi*, L., possibly a small *orientis*, Obthr., but beneath like ab. *napaeae*, Esp., and called *heptapotomica*, Krulck. The upperside is very dark along the veins. *P. melete*, Mén., a large species with a soft mealy surface; markings prominent, spotting like that of *brassicae* but softer, and more diffuse. Occurs further West. *Leucochloë daplidice*, L., quite comparable with specimens of S. Europe. *Midea scolymus*, Btlr. An Eastern species with falcate wings. China and Japan. *Gonepteryx rhamni*, L. Specimens of a richer colour than British examples, the ♀ has stronger coloration, race *amurensis*, Graes. *Colias hyale*, L. The local race is a large form, *poliographa*, Mén., but the specimens received are the small spring brood; the ground colour is a stronger yellow. *Leptosia amurensis*, Mén. This species is much larger than our *sinapsis*, but those received are small. The species has pointed forewings, rather long and narrow. Of the above species 6 are indigenous in Britain; only 3 are really Eastern, the remainder are closely allied to or are European species.

The *Satyridae*. Five species were received. *Lethe epimenides*, Mén., about the size of British *semele*, sits on trunks of trees and is common. *Ypthima baldus*, Fb., one of the commonest smaller East Asiatic butterflies, sits several on a leaf at one time. It is most variable in the number of ocelli on the hindwing beneath, from 6 to 1. The apical ocellus has two white pupils. *Satyrus* (*Melanargia*) *halimede*, Mén., a somewhat smaller species than our British *galathea*. The S. China form is much larger. It is really an outlying species of a genus mainly confined to the Mediterranean countries. *Oeneis urda*, Er. A small obscure-looking insect of northern affinities, common in the Amur area. *Satyrus dryas*, Scop., f. *bipunctatus*, Molsch., is a small and very black race of a common alpine and widely distributed species. The ocelli are present but strongly obscured by the deep black ground colour.

Of the *Nymphalidae* there is *Apatura ilia*, Schiff., a species which occurs from Northern France to the Amur and Japan. The local form is *substituta*, Btlr., generally darker ground colour, and whiter band, etc., on the underside. *Neptis coenobita*, Stoll. (*lucilla*, Fb.), an East European species. The local form is *magnata*, Heyne, with increase of white marking and paler brown underside. *Neptis alwini*, Brem. & Gray. A Chinese species. *Vanessa io*, L., ssp. *geisha*, Stich., deficient in blue scaling in the apical ocellus and brighter yellow patches on the forewings. *Polygonia c-aureum*, L. A far Eastern species somewhat larger than our *c-album*, darker above with less irregularly margined wings and a more uniform light brown below. *Araschnia burejana*, Brem. A far Eastern species allied to the Central European *A. levana-prorsa*, L. It is somewhat larger than that species, but resembles it in general appearance and in its line of variation. *Melitaea aurinia*, Rott., ssp. *mandchurica*, Stdgr., much larger than Western Palaearctic forms, with uniformly reddish yellow ground. *Melitaea didyma*, Ochs., f. *mandchurica*, Seitz. Forewing more elongate and pointed, hindwings of ♂ almost markingless with broadish black margin; ♀ strongly spotted with black. *Melitaea athalia*, Rott. A small specimen, possibly of race *niphona*, Btlr. *Melitaea dictynna*, Esp., race *erycina*, Stdgr. Above very like European specimens, but beneath more variegated and slightly smaller. *Brenthis selene*, Schiff. Small, paler than British

examples, with more and somewhat stronger silver spots. *Argynnis laodice*, Pall. A species ranging from Eastern Germany to Japan. Larger than the European form and probably f. *ariana*, Fruh. No " blues " or " skippers " were received. But there was a good sample of common Heterocera, mainly true Palaearctic species.

Mr F. W. Frohawk. A gynandromorph of *Euchloë cardamines*, L. R. side ♂, left side ♀. Swindon, 3.v.1933; ab. *macula-punctata*, Froh. ♀ in which there occurs a row of punctate black spots on the margin of the hindwings at the termination of the nervures. vi.1892. Horsley, Surrey. *Colias croceus*, Fourc. ♀ ab. *pallida-obsoleta*, Froh., 13.ix.1928, in which the extreme white form named *pallida* by Tutt is united with the form of female with obsolescent marginal spotting in the margin. Broadstairs. *Aglais urticae*, L., 2 ♀♀ of ab. *nigra*, Tutt, with entirely black hindwings. East Farleigh, Kent. (1) 2.x.1936; (2) 2.ix.1939, both caught by Captain E. B. Purefoy in his garden within 5 yards of each other but 3 years between.

Mr H. O. Wells. *Polygonia c-album*, L., in which the hindwings are entirely black. Wye Valley, 1939. *Argynnis paphia*, L. A form with large whitish spots on each forewing. Wye Valley, 1939. *Maniola* (*Epinephele*) *jurtina*, L. (*janira*, L.). Aberrations from the Wye Valley and Eastbourne at which last place the species were swarming on the Downs at the end of August. *P.* (*L.*) *coridon*. A good series of minor aberrations from Herts and Sussex and 1 ab. *fowleri* from Sussex. *Coenonympha pamphilus*, L. A form from the Wye Valley with large white blotches on each of the hindwings.

Mr Leonard G. Hulls. A long bred series of *Manduca* (*Acherontia*) *atropos*, L., from West Sussex, 1938. A series of teratological specimens of this species illustrating various forms of deformity. A painting by Mrs Hulls of a brown form of the larva taken in W. Sussex, October 1939. Living specimens of the S. African Phasmids, *Phalces longiscaphus*, and of *Macynia labiata*, reared on bramble, from ova sent by Dr Le Feuvre from the Cape. Examples of the ♂ of the Phasmid *Carausius morosus*, reared during 1939.

Mr S. Wakely. Species bred by him during 1939. *Nonagria sparganii*, Esp. (The Wilderness, Isle of Wight); *Boletobia fuliginaria*, L. (Berkshire); *Salebria obductella*, F.R. (Kent); *Alispa angustella*, Hübn. (Mickleham, Surrey); *Epischnia bankesiella*, Rich., and *Euzophera cinerosella*, Zell. (Portland, Dorset); *Homoeosoma binaevella*, Hb., and *H. saxicola*, Vghn. (Compton, I.W.); *H. cretacella*, Rössl. (Gurnard, I.W.); *Eurhodope marmorea*, Haw. (Niton, I.W.); *Pyrausta nubilalis*, Hübn. (Benfleet, Essex); *P. asinalis*, Hb. (Portland, Dorset); *Trichoptilus paludum*, Zell. (Pardy Heath, Dorset); *Pterophorus osteodactylus*, Zell. (Grange-over-Sands, Lancs.); *Agdistis statices*, Mill. (Portland, Dorset); *Phalonia implicitana*, Wocke (Gurnard, I.W.); *P. flaviciliana*, Wilk. (Coulsdon, Surrey); *Euxanthis aencana*, Hübn. (Benfleet, Essex); *Evetria purdeyi*, Durr. (Gurnard, I.W.); *Eucosma aemulana*, Schläg., and *E. trigeminana*, Steph. (Benfleet, Essex); *Hemimene aeratana*, Pierce (Bexley, Kent); *Enarmonia conicolana*, Heylaerts (Holmsley, New Forest); *Phthorimaea obsoletella*, Fisch. v. Rösl. (Upper Norwood, London); *P. acuminatella*, Sirc. (Reigate, Surrey); *P. fraternella*, Dougl. (Upper Norwood and Horsley, Surrey); *Thiotricha subocellea*, Steph. (Coulsdon, Surrey); *Telephila schmidiella*, Heyd. (Boxhill, Surrey, and

Niton, I.W.); *Brachmia rufescens*, Haw. (Dorset); *Mompha schrankella*, Hübn. (The Wilderness, I.W.); *Depressaria umbellana*, Steph. (Gurnard, I.W.); *D. putridella*, Schiff. (N. Kent); *D. purpurea*, Haw. (Kent and I.W.); *Stephensia brunnichella*, L. (Coulsdon, Surrey, and Eynsford, Kent); *Elachista magnificella*, Tengst. (Bexley, Kent); *E. cinereopunctella*, Haw., and *Eupista potentillae*, Staint. (Riddlesdown, Surrey); *E. badiipennella*, Dup. (Benfleet, Essex); *E. hemerobiella*, Scop. (Dartford, Kent); *E. ochrea*, Haw. (Niton, I.W.); *E. vibicella*, Hübn. (Gurnard, I.W.); *E. discoidella*, Zell. (Chesil Beach, Dorset); *E. inulae*, Wocke (Gurnard, I.W.); *E. tripoliella*, Hodgk., and *E. argentula*, Zell. (Benfleet, Essex); *E. erigerella*, Ford (Gravesend, Kent); *E. obtusella* (Benfleet, Essex); *Gracillaria auroguttella*, Steph. (Coulsdon, Surrey); *Phaulernis dentella*, Zell. (Riddlesdown, Surrey); *Tischeria complanella*, Hübn. (Holmsley, New Forest); *Meessia richardsoni*, Wals., and *Teichobia verhuellella*, Staint. (Portland, Dorset); and *Nemotois scabiosella*, Scop. (Coulsdon, Surrey). Other species which had been captured as imagines were: *Setina irrorella*, L., and *Psammotis hyalinalis*, Hübn. (Mickleham, Surrey); *Platytes cerussella*, Schiff. (Niton, I.W.); *Hysterosia inopiana*, Haw. (Gurnard, I.W.); *Thiotricha subocellea*, Steph. (Niton, I.W.); *Eupista frischella*, L. (Faversham, Kent, and Gurnard, I.W.); and *Eidophasia messingiella*, Fischr. v. Röslr. (Faversham, Kent).

Baron de Worms. A few examples of the form *assimilis*, Dbldy., of *Crymodes exulis*, Lef., which is a deeper dark brown than the type, with slight purple flush. Rannoch. *Polyploca flavicornis*, L., a ♀ with melanic body and thorax and with unusual and extended dark markings on the wings. Ascot, March 1939. *Taeniocampa populi*, Strm. (*populeti*, Fb.), with a very pronounced row of spots on the forewing marginal area. Ashford, Kent. *Cucullia gnaphalii*, Hb., a specimen taken at light, 21st June. Kent. *Crocallis elinguaria*, L., a varied series from Aviemore, some with cross lines absent. Numerous other species and local forms especially from Aviemore, Rannoch, and Forres, from which last place the sandhill forms of *Eumenis semele*, L., and *Agrotis cursoria*, Bork., were obtained, and *Poecilopsis* (*Nyssia*) *lapponaria*, Bdv., from Struan, Perthshire.

Of the Variation Barrett said:—

"Consistently variable so as always to divide into the pale and dark forms irrespective of sex; but in each there are modifications of the dark or pale ground colour, and variations in the breadth and intensity of the central transverse band. In some this is quite absorbed in the general dark colour; or, on the other hand, reduced to a condition very little darker than the palest ashy-grey forms. The most beautiful is that in which the pale colour becomes whitish-grey, while the central band remains dark purple-brown; but extreme forms are found having the forewings almost of a liver-colour, or, on the other hand, of a glossy grey-black."

The Names and Forms to be considered:—

opima, Hb. (1808-9), *Samml. Noct.*, 424.
f. *firma*, Hb. (1818-22), *l.c.*, 676-7.
ab. *fuscus*, (Greg.), Robson (1888), *Young Nat.*, IX, 122.
ab. *grisea*, Tutt (1892), *Brit. Noct.*, II, 143.
ab. *virgata-grisea*, Tutt (1892), *l.c.*
ab. *intermedia*, Tutt (1892), *l.c.*
ab. *brunnea*, Tutt (1892), *l.c.*
ab. *unicolor*, Tutt (1892), *l.c.* [*Brit. Noct.*, IV, 119].
ab. *mediolugens*, Schultz (1900), *Illus. Zt. Ent.*, V, 349.
ab. *rufo-fusca*, Strnd. (1916) [Hamp., *Cat. Phal.*, V, 428 (1905)], *Arch. Naturg.*, LXXXII, A2, 30.
ab. *griseor*, Strnd. (1916) [*l.c.*], *l.c.*
ab. *obscura*, Lenz. (1927), *Osth. Schm. Sudbay.*, II (2), 316.
ab. *virgata*, Lenz. (1927), *l.c.*

Tutt dealt with (1) *opima*, Hb., slaty-grey almost purplish with median transverse line. (2) f. *firma*, Hb., ditto, with broad central band. (3) *grisea*, greyish-white with central shade obsolescent. (4) *virgata-grisea*, ditto, with central band (shade emphasised). (5) *intermedia*, greyish-brown, almost unicolorous. (6) *brunnea*, dark brown, stigmata and subterminal lines paler. (7) *unicolor*, ditto, unicolorous [=*fuscus*, (Greg.), Robson].

ab. *mediolugens* (Schultz, *Ill. Zeit. Ent.*, V, 349, 1900).

Diagnosis:—"Medio spatio alarum anteriorum obscurascenti."

"The dark median shade, as it is found in typical specimens of this species, is especially emphasised and widened and includes almost the whole central area of the forewings."

Bred from pupae with typical examples.

Tutt (*in lit.*), "=Hübner's type unless it is the greyish-white form with band."

ab. *rufo-fusca*, Hamp. (Strnd.), *Cat. Phal.*, V, 428 (1905): *Arch. Naturg.*, LXXXII, A2, 30 (1916).

Orig. Descrip.—"Wholly suffused with fuscous-brown, with a reddish tinge."

ab. *griseor*, Hamp. (Strnd.), *Cat. Phal.*, V, 428 (1905): *Arch. Naturg.*, LXXXII, A2, 30 (1916).

Orig. Descrip.—"Greyer; forewing without rufous suffusion on medial area, but with an indistinct medial shade."

ab. *obscura*, Lenz., *Osth. Schm. Sudbay.*, II (2), 316 (1927).
ORIG. DESCRIP.—" Central area darkened grey-black."

ab. *virgata*, Lenz., *Osth. Schm. Sudbay.*, II (2), 316 (1927).
FIG.—*l.c.*, plt. 16, 9.
ORIG. DESCRIP.—" Basal and marginal areas dark grey."

Taeniocampa, Gn. (1839?) (1852). Most authors. [*Monima*, Hb. (1821). Meyr., Hamp., Warr., Meyr.: *Orthosia*, Hb. (1821), Frr., H.-S.] *gracilis*, (Fb.) Schiff.

This is another species name, which Tutt did not trace to its original in the *Verz.* of Schiff. (1775), where there is no specific description except p. 76. The " Weiderich Eule," i.e., the Noctua of the *Lysimachia vulgaris. gracilis.* Fab. (1787), *Mantissa*, II, 148, gave a description, which Tutt quoted as the original, *Brit. Noct.*, 144. Thus we should write *gracilis*, Schiff. [or (Schiff.) Fabricius, as the latter adopted Schiff.'s name].

Tutt, *Brit. Noct.*, II, 144 (1892): Meyr., *Handb.*, 73 (1895): Barr., *Lep. Br. Is.*, V, 221, plt. 213 (1899): Hamp., *Lep. Phal.*, V, 431 (1905): Splr., *Schm. Eur.*, I, 241, plt. 45, 7 (1906): South, *M.B.Is.*, I, 331, plt. 158. 3-4 (1907): Warr.-Stz.. *Pal. Noct.*, III, 92, plt. 22k (1910): Culot, *N. et G.*, I (2), 67. plt. 50, f. 13 (1914): Meyr., *Rev. Handb.*, 143 (1928).

On plt. 152, f. 6, Esper, *Abbild.*, IV (1788?), gave a figure labelled *collinita*, which is so bad that it might be anything, but which from the text IV (2), 505, is undoubtedly intended for *gracilis*, teste Werne., *Beitr.*, II, 47 (1864).

Ernst & Engr., *Pap. d'Eur.*, VII, 14, fig. 414 (1790), dealt with 10 figures which they said probably represented several species. Fig. 414 b and c, the most delicate in colour and design on the plate, probably are *gracilis*, the others representing *populeti*, *incerta* (several forms), and *opima*. Werneberg, *Beitr.*, II, 115 (1864), determined 414 b and c as *gracilis*.

Borkhausen, *Naturg.*, IV, 597 (1792), recognised *gracilis* in the figure and description of *collinita*, Esper, plt. 152. On p. 600 he redescribed the *lepida*, Brahm (1791), which is only a description of *gracilis*.

Illiger, *Verz.*, I, 231 (1801), also recognised *collinita*, Esper, as *gracilis*, Schiff.

Hb., *Samml. Noct.*, 168 (1800-2), gave a very good figure of the rich red form.

Treit., *Schmett.*, V (2), 217 (1825), noted that he had seen the *lepida* of Brahm and that Brahm himself admitted that it was *gracilis*.

Dup., *Hist. Nat.*, VI, 141, plt. 82, f. 1 (1826), gave a figure of a light brownish grey dove colour, by no means typical of *gracilis*.

Steph., *Ill.*, II, 142-3 (1829), described various forms of this species under Haworth's name of *sparsa(us)* and with doubt as to the specific validity of the pale *pallida*. He remarked on the two extremes in coloration " bright rusty griseous " and " nearly grey or hoary." His *pallida* is a " nearly uniform pale rufous brown."

Wood's fig. 176, *Ind. Ent.*, p. 40 (1834), is very poor. "The pale quaker."

Freyer, *Neu. Beitr.*, IV, 45, plt. 317 (1842), gave a beautiful figure. He referred to Esper's fig. named *collinita* as being so bad as to be unrecognisable as *gracilis*. He also said that Brahm named it *lepida*.

H.-S., *Bearb. Noct.*, II, 204 (1851), fig. 383 (1849), gave a nice figure of a grey form but not delicate enough. He said Hb. 168 was too red, considered *collinita*, Esp., as a synonym, and *subplumbea*, Curt., and var. *lepida*, Brahm, as variations. Genus, *Orthosia*.

Gn., *Hist. Nat. Noct.*, V (1), 356 (1852), described two forms of this species. A—*pallida*, uniform, rosy, almost devoid of black atoms. B—A grey, bluish slaty colour. He noted the numerous minor variations and also that the *lepida* of Bork., Treit., and Bdv. is this latter form. The former may be Tutt's *rosea*.

Meyr., *Handb.*, 73 (1895), used the genus *Monima*.

Stdgr., *Cat.*, IIIed., 202 (1901), briefly described his *pallidior* (1888) as "multo pallidior cinerea."

Hamps., *Lep. Phal.*, V, 431 (1905), described an aberration "forewing suffused with fuscous brown," which Strand subsequently (1916) named *obscurior*.

Splr., *Schm. Eur.*, I, 241, plt. 45, 7 (1906), gave a by no means good figure. It is unrecognisable as this species.

South, *M.B.I.*, I, 331, plt. 158, figs. 3-7 (1907), gave 5 figures all fairly good.

Warr.-Stz., *Pal. Noct.*, III, 92, 22k (1910), gave seven figures, ♂ and ♀ *gracilis*, *pallida*, ♂ and ♀ *rosea*, *rufescens* and *ella*, but not one showing the beautiful coloration of the species. There is far too much influence of the red brown general colour of the plate.

Culot, *N. et G.*, I (2), 67, plt. 50, fig. 13 (1914), gave a very good figure.

Meyr., *Rev. Hand.* (1928), 143, also genus *Monima*.

Barrett says of the Variation:—

"Usually very constant in marking—only varying a little in the degree of grey dusting, or of grey-brown, or pale red shading."

He reports specimens, "Of uniform whitish-buff colour almost devoid of any trace of markings."

One from Armagh, "Has a smoky-black cloud along the dorsal margin of the forewings, and the hindwings very dark, the apex and part of the hind-margin being edged with black."

From the New Forest, (1) "Light fulvous red." (2) "Darker varying to tawny and to purple-red." (3) "Some with stigmata scarcely visible." (4) "Others with stigmata outlined with white." (5) "In some a similarly margined broad claviform stigma makes its appearance." (6) "Very pale purple-drab with nervures darker." (7) "Deep dark purple-brown or liver-coloured with stigmata obscured." (8) "Of a rich clay-red with yellow subterminal line and the stigmata yellow edged." (9) "Dark livid greyish-purple, unspotted, but having the costal region, the subterminal line, and the cilia dull yellow."

From Scotland, one "Of a very soft bright red, or fulvous with the subterminal line deeper red."

Another from Rannoch, " Is brick-red, and has its costa straighter than usual, giving it a very peculiar shape."

Another, " Has pale clouds around the stigmata."

" Another, " Has the stigmata all but obliterated and no pale edging to the subterminal line."

The Names and Forms to be considered are:—

gracilis, Schiff. (1775), *Verz.*, 76.
gracilis, Fab. (1787), *Mant.*, II, 148.
collinita, Esp. (1787-9?), *Abbild.*, IV (2), 505, plt. 152, 6.
lepida, Brahm (1791), *Ins. Kal.*, II, 271.
f. *sparsus*, Haw. (1803), *Lep. Brit.*, 122.
ab. *pallida*, Steph. (1829), *Ill.*, II, 143.
ab. *pallida*, Gn. (1852), *Hist. Nat. Noct.*, V, 356.
r. *ella*, Btlr. (1878), *A.M.N.H.*, 5 (1), 167.
r. *pallidior*, Stdgr. (1888), *Stett. e. Zt.*, 32.
ab. *rufescens*, Ckrll. (1889), *Ent. Rec.*, V, 216.
ab. *rosea*, Tutt (1892), *Brit. Noct.*, II, 145.
ab. *rosea-sparsus*, Tutt (1892), *l.c.*
ab. *brunnea*, Tutt (1892), *l.c.*
ab. *obscurior*, (Hamp.) Strnd. (1916) [*Lep. Phal.*, V, 431 (1905)] *Strnd. Arch. Naturg.*, LXXXII, A2, 30 (1916).
ab. *cruda*, Lenz. (1927), *Osthldr. Schm. Sudbay.*, II (2), 316.
ab. *fasciata*, Lenz. (1927), *l.c.*
ab. *nictitans*, Lenz. (1927), *l.c.*
ab. *obsolescens*, Lenz. (1927), *l.c.*
ab. *marmorata*, Lenz. (1927), *l.c.*, p. 317.
ab. *obscura*, Lenz. (1927), *l.c.*
ab. **nigra,** n. ab.

Tutt dealt with (1) *gracilis*, Fb., pale grey-white, subterminal line orange or reddish; (2) *sparsus*, Haw., ditto, subterminal line grey, mottled; (3) *pallida*, Steph., not mottled with black atoms; (4) *pallida*, Gn. = (5) *rosea*, Tutt, pale reddish or orange, not mottled with black atoms; (6) *rosea-sparsus*, Tutt, ditto, mottled with black scales; (7) *rufescens*, Ckll., almost unicolorous dark red; (8) ab. *brunnea*, Tutt, almost unicolorous dark brown.

Tutt referred (p. 146) under his var. *brunnea* that it was an " extreme form of var. *rufa*." I take it that "*rufa*" should be " *rufescens*." In his tabulation of forms, *rufescens* is " almost unicolorous dark red " and *brunnea* " almost unicolorous dark brown."

lepida, Brahm, *Insektenk.*, II, 271 (1791).

Fig.—*Scriba's Mag.*, III, plt. 18, f. 7 (1793).

Orig. Descrip.—" The forewings are fawn pale grey, with very indistinct marking; the usual stigmata are not distinguishable, but it can be noted that the lower portion of the reniform is of a dark colour. Not far from the outer margin lies a moderately light grey transverse line shading out to brownish on the inner side, and inside beyond it lies a wavy row of blackish dots. The hindwings are whitish, shaded brownish toward the outer margin and a portion of the inner margin. On each of the three branches of the chief wing vein stands a slight blackish dot. All the wings are whitish below, with a row of blackish dots on

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.

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

Articles that require ILLUSTRATIONS are inserted on condition that the AUTHOR defrays the cost of the illustrations.

TO OUR READERS.—Short Collecting Notes and Current Notes. Please, Early.—EDS.

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.

Urgently Wanted for Experimental Purposes.—Pupae of *hirtaria* and *lapponaria*. I can offer duplicates of very many species in return.—*Harold B. Williams, Croft Point, Bramley, Surrey.*

Desiderata—British *dominula* varieties with full data other than var. *lutescens* and var. *lineata*. Other vars. acceptable. *Duplicates*—British *L. l-album, exigua, cribrum, ocellaris,* and *intermedia,* etc.—*Dr H. B. D. Kettlewell, Cranleigh, Surrey.*

Duplicates.—Erebia manto ssp. constans f. gnathene. Mostly ♂♂, Mont Dore, Central France. *Desiderata.*—Erebia manto, Austrian. Erebia lefebrei, L. or Scandinavian Erebiae.—*H. G. Harris, 5 Archer's Road, Southampton.*

Duplicates.—Several thousand British Macro-Lepidoptera in perfect condition; full data. *Desiderata.*—British Micro-Lepidoptera in similar condition.—*S. C. S. Brown, Kingsholme, 454 Christchurch Road, Boscombe, Bournemouth.*

Duplicates.—P. brassicae,* Rapae,* Sinapis (Irish), Croceus, Rhamni, Argiolus, Coridon, Bellargus, Paphia, Aglaia, Cardui, Atalanta,* Io,* Galathea, Semele, Tages, Malvae, Sylvestris, Venata, Vinula,* Bucephala,* Similis,* Perla, Muralis, Ochroleuca, Flavicincta, Bipunctaria, Ochrearia,, etc. *Desiderata.*—Numerous, black pins, data.—*L. H. Bonaparte Wyse, 53 Victoria Road, Shoreham-by-Sea.*

MEETINGS OF SOCIETIES.

WAR-TIME ARRANGEMENTS.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON : 41 Queen's Gate, S.W.7. —April 3rd, May 1st, June 5th, at 5 p.m.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. —2nd and 4th Thursdays from April onwards, 6 for 6.30 p.m., Chapter House Hall, St Thomas Street, S.E.1. *Hon. Sec., S. N. A. Jacobs*, Ditchling, Hayes Lane, Bromley, Kent.

THE LONDON NATURAL HISTORY SOCIETY.—Fixtures as printed in current syllabus cancelled. Members will be notified of further arrangements. *Hon. Sec., A. B. Hornblower*, 91 Queen's Road, Buckhurst Hill, Essex.

ENTOMOLOGICAL SECTION, BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—Evening Meetings. On the third Monday of each month, 7 p.m., at 55 Newhall Street, Birmingham. Visitors welcomed. Those who would like to attend or exhibit please apply to *G. B. Manley*, 72 Tenbury Road, King's Heath, Birmingham.

SOCIETY FOR BRITISH ENTOMOLOGY.—All meetings suspended till further notice. *Hon. Sec., E. Rivenhall Goffe*, 102 High Street, Southampton.

Communications have been received from or have been promised by T. Bainbrigge Fletcher, A. J. Wightman, W. P. Curtis, H. Willoughby-Ellis, E. Ernest Green, A. J. Bowes (plate), E. P. Wiltshire, Dr E. A. Cockayne, H. B. D. Kettlewell, H. W. Andrews, Rev. G. Wheeler, Abdul Mun'im S. Talhouk, Austen Richardson, M. Niblett.

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

Printed by T. Buncle & Co. Ltd., Arbroath.

Vol. LII.

No. 4

APRIL 1940.

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

CONTENTS.

Subscription for Complete Volume, post free
TEN SHILLINGS,
to *The Hon. Treasurer*, H. W. ANDREWS, F.R.E.S.,
6 Footscray Road, Eltham, S.E.9.

This number, Price ONE SHILLING AND SIXPENCE (net).

ORIA (SYNIA) MUSCULOSA, HB., INDIGENOUS IN BRITAIN.

By E. A. Cockayne, D.M., F.R.E.S., F.R.C.P., and H. B. D. Kettlewell, M.A., M.B., B.Chir.

We feel that the time has now come when our observations on this species extended over the past few years, incomplete as they are, may be of some value to other entomologists. Our excuse for publishing this paper before our evidence is complete is that while the war lasts we may be unable to add to our knowledge.

We had held the view for some time that, judging by past records and by its habits abroad, the insect was not a migrant. The type of terrain where it had been taken previously gave us no satisfactory clue to the nature of its breeding grounds. Eventually we thought that it must breed in river valleys, chiefly from evidence afforded by the capture of small numbers over a period of years near such a valley.

On August 4, 1938, H.B.D.K. took his first *musculosa* at light in this valley at 1 a.m. Subsequent nights proved unproductive, though moths came to light in great numbers. This capture confirmed our view and so we took at intervals through the year a survey of all the coarse grasses which grew there in the hope of finding the larva. This led to no result, and we found that in the winter the place was completely flooded. In view of its life history on the Continent we decided that it was unlikely to breed in the valley and tried the higher ground about a mile away. This consisted of rolling arable land, stony and poor, with a chalk subsoil. The only unusual feature was the absence of boundary hedges, which were replaced by narrow strips of grassy ground separating one field from another. The chief crops were winter wheat, winter oats, and barley. Practically no root crops of any kind were grown and very little rye. Rye has always been called the chief food plant of *musculosa*, but it became increasingly obvious that it could not account for the presence of the insect in this district. We undertook a further survey of coarse grasses in this area, which will be referred to later. During May and June 1938 H.B.D.K. carried out a search of many crops in the area for larvae. We were then in possession of the Continental life-history. H.B.D.K. used three methods, searching by day, searching by night with a petrol vapour lamp, and sweeping by night, the last producing insects in great variety and vast numbers, but none of them producing the larva of *musculosa*. The crops examined were chiefly winter wheat and winter oats, and these only along the outer margins. Nevertheless, at the margin of one of these fields, which had been worked, *musculosa* was common later in the year, and 59, all males, were taken. The male is very strongly attracted to light, and on some nights was the commonest species on the sheet. The weather was most unfavourable, and on most nights it was either bitterly cold, with a full moon, or there were thunderstorms with torrential rain. We believe, therefore, that the species is even commoner than our figures suggest. The following is a list of dates and captures:—

27.7.1939. 2 males, 12.10 a.m. Very cold, some cloud.
31.7.1939. 2 males assembling, 10.10 p.m. Very cold.
1.8.1939. 1 male, 11 p.m. Clear cold moonlight night.
2.8.1939. 5 males between 10 and 10.30 p.m. Cold, very dark and very wet.

3.8.1939. 8 males, 10, 10.5, 10.10, 3 at 10.35, 11.5, 11.10. Dark and very wet, so that many stuck on the sheet and were ruined.
4.8.1939. 5 males, 9.55, 10.5, 2 between 10.20 and 10.45. Rather cold, north wind, dark.
5.8.1939. 9 males, 10.5, 2 at 10.20, 10.35, 10.40, 10.55, 11.5, 11.10, 11.15. Dark until 11.10.
6.8.1939. 11 males, between 10.5 and 10.40. Dark and fairly warm.
7.8.1939. 12 males, 9.50, 5 at 10.25, 10.45, 3 at 11.10, 11.12, 11.15, 11.20. Warm and dark.
12.8.1939. 3 males. Fair night.
13.8.1939. 1 male (R. P. Demuth). Very favourable night.
16.8.1939. None (R. P. Demuth). Fair night.

It will be noted that only males were taken and that there is a definite flight between 9.50 and 11.20 p.m. (summer time), and that the moth is commonest during the first week in August.

We will now describe more fully our method of collecting. The place where we found it to be most numerous was on the edge of a very large field of winter wheat, which abutted on an enclosure of coarse grass, chiefly *Dactylis glomerata*, *Arrhenatherum*, and *Bromus erectus*. This enclosure of about ten acres had been allowed to go wild for years with the object of providing a breeding cover for game, a method frequently adopted in districts where there are no copses or coverts. There was no hedge separating the wheat from the grass. We also found *musculosa* in other similar places in the district. We placed from two to six petrol vapour lamps on the edge of the field, sometimes hanging one lamp six feet above another, which rested on a sheet on the ground, so that the upper one threw a beam over the top of the uncut wheat. As many moths came to sheets without an upper lamp as to those with one, and none were seen flying round the upper lamp on their way to the sheet. All those observed came out of the wheat flying very low, and none were seen flying out of the grass. They fly rapidly and buzz on the sheet for a few minutes, rubbing all their scales off when the sheet is soaked with rain. They then sit quietly, often near the edge of the sheet, where they can be identified with ease.

It is reported that in the neighbourhood of Gibraltar the moth is frequently found on flowers by day. We searched knapweed and ragwort, both by day and by night, close to the place where the moths came to light. We found no *musculosa*, though on some nights other moths were not uncommon. The weather, however, was very unfavourable.

On the evening of July 31 H.B.D.K. was fortunate enough to see males of *musculosa* assembling. At 10.10 (dusk) a light-coloured moth was seen slowly threading its way through the heads of corn, flying rather like *Tapinostola elymi*. It was netted and proved to be *musculosa*. A minute later another was seen flying in exactly the same way to the same spot, but was missed with the net. Assembling was now suspected. Immediately after this a third approached, flying very low, but in catching it a small area of the surrounding wheat, on which there is little doubt the female was sitting, was disturbed. Though the ground was searched for an hour it was impossible to find her owing to the thickness of the undergrowth of weeds. Needless to say, no lamp was in use when the males were assembling.

This observation is a step forward in the discovery of the breeding place of *musculosa*. The calling female must have been sitting about one and a half yards from the edge of the wheat, which again was some two yards from the coarse grass. Assuming that the female had emerged recently at that spot, we can say that the egg from which she came was laid quite near in July or August 1938. The farmer told us that at that time the large wheat field was an area of bare stony fallow with the nearest corn several hundred yards away. The grassy edges and enclosure, however, would be unchanged. The farmer who owned the field was a particularly tidy worker and he assured us that all weeds and rubbish were burnt prior to ploughing and sowing in September and that the fallow had been ploughed previously during the summer.

Abroad, the presence of *musculosa* is looked upon as a sign of untidy farming where rubbish is left unburnt. It is therefore unlikely that ova laid on the fallow would have a chance of surviving and it is probable that they were laid on the grassy edge or in the enclosure.

The larvae then fed on (a) coarse grasses only, (b) on wheat, (c) on both. Let us examine the evidence in favour of each, for this question of food is probably a factor of the greatest importance in determining the distribution of *musculosa* in this country.

(a) Grass only. The Continental literature does not make it clear whether grass alone will suffice, but presumably the larva fed on wild grasses before wheat and other cereals were evolved by man. In our district it appears that crops play a part. In the places where we placed our lamps in large areas of wild coarse grasses (chiefly *Arrhenatherum*) away from any crops we took no *musculosa*, though other species were abundant. The coarse grass, *Calamagrostis epigeios*, is given as a food-plant by Hoffman. We have never seen it in the vicinity of crops, though it grows in a few places in the district. We visited these and it seems unlikely that *musculosa* breeds in any of them. The nearest is five miles from any of the places where we took it. *Triticum repens* and *Aegilops cylindricum* do not occur in this country, nor do *Bromus tectorum* and *B. inermis*, all stated by Continental authors to be food plants, but *Bromus erectus* is common in this district and grows along the edges of corn fields. It appears to us the most likely food plant in this country, but since the larva eats grasses so distantly related as *Calamagrostis* and *Bromus*, other grasses with thick stems, such as *Arrhenatherum*, may be alternative foods. The larva is said to bury itself about an inch and a half below the surface in loose earth for pupation, and the absence of patches of bare earth in the large areas of wild coarse grass may render these unsuitable.

We spent a long time every night searching for females ovipositing, but without success. This suggests that she does not lay eggs on the growing corn. We also searched the grass and rubbish along the path between the corn and the enclosure. The usual practice in this district is to sow rye grass and clover with wheat and allow it to grow as a crop for feeding sheep the next spring. Some of the fields are then put under plough late in the summer after the sheep have finished with it. The fields therefore have a short period in fallow through the months of July and August prior to the autumn sowing with winter wheat or winter oats.

Further, we found on enquiry that our farmer for the past seven years had left some of his fields fallow for a whole year after harvest, ploughing them a second time in the summer to aerate the soil. This last method, however, is not adopted by any other farmer in the district. In any case, there are a number of fields over the whole of this area which are bare and ploughed during July or August and are subsequently sown with wheat or oats. The presence of fallow fields might therefore afford the special conditions required, for, if the moth laid eggs on grasses growing along the edges of fallow fields, the larvae would be sure to have a crop of corn to enter and loose earth to pupate in.

Though this is possible, we have no definite evidence that this is the usual habit of *musculosa*, but it is extremely probable that the absence of root crops and the presence of grassy strips instead of hedges between the fields in this district may be the chief factors which enable the insect to prosper in this area.

(b) Wheat only. We do not think it likely that wheat alone is the food plant. Eggs laid on fallow would be ploughed in, and of those laid on growing corn some would be carted away and others remaining on the stubble would be ploughed in and there would only be rye grass for the young larvae to feed on in the spring. If the eggs were laid on rubbish at the edges of the corn fields most of it would be burnt before they were due to hatch.

(c) Grass and wheat or oats. We think it probable that the eggs are laid on grasses bordering the fields and that the young larvae feed first on grasses and when larger wander into the corn. Against this is the fact that no yellow stems were found along the edge of the field where *musculosa* was taken most commonly later in the same year. The wheat was examined again while the moth was on the wing and, though many stunted stems were found with the sheathing leaf still partially covering the ear, all of them were found to contain young larvae of *Apamea basilinea*.

The following is a summary of the life history taken from a paper by Professor S. Mokrzecki (*Zeitschr. f. Wissensch. Insektenbiol.*, 1907, 3. 50, 89).

This insect is a periodic pest in South Russia, where it is known as "Blade Pest." It also occurs in Denmark, middle and south Germany, Hungary, N.W. Africa, the Canary Islands, Syria, Armenia, N. Persia, and Turkestan. The first investigations were carried out by Professor K. Lindeman in the Caucasus, and the insect was named by him *Tapinostola frumentalis* (*Ent. Nachr.*, 1884, 10. 173). Its first appearance on the wing is in early June and the numbers increase up to July 5th or 6th. After this date the numbers decrease up to the end of the month.

During the daytime the moths rest on the ground or on a stalk. At dusk they become active and visit various flowers. They fly till midnight and are attracted to bright light in numbers. They pair in the evening and then begin to lay their eggs immediately. A female that emerged on June 18th paired the following night and then started laying eggs. It was in copulâ one hour.

In nature the eggs are laid on the stalks of grasses growing near wheat, usually under a sheathing leaf. They are laid in lines, 20 in a line, and two lines are laid alongside one another. They are also laid on dead objects in a field such as posts. The eggs are stuck on with

an adhesive liquid which hardens in the air and forms a protective covering, enabling them to survive the winter. The moth lives on an average for 5 to 7 days. Before ovipositing the female becomes very active, running up and down the stem on which she intends to lay. In captivity eggs are laid on the sides of the box as well as on other dead objects.

The egg, flat on the top, is bright yellow at first and later turns white. The shell is very thick and hard. At this time it resembles a small seed of some weed. The embryo develops inside the egg in the late summer and in October the fully developed larva lies inside. The larva hatches at the beginning of March, or according to Kurdjumov (*Rev. Applied Ent.*, 1914. 2. Ser. A. 171), at the end of April. On March 7th, 1893, a field was sown with oats, which germinated on March 20th. On March 25th, shoots appeared, which were affected by the young larvae. At the beginning of March these had been found in *Bromus*. In 1897 barley germinated on April 9th, and larvae of *musculosa* appeared in the stems between April 11th and 14th. The stem measured .8 mm. in diameter, while the larva was 3.5 mm. in length. At this stage the larva (first instar) is dirty white in colour with a dark brown head. The abdomen has four longitudinal brown stripes and is covered with fairly long hair.

On emergence from the egg the larva finds the nearest grass and later transfers itself to winter wheat, summer wheat, rye, oats, or barley. It bores into a stem, making a small round hole near the ground, and feeds internally. There is an exit hole above this, usually below the lowest leaf, the upper hole being larger than the lower, their distance apart being 1 to 2 cm. On opening the stem one finds greenish-white frass. When the old stem can no longer contain it, the larva wanders off to another shoot. The old shoot withers above the infected part, but the roots and lower part of the shoot remain undamaged. There is only one larva to each shoot, but frequently every shoot in a given plant is attacked in turn by the same larva. The larva changes its position during the night, and usually moves into the nearest stem. As the larvae increase in size the whole field may become covered with brown withered shoots. When full grown the larva leaves the stalk and takes up a position beneath the sheathing leaf, which covers the ear of corn, and feeds on the unripe grains and fills the whole sheath with white frass. The whole ear may be eaten. The dead ears, which are unopened, are fairly conspicuous and can be found from the end of May onwards in winter wheat. Less often the dead ear is bitten off and falls to the ground. In some crops fifty per cent. of the heads are damaged. About the first week of June the larvae leave the sheath and burrow into the earth to pupate, but some can still be found up to June 10th feeding on the late ears.

The full grown larva is 26 mm. in length, spindle-shaped, tapering posteriorly, and is a light green in colour, very smooth, but with whitish hairs. There are four longitudinal dark red-brown stripes, the two median being broader than the two lateral. The head is yellowish-red with black ocelli. The prothoracic plate is reddish with darker edges. On the sides of the prothoracic somite there are small black tubercles with fine hairs springing from them, and these are present on the other somites, but more conspicuous on those towards the anal end. The legs and the five pairs of prolegs are greenish in colour.

The pupa is 15 mm. long, brownish red, smooth, and shining, with reddish spiracles. The cremaster ends in two small spines.

The larva usually pupates under an infected stem and when this is pulled up the pupa may be found exposed in the earth underneath. The larval period is about two and a half months and the pupal period a fortnight (Kurdjumov).

Musculosa is most common on peasant holdings, which are badly worked and unscientifically ploughed and treated. Counter measures consist in burning the stubble and all rubbish, and in deep ploughing in the autumn. The introduction of rotation of crops is also recommended, particularly with the growing of roots. The saying among the peasants is "the bladeworms have taught us how to plough." It is nearly always the outside edges of the fields that are affected most, especially those alongside a road. Certain areas are free from infection and then one comes across a place where nearly every shoot is affected (Jablonowski, J. *Rev. Applied Ent.*, 1914, 2. Ser. A. 526).

The history of *Oria musculosa* in England is interesting. The first specimen, a very perfect male, was taken at a gas-light in the Sussex County Hospital, Brighton, 17.viii.1855, by J. N. Winter (*Zoologist*, 1855. 13. 4904), and was figured in the frontispiece of the *Entomologist's Annual*, 1856. A beautiful specimen was caught in the evening, 7.viii.1856, at Brighton, by A. J. Wigginton (*Ent. Weekly Intelligencer*, 1856. 1. 154), and another in the same year by Henry Cooke, flying round a lamp at the corner of the Pavilion Gardens in the very centre of Brighton (*Ibid.*, 173). W. H. Allchin took one on a flower, 15.viii.1858, at Brighton (*Ent. Weekly Intelligencer*, 1858-9. 5. 12). T. Thorncroft caught a female, 10.viii.1858, and a friend with him caught a male and a female on the same date at Brighton (*Zoologist*, 1858. 16. 6284). According to Barrett others were taken in the following years in the same locality, and J. H. A. Jenner caught one at Bexhill, Kent (presumably a mistake for Sussex). I have been unable to trace these records. Barrett says "it appears as though from 1855 to 1860 a strenuous effort must have been made by the species to form settlements in the Southern Counties, but since 1860 it seems very nearly to have died out." W. E. Parsons, however, caught one on clover heads flying in the daytime near Brighton in 1883 (*Entomol.*, 1883. 16. 261).

On the facts at his disposal Barrett's conclusion that *musculosa* is an immigrant, which established itself on the south coast for several years, was justifiable, though in all probability it was incorrect. No further records appeared until H. Haynes published a note saying he had taken six in 1909 and three in 1910 at Salisbury (*Entomol.*, 1910. 43. 250). These were all taken on gas lamps and he took others in the same way in subsequent years until building operations spoilt the place and wheat and oats were no longer grown there. Mr Caleb Gater took three, which he kindly showed to us, all in different localities and all some miles from the Salisbury locality. They were caught in the daytime as they flew out of winter wheat during harvesting. The dates were 22.vii.1911, 25.vii.1929, and 12.viii.1932. Another specimen is said to have been taken by day on a flower of knapweed on Salisbury Plain in 1938. G. H. Dixon took a single specimen at light, 24.vii.1933, at Micheldever, Hants (*Journ. Soc. Brit. Ent.*, 1934, 1 (1). 9), and E.

Kefford captured a male at light at Great Ballard School, New Milton, Hants. 25.vii.1935 (*Ibid.*, 1936. 1 (5). 121). These probably fall within the breeding area centred on Salisbury Plain.

The origin of the three following specimens is less easily explained. One was taken by Jager in S. Devon in 1899 (*Entomol.*, 1899. 32. 286): the second, recorded by Hawker-Smith (*Ent. Record*, 1928. 40. 39), according to G. Talbot, was a male taken in the light trap in the grounds of the Hill, Wormley Hill, near Witley, Surrey, and the third was taken at light at Eton College by E. C. Pelham-Clinton, 24.vii.1938 (*Entomol.*, 1938. 71. 237).

We are convinced that this species is not migratory and in fact may not wander far from its field-side localities. This is supported by the fact that only a solitary specimen was captured after days of collecting in ideal conditions at a spot only one mile away from a place where large numbers are known to occur. The species is indigenous and will probably be found in other districts where the type of soil and method of farming suit it. In such localities it has probably been overlooked because no one has used light in harvest fields. Even if light were used in such a situation *musculosa* might pass unnoticed among swarms of *Leucania pallens* and *impura* by anyone who was not expecting to see it.

In conclusion, we must thank Mr Haynes, whose earlier captures led us to look for the species where we did and who without hesitation showed us his old locality. We must express our gratitude to Mr Pitman and Mr Gater, who were the first to suspect the real habitat, and to Miss Gullick, who went with us to identify the various grasses, and to Mr Goddard for putting at our disposal his great knowledge of crops.

INSECT BIOTOPES IN SYRIA, IRAQ AND IRAN.

ECOLOGICAL FIRST IMPRESSIONS.

By E. P. Wiltshire, F.R.E.S.

The following notes endeavour briefly to summarise the ecological conditions governing insect-life in those Near East countries that I know. Anatolia, which I have not yet personally visited, cannot justly be omitted from such a summary, and my remarks on it, not being first-hand, are abbreviated. In the absence of an exhaustive zoogeographical analysis of all the biotopes, zoogeographical conclusions are also reduced to a minimum and expressed in general terms; any other course is impossible until the fauna of these lands is better known than it is to-day.

Taking geographical units such as Syria, Anatolia, Iraq, and Iran as heads of columns or vertical divisions, it is possible to trace four or five characteristic horizontal divisions which produce biotopes more or less corresponding to, and in some cases physically linked with, their counterparts in the other columns; these horizontal divisions are:—

1. High peaks.
2. Middle heights: either wooded hills or hilly steppe.
3. Deserts (and steppes).
4. Oases: rivers, irrigated cultivation and marshes.
5. Houses. (This class will not be discussed here.)

I shall now follow each of these divisions through the geographical units under discussion.

1. HIGH PEAKS.

The tops of mountains are ecologically isolated and contain a number of endemic species, or well-differentiated races. Probably during or just after the last Ice Age many of them were faunistically joined, but this is less probable of the Iranian mountains, for the climatic conditions of the Iranian plateau were hardly affected by the European Ice Ages; the differentiation of races of peak-species, therefore, is more complete in Iran. Nevertheless, the Iranian peak-fauna shows signs of a common, if remoter, origin. In many cases it is debatable whether local forms occurring on Iranian peaks should be regarded as distinct species or as subspecies.

A. *Syria.* Palestine should not really be separated from Syria except in considering the peculiar Jordan valley and Dead Sea fauna, but it contains no really high peaks. In Syria, there are the Lebanon, Anti-Lebanon and Hermon mountains, of which only the first[1] has been adequately explored.

B. In *Anatolia*, the Taurus[2] peaks are those that have been best explored.

C. In *Iraq* (and S.W. Iran), the Zagros peaks still require further exploration, though one of the (Iranian) Farsistan mountains has recently been fairly thoroughly explored, viz., Barm-i-Farus.[3]

D. *Iran* has recently received much attention from naturalists.[4] The Elburz range in N. Iran contains the greatest heights of any of my vertical divisions. During the Ice Age the Elburz snow-line was not more than 1000 m. lower than to-day, but the south side was even then arid.[5] There are many other high ranges in Iran, only some of which have been explored; but none of them contain the quantities of water at great heights which are found in the Elburz. The great richness of species of the Elburz marks it out as a primary centre of distribution for the whole Near East.

Most of the species peculiar to these great heights are restricted climatically. For instance, *Vanessa urticae* (a Euro-Siberian species) occurs in the Lebanon, Kurdistan, Anatolia, and North and Central Iran together with *Urtica dioica*, L., which I have only seen growing where ice-cold water flows; on the Syrian coast a different species of nettle grows which it will eat but on which it will not survive if bred at sea-level. Evidently both foodplant and host are restricted climatically, but I think it improbable that any characteristic peak-species is now restricted only by the availability of its foodplant. Failures to breed many polyphagous mountain-top larvae at other levels confirm this view.*

[1]Zerny; Ellison & Wiltshire.
[2]Osthelder & Pfeiffer.
[3]Brandt.
[4]Alberti; Brandt; Osthelder; Pfeiffer.
[5]Bobek.

*I think that the difference of air pressure is also concerned, perhaps especially in connection with eclosion from the pupa. In India I found this difficulty in rearing in the Plains insects brought down from the Hills.—T. B. F.

2. MIDDLE HEIGHTS.

These are either wooded or steppe-like, according to the degree of humidity. Deforestation also may reduce originally wooded hills to the status of hilly steppe.

Most of the Middle Heights of the extensive area under consideration have a typical population of steppe species, which I here term Anatolian-Iranian, which is the handiest English equivalent that I can find for Amsel's " Vorderasiatisch-Mediterran."

A. and B. In coastal Anatolia and the Lebanon a humid woodland, of a Mediterranean character, covers these Middle Heights, scrub-oaks, Aleppo pine and pistaccio being the characteristic indigenous trees, with juniper at the upper limit. Various degrees of deforestation and degradation occur, the extreme being in Palestine; but the resulting steppe-like terrain differs from the inland steppes, being favoured by mild winters and high humidity. On the east side of the Lebanon and in the Anti-Lebanon genuine hilly steppe occurs, with vestiges of juniper wood at a fair height. The Bekaa and Central Anatolia are also steppe-like.

C. The Zagros woods are linked up physically with the Anatolian; they differ from the Lebanon woods by their drier atmosphere and colder winters. They consist of several kinds of scrub-oak, pistaccio and paliurus, and are partly deforested.

D. *Iran*. The North Side of the Elburz is clad with a humid deciduous forest, of Euro-Siberian and Mediterranean character, but of tropical density, with junipers at the upper limit. High up on the arid south side of the range, the miserable relicts of a juniper woodland are to be found. The Middle Heights of the rest of Iran are steppe-like, except for the undeforested parts of the Zagros, and were probably not wooded even in the Pleistocene Age.

We find some species (e.g., *Simyra dentinosa*) apparently absent from the humid Lebanon woodland, but present at Upper Heights in the Lebanon and on steppe-like Middle Heights in Syria and Iraq; others (e.g., *Cucullia barthae*, Brsn.) occur at 8000 ft. in the Elburz, and down to 3000 ft. in Syria and Anatolia, including the humid woodlands in their range. The distribution of such species is of great interest, but further precise records from many parts of the Near East are needed before zoogeographical generalisations are possible.

The complete absence of woodland from the Interior of Iran does not result in the complete absence of species that seem typical of woodland in S. Europe and Asia Minor, because some of them depend on undergrowth vegetation, which exists in the oases (see below), while others in Iran become feeders on water-trees (e.g., *Lymantria dispar*, on oak in the Lebanon, on poplar in Iran).

Many species occurring at great heights occur also at Middle Heights, especially where the latter are arid and steppe-like and there is less difference in the vegetation of the two zones. Such species are less differentiated into local forms than those confined to the peaks. The vertical limits of a species' range are not necessarily identical in Syria, Iraq and Iran. Middle Height species tend to be euryoecous over large areas. Even in the arid parts there is a fairly strong " Mediterranean " penetration, growing weaker eastwards.

3. DESERTS AND STEPPES.

A regular winter rainfall distinguishes all the desert of the area under consideration from the " true " Sahara, in the sense of Zolotarevsky and Murat. (It resembles, therefore, that part of the Sahara closest to the Mediterranean, defined by Chevalier[6] as the " Northern Saharan Zone.") Most of the desert is stony, but in Central and Lower Iraq it consists of alluvial mud. In both kinds, but especially often in the alluvial, the soil has a salty tendency. Sand-dunes are not usual, except coastally. The alluvial desert is less rich in vegetation and animal life than the stony, except where marshes intrude on it.

The heavier precipitation of the Anatolian and Iranian high steppes cannot benefit vegetation because it coincides with the cold winter; it thus fails to relieve the desert-like nature of the Anatolian-Iranian plateau.

A. *Syria.* Here the desert proper begins eastward of the Anti-Lebanon. This range, however, and the Bekaa plain also, have a steppe-like character and harbour many desert-species. The dunes of the sea-shore, a continuous strip in Palestine from Sinai to Carmel, but only represented by outliers north of Mt. Carmel, carry the true desert-fauna northward up the western side of the Judaean and Lebanese hills. Here (and also on the shores of the Persian Gulf) the proximity of sea and desert, without intervening mountains to ward off the former's humidity, produces a particularly rich desert fauna. In such localities the two seasons of greatest insect-activity tend to converge, being divided by the coldest part of the year, i.e., a few weeks in January. The appearance on the wing of Lepidoptera in such localities, however, seems not to be so much regulated by this brief cold spell as by the incidence of autumnal rains.[7]

B. The steppes of Central Anatolia and Armenia must be considered together with those of Iran.

C. *Iraq.* In the North of Iraq, the desert is stony, i.e., a steppe desert, and inseparable from the Syrian desert. On some desert mountains in this desert the vestiges of pistaccio woodland survive (*P. mutica*). In Central and Southern Iraq, an alluvial desert, more or less relieved by irrigation or marsh, occupies the low valley of the Euphrates and Tigris, with a border, on either side, of low steppe desert. The low steppe desert, even in Northern Iraq, has milder winters than the Anatolian-Iranian steppe, but the coolness of its winters varies locally according to its elevation, which increases gradually towards the west and north. At higher elevations snow-falls occur every winter. A more detailed account of this desert is given in another paper.[8]

D. *Iran* contains deserts and steppes of all types. In the north and west-centre are high steppes subject to intense cold in winter and with the meagrest vegetation, which merge at their upper limits into high steppe-like mountains. In the centre and south are deserts warm enough to permit palm-cultivation in oases, but quite dry; the low, humid, torrid shores of the Persian Gulf and Indian Ocean are also desert.

[6]Vide Zolotarevsky & Murat.
[7]Wiltshire, 3.
[8]Wiltshire, 5.

Desert-species are euryoecous over vast areas. The Syrian-Mesopotamian desert is populated by Eremic species but has a strong penetration of Anatolian-Iranian species, a weaker " Mediterranean " penetration, and a still weaker penetration of Euro-Siberian species. Northward migrations of tropical species occur. Some of these migrants do not appear to breed in the desert, but rather in the oases; others probably cannot survive in any biotope, their appearance depending on fresh immigrants each year. The colder the winter, the larger will be this last class.

4. OASES: RIVERS, IRRIGATION AND MARSHLAND.

It is only possible in some cases to distinguish these three types of oasis-biotope from each other. Their common feature is the dependence of their vegetation on more water than is provided by local precipitation alone. In countries, therefore, where summers are rainless, there is a sharp contrast between them and the surrounding land. Their characteristic species are stenoecous, but they often contain thriving colonies of desert- and steppe-species, if the plants on which these feed like moist situations. When irrigation is interrupted or declines, the neglected land reverts to desert or steppe. Some of the stenoecous species migrate across the surrounding desert, but I have only noted this tendency in those of tropical origin. Wagner, however, has taken marsh-species at light in the Anatolian steppe at 10 km. from their breeding-ground. The various kinds of oasis will be dealt with in order of elevation: —

a. High rivers of the Elburz.
b. Mountain streams and rivers, and derived irrigation.
c. Persian gardens.
d. Hot desert rivers, and derived irrigation.
e. Marshes.

Zoogeographists class both oasis and desert insects as eremic, if their distribution so warrants. It is, however, noticeable that oasis-insects tend to be less pan-eremic than desert-insects; that is, they have become differentiated into many distinct species each with a more limited territory (cf. the tamarisk-feeding genus *Clytie*); this tendency is not surprising in stenoecous insects. It may be taken as a sign of the geological antiquity of the intervening desert tracts.

a. The high rivers of the Elburz (e.g., Lar). The meadows bordering these rivers contain many Euro-Siberian plants, but are treeless. These plants and their peculiar insect-hosts are stenoecous, the surrounding mountains being arid.

b. Mountain streams and rivers. These are generally characterised by walnut, poplar, willow, ash, tamarisk and oriental plane, in Syria, Iraq and Iran, and doubtless also in Anatolia; also in places, by *Phragmites* and *Typha*. Where the ground-contours permit, irrigation-channels lead the water off; the resulting strips of cultivation or " valley-oases " are more conspicuous in unwooded country, though even in wooded country closer investigation will reveal a certain number of stenoecous species dependent on water-trees and other hygrophilous vegetation. Nevertheless, the more humid a district, the less restricted many of these species will be. The humidity of the Lebanon woods and Caspian forests enables many species to be euryoecous there which are

stenoecous on the Iranian plateau and even in the Zagros. I have already quoted the case of *L. dispar* in this connection; another example is *Bapta distinctata*, euryoecous in the Lebanon woodlands, stenoecous in Iranian gardens. The trees and plants characteristic of the rivers are also, as a rule, to be found in the irrigated gardens of that district, except that tamarisks seem less frequent in the latter biotopes. Tilling of the ground, for vegetables or cereal-crops, usually only takes place on irrigable ground; spring barley is an exception to this rule. Often the extent of barley cultivation varies from year to year, according to the amount of spring rains. In such localities, therefore, a marginal zone of desert or steppe is to be found, on which cultivation has come and gone, to the detriment of the original steppe- or desert-flora and fauna. Rice is grown in certain Kurdish valleys, though less than on the Caspian littoral, and in lower Mesopotamia.

A and C. The above general remarks apply to *Syria* and *Iraq*.

D. *Iran*. In addition to the above-named trees, rivers and gardens in N. Iran permit the growth of *Celtis*, elm and wild olive.

The percentage of Euro-Siberian species in these stream-side and garden biotopes is higher than in the surrounding arid country, whether flat steppe or mountain-side. Whether these species are relicts of a fauna more euryoecous in a previous geological period or whether they are advance-colonists cannot here be discussed; it must, however, be stressed that trees and plants that will grow almost anywhere in Europe (e.g., sloe, hawthorn, elm, *Asperugo*) are strictly hygrophilous over the greater part of Iraq and Iran, and in places only grow where planted by man. Some Mediterranean species which penetrate are similarly restricted to oases, though a smaller proportion of them than of Euro-Siberian.

Where human culture has not interfered in oasis-biotopes, the fauna is often peculiar and of great interest on account of its endemic species, as in the case of the Tigris fauna (see below), but where cultivation has attacked these biotopes, they are less interesting, harbouring well-known cultivation-followers of the Euro-Siberian or Geopolitan categories. The intenser the cultivation, the less characteristic of the country does the biotope's fauna become. A similar lack of speciality is noticeable in artificial biotopes in Europe but with this difference: since cultivation in Europe implies clearing away and destroying the virgin flora, the fauna of the secondary biotope is an impoverished version of the original virgin fauna; whereas in Iraq and Iran, where cultivation implies irrigation and increases rather than diminishes general vegetable growth, artificial biotopes, even though some of the primary fauna may be exterminated, enrich the original euryoecous fauna by supporting quite foreign elements besides some of those species pertaining to natural uncultivated oases.

There are curious irregularities in the distribution of species attached to oasis-biotopes; for instance, the genus *Dicranura* seems absent from Syria and Palestine, though present in Anatolia, Iraq and Iran; and *Marumba populi* occurs in Iran but not in Iraq or Syria.

c. Persian gardens. Gardens in Iran may be watered directly by surface-channels, or by underground " canats "; the construction and operation of the latter is of great antiquity and characteristic of Per-

sian culture; they produce oasis-gardens or fields like green islands in a dusty plain, often miles from the mountains from which the water is derived. Such oases may either be of a flora like that described above under b, or, the climate permitting, as under d below. This method of irrigation is prevalent in Oman[9] and traces of it survive in Syria and Iraq, where, however, it is decadent (e.g., Palmyra and Kirkuk). Its presence outside Iran is doubtless a sign of previous Persian influence.[13]

d. Desert rivers. These are characterised by *Populus euphratica*, tamarisk, and, south of about latitude 34, palm-cultivation. This cultivation is as old as human culture in Iraq, land of the oldest human civilisation known to science. The rivers are:—The Jordan, the Euphrates and its tributary the Khabur (in N.E. Syria), the Tigris and its tributaries the two Zabs, the Dyala, the Kerkheh and the Karun. The isolated tropical species of the Jordan valley are thought to have gained access thither via the Gulf of Akaba, before the elevation of the floor of the Jordan-rift-valley in that vicinity and the subsequent separation of its flora and fauna from the Red Sea. This may be sufficient explanation for the similar flora of the Jordan and Euphrates valleys; or else this similarity may be explained by the Pleistocene Pluvial periods providing some link between these now separated but similar biotopes. The dried-up courses of one or two great Arabian rivers running eastward towards the Euphrates and the Persian Gulf may be evidences of such a link; or else the Bekaa plain (which we know was a lake in late Tertiary times) may have been then in some way connected faunistically with the upper reaches of the Euphrates.

These rivers are violent and irregular in behaviour. Every year spring floods half-submerge the river-trees at the very period of maximum insect-activity (April-May); minor alterations in the rivers' courses are frequent, and islands are constantly being formed and wiped out. Often the rivers break their banks and flood wide areas of desert; their lower courses are exceedingly marshy.

Palm-cultivation occurs at small oases as well as along these rivers, if the climate is suitable. In Iran palms grow at higher altitudes than in Iraq; Tabbas and Khur, the northernmost Iranian palm-oases, are 1858 m. high but within a degree of the latitude of the northern palm limit in Iraq; Mosul, which has no palms, is hardly 250 m. high. Palm-oases lack elm, plane, and ash, but often harbour many tamarisks as well as willow, poplar and nebek (*Zizyphus spina-christi*). An exclusively palm-garden will afford less protection to undergrowth (and therefore insects) than fruit-gardens, but usually in Iraq the two types of cultivation are mixed together. Where there is good protection from the heat of the sun and the aridity of the desert winds, a stenoecous fauna exists, the counterpart of that found in Persian gardens, but containing fewer Euro-Siberian species.[10]

The oases and irrigated fields of lower and Central Iraq are watered by lift-irrigation or dam-fed channels; the motor-pump has now replaced the water-wheel, and the principal dams are the Hindiya and the Kut barrages. Rice, wheat and cotton are here grown. In the golden

[9]Hogarth.

[13]Philby: Vol. II, pp. 28-29.

[10]Wiltshire, 4.

age of Mesopotamian civilisation big areas of continuous cultivation must have existed, but to-day the patches of cultivation are often separated, like islands, by a sea of invading desert. Years more of consistent progress are needed to restore Iraqian agriculture to what it used to be.

It is curious that some northward penetrating tropical species (e.g., *Taragama siva* and *Thermesia arefacta*), which feed in moist places on *Prosopis stephaniana* (*T. siva* also feeds on Euphrates poplar, tamarisk and pomegranate) do not seem to accompany that thorn into the unrelieved desert.

f. Marshes. Small swamps may occur in all the rivers and streams discussed above, but they are less characteristic than the marshes named below, because they are often so isolated and ephemeral. The larger marshes, in addition to the usual river fauna of the district they belong to, contain also a number of characteristic species. Amik and Ak-shehir are the only marshes of those mentioned below of which any record has been published.[11] Doubtless the vast Euphrates marshes contain some highly interesting secrets.

A. *Syria* (and Palestine). Oumk, on the Orontes; Amik, in the Bekaa; and Huleh, above Lake Tiberias.

B. *Anatolia*. Ak-shehir Lake.

C. *Iraq* (and S.W. Iran). The Euphrates, Tigris and Kerkheh marshes.

Internal reed-feeders appear earlier than in Europe, but produce no second brood (e.g., *P. typhae*, *A. sparganii* and *geminipuncta* in early July at Amik; *P. castaneae* in April in Khuzistan). *Phragmatobia fuliginosa*, however, a river and marsh insect in Syria, appears in two broods.

Having now followed our corresponding biotopes through the different Near East countries, and remarked the variations in each, some general remarks of a zoogeographical nature are possible.

Close though the correspondence may be between insect and plant distribution, phytogeography is not an infallible premise for zoogeography. Primarily climate governs the range of both plants and animals, which may react differently; the influence of vegetation on insects is secondary. The following illustrations will serve:—

1. A plant may range beyond the distribution of the insect attached to it. This is probably due to climatic or historical causes. Examples:

Chilena proxima is only known from the Mesopotamian desert, from Nisibin and Hassetche to Ahwaz, but apparently does not accompany its foodplant, *Prosopis stephaniana*, across the Zagros.

Taragama siva, *Thermesia arefacta* and *P. stephaniana*, see above.

Dicranura and poplar, see above.

Further examples are the numerous European species absent from England though their foodplant is present.

2. A plant's range may be far less wide than that of the insect attached to it in one country. This is largely because even non-polyphagous insects are usually addicted to a genus or family rather than a single species of plant. This adaptibility has doubtless been of great

[11]Ellison & Wiltshire; Wagner.

service to insects in the past and enabled them to survive environmental changes. The case of polyphagous species is so obvious an example of the above observation that I quote no examples, but the following are a few random examples of non-polyphagous insects: —

Hylaicus pinastri, only on Cedars of Lebanon. Two kinds of pine are available in the Lebanon, at lower altitudes than the cedars; in Europe, it is a typical pine-forest moth.

Lycaena alcon, F., feeding in one German biotope on *Gentiana cruciata*, in another on *Gentiana pneumonanthe*.[12]

The penetration of the Euro-Siberian element into these countries naturally interests European scientists. This penetration occurs in four ways: the species may occur (1) at great heights; euryoecously over isolated areas; *V. urticae*. (2) In deserts; absolutely (*P. gamma*) or partially (*P. machaon*) euryoecously. (3) In woods; euryoecously over the wooded area: *Thecla spini* (Lebanon), *Zephyrus quercus* (Kurdistan). (4) In oases; stenoecously: *Chr. phloeas*.

The third and fourth of these biotopes are the most favourable to Euro-Siberian species, and since even the relatively dry woods of Kurdistan are humid in comparison with the enormous expanse of steppe and desert and arid mountain, it can with reason be concluded that moisture plays as important a part as height, indeed a more important part, in permitting Euro-Siberian penetration. A combination of both factors will allow the most Euro-Siberian penetrants.

Some of these species penetrate on several of the biotopes, and one would expect those that penetrate the most unfavourable of the four biotopes (the desert) also to be able to live in two, if not three, of the others. And this is, as far as I know, the case, the third biotope (from which some are absent) being the mountain-tops. Absence from here can in some cases (e.g., tree species) be attributed to absence of foodplant but this explanation may not apply to all cases of absence. *P. machaon* is an example of a species penetrating all four biotopes, though less numerous in woodland and desert than in gardens, marshes, and on hill-sides. It is not absolutely euryoecous in the desert because its foodplant is absent from the flatter parts of the desert.

It is remarkable that the ecological valency of a so-called Euro-Siberian species should be as wide as that of *gamma* and *machaon*; one is tempted to question the correctness of their attribution to the Euro-Siberian category and to attribute them to a new category, the Holo-Palaearctic. I put forward the suggestion that where a species occurs and thrives in all the biotopes of a district of which it is not considered zoogeographically characteristic, the category to which it is attributed should at least be reconsidered.

In most other cases of equal adaptibility, one finds that the species in question are geopolitan in range, or at least widely distributed in the Palaeo-Tropical as well as the Palaearctic zones (e.g., *Nomophila noctuella* and *Euxoa ypsilon*).

To the question: Do insects belonging to one zoogeographical category react uniformly to ecological conditions? the answer is: Probably not.

For instance, Euro-Siberian species indeed seem usually to aestivate in deserts (or perhaps to emigrate thence in summer), but in adjoining

[12]Warnecke, 2.

oases may or may not aestivate (e.g., *P. rapae*, L., does not). Tropical species seem more often to have their repetition of broods interrupted by winter in deserts and oases than by summer, but *Agrotis ypsilon* is an exception. But until the life-cycle of each species has been observed throughout the year in all biotopes, a definite answer is not possible; when the full truth is known, I expect that no uniformity will be discovered.

[Biotopes = habitats; eremic = desert; euryoecus = widespread; stenooecus = localized.—G. W.]

BIBLIOGRAPHY.

B. Alberti: *Revision und Neubeschreibung asiatischer Procris-Arten*, Mitt. Muench. Ent. Ges., 1938, II.

H. G. Amsel: (1) *Die Lepidopteren Palastinas*, Zoogeographica, 1933, Heft 1. Band 2 (Jena). (2) *Weitere Mitteilungen über palastinensische Lepidopteren*, Veroff. Deutsch. K.-U. Mus., Bremen, December 1, 1935. (3) *Neue palastinensische Lepidopteren*, Mitt. Zool. Mus. Berlin, Band 20. Heft 2, 1935. (4) *Grundsatzliche Bemerkungen zur Frage der Faunen-elemente*, Zool. Jahrb., 1939, 72, 1-2 (Jena).

Hans Bobek: *Reise in N.W. Persien, 1934*, Zeits. d. Ges. f. Erdk. z. Berlin, 1934, 9-10.

F. S. Bodenheimer: *Animal Life in Palestine*, Jerusalem, 1935.

W. Brandt: *Beitrag zur Lepidopteren-Fauna von Iran*, Ent. Runsch, 1938-39 (J. 55-56).

P. A. Buxton: *Animal Life in Deserts*, London, 1923.

J. Dinsmore and Post: *Flora of Syria, Palestine and Sinai*, American Press, Beirut, 1933.

R. Ellison and E. P. Wiltshire: *The Lepidoptera of the Lebanon*, Trans. R. Ent. Soc. London, 1939, Vol. 88. I.

D. G. Hogarth: *The Penetration of Arabia*, Lawrence & Bullen (London, 1904).

Osthelder: *Neue Kleinfalter aus dem Tahte Soleiman in Nord-Persien*, Mitt. Muench. Ent. Ges., 1938. I.

Osthelder and Pfeiffer: *Lepidopteren-Fauna von Marasch in turkisch Nordsyrien*, Mitt. Muench. Ent. Ges., 1931-35, 37, 39.

Ernst Pfeiffer: *Notizen über persische Lycaenidae*, Mitt. Muench. Ent. Gesell., 1937, 38.

H. St J. Philby: *The Heart of Arabia*, Constable, London, 1922.

Fritz Wagner: *Weiterer Beitrag zur Lepidopteren-Fauna Inner Anatoliens*, Mitt. Muench. Ent. Ges., 1929, 1.

G. Warnecke: (1) *Grundsatzliches zur Methodik zoogeog. Untersuchungen in der Entomologie*, Int. Ent. Z. Guben, 28 J., 35-38. (2) *Uber die Konstanz der oekologischen Valenz einer Tierart als Voraussetzung fur zoogeog. Untersuchungen*, Ent. Rundsch., 53 J., Nos. 14-16.

E. P. Wiltshire: (1) *Autumnal Lepidoptera in Kurdistan*, Ent. Rec., VIII and IX. 37. (2) *More Notes on Kurdish Lepidoptera*, Ent. Rec., VII-IX, 39. (3) *Notes on the Winter Flight in Mild Climates of Vernal and Autumnal Moths*, Ent. Rec., XI, 38. (4) *Lepidoptera of a Bagdad Orchard*, Ent. Rec., II, 39. (5) *The Saharan and other Affinities of the Mesopotamian Desert Fauna* (ined.).

Zerny: *Lepidoptera of the Northern Lebanon*, Iris, 1932-34.

B. Zolotarevsky and M. Murat: *Divisions naturelles du Sahara et sa limite méridionale*, Soc. de Biogeog., Paris, VI, 1938.

Correction.—The legend of the plate in the March number should be "Locality for *M. japygia* f. *cleanthe*, Montagne de Lure."

each, and a single one in the middle of the hindwing. The body is of the same fawn-grey colour; the males have somewhat flesh coloured sides and anal tuft fringes."

f. *pallida*, Gn., *Noct.*, V, 356 (1852).

Orig. Descrip.—" Of a paler colour, more rosy, and almost without black atoms." Gn. referred this to Stephen's *pallida*, which is really a greyish-white form, and not rosy. It would appear that this form of Gn. was really the form which Tutt subsequently named *rosea*, *B.N.*, II, 145.

race *ella*, Btlr., *A.M.N.H.*, 5 (1), 167 (1878).

Orig. Descrip.—" Allied to *T. gracilis*, but rather larger, the markings darker, the discal line of primaries bordered internally by a blackish streak; secondaries broader, whiter; under surface whiter, with well defined discocellular spots." Yokohama. " The dusky bordered white secondaries distinguish this species readily from *T. gracilis*. In the latter they are wholly or largely clouded with greyish."

ab. *pallidior*, Stdgr., *Stett. e. Zt.*, 32 (1888).

Orig. Descrip.—" The very pale, ashy- or sand-grey *gracilis* obtained from Kuldja, Marzelan, and the Alexander Mts. must also bear a distinctive name. I possess only one almost equally pale (light) conspicuous aberration from Denmark like this. I denote the Central Asiatic light form as var. *pallidior*."

ab. *obscurior*, (Hamp.) Strnd. (*Cat. Phal.*, V, 431 (1905)), *Arch. Naturg.*, LXXXII, A2. 30 (1916).

Orig. Descrip.—" Forewing suffused with fuscous-brown."

ab. *cruda*, Lenz., *Osth. Schm. Sudbay.*, II (2), 316 (1927).

Orig. Descrip.—" With sharply defined dark transverse lines on the margins of the discal area."

ab. *fasciata*, Lenz., *Osth. Schm. Sudbay.*, II (2), 316 (1927).

Orig. Descrip.—" With dark central band and the reniform similarly darkened."

ab. *nictitans*, Lenz., *Osth. Schm. Sudbay.*, II (2), 316 (1927).

Orig. Descrip.—" With conspicuous clear margining of the reniform and a similar line before the outer margin."

ab. *obsolescens*, Lenz., *Osth. Schm. Sudbay.*, II (2), 316 (1927).

Orig. Descrip.—" All the markings more or less lost in the ground colour."

ab. *marmorata*, Lenz., *Osth. Schm. Sudbay.*, II (2), 317 (1927).

Orig. Descrip.—" Marked with small dashes on a clear ground."

ab. *obscura*, Lenz., *Osth. Schm. Sudbay.*, II (2), 317 (1927).

Orig. Descrip.—" Dark grey."

MONIMA GRACILIS, FAB.

Uniform ground colour forms. "Grey groups."

A. Basal. Inner. Outer. Submarginal. Orbicular. Reniform. Dots on the outer margin clear and strong. Claviform just discernible.
B. Inner. Outer. Lower part orbicular and reniform only sharp markings. Submarginal pale.
C. Submarginal edged in black. Orbicular and reniform darker than ground colour.
D. Unicolorous. No distinct markings.

Markings other than above :

1.	As A,	B,	C, or D,	but whole wing peppered with black irregular spots.
2.		do.	do.	do. with black fine dots.
3.		do.	do.	dusted with coarse black atoms (rough or matt appearance).
4.		do.	do.	do. with fine black atoms (smooth looking).
5.		do.	do.	do. with pink or red fine dots.
6.		do.	do.	do. with coarse pink or red, or coarse red brown atoms (rough).
7.		do.	do.	do. with fine pink or red atoms (smooth).
8.		do.	do.	do. with blue-black fine atoms.
9.		do.	do.	do. with blue-black and red fine atoms.
10.		do.	do.	do. with paler ground colour in area around the stigmata.
11.		do.	do.	do. with darker shading between inner and submarginal lines.
12.		do.	do.	do. with darker shading between submarginal and outer margin.
13.		do.	do.	do. washed with orange.
14.		do.	do.	do. yellow submarginal.
15.		do.	do.	do. orange submarginal.
16.		do.	do.	do. red or pink submarginal.

All above have dark grey hindwings.

It seems to me that the normal ground colour in "grey" *gracilis* is bone white, but brighter shades occur in many localities as pale ochreous, sulphur and rose-tinted ashy-grey, all pale shades.

The great number of distinct looking colour shades are produced by the colour of the powdering, which is either black, blue-black, pink or red, and which may be fine and almost obscure the paler ground colour, or coarse and allow the paler ground colour to appear evenly all over the wing.

The bulk of specimens are of some shade of ashy-grey, from pale to almost lead-grey, but there are many beautiful forms to be had.

Pale bone white, pale sulphur, pale ochreous, and pale pinkish-grey are normally almost unicolorous, being true ground colours. Some of the darker greys also appear to be true ground colour.

Pale pinkish-yellow = pale sulphur, dusted with pink scales.
Pale reddish-yellow = pale sulphur, dusted with red scales.
Lavender to lilac = pale bone white, dusted with blue-grey and pink scales.

Blue-grey = pale bone white, dusted with blue-grey only.
Olivaceous-grey = pale ochreous, dusted with fine brownish-grey atoms.
Pale orange-grey = pale bone white, washed with fine pink and sulphur atoms.
Pale pink = pale pinkish-grey, dusted thickly with fine pink atoms.
Pale pinkish-red = pale pinkish-grey, dusted thickly with fine red atoms.
Smoky-grey = bone white, thickly dusted with black scales.
Steel-grey = bone white, thickly dusted with black scales and blue-grey atoms.
Dull brownish red = pale ochreous, thickly dusted with red scales and red-brown atoms.

As far as I have been able to tell from working a limited number of localities, when sulphur ground colour occurs with pink dusting, cilia are always pink. I have never bred a "grey" form from New Forest "red" area, and I have bred many hundreds. All New Forest forms are recognisable as such. They have a distinctive facies, pale hindwings, and not only differ from red forms taken in "grey" areas but also from the North Kent and Struan "red area" forms.

I suspect that throughout the area of its distribution this species tends to produce local colour groups.

The term atom used above means minute colour unit of less size than scale, while dots are still rather larger, and irregular large dots =spots.

Red Group, No. I. New Forest bogs, Hampshire. Slate-grey marked Ia, pale flesh colour marked Ib.

New Forest *gracilis* are not all true "reds," although the great majority are. Those forms which are here treated as Sub-group Ia are of rather a different appearance to the true reds, Sub-group Ib, but nevertheless have little if anything in common with similar colour forms from outside areas, and really belong to this very specialised local group. No forms occur in the New Forest bogs outside these two Sub-groups. I have bred very large numbers and make this assertion with confidence, but a stray "grey" from outside area may once in a way reach the area and lay, but hindwings would be telltale. Nevertheless there must be a ring of areas in which the reds of this local race meet the greys of outer localities, and on this line the two colours may occur side by side.

Sub-group, Ia.

The insects included in this group have ground colours from pale ochreous-red through orange, orange-red to terracotta and brown. All have distinct markings in slate colour; never a grey ground colour. The hindwings are pale as in all *gracilis* from this area.

A. Reniform. Orbicular. Submarginal. Darker than ground colour. Pale edge on outer side of submarginal. Slate-grey distinct markings in areas on both sides of submarginal.

B. As A, and with slate-grey net-like etching over whole area of forewings.

C. As A, but with area between submarginal and outer margin of a paler grey, making a pale slate-grey marginal band.

D. Unicolorous. No markings at all.

All forms, A, B, C occur in colours 1-6; D only in 7 in this group, and 18 and 19 below.

1. Dull (slate-grey suffused) red. These are red at a glance, but very slate-blue in fact.
2. Orange. Most plentiful in A and C forms.
3. Orange-red. Most plentiful in A and C forms.
4. Deep orange-red. A, B, or C forms.
5. Deep terracotta-red. A, B, or C forms.
6. Pale copper-red. Markings always paler than above forms. Occurs A, B, and C forms.
7. Deep brown. Unicolorous = D.

Sub-group Ib.

The insects included in this group are from bright pale pink through maroon to deep reds, blackish-reds to purple-brown with reddish tinge.

E. Unicolorous even ground colour. Stigmata darker, edged with palest flesh colour. Submarginal same pale shade. No slate-grey markings.
F. As E, but submarginal area with 7 pale fine longitudinal lines to outer margin.
Forms F and E occur in nearly all the following colours, but F is scarce in the pinks and lighter reds.

8. Bright pale pink. Very solid looking ground colour. Smooth and even.
9. Deep pink. do.
10. Maroon. do.
11. Puce. do.
12. Pinkish-red. do.
13. Bright red. do.
14. Dull red. do.
15. Deep red. do. In Nos. 15-19 the stigmata interior may be same shade and concolorous with ground colour.
16. Dark red. do.
17. Purplish-red. do.
18. Blackish-red. do. } These 2 colours are sometimes unicolorous. No pale markings.
19. Purple-brown, red tinge. do. }

From above it will be seen that in this group inner and outer lines are absent even in well marked examples. There are many other shades, but the eye can see what the pen is unable to differentiate.

NOTE.—The "reds" from the New Forest, despite the great variation, are a distinctive race, and this also applies to the "reds" from certain other special areas. I have never taken the North Kent or Scotch "red" *gracilis*, but I have seen good series and could at once say that they definitely differ not only from the New Forest forms, but from one another.

The Scotch forms are of a more translucent group of shades, the colours being less solid looking even when deep in shade. A pure white form is reported as occurring in this group, and this is less remarkable than might be supposed, as the whole colour range is so much less heavy than in ordinary greys and New Forest reds. [I strongly suspect the white form to be a scale defect.—E. A. C.]

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.

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

Articles that require ILLUSTRATIONS are inserted on condition that the AUTHOR defrays the cost of the illustrations.

TO OUR READERS.—Short Collecting Notes and Current Notes. Please, Early.—EDS.

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.

Urgently Wanted for Experimental Purposes.—Pupae of *hirtaria* and *lapponaria*. I can offer duplicates of very many species in return.—*Harold B. Williams, Croft Point, Bramley, Surrey.*

Desiderata—British *dominula* varieties with full data other than var. *lutescens* and var. *lineata*. Other vars. acceptable. *Duplicates*—British *L. l-album, exigua, cribrum, ocellaris*, and *intermedia*, etc.—*Dr H. B. D. Kettlewell, Cranleigh, Surrey.*

Wanted—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Estación Experimental, Casilla Correo 71, Tucuman, Republica Argentina.*

Duplicates.—Several thousand British Macro-Lepidoptera in perfect condition; full data. *Desiderata.*—British Micro-Lepidoptera in similar condition.—*S. C. S. Brown, Kingsholme, 454 Christchurch Road, Boscombe, Bournemouth.*

Duplicates.—P. brassicae,* Rapae,* Sinapis (Irish), Croceus, Rhamni, Argiolus, Coridon, Bellargus, Paphia, Aglaia, Cardui, Atalanta,* Io,* Galathea, Semele, Tages, Malvae, Sylvestris, Venata, Vinula,* Bucephala,* Similis,* Perla, Muralis, Ochroleuca, Flavicincta, Bipunctaria, Ochrearia,, etc. *Desiderata.*—Numerous, black pins, data.—*L. H. Bonaparte Wyse, 53 Victoria Road, Shoreham-by-Sea.*

New Address—Kenneth J. Hayward, F.R.E.S., F.R.G.S., F.Z.S., Estación Experimental Agricola, Casilla Correo 71, Tucuman, Republica Argentina.

New Address—Bernard Embry, Esq., 23 Mill Drove, Uckfield, Sussex.

MEETINGS OF SOCIETIES.

WAR-TIME ARRANGEMENTS.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON : 41 Queen's Gate, S.W.7. —May 1st, June 5th, at 5 p.m.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. —2nd and 4th Thursdays from April onwards, 6 for 6.30 p.m., Chapter House Hall, St Thomas Street, S.E.1. *Hon. Sec., S. N. A. Jacobs*, Ditchling, Hayes Lane, Bromley, Kent.

THE LONDON NATURAL HISTORY SOCIETY.—Fixtures as printed in current syllabus cancelled. Members will be notified of further arrangements. *Hon. Sec., A. B. Hornblower*, 91 Queen's Road, Buckhurst Hill, Essex.

ENTOMOLOGICAL SECTION, BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—Evening Meetings. On the third Monday of each month, 7 p.m., at 55 Newhall Street, Birmingham. Visitors welcomed. Those who would like to attend or exhibit please apply to *G. B. Manley*, 72 Tenbury Road, King's Heath, Birmingham.

SOCIETY FOR BRITISH ENTOMOLOGY.—All meetings suspended till further notice. *Hon. Sec., E. Rivenhall Goffe*, 102 High Street, Southampton.

Communications have been received from or have been promised by T. Bainbrigge Fletcher, A. J. Wightman, W. P. Curtis, H. Willoughby-Ellis, E. Ernest Green, E. P. Wiltshire, Dr E. A. Cockayne, H. B. D. Kettlewell, H. W. Andrews, Rev. G. Wheeler, Abdul Mun'im S. Talhouk, Austen Richardson, M. Niblett, J. E. Collin.

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

Printed by T. Buncle & Co. Ltd., Arbroath.

Vol. LII.

No. 5

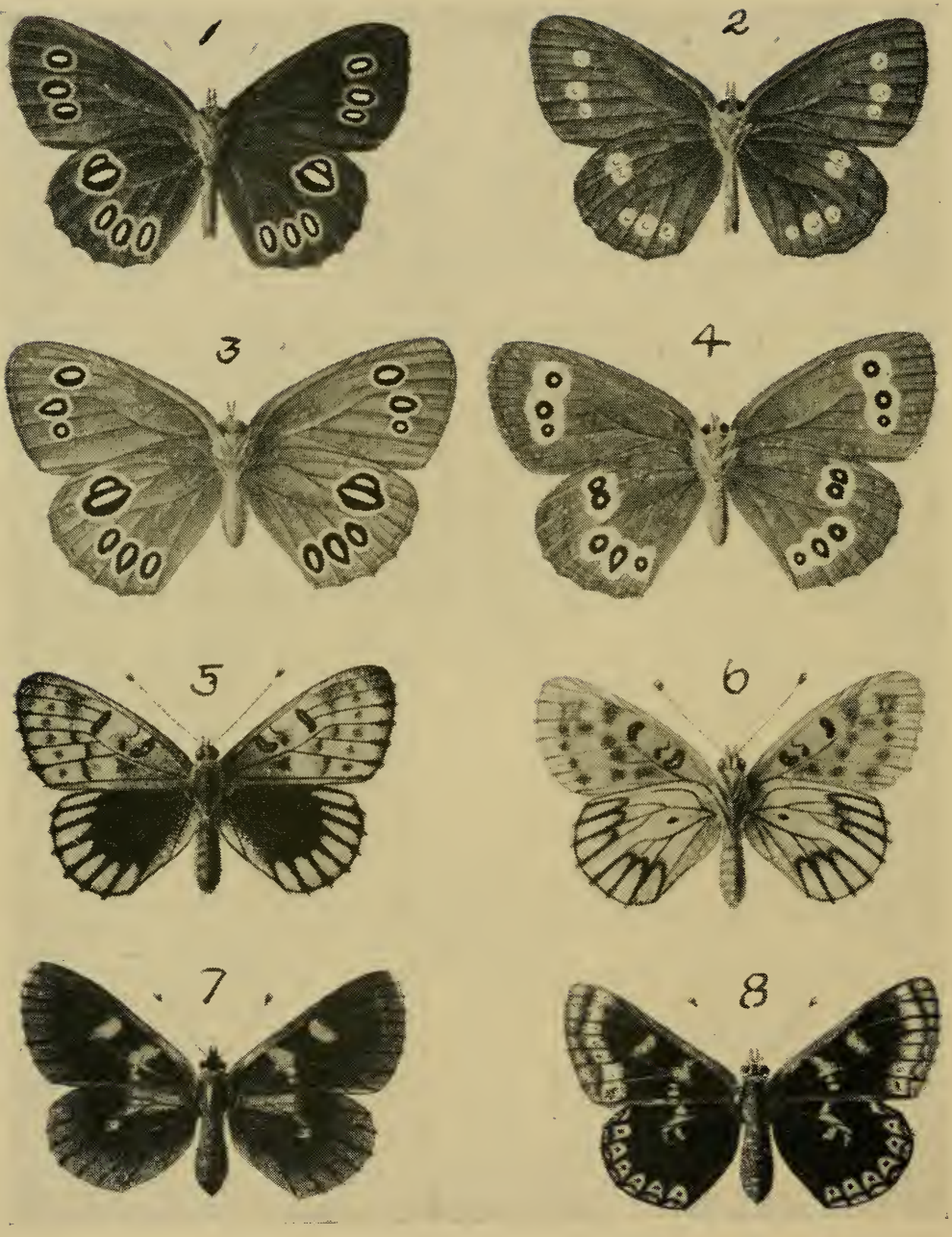
MAY 1940.

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

CONTENTS.

Subscription for Complete Volume, post free
TEN SHILLINGS,
to *The Hon. Treasurer*, H. W. ANDREWS, F.R.E.S.,
6 Footscray Road, Eltham, S.E.9.

This number, Price ONE SHILLING AND SIXPENCE (net).



Photos E. C. Banks, Eastbourne, del. E. L. Wykes.

REFERENCE TO PLATE OF ABERRATIONS IN THE COLLECTION OF S. G. CASTLE-RUSSELL.

(Plate III.)

Fig. 1. *Aphantopus hyperantus*, Linn., ab. *lanceolata*, Staud. Caught by S.G.C.R., New Forest, July 1935.
Fig. 3. ♀. Do., July 1936.
Fig. 2. ♂. Caught at Newbury, 1898.
Fig. 4. ♀. New Forest, ex A. B. Farn collection.
Fig. 5. ♀. *Argynnis* (*Brenthis*) *euphrosyne*, Linn. Taken by S.G.C.R., Chiddingfold, 25.v.1933.
Fig. 6. Do. ♀. Underside of Fig. 5.
Fig. 7. *Euphydryas aurinia*, Rott. ♀. Bred by S.G.C.R., 25.v.1939, Highcliffe-on-Sea.
Fig. 8. ♂. Do.

COLLECTING NOTES, 1939. I. JANUARY-MAY.

By A. J. L. Bowes.

There is nothing like a warm spell in February to tempt the Aurelian from his winter sleep; some odd variety may turn up among the spring Geometers, and it is always a source of mild interest to see which species comes out first. Last year's warmth brought out *Alsophila aescularia* on 4th February in Surrey, *Phigalia pedaria* on the 6th, and on the 10th seven species came to light—*Orrhodia vaccinii*, *Eupsilia satellitia*, *Operophtera* (*Cheimatobia*) *brumata*, *Theria rupicapraria*, *Alsophila aescularia*, *Erannis leucophaearia* and *Phigalia pedaria*. Several of the *leucophaearia* were good dark forms. It was noticeable that on the three nights when the light was lit, *P. pedaria* without exception came before 7.30 p.m., while all the *E. leucophaearia* came after 7.30. Three nights are hardly sufficient evidence on which to form any theory, but the times of flight of some species are so regular and so peculiar that further enquiry might repay. For instance, the flight of *Tapinostola bondii* at Folkestone is no less punctual (at 9.25 p.m. B.S.T.) than the B.B.C.'s pips.

During late February and March I spent some time hunting for larvae of *Synanthedon andrenaeformis* on the Hog's Back and near Netley Heath above West Horsley. In the latter place the bushes of Viburnum on the chalk slopes were riddled with larvae and old workings, and though a large percentage were parasitised, a small series emerged successfully during June. The twigs were sprayed with water every week or so, but otherwise received no special treatment. *Andrenaeformis* is an elusive creature when he emerges, as South wistfully admits, and great care must be taken when boxing him; the tightly closed window of a white-walled bathroom is as good as anything. Capped burrows can be spotted with practice, but they are very hard to see, and I found as many as I wanted in borings from which the caps had dropped off, leaving a circle of white wood and the usual neat hole in the centre.

On 12th March I collected with Dr de Worms in the woods near Ascot; it was a cold night and there was little flying except *Erannis*

(*Theria*) *marginaria*, of which I was lucky enough to take a fine ab. *fuscata*. This form, it seems, is regular in Epping, and Mr Austin Richardson has found it in Gloucestershire, but there is, as far as I know, only one previous record for Surrey. On 1st April *Bapta distinctata* (*pictaria*) was well out near Horsley, with *Calostigia multistrigaria* and a single *Taeniocampa gracilis*; a fresh *Theria rupicapraria* was a surprise and was at first taken for *distinctata*.

Easter fell conveniently for a sally to Scotland, and Mr and Mrs Peyton and I set out by car with all our gear from Kent on the morning of 6th April. We reached Bowes that night, lay at the "Unicorn," and after a magnificent run over the moors in crisp sunshine, lunched at Lanark and were at Struan at tea-time, early enough for a walk along the moors where *Poecilopsis* (*Nyssia*) *lapponaria* occurs. There we heard the first bubbling curlew of our year on those wild hills, a sound worth more than five hundred miles of road, and were lucky enough to see the males of *lapponaria* flying freely over their limited ground. This has been described at length elsewhere (*Entomologist*, lxxii, 232). The insect was also common on its usual posts, males and females alike. After dark we worked near the station; no sallows were out, but a few insects came to light, mainly *Polyploca flavicornis* and *Calostigia multistrigaria*, with a sprinkling of *Calocampa exoleta* and *Taeniocampa gothica*, f. *gothicina*.

Then on to Aviemore, that Eastertide Mecca of entomologists. There can be few finer collecting grounds in the British Isles, and it was hard to keep one's eyes off the snowy Cairngorms and concentrate on the big birch trunks where *Brachionycha nubeculosa* sits in the daytime. We found only one that day and none came to lamps during a chilly evening's work; there were, though, some *Polyploca flavicornis* on the trunks and *Brephos parthenias* flew freely. *Lycia hirtaria*, which we had found commonly the previous year, was barely coming out, and only a few males were seen during our four days' stay. The next day, 9th April, was warmer, and *parthenias* flew in swarms, strongly in the morning, less so in the afternoon, and quite tamely in the early evening, when they could be easily netted. Sugar and light were both successful after dark. Sugar drew a good many *Calocampa exoleta* and *C. vetusta*, a few *Taeniocampa incerta* and *T. gothica*, and a solitary *B. parthenias*. We hung one lamp high on a deer fence, overlooking miles of open moor with scrubby birch, and between 9.20 and 11.20 p.m. a dozen fine *nubeculosa* came to it. We could see them quite clearly zooming up from the open country, and since a lamp among the big trees attracted only one during the same period, it appears that the theory that *nubeculosa* keeps to the big trees may have to be abandoned. The arrival of a male in my bedroom in the village during the same evening is also suggestive. The next two days and nights were similar, with the addition of a few *nubeculosa* on sugar (all within a few minutes of 8.30 p.m.), and many *Calocampa exoleta* and *Taeniocampa gothica*, f. *gothicina*. At any time after dark *Peronea niveana* could be found sitting on low birches, glistening bright white. Only one *Endromis versicolora*, a male, was seen, and no *Lampropteryx suffumata*. An afternoon trip with Dr de Worms to find the Crested Tit at Loch-an-Eilean showed us some magnificent country, thick with juniper and bilberry, and more accessible than the Black Wood near Loch Rannoch.

On our way back on the 12th we slept at Struan and worked there in the evening. The famous sallows on the railway line near the station were now out, and shed a swarm of insects when shaken, *Taeniocampa gothica* all-sorts, *T. incerta*, *T. populi* (*populeti*), and *Pachnobia rubricosa*. Light was disappointing, and produced only *Nothopteryx carpinata*. Though we worked hard, we could see none of the larvae of *Eurois occulta* which had been not uncommon the year before, and *Taeniocampa gracilis* was not yet about.

A long day's run through the Lowlands and the Lake District, over the Kirkstone Pass, brought us to Witherslack in time to collect in Black Tom's Lane that night. Unlike Struan, the Lane did not live up to its repute: sallows were shaken, sheets spread and lamps lit, but there was no sign of *Pachnobia leucographa*, our main object. Here and there a moth flew half-heartedly, but the only insects of interest to us were a few of the melanic form of *Eupithecia abbreviata*, and a smoky form of *Nothopteryx carpinata*, quite unlike the Scottish and South of England races. One would have said that the night was ideal —dark, with a warm S.W. breeze; we felt that it was unkind of so rich a locality to throw a temperament for the benefit of three weary collectors who could spend only one night there, but we had no just cause to be irritable after Scotland's bounty.

Back in the south again, I did little field work in April except to spend a few hours grubbing Clearwing larvae out of tree trunks. Larvae of *Synanthedon vespiformis* were found commonly in several spots in Wilts, Surrey, and Kent, and many had already spun up their tough little cocoons just below the sawn surface of the oak stumps. *S. culiciformis* is not so easy; one can, of course, take whole trunks home, a weary and a messy affair; but on the other hand my naked excavated pupae, extracted from adamantine stumps with much sweat and blasphemy, did badly even when packed in moss. But my treatment of them may not have been warm or damp enough. Only two out of over a dozen pupae completed their course, while the emergence of *vespiformis* was placid and complete.

On 7th May, Mr Howard and I spent an afternoon on the heath near Brockenhurst, where *Boarmia cinctaria* occurs so commonly. The males were well out but very lively, and often leapt off the trunks before we reached them; few females were seen. On our way we found a row of birch stumps from which many empty cases of *Synanthedon culiciformis* were protruding, but we saw no insects flying; later, Mr Arthur Welti told me that the main flight takes place each year not where they are emerging, but where they are likely to lay their eggs, i.e., on newly cut birch stumps. A week later *Boarmia consonaria* was not uncommon on beech trunks in the woods above Shere in Surrey; a female found in this way laid many eggs, and the resulting larvae were bred easily on birch; she found a small ball of butter-muslin a great inducement to laying. An evening visit to the Chiddingfold woods on the 20th was spoiled by a cold wind, and the only species seen were *Notodonta trepida*, *Numeria prosapiaria*, *Gonodontis bidentata*, and *Lithina chlorosata* (*Lozogramma petraria*). At this time several low pasture fields between Ripley and Ockham were alive with *Perizoma albulata*; they could be flushed in hundreds during the day, and at sundown would fly in great profusion among the long grasses and yellow-

rattle, reminding one vividly of China-marks going quietly about their business in a reed-bed.

On 28th May, Dr Cockayne introduced me to *Parascotia fuliginaria* in the Ascot district. The colony of this exciting little insect, which has been living for several years on the fungus of a few derelict logs, is now finding food scarce as the logs break up, but we were able to find several fine large larvae and a few cocoons by upending the logs, and a dead birch branch no bigger than my arm yielded ten larvae. They are not hard to see, but quickly scuttle for shelter when brought into the light. Usually they spend the day in the twilight beneath a log, and unless there is room to wriggle underneath and look upwards, it is best to turn the whole affair over and secure the larvae before they reach darkness again. We found little colonies over a considerable area, and there is no reason why the insect should not occur in any suitable spot where trees have been felled and allowed to lie for a year or two. The general tidiness of our woodlands may well account for the scarcity of permanent colonies.

BRITISH TRYPETIDAE.

By M. Niblett.

Since the publication of my previous papers (1), (2), (3), I have succeeded in breeding out several fresh species of Trypetids, and have made new observations on others; the following notes give details of these and include references to localities where I have found the larvae. All localities given are in Surrey unless otherwise stated. I have not referred to any of the gall-causing species, having already dealt with those in a recent paper (4).

Euribia quadrifasciata, Mg.—This species is undoubtedly double-brooded; 25th May and 1st August are the earliest and latest dates I have had it emerge. I have found the larvae at Banstead Downs, Park Downs, Riddlesdown, Epsom Downs, Epsom Common, Chipstead; Brockenhurst, Hants; and Sandown, Isle of Wight.

E. spoliata, Hall.—Through the kindness of Mr H. W. Andrews, who gave me flower-heads of its host-plant, *Serratula tinctoria*, L., from the Isle of Wight, I have been able to breed specimens of this species which emerged from 24th June to 14th July of the second year.

I have had some thousands of flower-heads of the host-plant from several Surrey localities, but they have failed to yield this fly.

Phagocarpus permundus, Har.—Larvae collected at Epsom Downs on one occasion gave a high percentage of flies; on another they were quite plentiful at Ranmore Common; 48 larvae pupated but the only emergences were 10 Chalcids.

Philophylla heraclei, L.—From larvae in mines on leaves of Hogweed (*Heracleum sphondylium*, L.), found at Albury on 8th July; the flies emerged on 3rd and 6th August. From a few mined leaves of Wild Parsnip (*Peucedanum sativum*, B. & H.), found in the same place, the larvae pupated but no flies emerged.

Ceriocera ceratocera, Hend.—This species still appears to be very scarce in my district. I have only bred 9 flies between 1932 and 1939, these from Banstead Downs, Epsom Downs, and Woodmansterne. I

have during that period had several thousands of flower-heads of its host-plant, *Centaurea scabiosa*, L.

C. microceras, Hering.—I first heard of this species in January 1937, and at the first opportunity went out and collected a number of old stems of its host-plant, *Centaurea scabiosa*, in which the larvae live; from these I had emerge in the following July 1 ♂ and 4 ♀♀ of *microceras*.

I have succeeded in finding the larvae at Epsom Downs, Woodmansterne and Banstead Downs, the insect emerging from 22nd June to 20th July.

Terellia serratulae, L.—I have now bred this species in some numbers; flower-heads of *Cnicus lanceolatus*, Willd., from Park Downs, Epsom Common, Banstead Downs, Boxhill, Riddlesdown, Mitcham Common, Buckland Hills; Eastbourne, Sussex; Keyhaven Marsh, Hants; and Ningwood, Isle of Wight; from flower-heads of *Carduus nutans*, L., from Park Downs, Banstead Downs and Banstead Heath have yielded a fairly good percentage of flies, while from a few heads of a hybrid thistle, *C. crispus* × *nutans* (*newbouldii*, Wats.), taken on Beachy Head, Eastbourne, 2 ♀♀ emerged in June.

Orellia colon, Mg.—This species is definitely double-brooded, but whether the flies emerging in late July and August survive the winter in hibernation, I am unable to say. It appears to occur in most localities where its host-plant grows; I have had the larvae from Woodcote, Epsom Downs, Banstead Downs, Dorking, Ranmore Common, Riddlesdown, Walton Heath, Woodmansterne, Headley, Ashtead; Eastbourne, Sussex; and Burwell, Cambs.

The larvae do not appear to suffer from the attacks of parasites to any great extent, the dense cocoon in which they enclose themselves probably offering considerable protection. Against 134 flies I have had 25 Chalcids emerge and in June 1938, 3 Braconids.

O. ruficauda, Fab.—As I have previously stated, this species does not appear to occur in any great numbers in localities I have worked, 78 flies having emerged from many hundreds of flower-heads collected; 21 Chalcids and a few specimens of the Braconid *Microbracon erraticus* also emerged.

I have bred this fly from *Cnicus pratensis*, Willd., taken at Epsom Common; from *C. arvensis*, Hoffm., at Riddlesdown, Banstead Wood, Park Downs and Banstead Downs; from *C. palustris*, Willd., at Epsom Common, Fetcham, Barnthorne Wood, Ranmore Common, and Epsom Downs. Thistle-heads from many other places have not contained the larvae.

O. tussilaginis, Fab.—Have now bred this species from *Arctium minus*, Bernh., as well as *A. majus*, Bernh., have had the insect emerge also in July. Tattenham Corner, Banstead Wood, Epsom Common; and Eynsford, Kent, are the only localities from which I have had Burdock heads containing the larvae.

O. winthemi, Mg.—Additional localities for the larvae of this species are Epsom Downs, Mickleham Downs, Buckland Hills, Farthing Down, Dorking, Chipstead, Burford Bridge, and Ashtead. It appears to be not uncommon in the localities where its host-plant, *Carduus crispus*, L., occurs; I have bred in all 149 ♂♂ and 165 ♀♀ since my first discovery of the larvae in 1932.

O. vectensis, Collin.—Again due to the kindness of Mr H. W. Andrews in supplying me with material I was enabled to breed out this insect, the flies emerging in July of second year. The remarks referring to the host-plant of *E. spoliata* also apply here.

Xyphosia miliaria, Schr.—This species is at times, if not always, double-brooded; the majority I have bred have emerged from 30th May to 16th July of second year, but from larvae found on 1st July the fly emerged on 21st July, and from larvae found 22nd and 24th July they emerged on 9th and 8th August of the same year.

Flower-heads of *Cnicus arvensis*, Hoffm., containing larvae I have found at Burgh Heath, Walton Heath, Epsom Downs, Woodcote, Park Downs, Banstead Downs, Tattenham Corner, Epsom Common; and Royden, Hants, while *C. palustris*, Willd., with larvae, was found at Epsom Common, Barnthorne Wood and Ranmore Common.

Ensina sonchi, L.—Appears to be widely distributed; larvae or pupae I have found in flower-heads of *Tragopogon pratense*, L., at Carshalton and Ranmore Common; in *Hypochoeris radicata*, L., at Epsom Downs, Ranmore Common, Ashtead Common and Abrook Common; in *Leontodon hispidum*, L., at Riddlesdown, Boxhill, Woodmansterne, Epsom Downs; and Littlehampton, Sussex; in *Picris hieracioides*, L., at Boxhill and Epsom Downs; in *Sonchus oleraceus*, L., at Bookham Common; and in *Sonchus arvensis*, L., at Epsom Common, Norbury Park, Epsom Downs and Bookham Common.

Tephritis bardanae, Schk.—This species appears to be fairly widely distributed. Burdock plants found at Tattenham Corner, Park Downs, Banstead Downs, Buckland Hills, Banstead Wood, Boxhill, Banstead; Peacehaven, Sussex; Brockenhurst, Hants; and Yarmouth, Isle of Wight, have all contained larvae of this species and from them a considerable number of *bardanae* have emerged from 7th August to 24th September.

T. hyoscyami, L.—Dr Hering expressed considerable doubt as to the identity of specimens presumed to be this species which I sent to him, he being rather inclined to the opinion that they were *Tephritis heiseri*, Frfld., the true *hyoscyami*, L., being apparently a smaller, less robust insect. There is considerable variation in the intensity of the wing-markings of the insects I have bred, even from the same batch of larvae. I have not been able to investigate this matter further and feel that to clear it up satisfactorily comparison with the types is necessary, the insects being so much alike.

Flower-heads of *Carduus crispus*, from Boxhill, Ranmore Common, Banstead Wood, Riddlesdown, Boxhill, Chipstead, Mickleham Down, Park Downs, Epsom Downs; and Eastbourne, Sussex, have all yielded considerable numbers of these flies which have emerged from 17th July to 26th August of first year.

T. leontodontis, De Geer.—From a few flower-heads of *Chrysanthemum leucanthemum*, L., found at Mugswell on 30th July several *leontodontis* emerged on 4th August; from a series of heads from Epsom Downs collected on 1st July, 28 ♂♂ and 34 ♀♀ emerged between 11th and 28th July.

T. vespertina, Lw.—Flower-heads of *Hypochoeris radicata* with either larvae or pupae in them I have found at Banstead Wood, Riddles-

down, Burgh Heath, Epsom Common, Bookham Common, Walton Heath, Westcott, Epsom Downs, Albury Downs; and at Benfleet, Essex.

I have not yet found definite proof that this species is double-brooded; emergences I have had from 30th June to 8th August of first year.

I have included localities in this paper at the request of several friends.

REFERENCES.

(1) Niblett, M. Some Notes on British *Trypetidae*, *Ent. Rec.*, 1934.
(2) Niblett, M. *Trypeta (Orellia) winthemi*, Mg., *Ibid.*, 1934.
(3) Niblett, M. British *Trypetidae*, additional notes, *Ibid.*, 1936.
(4) Niblett, M. British Gall-causing *Trypetidae*, *Ibid.*, 1940.

SOME REMARKS ON THE SPECIFIC NAMES OF SOME OF THE EUROPEAN EREBIAS.

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

As I was wanting some information with regard to *Erebia stygne*, I naturally turned at once to Warren's magnificent monograph of the genus, feeling confident that I should find all I could possibly want. The whole work is a monument of patient investigation and scientific insight, as instanced by the author's new grouping of the species, and beyond all by his theory of the evolution of the androconial scales, which opens up a new point of investigation with, I anticipate, far-reaching results. And then the skill with which the genitalia have been prepared and the excellence of the illustrations are astonishing, and (as I had pointed out some years ago was necessary to make such illustrations intelligible) all taken in the same direction from the same point of view.

With all these excellencies I anticipated no difficulty in arriving at the information I wanted, but alas! on looking for *stygne* in the list of species, 391-399, no such name was to be discovered! In addition to *stygne* I looked in vain in the index for any one of the following universally recognised names: *evias*, *nerine*, *lappona*, *arete*, *glacialis*, *ceto*, *goante*; so I had to search through the body of the work (no mean task) to find out under what headings to look for information about any of these species. *Glacialis* was easily found under *pluto* (though whatever de Prunner's *pluto* may have been it could not be *glacialis* as I will presently show), but the others were not so easy to find. The first name under which I found *stygne* was *nereine*, but this proved to be an exclusively Asiatic species, so a further search was necessary, and it was eventually found under *meolans* near the end of the book; in the same way *evias* was eventually found masquerading as *triarius*, *nerine* as *stirius*, *lappona* as *pandrose*, *arete* as *claudina*, *ceto* as *alberganus*, and *goante* as *montanus*.

How easy it would have been to save all this unnecessary trouble by adding the usually recognised name in brackets in the index after the name used in the body of the book.

No doubt the author had satisfied himself as to the species de Prunner was describing, but, in order that the names so identified should be

accepted for general use, it would be necessary to prove that de Prunner must have meant the species with which the author identified the descriptions, and that he could not possibly have meant anything else; for nothing short of absolute certainty would suffice to displace names universally recognised. But has he proved this? Most assuredly not. Take for example *evias*. The outstanding peculiarity of this species is the triple eyespot at the apex of the forewing. Does de Prunner's original description of *triarius* mention this? At the first glance one might suppose that it did, but on reading it the " three white-pupilled spots joined together " are found to be on the hindwing, and no reference is made to the outstanding characteristic of *evias*; there can therefore be no sufficient reason for this identification, or even a probability of its being correct, and there is certainly no reason why *triarius* should displace *evias*, and *evias* it must remain. Take *ceto* again. The special characteristic of this species is the elongated form of the spots. Not a word is said of this in de Prunner's description of *alberganus*, so why should we be expected to regard this description as necessarily, or even probably, referring to *ceto*? Again, *ceto* must remain *ceto*. With regard to *pluto*, the description might quite well refer to the black form of *glacialis*, but de Prunner says that his *pluto* is found at the end of May and in June! Now I will defy anybody to find any form of *glacialis* at the end of May, and I doubt whether it could be found even in the Basses Alpes in June, so one can only say that de Prunner has gone wrong somewhere, and that we don't know to what species his name refers; the dates would not, for instance, suit for the black form of *manto*, but might do for the black form of *oeme*, but certainly not with the absolute certainty required to displace a name universally recognised. The question of *meolans* for *stygne* is not so instantly disposed of, but having been carefully through the various possible species I fail to find anything which really corresponds with de Prunner's description. Some ♀ specimens of *medusa* come nearest to it in certain respects and specimens of *melampus* in others, but I can find no specimen of *stygne* which even approximately resembles it, even among specimens from its lower habitats; the mountain forms (and de Prunner says his species came from the mountains) are conspicuous for the absence of the " broad ochraceous band " on the upper side of the forewings, and indeed do not show a broad ochraceous band on any wing, upper or underside. The number of eyespots is in most species so variable that it can rarely be relied on as a distinguishing character. There is certainly nothing to give any probability, let alone certainty, that *meolans* represents *stygne*, and like *evias* and *ceto* the position of *stygne* remains unshaken. With regard to *montanus* for *goante* the case is different, being complicated by Hübner's *scoea*. De Prunner's descriptions so far have been so inadequate and so uncertain in their application that they have most wisely been generally disregarded, but in the case of *montanus* his description is much more certain than usual, and seems sufficient to displace not only Esper's *goante* but also Hübner's *scoea*, under the unfortunate " rules," which also uphold *claudina* against *arete*, though the latter is the earlier name, but was there any reason for bringing in the homonym rule in this case? With regard to *pandrose* for *lappona* it is rather surprising that Borkhausen's name has been so long overlooked in the intensive search for possible altera-

tions of accepted names. That Godart's *stirius* also refers to *nerine* seems certain.

I am quite tired of pointing out, what I should have thought obvious to any one, that unrestricted use of a priority rule is the surest possible way of securing instability in nomenclature, because an older name may be dug out at any time, and in some cases would upset not only the name of one species but of others dependent on it. How easy it would have been to insist on two general exceptions by enacting (1) " a generally (or universally) accepted name can never be displaced by the discovery of an older one," and (2) (still more important) " under no circumstances can a name generally recognised as belonging to our species be transferred to another." The instability caused by the present rules could hardly have a more striking example than the fact that at this late date an attempt has been made to displace eight generally accepted names in a single genus. It is bad enough when inevitable, but surely need never come into play because somebody thinks that a certain description applies to a certain species, least of all when it is generally taken to apply to another. Surely it is allowed by all sane people that the real reason for giving a name to anything is in order that one person may know what another is speaking (or writing) about, but this constant changing of names in accordance with this ridiculous code has no effect but that of making either past or present writing unintelligible, and in all probability making both past and present unintelligible in the future.

STENOPTILIA SAXIFRAGAE, FLETCHER, IN IRELAND.

By Bryan P. Beirne, B.Sc., F.R.E.S.

This interesting species was described as new by Mr T. Bainbrigge Fletcher in the March number of this journal. I first noticed the moth flying abundantly around saxifrage in the evening in a garden at Ballsbridge, Dublin, in 1934, and subsequently found it wherever I looked for it in gardens in County Dublin, at Rathgar, Harold's Cross, Shankill, and Seapoint. All these localities, with the exception of Shankill which is to the south of the county near the Wicklow border, are in the southern suburbs of Dublin. I have not looked for it to the north of the city but it probably occurs there, as I have no doubt that it occurs everywhere in gardens in and around Dublin, where it is by far the commonest species of plume. Its range, as far as it is known at present, appears to be the same as that of *Mnesipatris filicivora*, Meyr.

The moth apparently hides in the foliage of mossy saxifrage and neighbouring plants during the day and may be most easily captured while at rest on the saxifrage shoots in the evening between about 6 and 8 o'clock. It flies in the late evening until after dark and the males come freely to light. Last summer, 1939, it was considerably less common than in previous years, but this was probably due to the general unfavourableness of the season. Mr A. W. Stelfox, of the National Museum, Dublin, has a large number of mossy saxifrages in his garden at Harold's Cross, where the moth occurs very commonly. These saxifrages, which include most of the native Irish varieties, he brought from the north of Ireland about twenty years ago, and he informs me that

he does not remember seeing the plume until a few years later. From that time onwards it occurred very commonly and was extremely abundant in some years. Mr Stelfox has a specimen, which he never had identified, captured on the 15th of June 1925. The majority of garden saxifrages in Dublin are originally imported forms, the Irish varieties are not common. As the moth has only been taken in gardens there is no indication as to whether it is a native Irish species, introduced into gardens with native saxifrages or, as is far more probable, a foreign species introduced with foreign plants. The moth is firmly established and widespread in Dublin and has evidently been in Ireland for a considerable time.

The eggs are laid towards the end of July, apparently on the undersides of the leaves of various forms of mossy saxifrage. Immediately after hatching the young larva makes its way to the base of the leaf and burrows into it forming a mine or blotch. When it has finished one leaf it moves on to another. About the middle of September the larva forms a cocoon-like hibernaculum in the main stem of a shoot near the tip which becomes withered. If there are several larvae to a shoot they apparently eat each other until only one is left. I have not yet seen the full-grown larva or the pupa.

The moths are most common during July but may be found fairly commonly from the middle of June to the middle of August, and odd specimens as early as the end of May and as late as the middle of September.

A specimen of this species was identified for me at the British Museum a few years ago as *Stenoptilia graphodactyla*, Tr., which it sometimes superficially resembles. I recorded it as this species in *Entom.*, lxxi (1938), 194, and *Irish Nat. Journ.*, vii (1938), 3. These records of *S. graphodactyla* from Ireland should therefore be deleted.

COLLECTING NOTES.

Records from North Wales, August 1939.—Recent records from North Wales seem scarce, so perhaps it may be of interest to record some of the more interesting Lepidoptera noticed during the period 12th to 31st August in the Portmadoc district, Merionethshire.

Sugar only began to work on the last few nights, but " light " was very prolific until 22nd. Of the " Prominents," *Drymonia trimacula*, *Lophopteryx camelina*, *Notodonta ziczac*, and *N. dromedarius* appeared at " light " or were beaten out as larvae; the last-named rather dark, though not so much so as specimens obtained on the Lancashire mosses. *Polyploca* (*Asphalia*) *diluta* was a positive nuisance at light inland and once appeared at sugar on the sandhills, the former being darker than those taken in the New Forest and also, I am told, than Lake District specimens, but less so, I think, than those from Yorkshire, of which I have only one specimen for comparison. *Miltochrista* (*Calligenia*) *miniata* and *Lithosia complana* were plentiful, the former in oak woods and the latter on the coast and on an inland moss where a rather dark suffused form occurred—apparently leading in the direction of *L. sericea*. I have also taken this form in the New Forest. *L. griseola*, *L. lurideola*, and *Nudaria mundana* were also seen.

Amongst the Noctuids, *Acronicta rumicis* and *A. menyanthidis* larvae were taken. *Agrotis praecox*, *A. tritici*, and *A. vestigialis* were very common on the coast, the last two very variable, but no *A. cursoria*. A search for the larvae of *A. ripae* under the usual plants proved unsuccessful. One specimen, *A. obelisca*, turned up on 27th August. Of the *Hydroecia*, a few examples of *H. micacea* were taken at ragwort. *H. nictitans* was common and in two localities, both inland mosses, a large form was obtained flying in the afternoon sunshine—probably *H. crinanensis*—one specimen having the stigmata joined on one forewing by a pronounced orange-coloured wedge. *Stilbia anomala* and fine dark *Luperina cespitis* were common on the coast and two specimens of *Cucullia asteris* came to light, *Solidago virgaurea* being plentiful in the district. As I left the district *Cirrhoedia xerampelina* was appearing at the roots of ash timber but no varieties were obtained. Other Noctuae included *Noctua castanea*, f. *neglecta*, *N. glareosa* (rosy form), *N. ditrapezium*, *Axylia putris*, *Triphaena fimbria*, *T. janthina*, *T. interjecta*, *Harmodia* (*Dianthoecia*) *capsincola*, *H.* (*D.*) *andalusica*, f. *barrettii* (one pupa under *Silene maritima*), *Leucania litoralis*, *Plusia festucae*, *Abrostola triplasia*, *A. tripartita*, *Anarta myrtilli* (larvae), *Plastenis retusa*, *Celaena haworthii*, *Oligia* (*Miana*) *literosa*, *O.* (*M.*) *bicoloria*, *Calymnia affinis*, *Polia chi* (typical), *Naenia* (*Mania*) *maura*, *Charaeas* (? *Cerapteryx*, Curt.) *graminis*, of which a reddish form was common.

Among Geometers I observed *Abraxas grossulariata* (the prevailing form being heavily marked), *Pseudoterpna pruinata* (*cytisaria*), *Acidalia imitaria*, *A. marginepunctata*, *Sterrha* (*A.*) *dimidiata* (*scutulata*), *Cosymbia* (*Ephyra*) *porata*, *Ortholitha mucronata*, *Perizoma* (*Emmelesia*) *affinitata*, *P.* (*E.*) *alchemillata*, *P.* (*E.*) *flavofasciata*, *P.* (*E.*) *albulata* (pretty forms), *Calostigia* (*Amoebe*) *olivata*, *C.* (*A.*) *salicata*, *Ewphyia silaceata*, *Anaitis plagiata*, *Acasis* (*Lobophora*) *viretata*, *Orthonama lignata* (*vittata*), *Eupithecia pulchellata*, *E. tripunctaria* (*albipunctata*), *E. absinthiata*, *E. centauriata* (*oblongata*) larvae, *E. icterata* (*subfulvata*), r. *oxydata*, *Gymnoscelis pumilata*, *Ennomos alniaria* (*tiliaria*), and *Gnophos obscurata*.

Of the Rhopalocera the most interesting seen were *Pararge aegeria* (plentiful on an inland moss, the females shot with blue but too worn to gauge the extent of variation); *Polygonia c-album*, which was as widely spread as when I last visited the neighbourhood, some fifteen years ago; *Coenonympha tullia* (*tiphon*) was also taken fairly plentifully near Bala earlier in the year (on 25th June).—Austin Richardson, Beaudesert Park, Minchinhampton, Glos.

Pairing Habits of Ypsolophus ustellus, Clerck.—I do not find in the *Entom.*, *E.M.M.*, or *Ent. Rec.* any notes on the life-history of *Ypsolophus ustellus*, Clerck (*Cerostoma radiatella*, Donovan, of Meyrick's Revised Handbook), possibly because it is so common. Its larva was described by Sorhagen, *Berlin Ent. Zts.*, XXIX, 89-90 (1885), but he said nothing about the life-cycle; it is, of course, well-known that the moth hibernates. During this winter Mr Austin Richardson has brought me two pairs found *in cop.*, one at Symond's Yat on 18th January, the other on 21st February. It seems rather unusual for hibernating moths to pair at odd times during the winter. Can anyone give

further information?—T. Bainbrigge Fletcher, Rodborough, Glos., 6.iii.1940.

Simultaneous "Flashing" of Glow-worms.—The note on this subject (p. 35) reminds me of a similar case which I saw in Ceylon on 11th May 1908 when travelling up-country by train between Polgahawela and Nanuoya. An extract from my Journal reads:—"Went on by train to Nanuoya, where I arrived about 9 p.m. I have never seen such numbers of Glow-worms as there were as we went up the line this evening. They seemed to be congregated by scores in certain trees and the effect of the mass of their twinkling lights was very pretty. The peculiar point, however, about this magnificent sight was the absolute simultaneousness with which the insects in any given bush flashed their lights. One moment a bush would be a vivid blaze of light, the next it would almost disappear in the darkness, only to blaze up again a moment later. The absolutely synchronous character of the alternate flashing out of the lights and their disappearance was evidently due to quite simultaneous collective action on the part of the countless individual insects."—T. Bainbrigge Fletcher, Rodborough, Glos., 6.iii.1940.

The Flashing of Fireflies.*—Dr Malcolm Burr, on page 35 of your March issue, states that instances of this phenomenon have seldom been recorded.

In the early part of 1914, I descended the Muar River by canoe from Upper Perak, a twenty-four hour journey. During the night, some four or five separate assemblages of the insects were seen on bushes or the lower branches of trees overhanging the water, each of which was flashing rhythmically.

I can quote no exact details, as my diaries were lost during the war, but the assemblages were quite unconnected, of considerable size, and visible from some distance ahead of the boat.

The natives with me were amused at my interest, as they said that the occurrence was a common one on the river, and this was confirmed later by the manager of a tin mine who had made the trip more than once.

I assumed at the time that the presence of water was necessary for the assemblages, as I met with no instances during moth-hunting excursions in the jungle in different parts of the Peninsula.—C. L. Collenette, 15 Warren Avenue, Richmond, Surrey.

Records of Hibernating Species.—Yesterday my wife saw three "Tortoise-shell" butterflies toying with each other in the garden, and we have had two *Vanessa atalanta* hibernating with us this winter, one in our own bedroom, and one in another bedroom only used occasionally. The one in our own room was let fly out of the window ten days ago, that in the other room, after moving its position, escaped through the open window yesterday. Yesterday, 17th April, also the first *Pieris brassicae* put in its appearance, compared with March the tenth last year, but then we had an exceptionally sunny month.—G. T. Bethune-Baker, 6 Compton Place Road, Eastbourne.

*"Fireflies." The true fireflies are Neotropical Elaterid beetles. The Oriental photogenous Coleoptera are Lampyridae (Glow-worms).—T. B. F.

Early Notes.—On 23rd and 26th March I visited a locality some seven miles from Coventry to ascertain if the extreme and severe cold winter would cause a backward season. Such, however, does not appear to have been the case. On both these visits *Brephos parthenias* was on the wing. I succeeded in capturing a specimen for examination. This was in perfect condition, a female. Many, however, were flying high and did not come down. A strong breeze blowing on both dates. In addition *Aglais urticae* was in evidence. Out from hibernation, four specimens were observed, three being captured for examination. One of these had a very worn appearance, but the others were in very fair condition. Of these one was male, the remaining two females.

Taking the dates for Warwickshire, I should say the foregoing are well on time after the Arctic conditions.

Other signs such as food plants showing, and the primrose in flower too, on 26th March for Warwickshire is another early sign.

May this good work carry on for a season that 1940 will be one of the years to produce many things in Lepidoptera that will be well remembered.—F. V. Sills, "Corydon," 14 Bede Road, Radford, Coventry.

Early Migrants (?) 1940.—My cousin, Dr Norman Kettlewell, saw a specimen of *Nymphalis* (*Vanessa*) *antiopa* in his garden at Easter in Godarno, Bristol, on the 23rd of March. It was settled on a mass of white arabis. He noted that the border was yellow and not white. *Vanessa cardui* has already been recorded in "The Times," and was observed by R. P. Demuth on 6th April at Ringwood, and at another spot nearby a week prior to this.—H. B. D. Kettlewell, M.B., B.Chir.

Microdynerus exilis, H.-S. (Hym.) in the Isle of Wight.—In the *E.M.M.*, Vol. lxxiii, page 13, the late H. P. Jones admitted this species to the British list on the strength of 16 specimens being taken at Botley and Wickham, Hants, in 1936, and entrusted to him for determination. When sweeping for Sawflies and *Trypetidae* here at East Cowes, 2.viii.39, I noticed an unfamiliar *Odynerus* in the net; this I find agrees with his description of *Microdynerus exilis*, H.-S., and as far as I know is the first record for the Isle of Wight.—J. W. Saunt, Riverview, Minerva Road, East Cowes, I.O.W., 21st April 1940.

[Considering the lack of recent records on the island of the Hornet, *V. crabro*, L., it may be of interest to know I had a fine ♂ brought here to me, 7.x.1939.—J. W. Saunt.]

A Brief Review of the Acrididae and Tettigoniidae in Angus, Scotland.—The following is an account of field work done by the writer during the summers of 1937-39 in search for *Acrididae*, and especially for *Tettigoniidae*, in the county of Angus, Scotland.

Below is a list of the main centres from which collecting was done:—Forter, Glen Isla; Glen Isla village; southern face of Mount Blair (between Glen Shee and Glen Isla); Braedownie, Glen Doll; Blacklaw Heath (between Dundee and Coupar-Angus); Dronley; Barry Links; Auchmithie; Kingoodie (East Perthshire).

The only new find to report since my note to the *Scottish Naturalist*, No. 231, May-June 1938, is *Chorthippus parallelus*, Zett., which is not scarce but only wants recording.

It may, however, be useful to give a rough summary of the relative abundance and distribution of the species of *Acrididae* to be found in this county (see table).

I should here like to acknowledge the expert assistance of Dr Malcolm Burr in the identification of specimens.

Localities.	1.	2.	3.	4.
Wayside and fine grass	53.3%	——	28.57%	100%
Heath and coarse grass	40%	71.42%	57.14%	——
Moor	6.66%	28.57%	14.28%	——

1. *Omocestus viridulus*, L.
2. *Myrmeleotettix maculatus*, Thunberg.
3. *Chorthippus parallelus*, Zett.
4. *Chorthippus bicolor*, Charpentier.

Omocestus viridulus, L. This grasshopper is *the* commonest, being found in all types of localities, but is most abundant by the wayside and in fields and pastures. In heathy country and where the grass is coarse it is only a little less abundant. Moorlands appear to be least suited to it.

Myrmeleotettix maculatus, Thunberg, is quite common where it is found, and here one associates it with coarser land, such as heaths and moors. At no time have I found it amongst finer grass. It is interesting to note, in passing, that this species is frequently to be found on or near burned patches of heather and gorse; its brown colour serving well to camouflage it.

Chorthippus parallelus, Zett. Like *O. viridulus*, this species is to be found in all types of localities, but, unlike it, it is most abundant on heaths and coarser vegetation. It is, however, less abundant than the two species mentioned above.

Chorthippus bicolor, Charpentier. This appears to be the least common of the four species found in Angus. As will be seen from the table, all specimens taken were found by the way-side. Its colours vary greatly, a fact which often makes identification in the field difficult.

Coastal localities were searched for *Chorthippus albomarginatus*, De Geer, but all attempts to find it proved fruitless.

In August and September a special search was made for specimens of *Tettigoniidae*, but this too met with no success. It would seem that these insects, if present, cannot be very abundant, but if the search were more widespread and carried out by more workers, positive results might well be obtained.—A. R. Hill.

CURRENT NOTES.

The amount of our usual postage will be almost doubled under the new rates. The small subscription will not be sufficient to cover double expense in stamps. Hence for the future no proofs will be sent to contributors except by special request and postage prepaid. If MSS. be well and clearly written there will probably be but little need for proofs as our printers are one of the most efficient firms and the panel

of editors are fully competent from long experience to read proofs dealing with matter in which they specialise.

At the same time may we state that the make up of the April number was exceptional and will not re-occur. In the future we cannot promise to publish long articles as a whole but must, in the interests of the bulk of our subscribers, break such papers, so as not to defer the pages devoted to " Collecting " and " Current Notes."

Referring to the " Notes," we ask for such from all our subscribers. If unaccompanied by a formal letter these notes can be sent in an unsealed envelope for a penny if not over 2 oz. Of course signed by the author's name and address.

The Royal Ent. Society of London has recently published part 6 of the *Generic Names of Insects*, containing the generic names of the British *Carabidae*, with a check list of the British species. Mr H. E. Andrewes, who for long has been the World authority on this Family of Coleoptera, is the compiler and author.

Our correspondent, Capt. K. J. Hayward, has just been appointed Entomologist to the Tucuman Experimental Station, a much better post than that he has held for some years in Concordia. We hear that the Station is well staffed with technical men. Tucuman is much farther up country in the Argentine. Some 25 years ago we had numerous entomological specimens sent to us from Tucuman by a correspondent who had been well known to the late A. E. Gibbs of St Albans, Herts. We congratulate our friend Hayward.

Two further contributions to our knowledge of the *Hesperiidae* of S. America have reached us from Capt. Hayward, who states that he would be pleased to have species of that Family from all parts of the Continent.

Heft. 1 of Vol. xviii of *Mitt. Schweiz. ent. Ges.* (iii, 1940) contains two papers on Diptera, (1) by Herr A. Gansser-Burckhardt, on the differential-diagnosis of *Hypoderma bovis* and *H. lineatum* of Swiss origin and their geographical distribution, (2) by Dr G. Bouvier, on the *Tabanidae* of Switzerland (pp. 15-47, 20 figs.). The latter paper may be compared with Mr Muschamp's article on " Gadflies in the Savoy Alps, 1938 " (*Ent. Rec.*, li, 49-55, t. 4).—T. B. F.

In South Africa Professor A. J. T. Janse continues to work at " The Moths of South Africa," of which Part 4 of Volume III was issued on 15th September 1939, completing the text of Volume III. Besides the plates, these volumes are illustrated by numerous text-figures showing genitalia and structure.—T. B. F.

In a note " on the structure of Lepidopterous Larvae, with special reference to the mature larva of *Leto venus*, Stoll," in the Journal of the Ent. Soc., S. Africa, II, 165-175, 3 figs. (30.x.1939), Professor Janse describes the structure of the larva of this large silver-spotted Hepialid, which was first made known by Stoll from an unspecified locality " about 200 leagues beyond the Cape of Good Hope." Stoll's figures (t. 286 C, D) show it with long filiform antennae, perhaps added to give an air of verisimilitude. It is apparently only known from the Knysna District

and we are told that " what is known about the life-history by one local family is kept secret, with a view to restricting the market of this beautiful moth and thus keeping up the price "! The larva lives under the bark of " a certain tree " and it is suspected that it would take freely to the Wattle tree now planted near its habitat, which calls to mind that the larva of the large Indian Hepialid, *Phassus malabaricus*, has also taken kindly to old stumps of introduced Wattle trees at Kodaikanal in South India.—T. B. F.

In the British Islands we have close on 2200 species of Lepidoptera on our List and thousands of Lepidopterists—of whom, we may add, probably ninety per cent. take an interest only in the larger species, thereby restricting themselves to the smaller half of the loaf—but it is now over seventy years since the publication of any book containing illustrations of all our species, so far as known at the time. New Zealand, with an area a little smaller but lying nearer to the Equator, can count just on 1500 species of Lepidoptera and the comparatively few collectors are in the happy position of having an up-to-date book with complete descriptions and coloured figures of all their species. This is due entirely to the personal exertions of Mr G. V. Hudson, who has produced three books on this subject. In 1898 his " New Zealand Moths and Butterflies (Macro-Lepidoptera) " dealt only with the larger species, including the Hepialidae. In 1928 he published a large volume, with 62 plates (of which 53 were coloured and 9 were structural drawings) with descriptions of all the 1271 species then known. To this he has added in 1939 a Supplement with a further 10 coloured plates (with 74 figures of early stages and 232 of adult forms), bringing the information up to date by adding descriptions and figures of another 200 species, besides additional notes on many recorded previously. A debt of gratitude is due to Mr Hudson, not only by local collectors but by all interested in the Lepidoptera of New Zealand.—T. B. F.

I sometimes look into odd corners of my entomological library and meet with many items of interest, personal and otherwise. Edward Newman, the proprietor and editor of the early volumes of the " Entomologist," in his preface to one volume refers to his subscribers as " collectors." He goes on to say:—" I use the term ' collector ' advisedly; first, because it is transparent and truthful; secondly, because I like it. We have, in days gone by, met with ' aspirations ' that we should become ' entomologists,' something better than ' mere collectors,' which means that we give up the fields and forests, the lanes and the streams; give up the net and laurel-box, and take to writing in a language that no one can read; that we print alternate words in italics, and stop every third word in the middle. I am a ' mere collector,' and only wish I had the time at my disposal to be a more assiduous one." My comment is that there are few " collectors " of the present day to whom the word " mere " could be applied. Perusal of our magazines will prove that. Most workers in entomology now make a study of the life-history, variation, distribution, etc., of species after species. The few who reach the age of " the sear and yellow leaf " may, per force of nature, become more or less " mere collectors." Then 'tis well if they devote their attention to the fauna of other lands; what they get together can become a nucleus for others to work out, and carry on the study of related and distant faunas.

ab. **nigra,** ab. nov., *E.M.M.* (1924), LX, 21.

Orig. Descrip.—At the Ann. Meeting of the Ent. Section of the Yorkshire Naturalists' Union in October 1924 " Mr H. Maxwell Stuart showed a box of interesting moths from Everingham, the most notable being a probably unique *Taeniocampa gracilis* entirely black, except the edging of the stigmata and the subterminal lines which remained pale." (Report of the meeting.) Dr Cockayne has kindly called my attention to this Report. I have called it ab. *nigra*. I have never heard of another black one.

Dr Cockayne possesses a specimen in which the basal and marginal areas are a little darker than the central area.

Taeniocampa, Gn. (1839? 1852), most authors. [*Monima*, Hb. (1821). Meyr., Hamps., Warr., Meyr.: *Orthosia*, Hb. (1821), Tr., Steph.] *populeti*, Fb. (1793) = *populi*, Stroem (1783).

Aurivillius, *Nord. Fjar.*, p. 159 (1888-1891) used the name *populi*, Stroem, in his book. Stroem's description appeared in an extremely scarce publication, " Skrivt. Kjölh. Selsk.," p. 75, f. 24 (1783). The spelling *populi* was not used until modern research adopted it from the time of Aurivillius. This I have not been able to verify with the original as the B.Mus. Library does not appear to possess a copy of the work.

Tutt, *Brit. Noct.*, II, 146 (1892): Meyr., *Hand.*, 73 (1895): Barr., *Lep. Brit. Is.*, V, 204, plt. 210, 1 (1899): Stdgr., *Cat.*, IIIed.. 201 (1901): Hamp., *Lep. Phal.*, V, 417 (1905): Splr., *Schm. Eur.*, I, 240, plt. 45, 5 (1906): South, *Moths Br. I.*, I, 329, plt. 157, 7-8 (1907): Warr.-Seitz, *Pal. Noct.*, III, 90, plt. 22d (1910): Culot, *N. et G.*, I (2), 63, plt. 50, f. 1-2 (1914): Meyr., *Rev. Hand.*, 144 (1928).

Tutt cited *donasa*, Esp., *Abbild.*, III, 264, plt. 52, 7 (1783-), to this species *populeti*, following Treit. and H.-S., but Wernebg. argued at length that *donasa* is an *instabilis*. The figure in *Pap. d'Eur.*, VII, fig. 414, cited by Treit. for *donasa* agreed fully for a form of *instabilis*. This figure of Ernst and Engr. is cited to *gracilis* not to *populeti*. Tutt noted that he had two specimens from Rannoch similar to *donasa*, Esp. My own opinion agrees with Werneburg.

Ernst and Engr. figured in *Pap. d'Eur.*, VII, plt. 263, a number of insects of which 414i, a rough and bad figure, is considered by Werneburg to represent *populeti* better than any other on the plate.

Fab., *Ent. Syst. emend.*, III (1), 476 (1793), referred in his description to Dr Stroem, who was the first describer.

Dup., *Hist. Nat.*, III, 311, plt. 29, 1a-b (1836), gave two good figures, but the grey somewhat too dark in both.

Freyer, *Neu. Beitr.*, I, 168, plt. 95, 2 (1833), figured this species quite well under the name *ocularis* (nec Schiff.) after long doubt as to its status.

H.-S., *Syst. Bearb.*, II, 202, fig. 109 (1846) gave a good, but unusually dark figure of *populeti*. He cites *donasa*, Esp.

Splr., *Schm. Eur.*, I, 240, plt. 45, 5 (1906), used the name *populi*, Stroem (" nach Aurivillius "), that is following the use of Aurivillius.

The figure is a much too heavily marked example for an average *populi* (*eti*) with large features (stigmata, etc.).

South, *M.B.I.*, I, 329, plt. 157, figs. 7-8 (1907), gave 2 figs. which unfortunately shared too much in the general ruddy colour of the plate, which completely effaces the plumbeous colour in this species.

Culot, *N. et G.*, I (2), 63, plt. 50, 1-2 (1914), gave two good figures hardly as grey as normal British examples.

Warr.-Stz., *Pal. Noct.*, III, 90, plt. 22d (1910), treated *populeti*, Fb., *subplumbeus*, Haw., *ocularis*, Frr., and *tremuleti*, Tetens., as synonyms, but *donasa*, Esp., as an aberration. The basic colour of the 2 figures is too ruddy instead of dark plumbeous grey.

Of the Variation Barrett says:—

"Usually very constant in colour and such markings as it possesses; but occasionally the black dots along the second line are accentuated and much more distinct. In Scotland, particularly in Perthshire, there is a tendency toward paler grey-brown colouring, and the same has been observed in Kent."

The Names and Forms to be considered:—

populi, Stroem (1783), *Skrivt. Kjölh. Schk.*, 76, f. 24.
donasa, Esp. (1783-?), *Schm. Abbild.*, III, 264, plt. 52, 7.
populeti, Fb. (1793), *Ent. Syst. emend.*, III, 476.
subplumbeus, Haw. (1803), *Lep. Brit.*, 121 (1809), 242.
f. *intermedia*, Steph. (1829), *Ill.*, II, 140.
gracilis, Steph. (1829), *l.c.*, 141 (nec Schiff.).
f. *ocularis*, Frr. (1833), *Neu. Beitr.*, I, 168, plt. 98, 2 (nec Schiff.).
f. *tremuleti*, Tetens. (1876), *Verh. Ver. Hambg.*, II, 161.
ab. *obsoleta*, Tutt (1892), *Brit. Noct.*, II, 146.
ab. *nigra*, Tutt (1892), *l.c.*, 147.
ab. *atropunctata*, Geest. (1903), *Allg. Zeit. f. Ent.*, VIII, 313.
ab. *atropurpurea*, Geest. (1903), *l.c.*
ab. *nigropunctata*, Dufrn. (1935), *Lambill.*, XXXV, 52.

Tutt dealt with (1) *populeti* as described by Fab.; (2) ab. *obsoleta*, with obsolescent or absence of marking; (3) ab. *ocularis*, Frr., with well-marked strigae and complete row of submarginal dots on the subterminal line; (4) ab. *donasa*, Esp., grey with central area reddish brown; (5) ab. *intermedia*, Steph., dark grey-brown; (6) ab. *nigra*, black.

subplumbeus, Haw., *Lep. Brit.*, 121 (1803).

Orig. Descrip.—"Alis plumbescentibus griseo subnebulosis, striga obsoleta postica e punctis griseis extus pallido adnatis."

It is placed in the Bombyx division with reference to the "Antennae multo magis pectinatae," and it is called the "Lead-coloured Drab." This answers well to *populeti*.

Subsequently, *l.c.*, p. 242 (1809), Haw. placed it among the Noctuae.

gracilis, Steph., *Ill.*, II, 141 (1829). Under this name Stephens describes this species "lead-coloured ash, more or less clouded with cinereous, with the ordinary strigae very obsolete." "The pale hinder striga is sometimes accompanied by an almost continuous series of black dots."

This description cannot possibly be applied to what we know as the beautiful *gracilis*, but it answers well for that we know as *populeti*.

ab. *tremuleti*, Tetens., *Verh. Ver. Hambg.*, II, 161 (1876).

Orig. Descrip.—" Ground colour as in *T. populeti*, Fb.; the waved line whitish-grey, and vein 7 (or 6) moved inwards considerably, in cell 1b with the convex bend near the basal cell of the wing, weak on the inside but not actually broken, brown tinged. Transverse lines lighter than the ground, almost as wide as the waved line and of the same colour as that, on the costa on the sides bent towards it tinged dark grey, becoming obsolescent when near the inner margin, in cell 1b."

ab. *atropunctata*, Geest., *Zts. f. Ent.*, VIII, 313 (1903).

Orig. Descrip.—" Pale grey, the waved line with a perfect row of black dots (analogous with the black, brown, or not spotted *munda* to ab. *immaculata*, Stdgr.)." Freiburg, Hagenau, Metz.

ab. *atropurpurea*, Geest., *Zts. f. Ent.*, VIII, 313 (1903).

Orig. Descrip.—" Dark red-brown, of very dull and thick coloration. Reniform and orbicular as well as the outer waved line narrowly pale yellow." Freiburg.

ab. *nigropunctata*, Dufrn., *Lambill.*, XXXV, 52 (1935).

Orig. Descrip.—" Like the typical form but the dark spots which are near the subterminal line are very black. One might confuse this form with certain forms of *M. munda*, but here the spots are not placed in groups of two." Marcinella, Belgium.

Taeniocampa, Gn., *gothica*, L.

Taeniocampa, Gn. (1838? 1852), most authors, Barr., Stdgr., Splr., South, Culot [*Orthosia*, Ochs. & Tr. (1816-25) H.-S.: *Graphiphora*, Hb. (1822): *Monima*, Hb. (1822), Meyr., Hamp., Warr., Meyr., Drdt.: *Semiophora*, Steph. (1829)] *gothica*, L. (1758).

In *Brit. Noct.*, IV, 120, Tutt discussed the *nigra*, Robson, concluding that it was the true *gothica* of Linn., " dark smoky-brown with the Hebrew character very distinct." In vol. II, 149, Tutt diagnosed the Linn. type as " dark blackish-grey with dark gothic mark."

In a footnote to *gothica*, Splr., *Schm. Eur.*, I, 239 (1906), said he had never seen dark black-grey examples to which Tutt gave the Linn. name *gothica* by giving the wrong interpretation to " fuscescentibus " in the Linn. diagnosis. When Tutt later on dealt with *gothicina*, H.-S., he stated that it was the dark Linn. form and laid the basis of his description on the ground colour, and Splr. here again says Tutt was in error, since the paler red-yellow-grey forms of *gothica* are the outstanding forms in S. Germany, and H.-S. determined the Linn. *gothica* not to be a restricted form as the diagnosis of Tutt stated.

Schiffermuller, *Verz.* (1775), 78, M.9, gave the name *nun-atrum* to a Noctuid, the larva of which fed on *Galium*.

Illig., *Verz.*, IIed. (1801), 242, said that without doubt this was the *gothica*, L. (1758), as stated by Schrank in *Fuess. Mag.*, II, 215.

Tutt, *Brit. Noct.*, II, 148 (1892): Meyr., *Hand.*, 75 (1895): Barr., *Lep. Brit. Is.*, V, 189, plts. 207-8 (1899): Stdgr., *Cat.*, IIIed., 201 (1901): Hamp., *Lep. Phal.*, V, 413 (1905): Splr., *Schm. Eur.*, I, 239, plt. 45, 1 (1906): South, *M.B.I.*, I, 326, plt. 155, 7-10 (1907): Warr.-Stz., *Pal. Noct.*, III, 90, plt. 22b (1910): Culot, *N. et G.*, I (2), 62, plt. 49, f. 15-16 (1913): Meyr., *Rev. Hand.*, 145 (1927): Draudt.-Seitz, *Pal. Noct. Supp.*, III, 115 (1934).

Esp., *Abbild.*, III, 383 (1782)?, plt. 76, f. 1-3, described and figured this species as *gothica*, the *nun-atrum*, Schiff. These figures are recognisable by the " nun-atrum " Hebrew character mark on the forewings. Fig. 3 is a variety in which the spot and the curve below the " nun-atrum " are missing.

De Villers, *Entom. Linn.*, II, 183 (1789), described a species with the " nun-atrum " character as *c-nigrum*, noted " affinis " *N. gothica*, and gave the characters by which it might be distinguished from that species, the latter having neither arc nor dot below the gothic mark. On p. 230, *l.c.*, he described *gothica*. Then in *l.c.*, IV, 465, he described the *nun-atrum* of Schiff. (*Verz.*, 78), " nimis affinis *N. gothica* from Fb.," treating it as a different species. In fact the sp. *gothica* is treated of twice as instanced by the references to the food plant, *Galium aparine*, in both species.

Regarding the statement of de Vill., *l.c.*, that the distinction between *c-nigrum* and *gothica* was in the absence of the arc and spot below the gothic mark in the latter, Knoch, *Ent. Beitr.*, stated that such marks were not specific but varietal characters. Bork., *Naturg.*, IV, 489 (1792).

Ernst & Engr., *Pap. d'Eur.*, VII, 23, figs. 422 c, d, e (1790), gave three good figures of *gothica*, including a small variegated light specimen. They recognise the *nun-atrum*, Schiff., as a *gothica* form.

Fab., *Ent. Sys. aug.*, III (2), 66, described the *nun-atrum*, Schiff., and said " Nimis affinis *N. gothicae.*" Fab., *l.c.*, 85, described *gothica*, L., and referred to *L.S.* and to *F.S.* and to Clerk's *Icones*, plt. I, 1.

Hb., *Samml.*, 112 (1802), gave a figure, which is quite unrecognisable as a *gothica* form, under the name *nun-atrum*.

Haw., *Lep. Brit.*, 119 (1803), classed it among his *Bombyx* species.

Godt., *Hist. Nat.*, V, 180, plt. 61, 3 (1824), gave a good figure of the non-variegated form of *gothica*. In his text he referred to the fact that Olivier and Fab., as well as Ernst and Engr., had made two species of this in error.

Treit., *Schm.*, V (1), 233 (1825), noted that as the ♂ antennae were strongly pectinated he at first considered it among the previous group [Bombycid], but that the bulk of the characters showed that it was a Noctuid.

Steph., *Ill.*, II, 138 (1829), referred to the evidently peculiar characters of this species as Ochs. placed it in the genus *Episema*. Treit. removed it to the genus *Graphiphora*, and Bdv. placed it in *Noctua* after Schrank, and he, Steph., concluded by founding the genus *Semiophora* for *gothica* alone.

Frr., *Neu. Beitr.*, I, 31, plt. 17 (1833), gave a very plain figure in which the " gothic " character was the main feature with more or less plain ground. He considers that the figures of both Hübner and Esper were not satisfactory.

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.

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

Articles that require ILLUSTRATIONS are inserted on condition that the AUTHOR defrays the cost of the illustrations.

TO OUR READERS.—Short Collecting Notes and Current Notes. Please, Early.—EDS.

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.

Urgently Wanted for Experimental Purposes.—Pupae of *hirtaria* and *lapponaria*. I can offer duplicates of very many species in return.—*Harold B. Williams, Croft Point, Bramley, Surrey.*

Desiderata—British *dominula* varieties with full data other than var. *lutescens* and var. *lineata*. Other vars. acceptable. *Duplicates*—British *L. l-album, exigua, cribrum, ocellaris*, and *intermedia*, etc.—*Dr H. B. D. Kettlewell, Cranleigh, Surrey.*

Wanted—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Estación Experimental, Casilla Correo 71, Tucuman, Republica Argentina.*

Duplicates.—Several thousand British Macro-Lepidoptera in perfect condition; full data. *Desiderata.*—British Micro-Lepidoptera in similar condition.—*S. C. S. Brown, Kingsholme, 454 Christchurch Road, Boscombe, Bournemouth.*

Duplicates.—P. brassicae,* Rapae,* Sinapis (Irish), Croceus, Rhamni, Argiolus, Coridon, Bellargus, Paphia, Aglaia, Cardui, Atalanta,* Io,* Galathea, Semele, Tages, Malvae, Sylvestris, Venata, Vinula,* Bucephala,* Similis,* Perla, Muralis, Ochroleuca, Flavicincta, Bipunctaria, Ochrearia,, etc. *Desiderata.*—Numerous, black pins, data.—*L. H. Bonaparte Wyse, 53 Victoria Road, Shoreham-by-Sea.*

New Address—Kenneth J. Hayward, F.R.E.S., F.R.G.S., F.Z.S., Estación Experimental Agricola, Casilla Correo 71, Tucuman, Republica Argentina.

New Address—Bernard Embry, Esq., 23 Mill Drove, Uckfield, Sussex.

MEETINGS OF SOCIETIES.

WAR-TIME ARRANGEMENTS.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON : 41 Queen's Gate, S.W.7. —June 5th, October 2nd, at 5 p.m.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. —2nd and 4th Thursdays from April onwards, 6 for 6.30 p.m., Chapter House Hall, St Thomas Street, S.E.1. *Hon. Sec., S. N. A. Jacobs*, Ditchling, Hayes Lane, Bromley, Kent.

THE LONDON NATURAL HISTORY SOCIETY.—Fixtures as printed in current syllabus cancelled. Members will be notified of further arrangements. *Hon. Sec., A. B. Hornblower*, 91 Queen's Road, Buckhurst Hill, Essex.

ENTOMOLOGICAL SECTION, BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—Evening Meetings. On the third Monday of each month, 7 p.m., at 55 Newhall Street, Birmingham. Visitors welcomed. Those who would like to attend or exhibit please apply to *G. B. Manley*, 72 Tenbury Road, King's Heath, Birmingham.

SOCIETY FOR BRITISH ENTOMOLOGY.—All meetings suspended till further notice. *Hon. Sec., E. Rivenhall Goffe*, 102 High Street, Southampton.

Communications have been received from or have been promised by T. Bainbrigge Fletcher, A. J. Wightman, W. P. Curtis, H. Willoughby-Ellis, E. Ernest Green, E. P. Wiltshire, Dr E. A. Cockayne, H. B. D. Kettlewell, H. W. Andrews, Rev. G. Wheeler, Abdul Mun'im S. Talhouk, Austen Richardson, M. Niblett, J. E. Collin.

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

Printed by T. Buncle & Co. Ltd., Arbroath.

Vol. LII.

No. 6

JUNE 1940.

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

CONTENTS.

Subscription for Complete Volume, post free
TEN SHILLINGS,
to *The Hon. Treasurer*, H. W. ANDREWS, F.R.E.S.,
6 Footscray Road, Eltham, S.E.9.

This number, Price ONE SHILLING AND SIXPENCE (net).

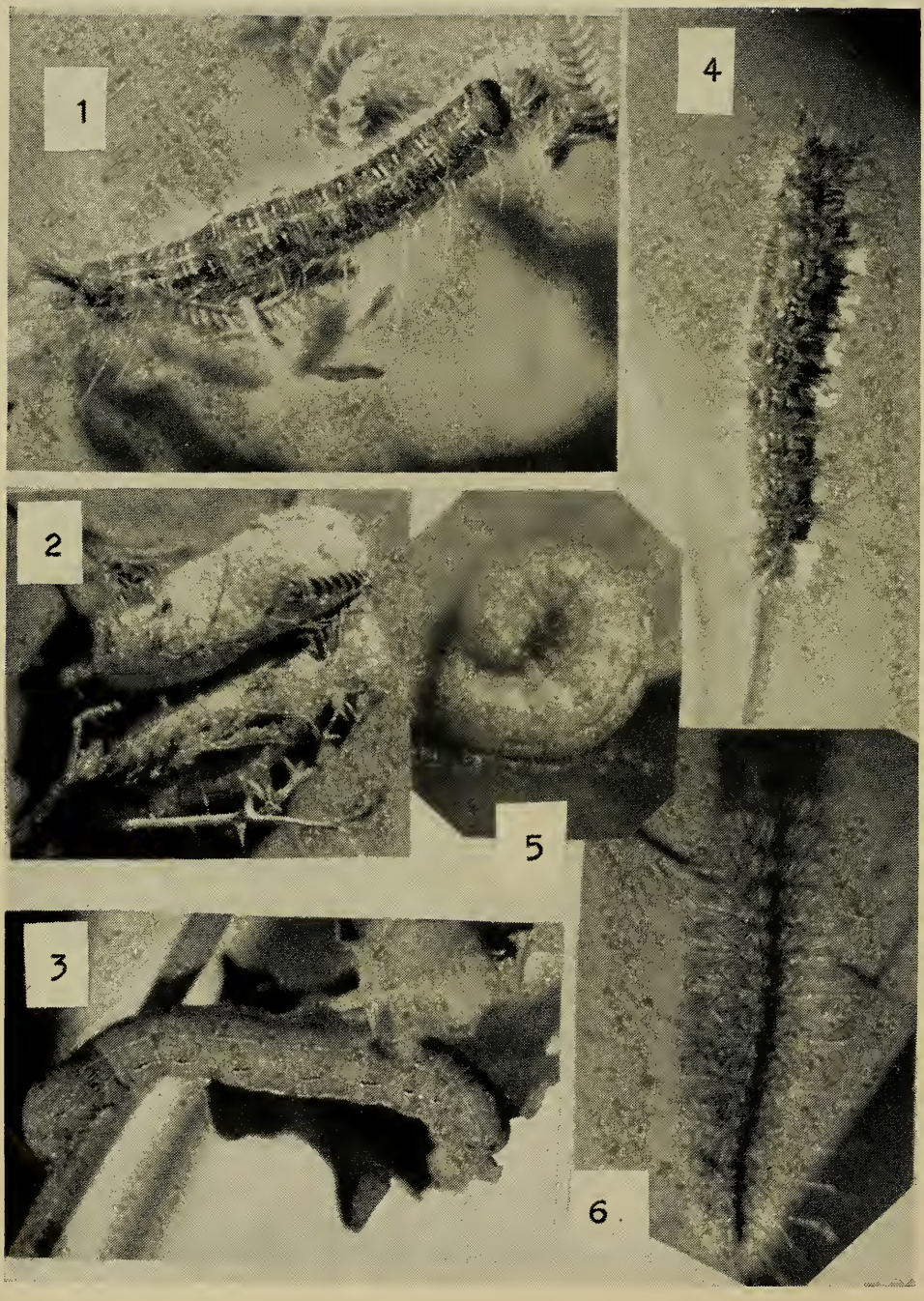


Photo. E. P. Wiltshire.

EARLY STAGES OF ORIENTAL PALAEARCTIC LEPIDOPTERA. IV.*

By E. P. Wiltshire, F.R.E.S.

(Plate IV.)

Including a Contribution by Abdul Mun'im S. Talhouk.

PART I.

When I left the Lebanon in early 1935 I had not definitely solved the identity of the caterpillar-tents to be seen on tall oaks (*Q. lusitanica*) on the road between Beirut and Aley, though it seemed likely that they would prove to be those of *Eriogaster philippsi*, Bartel, which was the only insect on our list to which they were appropriate. Passing through the Lebanon again in early June 1936 I found that I was too late for these larvae, only obtaining many shed skins and, on the oak-stem in the heart of the nest, a cluster of hatched ova. However, the resident and enthusiastic lepidopterist, Mr Talhouk, with whom I began corresponding, subsequently succeeded in breeding these larvae and confirming my previous guess as to their identity. Mr Talhouk, after kindly sending me a larval skin and several imagines bred by him, has now sent me an excellent biological account of this (to us) rare moth; I include it in this article at the end of my own descriptions.

The species described in this article come from a variety of districts, in Syria, Iraq and Iran.

AMATHES PAULI, Stgr.

In the first of the articles detailed in the footnote I described the early stages of *A. kindermanni*, ssp. *pauli*, and my account was summarized in Seitz III Supplement without mention of the subspecific name. Last year M. Charles Boursin informed me (*in lit.*) that an examination of the genitalia of the representatives of the genus *Amathes* showed that *pauli*, Stgr., was a *bona species*, distinct from *kindermanni*, F.R.; the example of *pauli* examined by Boursin was a Lebanese male from my own collection. Readers, therefore, are requested to note that the larval description attributed to me by Draudt-Seitz as *kindermanni* should really be *pauli*, as clearly indicated in my original article.

LACYDES SPECTABILIS, Tausch.

The larva of this mountain-species has apparently already been described, for a summary decription is given in Seitz II. Since I find this description unsatisfactory in one or two particulars I describe it again hereunder.

When full-grown, black, dappled sparsely and vertically with lemon-yellow, and densely covered with lemon-yellow hairs proceeding star-wise from brown warts; spiracles, black; below them, a clear yellow sublateral line. Dorsal line, broad and black, the hairs thereon being also

*Previous articles in this series appeared in (1) *Ent. Rec.*, Vol. xlvii, July-August 1935 (No. 7-8); (2) *Ent. Rec.*, Vol. xlviii, October 1936 (No. 10); (3) *Mitt. Muench. Ent. Ges.*, e. V. xxix, Jahrgang 1939, Heft 1.

black. Head, glossy-black with a white dot on each side of the mouth. (Figure 6.)

A larva was found on 11.vi.39 at 9000 feet on To-Chal, a mountain in the Elburz Range near Tehran. In captivity it only fed for one day (foodplant: *Salvia*) then fasted for six weeks, finally pupating on 4.viii.39. The larval skin was shed by a dorsal split but was not crumpled or passed backwards to the anal extremity, but remained beside the pupa looking like a dead mature larva. The imago hatched during the daytime on 30.viii.39. From this it would seem that a sort of aestivation takes place before pupation, remarkable in a peak-species.

ORGYIA DUBIA, Tausch.

Previous publications show that this larva varies geographically. The following is the difference between the Lebanon and the Elburz larvae.

Lebanon: Larva, black, with pale hairs low down on the sides, a pale fringe over the head, a pale anal tuft, and four honey-brown, white-tipped pencils on somites 4-7. A subdorsal chain of red warts sends red bars almost across the back of the other somites. Below them, a line of paler ochreous warts. Head, reddish, black at mouth.

Foodplant: *Astragalus cedreti*, on which it feeds with larvae of *Libanopacha schwingenschussi* at 5-9000 feet in mid-summer.

Elburz: Larva, black, with yellow mottling and orange-brown warts from which issue black hairs star-wise; a yellow transverse bar on each somite posteriorly except the thoracic somites, and two yellow subdorsal blobs on the fore part of each abdominal somite. The thoracic somites bear several finer yellow transverse lines. Four black tufts with white centres on somites 4-7. Anal pencil, white. Spiracles, indistinguishable. Feet, black and brown, orange centrally. Head brown, inclining to yellowish at the fork between the lobes, and black on the face. Ventral area, greenish. There are two orange circular dorsal buttons between the larger subdorsal warts. (Figure 4.)

Foodplants: *Astragalus*, *Rumex scutatus*, *Silene*. Observed at 8000 feet.

In both districts it is a day-feeder. Larvae usually produce a majority of females. The female remains in its cocoon and never becomes free of its thin pupal exuvium.

Elburz larvae were full-grown in vii.39, and the first male appeared from the cocoons on 25.vii.39.

ERIOGASTER PHILIPPSI, Bartel.

The following description of a mature larva was made by me from a skin sent me by Mr Talhouk:—

White, freckled with black; dorsal chain, velvety-black and interrupted, each link containing two tufts of gold-brown hair. Similar yellow-brown tufts on the sides of each somite. On somites 2 and 3 the dorsal patches are broader and contain redder-brown hairs; on somite 1, a black collar split by a fine white dorsal line. Head, glossy black with a few pale ochreous markings. Feet, pale yellow brown. Spiracles, yellow-brown, black-rimmed.

Further details, from Mr Talhouk's own pen, are given at the end of this paper. The only comment I have to offer on them is on the

opening sentence, which indicates that Mr Talhouk has found this moth much commoner than did Mr Ellison or I. There are two possible explanations of this: either the species has increased greatly in numbers since we left (cf., the irregular profusion of its relative *Eriogaster lanestris* in England) or Mr Talhouk's remarks apply especially to the Aley region, where he lives, whereas I and Mr Ellison paid more special attention to the Brummana-Shweir Middle Heights, further north. Around Aley oak-trees are scarcer than further north, and infestation of trees there might therefore be proportionately intenser. Probably both these explanations operate together in this case.

Quite likely Mr Talhouk may find the caterpillars much scarcer again in a year or two.

CHILENA PROXIMA, Stgr.

Egg: Oblong-oval, slightly flattened above and below, but not always laid flat; laid in irregular strings or small batches; putty-white, with a slight glaze, and a depression on the top side.

Larva: I give below a tabular comparison between the larvae of *proxima* and *sordida*, Ersch, made from larval skins of the former from Iraq in my own collection and skins of the latter in the British Museum labelled " Christoph. coll. 1902-195. *obliquata*, Klug. = *sordida*, Ersch. Turkestan."

SORDIDA.	*PROXIMA.*
TUFTS ON SOMITES 2 AND 3.	
Black and yellow.	Black and orange.
DORSAL LINE.	
Cream-coloured, black-edged.	Orange, indefinite.
DORSAL AREA, BETWEEN DORSAL AND SUBDORSAL LINES.	
Blue, interrupted transversely with brick-red and lightly mottled with black and yellow near the dorsal line.	Blue, interrupted transversely with brick-red and heavy transverse black dashes.
SUBDORSAL LINES.	
Brick-red, with a whitish infusion in the centre of each somite, and black freckling below.	Brick-red, defined above and below with black.
LATERAL AREA, BETWEEN SUBDORSAL AND LATERAL LINES.	
Heavily freckled with black.	Lightly freckled with blue, yellow and black.
LATERAL LINES.	
Creamy, with freckled black edging above.	Yellow and orange, ill-defined, flecked with black, and having a heavy black interrupted edging below.
SUBLATERAL AREA, BETWEEN LATERAL LINE AND SPIRACLES.	
Pale creamy, thickly mottled with slatey-lilac.	Ochreous, dappled with black, blue and orange, with an interrupted thick black line above the spiracles.
SPIRACLES.	
Ochreous, black-rimmed; behind each is a conspicuous orange seta.	Ochreous, black-rimmed.

The larva of *proxima* (Figure 1) has a blue-grey head, orange thoracic feet, and soft whitish hairs especially low down on the sides. The underside is banded and dappled with blue, cream, black, and orange. Claspers, orange, black-marked. On somites 2 and 3, a black dot fairly high up on each side. Somite 1 is bluish-grey dorsally.

It feeds in broad sunlight on bushes of *Prosopis stephaniana*, often accompanied by larvae of *Taragama siva* (which, however, feeds also on *Populus euphratica*, pomegranate, and tamarisk). It moves briskly, and grows rapidly, producing a succession of broods during the long Mesopotamian summer.

The cocoon (Figure 2), which is usually spun high up in the foodplant, is rather like a monkey-nut, but slightly woolly; it is firmer and smaller than that of *O. potatoria*, and becomes bleached with exposure. Pupal period, in summer, 9 days. I believe the winter is passed in the egg stage, but have not established this.

Imago: To light, Hassetche (Syria) and Mosul Desert, 1935; Table Mt. and Bagdad (Iraq), 1936, '37; Ahwaz (Khuzistan, Iran), 1938. A characteristic insect of the Mesopotamian desert.

AGROTIS (CLADOCEROTIS) BENIGNA, Corti.

Ova: Bun-shaped, ivory-white at first, duller later, with brown apical dot and ring; laid in patches in honeycomb formation, or singly. Period, 13 days.

Larva: When freshly hatched, slug-grey, with a black head, thoracic plate, spiracles and thoracic feet.

The instars are similar except the first, which is distinguished by the black colouring of the head, etc.

The mature larva is putty-coloured, slightly brown-tinged, with scanty darker grey mottlings, and a green internal colouring showing at the joints and underneath. The skin is very thin; the habits are still rather sluggish; the general appearance undistinguished. All the lines are interrupted in the centre of each somite, and the dorsal line is only visible on the fore-part of each somite. The dorsal line has a pale centre and a darker grey edging; the subdorsal and sublateral lines are formed of grey mottling, the former being the most defined of all, and the latter being of varying intensity. Spiracles, black, conspicuous. Tubercles, grey, or, on hindmost somites, fine and black. Head and thoracic plate, light brown, speckled and dotted finely with black. Thoracic feet, light brown. (Figure 5.)

Foodplants: Many kinds of low plants. It feeds above the surface by night, concealing itself by day in crevices.

Imago: To light, Kermanshah, Iran (4800 feet), x.39.

The larva hibernates, but can be forced to attain full growth by December or January, if kept warm indoors.

DISCESTRA ARENARIA, Hamps.

I am not entirely satisfied that this name is the earliest for the present species. A thorough revision of the genera *Discestra* and *Cardepia* is needed, and synonymies between species now attributed to different genera are likely to be established. For instance, an examination of the type of Rothschild's *Cardepia taylori* has left me without any doubt that this is a synonym of *Scotogramma trifolii*, Rott.

The present species, studied in Khuzistan, extends to the Sind desert, and probably westward also.

The ovum is ivory white, later grey; bun-shaped; its sculpture is clearly visible under a lens. Laid singly.

The larva when freshly hatched is grey-green with pale setae and an ochreous grey head. The markings develop progressively in the successive instars; in the first two, the head seems to have black dots, but becomes glossy green in later instars; in the last, under a lens, it is seen to be lightly mottled with brown and to have blackish antennae, but when blown turns yellow. In instar 3 the larva is more noticeably swollen and rounded on somites 1-3 and 10-13 than when mature. The bands of dappling, described below, first appear in instar 3.

When mature, it is smooth, green, and of a lighter hue below the spiracular line. The centre of each somite is dappled with a band of blackish dappling, which is obsolescent in the light forms, and which, in the darkest forms, is also found ventrally on the thoracic somites, but is normally confined to the dorsal parts; where the dorsal and subdorsal lines pass through this band, they are black edged. The black dappling is sometimes intensified on somites 1 and 11, forming a blackish thoracic plate on the former. Dorsal and subdorsal lines, white, interrupted at the somital joints; the former has an interrupted black edging on either side, the latter a similar upper edging. The anterior half of the black dappled band is, when distinct, much more so than the posterior, but the dorsal line's black edging consists of two equally clear black lines, one in the anterior part and one in the posterior part of the band; thus, the black edging is interrupted, not only at the somital joints but also in the middle of each somite. The posterior section of black edging is the shorter and is obsolescent in the lighter forms. Spiracles, yellow-white, black-rimmed, set (as in *S. trifolii*) in a black shade just above the sublateral stripe; their rim is less intensely black and they are less conspicuous than the spiracles of *trifolii*. Sublateral line, broad, whitish-yellow, with a yellow-brown clouding in its centre on each somite; this line is conspicuous, but less vividly defined than in *trifolii*. (*Arenaria*: Figure 3.)

The following are the chief characteristics by which *arenaria* can be distinguished from *trifolii* larvae; the former's ground-colour is invariably green; the dorsal line, though interrupted, is white and clear, not obsolescent as in *trifolii*; the dorsal line is black-edged; the black edging to the subdorsal lines is clearly interrupted in the middle of each somite. *Trifolii* is more finely mottled, but the mottling is not black, nor concentrated into bands. The two species occur together.

Rate of growth: Irregular; the fastest larvae pupated 17 days after hatching from ova, but many of their brothers and sisters were then hardly half-grown. Ova laid on 24.iv.38 hatched on 28.iv, and the first pupa from these larvae was formed on 14.v.38. The first imago to hatch, from a pupa formed on 16.v, hatched on 23.v.38, while the first pupa did not develop till the autumn. The second summer brood was not observed in a state of nature, and is evidently only partial. The two regular broods are in late iv and late x. The imago comes to light.

Foodplant: *Atriplex*, and probably other plants to be found on salty desert soil.

Pupa, glossy, red-brown, similar in structure to that of *trifolii* but with a much thinner chitinous case, and hence lighter in colour. Rather smaller than *trifolii*.

The larva shrinks remarkably in pupating; an inflated mature skin is 3.5 cm. long, and a living larva which before burying was 2.5 cm. long produced a pupa only half that length.

EXPLANATION OF PLATE IV.
(Enlarged.)

Fig. 1. *Chilena proxima*, Stgr., mature larva on food plant (Iraq)
Fig. 2. *Chilena proxima*, Stgr., two cocoons.
Fig. 3. *Discestra arenaria*, Hamps., larva (Ahwaz).
Fig. 4. *Orgyia dubia*, Tausch, larva (Elburz).
Fig. 5. *Agrotis benigna*, Cti., larva (Iran).
Fig. 6. *Lacydes spectabilis*, Tausch, larva (Elburz)

COLLECTING NOTES. II. JUNE-SEPTEMBER 1939.

By A. J. L. Bowes.

A spell of warm weather at the beginning of June awoke pupae with a rush, among them a fine lot of *Synanthedon vespiformis*, which was also emerging in the wild at the same time; at Netley Heath old oak and birch stumps were full of empty pupa cases of *S. vespiformis* and *S. culiciformis*. The first of my larvae of *Parascotia fuliginaria* spun up on 5th June; when they reached their last stage they were put into a 7 lb. biscuit tin with plenty of fungus laid on the bottom and strips of old bark propped against the sides. This made a good dark retreat for them, and all pupated successfully in spite of repeated attempts at sabotage by late arrivals, which insisted on letting down guy-ropes already in position, and even on utilising them themselves.

A flying visit to Wye Downs and the Ashford Woods on the evening of the 10th was most enjoyable, but made unprofitable by a cool wind. At dusk, *Scoria lineata* was very common, flapping lazily over the long grass, an easy prey for hawking swallows. *Eupithecia scabiosata*, too, was common, flying around a spindle bush, where it can be found year after year even if none are seen on the surrounding hillside. *Pachetra leucophaea* came to sugar and light thinly up to 1 a.m. During an hour which I spent in the woods south of Ashford, barely half-a-dozen species were seen, a figure which compares oddly with a bag of over a hundred species on a similar date in 1934: even *Stauropus fagi* and *Drymonia trimacula*, usually to be reckoned as regulars in these woods, made no sort of a show.

Night work in Surrey was better sport. On the 17th, a night which made no pretensions to warmth, at Byfleet, sugar was visited by *Acronicta leporina*, *Aplecta tincta*, *A. nebulosa*, *Noctua festiva*, *Dipterygia scabriuscula*, and smaller fry, and after dark there was a fine emergence of *Perconia strigillaria*.

At the end of the month I paid several daytime visits to the downs near Newlands Corner, where on posts which ran up over the hillside sat a large number of assorted Noctuids. *Hecatera serena* and *Cucullia umbratica* were common, with a good many *Dianthoecia conspersa* and

Hama sordida, and occasionally *Mamestra contigua*, *Xylophasia sublustris* and *Sphinx ligustri*. The *contigua* laid me a good batch of eggs and the resulting larvae flourished until their last stage on sorrel and dock. Then, perhaps because they had to travel a long way by car in very hot weather, they all damped off, and a bare dozen pupated.

At the first week-end in July some friends and I foregathered on the Essex marshes not far from Southend. On our way, Mr Howard and I stopped in the Lea Bridge Road and, helped by a bevy of keen and grubby children, picked some pupae of *Leucoma salicis* off the railings; the species seems to be in enormous numbers, and the joints of the railings where they pass through uprights were a solid mass of pupae, many of them deformed and crushed by the intense congestion. The very meagre foliage of the poplars appeared to be equally crowded, and yet all my specimens came out well up to size. We had always understood that the larvae of *Malacosoma castrensis* conceal themselves when the sun is not out, but on this evening, in spite of rain and a cold wind, they were sitting up in hundreds on the first likely marsh that we visited, and little colonies could be seen ten or twenty yards off. These larvae did well on apple, and Mr Howard had no trouble with his, even in the middle of London; the difficulties of breeding this insect seem to be highly exaggerated in the popular books. As dusk came on, the wind and rain ceased, and moths began to fly: *Acidalia emutaria* was common, while *Leucania favicolor* dashed frantically over the short herbage. On one spot flew a few *Crambus salinellus*, and Mr Huggins pointed out to me *Catoptria rubescana*, which he has recently added to the British list. Sugar was good; besides *L. favicolor*, *L. pallens* and *L. impura* were common, and there was a good sprinkling of *Mamestra dissimilis* (with a single melanic example), *M. oleracea*, and *Aplecta advena*. A few *Euchloris smaragdaria* were found on herbage near their food plant, and one we took flying: we were also surprised to see *Eupithecia scabiosata* in so unlikely a spot. The next morning we gathered some pupae of *Nygmia phaeorrhoea* (*Euproctis chrysorrhoea*) at Benfleet, and from among them there later emerged several *Nola cucullatella*. Looking over my series of *phaeorrhoea* (*chrysorrhoea*), I notice that all but one of my males from the Kentish side of the Thames (a dozen or so) have black dots on the forewings, whereas not one of the hundred and more males that emerged from these Essex pupae are spotted at all.

At the end of the month I spent the first few days of my holiday in Wilts and Dorset. On 30th and 31st July Mr C. M. R. Pitman and I sugared in the N.W. corner of the New Forest, just in Wiltshire. Both nights were bad, with a cold breeze and herbage dripping after a wet day; however, a few *Catocala promissa* came to sugar, a token of what might be expected on a good night in this district. A few common insects came in numbers to a sheltered light—*Agrotis strigula*, *Pachycnemia hippocastanaria* and *Eupithecia nanata*. A day trip to Hincheslea Moor near Brockenhurst after *Selidosema ericetaria* was spoilt by a high wind and intensive military operations over the heather; but I was there long enough to see that the strong colony of the insect which I had met there some years before had either moved or been burnt out. In the Forest itself I saw very few *Limenitis camilla*, but *Argynnis paphia* and f. *valezina* were quite fresh and plentiful.

On 1st August I motored down to Swanage, stopping at Downton to examine some *Verbascum* by the roadside, which was alive with minute larvae of *Cucullia lychnitis*. Ballard Down was bathed in sunshine, and there was the usual profusion of butterflies, including *Thymelicus* (*Adopaea*) *acteon*. To my great surprise, I found a vigorous colony of *S. ericetaria* at one end of the hill, confined to less than a hundred yards of ground. They were beautifully fresh, and their food plant on that very grassy hill is a mystery to me. *Triphaena orbona* was also kicked up from the grass. Evening work at Durlston Head was very poor, including little except the commonest Noctuids, and there was no sign of my main object, *Agrotis lunigera*. On grass-heads inland were a few *Triphaena interjecta*, and one *Gnophos obscurata* came to light.

The next day I was joined by friends, and we went in a body to a cove between Swanage and Lulworth, where *Polyommatus* (*Lysandra*) *coridon* flew in countless hundreds. Experts who were there said that not for twelve years had *coridon* been less variable. Even without extreme variation, *coridon* is a good insect to watch, and it lives in pleasant places. In this case there was a pair of ravens soaring over the hill, and the ever-present threat of severe thunderstorms kept away boredom. *T. acteon* was commoner here than at Swanage; so too was *coridon*, but *Eumenis semele*, which swarmed on Ballard Down, appeared to be absent. On this night and the next, since the coast was cool, we moved inland to Studland, and lit our lamps there; sugar and ragwort enticed nothing, but a few moths came to light, chiefly *Leucania litoralis* and the exquisite silvery form of *Agrotis vestigialis*, which has so far been found, I believe, only on the heather of this area of Dorset and in a very few confined localities in Surrey. *A. nigricans*, *A. tritici*, and *A. strigula* came in small numbers, and there were plenty of second-brood *Eupithecia nanata* on heather tips. In view of the inclement weather we could not complain, although it is always, and quite illogically, irksome to find a famous locality belying its reputation.

On the 4th I went back to Wiltshire. For several years I had wanted to get to grips with *Oria musculosa*, and this seemed a good chance. A friend and I spent the afternoon in touring around to find a suitable spot; we chose some high ground under corn, with a good wide prospect, and at dusk began to work in the corner of a field where there had stood an old stack and where a few plants of last year's crop were still left to grow. Almost the first insect that I netted was a fine male *musculosa*, which, to judge from its condition, must have bred on the spot. A very cold wind spoilt our chances of taking anything at the lamps after dark, although we kept them going until the early hours. The next night began by being warmer, though the wind was still strong. We found a spot in the lee of a tall hedge, and there manoeuvred car and lamps to shine over a field of standing wheat. Nothing was seen at dusk, but between 10.30 and 11 p.m. moths swarmed at the headlights, including many *Calocalpe cervinalis* (*Eucosmia certata*), *Cleora lichenaria*, and *Crocallis elinguaria*. Two *O. musculosa* came too, both rather worn. At 11.15 moths stopped, and never moved again before we left at 1 a.m. We were pleased with our detective work on *musculosa*, and it was not until later that we learnt that *musculosa* had been taken in the very same spot ten years before. Clearly the species is indigenous over a wide area in Wiltshire; a good number were taken by other parties in

1939 not far from our locality. Owing to an engagement at home, these two unfavourable nights were all that I could spare last year, and I fear that the coming season will not see our lights lit there. Food plant and habits still remain something of a mystery, but evidence is gradually accumulating, and before long this insect, which has for thirty odd years been a sadly neglected unknown quantity on the British list, may well be found to be a regular breeder in England on wide corn-lands.

When I had returned to Kent, visits were paid to Sandwich and the Ashford woods. Sugar was disappointing at Sandwich, only twenty species coming on the night of 9th August; and those who went to Dungeness reported that there, too, insects were scarce. And yet the year before the sugar had been plastered with moths all through August; one would like to know what factors govern plenty or scarcity at this or that attraction, not merely on a few isolated nights, but over the period of a month or two. The woods were more exciting; on 20th and 24th August *Agrotis agathina* was fairly common on a small patch of heather, and there were second broods of several Prominents. On the 20th, after a terrific thunderstorm, a male *Oconestis quadra* came to light—the third recent record for this part of Kent. Larvae of *Cucullia asteris* had all pupated by this time in these woods, but on the marsh at Ebbsfleet near Ramsgate a fine colony of monstrous larvae was found on the 23rd, feeding on *Aster tripolium*. Mr and Mrs Peyton, who visited the spot a few days later, found several larvae of *asteris* feeding gaily on *Artemisia*, a plant which I have not seen recorded as a food of this species.

After the end of the month, when my collecting came to a sad and early end, I did nothing of note. The Old Adam would not be denied on warm nights in October, and I went out for one or two murky expeditions armed with an umbrella and a stick, and assaulted the garden ivy, to little purpose. There is a poor consolation in the fact that August did not promise plentiful migrants in the autumn; one hopes that when hostilities are over, we shall be treated to a series of bumper years such as now occur only in our dreams.

SYNONYMY IN THE GENUS MYOPITES (DIPTERA, TRYPETIDAE).

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

Two distinct species of *Myopites* occur in this country, one with a comparatively short head, more predominantly yellow abdomen, and stigma of wing more extensively darkened, the larvae of which form galls in the flowerheads of *Pulicaria dysenterica* (though apparently only near the south coast); the other with a longer head having a more projecting epistoma, darker abdomen, and stigma only dark on about apical half, the larvae forming galls in the flowerheads of *Inula crithmoides*. No less than seven different names have at various times been used for one or the other of these two species, the latest being *M. eximia*, Seguy, used by Mr Niblett in the recent February number of this magazine, for the species from *Inula crithmoides*.

The following notes on the old descriptions and records were made as an attempt to clear up the synonymy of our two British species, and are now published in the hope that it may lead to the confirmation (or

otherwise), by those in a position to undertake the work, of certain doubtful points.

M. blotii, Breb. (1826), was described from specimens bred from larvae found in autumn and winter in the galled flowerheads of "*Inula dysenterica*" growing in marshes and other sea-coast situations in Normandy; the flies themselves were said to be very common on the flowers of this plant in July, August, and September. The description of the insect itself is valueless for purposes of identification but the biological details fit so well with our species, having a similar life-history, that we might use the name *M. blotii* with confidence for our species except for the fact that a species certainly distinct from ours (*M. inulae*, v. Ros.) was originally recorded as living in the same foodplant in Central Europe (see, however, the note under that species). It is noteworthy that the distribution of this species of *Myopites* in England coincides with the distribution of a closely allied plant, *Pulicaria vulgaris* (*Inula pulicaria*), and not with the distribution of *Pulicaria dysenterica*, but I am assured by those who have collected the galled seedheads in the Isle of Wight that the plant concerned was certainly *P. dysenterica*.

In 1833 Newman described a *Tephritis hebe* from a single specimen taken at Southgate by Mr F. Walker. This was redescribed and the wing figured by Walker in 1836 under the name *Sphenella signata*, Mg. The synonymy of *hebe*, Newm., with *signata*, Mg., was certainly incorrect, but the description and figure prove that the insect concerned was a *Myopites*, though it does not help in identifying the species. Walker appears to have seen other specimens in addition to Newman's type, because he gives the species as occurring "in the south of England during the summer; but not common"; he may, indeed, have had both our species before him, but the locality for the type specimen of *hebe* (Southgate) is a northern suburb of London, and of the known foodplants of the two British species of *Myopites* the only one likely to be found growing in that locality is *Pulicaria dysenterica*. It is probably correct, therefore, to infer that *T. hebe*, Newm., is a synonym of the species we know as *M. blotii*, Breb.

M. inulae, v. Ros. (1840), as redescribed by Loew in 1846 from specimens sent to him by v. Roser, is certainly a species distinct from our *M. blotii*, having particularly a longer female ovipositor. I possess Continental specimens and can confirm the distinction. According to Loew, this species was bred by v. Roser from "*Inula dysenterica*," but there may well have been a mistake over this food plant record. Frauenfeld* recorded breeding it "freely from *Inula hybrida*, occasionally from *I. ensifolia*, but never from *I. dysenterica*"; Schiner bred it freely from *I. ensifolia*, and there is no record, other than that of Loew, of the breeding of the species from *I. dysenterica*. The record of *M. inulae* as British is due to Fitch (*Entomologist*, xv, 1882, p. 138), but his species having been bred from *Inula crithmoides* must have been our *M. frauenfeldi*. The true *M. inulae* is not likely to be found in this country.

M. longirostris, Lw. (1846), was described from two males and one female from Sicily which were not bred, and the *M. longirostris* re-

*This record is incorrectly placed under the synonym "? *stylata*, F.," in Kertesz's Catalogue.

corded by Frauenfeld as bred from *Inula viscosa* was not Loew's species of that name and was described as *M. limbardae* by Schiner. The references in Kertesz's Catalogue under *M. longirostris* to Schiner and Kaltenbach also relate to *M. limbardae* because they both refer to Frauenfeld's breeding record. Mr Niblett has established the fact that our species from *Inula crithmoides* is not *M. longirostris*, Lw., and it is most improbable that Loew's species will ever be found in this country.

M. frauenfeldi, Schin. (1864), and *M. eximia*, Seguy (1932).—It is certainly incorrect to sink *M. frauenfeldi*, Schin., as a synonym of *M. longirostris*, Lw. One has only to compare the descriptions given by Schiner for *frauenfeldi* and by Frauenfeld for the " ? *blotii* " which Schiner subsequently named *frauenfeldi*, with Loew's description of *longirostris*, to realise that they could not apply to the same species. *M. longirostris* is a more extensively yellow species, while *M. frauenfeldi* was described as having the very same darker colour characters used by Seguy for distinguishing his species *eximia*. So far as one can be certain without comparing types, our species from *Inula crithmoides*, Seguy's *eximia*, and Schiner's *frauenfeldi* (both bred also from this food-plant), are all the same species, which must be known as *M. frauenfeldi*, Schiner, the name under which I added it to the British List in 1910 (*Ent. Month. Mag.*, xlvi, 174). The breeding of this species from *Inula crithmoides* in Britain was first recorded by Walker in 1871 (*Entomologist*, v, p. 450) under the name of *T. signata* Mg. (v. Fitch in *Entomologist*, xv, 1882, p. 138). Fitch called the species *M. inulae*, v. Ros., failing to recognise it as *M. frauenfeldi*, probably because Schiner included this latter species under his couplet " Flügelrandmal gelb," whereas the species really has the stigma yellowish about the base and darkened towards tip.

I have bred both of our British species in very large numbers and there is considerable variation in both species in wing markings and, to a certain extent, in colour; for instance, in *frauenfeldi* the legs, usually yellow, may be extensively tawny-brown, and the dark markings on abdominal tergites may be restricted to a pair of large isolated spots on each tergite, always larger than in *blotii*, and never approaching the very restricted (or even absent) markings of *longirostris*; in any case, the palest *frauenfeldi* can always be separated from the darkest *blotii* by the shape of the head, while the stigma of wings is always more extensively darkened in the latter than in the former.

THE MISUSE OF THE HOMONYM RULE.

Our colleague, Rev. Geo. Wheeler, has called attention to the absolutely unnecessary suggested replacement of the Erebiid name *arete* in that splendid book on the genus *Erebia* issued by the Trustees of the British Museum (Nat. Hist.). I have looked closely into this in connection with the Homonym Rule. This rule was formulated to obviate the redundant use of the same specific name in any circumstances where confusion as to the particular species might arise with another species labelled with the same name. The only control as to its use in every case should be " confusion " and nothing else.

Now, how do we stand about the name *arete*. In 1764, at a period when specific names were given to all forms as they superficially appeared to differ from previously named forms (species), Müller, in *Faun. Ins. Fridrichsdalina*, p. 36, described a butterfly form new to him, "Alis dentatis utrinque cinereo-fuscis: primoribus duobus, posticis quinque punctis albis," to which he applied the name *Nymphalis arete*. On p. 33 of the same work Müller had included *hyperantus*, L., as a *Danaus* species. [Actually, as was the custom, Müller wrote *Papilis Nymphalis arete* which was in fact simply saying the butterfly *Nymphalis arete*.]

Twelve years later Müller revised his previous work and in *Zool. Dan. Prod.*, p. 114 (1776), gave a list of nine varieties to the species *hyperantus*, including his own *arete*. Thus he had become convinced of his own error in at first considering *arete* as a good species.

The descriptions of these nine varieties of *hyperantus* were repeated in the *Beitr.* of Göze, Vol. III (1), 197 (1779), and also by Esper, *Abbild.*, I (2), 38 (1780?), and the latter figured 3 of these forms including *arete* (plt. 57, figs. 2, 3, 4). We thus see that the name *arete* had been applied to what was really a pure aberration (not even a subspecies) of a previously described species. In this circumstance Fabricius was quite in order in describing his (Erebiid) species under the name *arete*, in the *Mantissa*, II, 42 (1787).

Borkhausen, *Naturg.*, II, 204 (1789), in his eagerness to name another species, renamed this *arete* of the *Mantissa*, stating "Herr Fabricius named this species *arete*: I have named it *claudina*, because my Herr fellow-worker in his systematic descriptions of European (butterflies) Lepidoptera has dealt with a supposed variety of *hyperantus* under the name *arete* as a true species and I think he is right." This in spite of all the information Borkhausen could have obtained. No one followed him in this.

There is no reason whatever for the substitution of *claudina* for the long-used *arete*. The name *arete* had been used for a form of insect which was shown to be only an aberration of a previously well-known species, and was recognised as an aberration by its sponsor twelve years later. No confusion of the application of this name ever existed until this unwarrantable substitution.—Hy. J. T.

[In view of the full descriptions of these nine forms of *hyperantus* given by the above three authors it is strange that Fabricius in his *Ent. Syst. emend.*, III (1), 216 (1793), six years later omits all reference to Müller, Göze and Esper, although he gives reference to no less than eleven other works.]

COLLECTING NOTES.

Ptilophora plumigera, Esp., in Bournemouth.—A male specimen of this very local species came to light on the night of 10th November 1938 in the centre of Bournemouth. Maple is almost absent in the district, but sycamore is common.—S. C. Brown.

Nepticula aurella, Staint., in February.—On the morning of 9th February 1939, a warm sunny day, I noticed a specimen of this species sunning itself on a leaf in a hedgerow in Kinson, Dorset.—S. C. Brown.

Drosera rotundifolia, L., capturing Bupalus piniaria, L.—It is seldom that *Drosera* plants are able to capture anything much larger than small Diptera, yet in May 1937, in the New Forest, I found a female of *Bupalus piniaria*, L., firmly attached to a plant of *Drosera rotundifolia*, L., by the abdomen and hindwings. The moth was dead.—S. C. Brown.

Spring Diptera.—On the 31st March of this year I was fortunate enough to add to my collection and to my local list a series of the Tachinid fly, *Gonia fasciata*, Mg. There do not appear to be many records of this species, probably on account of the early date of emergence and its habit of only flying in sunny weather. I found it on flowers of coltsfoot in the Thames Marshes near Stone, Dartford. It has been recorded by Mr Wainwright from Ventnor, Isle of Wight, and Mr Collin tells me it has also occurred at Eastbourne. At the same time and place the Syrphid, *Chilosia grossa*, Fln., was not uncommon at coltsfoot flowers, though some sallows nearby, where it might have been expected, were quite barren of insect visitors. On the following Saturday, 6th April, I went again, but this time the weather was dull and cold and no Diptera were seen. A third visit on 21st April in bright warm weather showed a few *G. fasciata* still about, but the commonest species on that date was *Eristalis aeneus*, Scop., which occurred both on coltsfoot flowers and blackthorn blossom, which latter also proved attractive to *Eristalis tenax*, L., and *E. intricarius*, L.—H. W. Andrews.

CURRENT NOTES.

There are still a few subscriptions outstanding for 1939 (Vol. 51). Will these subscribers, and all who have not already paid for 1940 (Vol. 52), please send their subscriptions to the Hon. Treasurer, 6 Footscray Road, Eltham, S.E.9, as soon as possible, in order to help the magazine in these difficult times. Bankers Order payment forms will be sent on application to any who may desire to save trouble and postages by subscribing through a Bank.

As somebody once said, "War is Hell," a saying which seems to have dogged the International Congress of Entomology. The Third Congress, which should have been held in Vienna, was delayed for ten years and finally took place in Zürich. Of the Seventh Congress, held in Berlin in 1938, we have so far received only an incomplete account (two volumes) of the Proceedings and the receipt of the final part is presumably delayed "for the duration." Of the Sixth Congress, held in Madrid in 1935, we had despaired of ever seeing any Proceedings at all, but of these Volume I has now turned up, quite unexpectedly, having been sent out on 30th April 1940, after an interval of nearly five years, and we must congratulate our Spanish confrères not only on the persistent energy which they have displayed in overcoming the unusual difficulties in its publication but also on the excellent *format* in which they have produced it. This first instalment consists of over 400 pages, with 12 plates and numerous text-figures, and contains over 40 of the papers presented to the Congress. Space prevents even a list of the

titles of the papers and it must suffice to say that their very diversity shows what a vast subject is Entomology nowadays. Plate 12, showing damage to books in Catalonia, looks at first sight like a relic of the late civil war, but is merely another example of the constant and insidious warfare waged by Insect Pests, especially in warmer climates; what with Insect Pests, Moulds, dry heat and excessive damp, a Librarian's life in the Tropics is by no means a happy one.—T. B. F.

No doubt readers have noticed in some natural history matter that the author's name is fenced in by brackets. This is only another unnecessary stupidity without giving any information of definite use. We are told that the indication intended is that the species so decorated is not now in the original genus in which it was placed by its describer, an indication practically of no use as the vast majority of species are in that category. How much better to attach the name of the author of the genus, as well as of the species, a piece of useful, informative, positive information, instead of fencing the species with useless, non-informative scratches, which presume to indicate imperfectly what has happened to the bulk of species.

Some twelve years ago Rev. George Wheeler gave his Collection of Western Palaearctic Butterflies to the Worthing Museum. It then consisted of some 10,000 specimens. Since that time some 3000 specimens have been added from several sources. As he now will be unable, at least for the present, to continue his annual visits abroad he is anxious to add still further to the collection and is asking collectors to spare some of their duplicates to fill the numerous gaps.

There are, for instance, no English specimens of *C. hyale*, *A. iris*, or *C. palaemon*, and very few *P. machaon* or *Z. quercus*; Scotch and Irish forms of many species are also in many cases poorly represented. In Europe there are no specimens from Denmark or Holland, and the Eastern countries show many gaps, a good many species being completely lacking. In Africa there are no specimens from Egypt, the Canaries or Madeira, in Asia very few from Syria or Asia Minor, there are also a good many spaces only partly filled and a few still quite empty among the Arctic species.

He will gladly pay postage and will also return all boxes in which set specimens may be sent.

[Since the request was first sent out Mr Wheeler has received numerous additions for which he is very grateful. Please note that only Western Palaearctic species are required.—Hy. J. T.]

Dr Bytinski-Salz, in his fifth study of hybrid Lepidoptera (Archiv. exper. Zellforschung, 1938, 22, 217-237), deals with the four species of *Platysamia* (Saturniidae) and discusses their geographical range, foodplants, colour, pattern, and genitalia. He gives a detailed account of the cytology of the four hybrids he obtained and gives an ingenious table showing all the hybrids which have been bred and their fertility so far as it is known. He finds a close parallel between chromosome affinity and fertility, and gives the following order of relationship:—*cecropia, columbia, euryalis, gloveri.*—E. A. C.

The Tunbridge Wells Municipal Museum now has an Entomologist on its staff and possesses collections of local insects of nearly all Orders. We are anxious to secure the co-operation of anyone studying or collecting insects in this district, and can provide facilities for identifying species of all orders of insects. If any of your readers are in this district this summer, they would certainly find a visit to this museum worth while. The area in which we are particularly interested extends from the escarpment of the North Downs in the north to the Forest Ridge of Sussex in the south, westward to about the line of the Surrey boundary and to a line approximately North and South through Goudhurst in the east. We should particularly like detailed records of the occurrence of Coleoptera in that area.

REVIEWS.

Zoology of Oxfordshire. Edited by B. M. Hobby, M.A., D.Phil., F.R.E.S. (Reprinted from the Victoria County History of Oxfordshire), 168 pp., large 4to.—No less than 117 of these pages form a splendid record of the Insect Fauna of the County. Each Order has been compiled by a well-known local entomologist each a specialist in his own branch. The result is that a mass of well authenticated records has been collected of inestimable value and a book of lasting reference for the University students and local societies in the County. The Lepidoptera, in which we are more particularly interested, occupy some two dozen pages, and for these records the late Commander J. J. Walker and Dr B. M. Hobby made themselves responsible. In the short introduction to this section we read " We are much indebted to the entomologists of Reading and its neighbourhood, and in particular to Mr A. H. Hamm and the late Mr William Holland." About the year 1908 these active collectors compiled a catalogue for the County History which remained unpublished till now, when it has formed the basis for the present list. Some portions of the Oxford area are very prolific; one small area including a wood has produced 39 species of butterflies, the five " hairstreaks " among them. There had been no list of the Micros extant until the late and much regretted Prof. E. G. R. Waters commenced their study in 1911; in about 20 years he was able to record more than half the British species as occurring within the Oxford county. It is perhaps best in such works as this to use the Nomenclature and Classification of some well authenticated list or book in more or less general use. In this case the R.E. Society List has been used for butterflies. The *List of Brit. Geometers* based on Prout's work and published in our magazine is used for that group. The *Moths of the British Isles*, R. South, is the basis of the Noctuae, etc., while Meyrick's *Handbook* is used for all the Microlepidoptera. " Ill weeds are sure to grow apace," e.g., *hyperant(h)us*, L.; even the R.E.S. could not spell this word aright. We can never understand why some family names in the Lepidoptera have " *-idae* " and others " *-dae* " as their family designation; *-idae* contains a " root " basis with a definite meaning of similarity, whereas " *-dae* " has no root basis. The compilers of the Zoological Code of Rules of Nomenclature were quite aware of this as they said definitely that *idae* was to be the

ending of all Family Names. It should be *Hesperiidae* and not *Hesperiadae*; this latter is an absolutely wilful error in more ways than one.

Turning to the Coleopterous Fauna we have a very fine survey of the County written in preparation for this list by the late Comm. J. J. Walker, whose experience of over thirty years active collecting in the district gave him an unequalled knowledge of this Order. His estimate based on his own knowledge and with the assistance of Mr J. Collins of the Hope Museum, was that nearly 60% of the British species were to be taken within the county boundaries. These records cover some 27 pages.

Other Orders are dealt with in a similar way. Diptera have some 22 pp. of records; Hymenoptera about the same, and so on.

The format of the volume is admirable and the printers and publishers are to be congratulated on their work. Particular thanks and praise are due to Dr Hobby for his share in the successful editing and bringing into line the work of the various contributors, the list of whom is printed on the opening page, and we heartily congratulate them all on their share.—Hy. J. T.

British Blood-Sucking Flies. By F. W. Edwards, Sc.D., F.R.S.; H. Oldroyd, M.A.; and J. Smart, Ph.D. Royal 8vo., pp. viii-156, 64 figs., 45 plates (44 in colour). Published by the Trustees of the British Museum, London; price, 15s.

This book deals with the identification, distribution, life-history, and habits of 117 species of 7 families of Diptera known to be blood-suckers. It is an enlargement of a previous work by the late Major E. E. Austen, but whereas that dealt with only one blood-sucking family, the *Tabanidae*, Dr Edwards and his colleagues have included in this volume, in addition to a revision of Major Austen's work based on material left by him, the blood-sucking species of the following groups:—*Nematocera* (gnats, midges and sandflies); *Muscidae* (stable and biting flies); and *Hippoboscidae* and *Nycteribiidae* (parasitic flies associated with animals, birds, and bats). Incidentally, this is the first British publication dealing with these last two families.

There are Keys for identification purposes of the females of each family—the males with very few exceptions not being blood-suckers—and to the individual descriptions of species there are added useful details of life-history, distribution, and habits. In an appendix, Dr Edwards has a valuable description, with figures, of the genitalia of the *Culicoides* (Nematocera). There are bibliographies of each group. The coloured plates are of the usual exceptionally high standard associated with British Museum publications, and the numerous text figures add greatly to the usefulness of the book. In view of the illustrations and general get-up, the price of 15s must be considered moderate, but it might have been made more available for students of limited means if it had been issued in separate parts for the three main groups, in paper covers after the Continental fashion. As it is, this book should be in the libraries of all Entomological Societies, and of all others who can afford to buy it in war-time.—H. W. Andrews.

Wood, *Ind. Ent.*, p. 39, plt. 10, f. 170 (1834), gave a very dark figure, good under a lens.

H.-S., *Bearb.*, II, 196, fig. 125-6 (1845), said that Hb.'s fig. 112 was not correct. He treated *gothicina*, Kef., as probably a species, his examples having come from Lapland. He used the genus *Orthosia*.

Gn., *Hist. Nat.*, V, 346 (1852), referred to its colour variation; more or less blackish-violet, or more or less reddish as insufficient even to form two races and certainly not two species as some older authors had done. He placed it in his genus *Taeniocampa*.

In the *Young Naturalist*, p. 121 (1888), Robson called a form of *gothica* of " a dark smoky-brown with the black Hebrew character very distinct," ab. *nigra*. Tutt, *Brit. Noct.*, IV, 120 (1892), said that it represented the Linnaean type, " Alis superioribus fuscescentibus; arcu nigro linea alba marginato."

Meyr., *Handb.*, 75 (1895), used the genus name *Monima*. In the *Rev. Handb.*, 145 (1928), he again used *Monima*.

Hamp., *Lep. Phal.*, V, 413, fig. (1905), gave a very poor b. and w. figure. He recognised the *askoldensis*, Stdgr., and *gothicina*, H.S., with the *nun-atrum*, Schiff., as a syn. He used the genus name *Monima*, Hb., which had long been invalid as out of use from transfer of its two species *miniosa* and *pulverulenta* to *Taeniocampa* by Gn. (1838 ? 1852).

Spuler, *Schm. Eur.*, I, 239, plt. 45, 1 (1906), referred to Tutt's named aberrations " ab. *pallida*, Tutt, pale grey to brown grey; often violet-brown grey (Linné); and through red-yellow grey, ab. *rufescens*, Tutt; to bright grey-yellow red or grey-violet red, ab. *rufa*, Tutt; and finally deep red-brown, ab. *brunnea*, Tutt." His figure is quite good, but the basic ground is too much shiny brown.

South, *M.B.I.*, I, 326, plt. 155, 7-8, 9-10 (1907), gave two figures of *gothica* and two figures of *gothicina*, all not good.

Warr.-Stz., *Pal. Noct.*, III, 89, plt. 22b (1910), treated *nun-atrum*, Hb., as a synonym; *gothicina* as an ab.; *askoldensis*, as a subsp.; adopted abs. *pallida*, *rufa*, *rufescens* and *brunnea* of Tutt; and added ab. *hirsuta* himself for a dark powdered form of ab. *pallida*. He gave seven figures, all having the ground colour too much dominated by the basic rufous brown of the plate, otherwise they are fairly good. They illustrate *gothica*, *gothicina* ♂ and ♀, *pallida*, *rufescens* ♂ and ♀, and *hirsuta*. Genus *Monima*, Hb.

Culot, *N. et G.*, I (2), 62, plt. 49, 15-16 (1914), gave a good figure of *gothica* and of *gothicina*.

Draudt-Stz., *Pal. Noct. Supp.*, III, 115 (1934), said that ab. *circumscripta*, Hasebrk., is probably the same aberration as the *conflua*, Kief., the black circumscribes the entire stigmata; if identical the name *conflua* would have priority. They referred to a hybrid which had been obtained, *stabilis* ♂ × *gothica* ♀, of which the resultant moths were scarcely to be differentiated from very dark *gothica*. Lower Austria.

Of the Variation Barrett says:—

" Exceedingly variable, the ground colour ranging from the palest purplish-drab or even purplish-grey, or light red-brown, to rich dark purple-red and blackish purple-brown; the pale clouding varies also in almost every possible degree, being sometimes almost absent, in other

cases invading large portions of the basal, costal, dorsal and hind-marginal regions or any of them, and in almost any degree; or instead of the hind-margin, lying in large clouds along the subterminal line." (Lowland Scotland.)

A further range of variation, found more especially in Scottish mountain districts, " has lost the rich tone of colouring altogether, and instead of some shade or tone of purplish-brown is of a dull reddish-drab of various degrees, clouded with paler, but without the usual gloss. The ordinary black markings in the middle of the forewings are frequently red-black, dull red, or red-brown, and sometimes scarcely perceptible." The paler so-called var. *gothicina* (incorrectly), in which these markings are not black " is represented in great variety and beauty in specimens from Sutherlandshire, ranging from red-brown to pale brown and almost to buff, sometimes almost devoid of markings, often having them rather dull and obscure and the ' gothic ' mark red, brown, indistinct or invisible, while sometimes the stigmata are blurred by large pale or whitish clouds."

A local variation at Haslemere " Has the black markings divided and the separated portions much reduced in size even to mere isolated black streaks."

He reports a specimen from Howth " With forewings almost entirely of a rich chestnut red."

Another " Entirely rich dark purple-brown."

Another " With the black markings extended very large."

In another " The usual black mark is represented by a wedge-shaped umbraceous blotch."

One bred from a Perth ovum " Is of a brilliant coppery-red."

Another " A dark rich purple-red clouded with darker red and having the ' gothic ' mark still darker and edged with bright light red."

The Names and Forms to be considered are:—

gothica, L. (1758), *Sys. Nat.*, Xed., 515.
nun-atrum, Schiff. (1775), *Verz.*, 78.
nun-atrum, Hb. (1802), *Samml. Noct.*, 112.
ab. *gothicina*, H.-S. (1845), *Sys. Bearb.*, II, 196.
nigra, Robs. (1888), *Young Nat.*, 101 = typical *gothica*, teste Tutt.
ab. *pallida*, Tutt (1892), *Brit. Noct.*, II, 149.
ab. *variegata*, Tutt (1892), *l.c.*, 149.
ab. *rufescens*, Tutt (1892), *l.c.*, 149.
ab. *suffusa*, Tutt (1892), *l.c.*, 150.
ab. *rufa*, Tutt (1892), *l.c.*, 150.
ab. *brunnea*, Tutt (1892), *l.c.*, 150.
ab. *obsoleta*, Tutt (1892), *l.c.*, 149.
ab. *obsoleta-pallida*, Tutt (1892), *l.c.*, 149.
ab. *obsoleta-variegata*, Tutt (1892), *l.c.*, 149.
ab. *obsoleta-rufescens*, Tutt (1892), *l.c.*, 150.
ab. *obsoleta-rufa*, Tutt (1892), *l.c.*, 150.
r. *askoldensis*, Stdgr. (1892), *Rom. Mem.*, 496.
ab. *hirsuta*, Warr.-Stz., *Pal. Noct.*, III, 90, plt. 22b (1910).
ab. *conflua*, Kief., *Ent. Rund.*, XXX, 32 (1913).
ab. *circumsignata*, Hasebrk., *Int. ent. Zt.*, IX, 36 (1915).
ab. (unnamed), Hoffm. & Kloss., *Schm. Stierm.*, III (1915), 133.

ab. *nictitans*, Lenz. (1927), *Osth. Schm. Sudbay.*, II (2), 312.
ab. *obscura*, Lenz. (1927), *l.c.*
ab. *obsolescens*, Lenz. (1927), *l.c.*
ab. *reducta*, Lenz. (1927), *l.c.*
ab. *taeniata*, Lenz. (1927), *l.c.*
ab. *expuncta*, de la Hey. (1933?) [quoted from Seitz, *Pal. Noct. Supp.*, III, 115].
ab. *auriflua*, de la Hey. (1933?), *l.c.*

Tutt dealt with (1) *gothica*, L., dark blackish-grey, with dark *gothica* mark; (2) *nigra*, Robson; (3) ab. *gothicina*, reddish with pale or obsolete *gothica* mark; (4) ab. *pallida*, pale whitish-grey, with distinct *gothica* mark; (5) *obsoleta-pallida*, with *gothica* mark absent; (6) *variegata*, dark grey mottled; (7) *obsoleta-variegata*, with *gothica* mark obsolete; (8) *obsoleta*, dark blackish-grey, with pale or obsolete *gothica* mark; (9) *rufescens*, pale reddish-grey, mottled, dark *gothica* mark; (10) *obsoleta-rufescens*, pale reddish-grey, *gothica* mark very pale or obsolete; (11) *suffusa*, unicolorous reddish with dark *gothica* mark; (12) *rufa*, bright red, with dark *gothica* mark; (13) *obsoleta-rufa*, bright red with pale or obsolete *gothica* mark; (14) *brunnea*, deep red-brown (purplish tinge), with dark *gothica* mark.

race *askoldensis*, Stdgr., *Rom. Mem.*, VI, 496 (1892).

Orig. Descrip.—" They have the ground colour a violet-grey instead of reddish brown, such as is approached only in a few specimens of the northern var. *gothicina*. But the three black spots in the forewing of the Amur specimens are sharply defined, whereas they are not developed in *gothicina*."

ab. *hirsuta*, Warr.-Seitz, *Pal. Gr. S.*, III, 90, plt. 22b (1910).

Orig. Descrip.—" A dark powdered form of ab. *pallida*, grey with a faint rufous tinge, plainest, as usual, at base of vein 2, thickly dusted with dark grey; the lines black, the inner preceded, the outer and subterminal followed, by a thick fuscous blackish shade, the black mark on sub-median fold before outer line slight, and the black of the cell reduced to two narrow spots, one horizontal, pointed outwardly, touching inner line, the other narrow, oblong and vertical, before reniform; hindwing pale luteous grey with broad fuscous terminal border, the whole dusted with darker; the cell-spot well marked; the fringe pale rufous."

ab. *conflua*, Kief., *Ent. Rund.*, XXX, 32 (1913).

Orig. Descrip.—" The dark brown area of the forewing upper side between the two stigmata is united with the dark longitudinal streak, also dark brown. Ground colour as in the typical form." Admant, Austria.

ab. *circumsignata*, Hasebrk., *Int. ent. Zts.*, IX, 36 (1915).

Orig. Descrip.—" In which the black of the orbicular wholly surrounded it."

ab. (unnamed), Hoffm. & Klos., *Schm. Stierm.*, III (1915), 133.

Orig. Descrip.—" A beautiful, pale and dark marked form, in both

sexes, affords a striking contrast to this. Had he seen it Tutt would probably have named this striking form."

ab. *nictitans*, Lenz., *Osth. Schm. Sudbay.*, II (2), 312 (1927).
FIG.—*l.c.*, plt. 15, f. 26.
ORIG. DESCRIP.—" The stigmata stand out unusually clear on account of their distinct margin."

ab. *obscura*, Lenz., *Osth. Schm. Sudbay.*, II (2), 312 (1927).
FIG.—*l.c.*, plt. 15, 25.
ORIG. DESCRIP.—" Ground colour dark brown."

ab. *obsolescens*, Lenz., *Osth. Schm. Sudbay.*, II (2), 312 (1927).
FIG.—*l.c.*, plt. 15, 29.
ORIG. DESCRIP.—" All the markings with the exception of the black elements in the discal area more or less obsolescent."

ab. *reducta*, Lenz., *Osth. Schm. Sudbay.*, II (2), 312 (1927).
FIG.—*l.c.*, plt. 15, 28.
ORIG. DESCRIP.—" The orbicular without black at the base. Only half of the horse-shoe mark present."

ab. *taeniata*, Lenz., *Osth. Schm. Sudbay*, II (2), 312 (1927).
FIG.—*l.c.*, plt. 15, 30.
ORIG. DESCRIP.—" With a strikingly distinct band inside the waved line before the outer margin."

ab. *expuncta*, Delahaye [quoted from Seitz, *Pal. Noctuae Supp.*, III, 115] (1933)?
DESCRIP.—" Is an ashy-grey mottled form without transverse lines, only the double subterminal line is retained. The black patch is absent except for a small triangular spot, all other markings are almost obsolete; obviously this is a form that exceeds *obsolescens*, Lenz." Draudt in Seitz. Supp.

ab. *aurifera*, Delahaye [quoted from Seitz, *Pal. Noct. Supp.*, III, 115] (1933)?
DESCRIP.—" Is a nice reddish-yellow to golden-yellow form, brightly marked and dusted with violet." Draudt in Seitz Supp.
I have been unable to find a reference for the original descriptions of the above two forms.

Taeniocampa, Gn. (1839?) (1852), Barr., Stdgr., Splr., South, Culot [*Monima*, Hb. (1821), Meyr., Hamp., Warr.-Stz., Meyr.: *Orthosia*, Hb. (1821), Steph., Frr., H.-S.] *stabilis*, Schiff. (View.).

The name *stabilis* was used in the *Verz.* by Schiff. to denote a Noctuid whose larva was attached to the Linden (lime), p. 76 (1775).
Fabricius, *Sys. Ent.*, 600, No. 42 (1775), described a species under the name *cerasi*, which has been considered by many to be *stabilis*, but as he gave the reference to a good figure in Rösel, *Ins. Belust.*, I, phal. 2, plt. 53, which undoubtedly gives a form of *incerta* (*instabilis*) and of its

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.

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

Articles that require ILLUSTRATIONS are inserted on condition that the AUTHOR defrays the cost of the illustrations.

TO OUR READERS.—Short Collecting Notes and Current Notes. Please, Early.—EDS.

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.

Urgently Wanted for Experimental Purposes.—Pupae of *hirtaria* and *lapponaria*. I can offer duplicates of very many species in return.—*Harold B. Williams, Croft Point, Bramley, Surrey.*

Desiderata—British *dominula* varieties with full data other than var. *lutescens* and var. *lineata*. Other vars. acceptable. *Duplicates*—British *L. l-album, exigua, cribrum, ocellaris*, and *intermedia*, etc.—*Dr H. B. D. Kettlewell, Cranleigh, Surrey.*

Wanted—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Estación Experimental, Casilla Correo 71, Tucuman, Republica Argentina.*

Duplicates.—Several thousand British Macro-Lepidoptera in perfect condition; full data. *Desiderata.*—British Micro-Lepidoptera in similar condition.—*S. C. S. Brown, Kingsholme, 454 Christchurch Road, Boscombe, Bournemouth.*

Duplicates.—P. brassicae,* Rapae,* Sinapis (Irish), Croceus, Rhamni, Argiolus, Coridon, Bellargus, Paphia, Aglaia, Cardui, Atalanta,* Io,* Galathea, Semele, Tages, Malvae, Sylvestris, Venata, Vinula,* Bucephala,* Similis,* Perla, Muralis, Ochroleuca, Flavicincta, Bipunctaria, Ochrearia,, etc. *Desiderata.*—Numerous, black pins, data.—*L. H. Bonaparte Wyse, 53 Victoria Road, Shoreham-by-Sea.*

New Address—Kenneth J. Hayward, F.R.E.S., F.R.G.S., F.Z.S., Estación Experimental Agricola, Casilla Correo 71, Tucuman, Republica Argentina.

New Address—Bernard Embry, Esq., 23 Mill Drove, Uckfield, Sussex.

MEETINGS OF SOCIETIES.

WAR-TIME ARRANGEMENTS.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON : 41 Queen's Gate, S.W.7. —October 2nd, at 5 p.m.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. —2nd and 4th Thursdays from April onwards, 6 for 6.30 p.m., Chapter House Hall, St Thomas Street, S.E.1. *Hon. Sec., S. N. A. Jacobs*, Ditchling, Hayes Lane, Bromley, Kent.

THE LONDON NATURAL HISTORY SOCIETY.—Fixtures as printed in current syllabus cancelled. Members will be notified of further arrangements. *Hon. Sec., A. B. Hornblower*, 91 Queen's Road, Buckhurst Hill, Essex.

ENTOMOLOGICAL SECTION, BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—Evening Meetings. On the third Monday of each month, 7 p.m., at 55 Newhall Street, Birmingham. Visitors welcomed. Those who would like to attend or exhibit please apply to *G. B. Manley*, 72 Tenbury Road, King's Heath, Birmingham.

SOCIETY FOR BRITISH ENTOMOLOGY.—All meetings suspended till further notice. *Hon. Sec., E. Rivenhall Goffe*, 102 High Street, Southampton.

Communications have been received from or have been promised by T. Bainbrigge Fletcher, A. J. Wightman, W. P. Curtis, H. Willoughby-Ellis, E. Ernest Green, E. P. Wiltshire, Dr E. A. Cockayne, H. B. D. Kettlewell, H. W. Andrews, Rev. G. Wheeler, Abdul Mun'im S. Talhouk, Austen Richardson, M. Niblett, J. E. Collin.

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

Printed by T. Buncle & Co. Ltd., Arbroath.

Vol. LII.

No. 7-8

JULY-AUG. 1940.

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

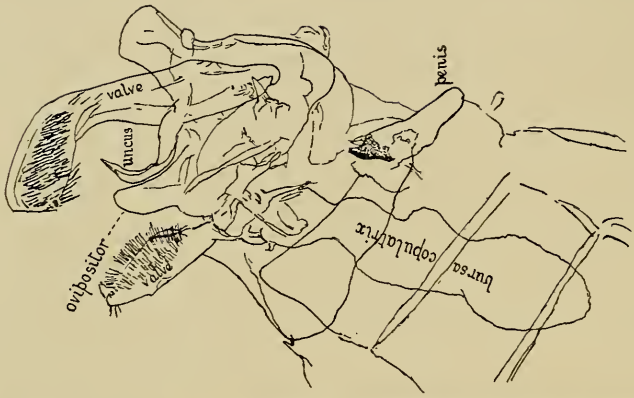
CONTENTS.

Subscription for Complete Volume, post free,
TEN SHILLINGS,
to *The Hon. Treasurer*, H. W. ANDREWS, F.R.E.S.,
6 Footscray Road, Eltham, S.E.9.

This number, Price ONE SHILLING AND SIXPENCE (net).

i.

ii.



iii.

iv.

v.

vi.

Photo. W. H. T. Tams.

ABERRATIONS OF BRITISH LEPIDOPTERA (enlarged).

NOTE ON PLATE NO. V.

By E. S. A. Baynes, F.R.E.S.

Figures (i) and (ii) on the accompanying Plate illustrate examples of moths the opposite sides of which exhibit the colouration and markings of different forms of the insects.

Figure (i) shows a specimen of *Apamea secalis* (taken at sugar at the Lizard, Cornwall, 10.viii.39) in which the moth is a gynandromorph, the left side being male and the right side female, while Figure (ii) shows a *Diarsia festiva* (taken at sugar at Aviemore, 24.vii.09) in which the moth is a somatic mosaic and the sex female throughout.

The principal markings of the two insects are as follows:—

Apamea secalis, L. ♂.—Ground colour of the left upper wing ochreous, reniform white, cross lines united by a thick blackish bar. The right upper wing is of the blackish brown almost unicolorous form with ochreous reniform.

Diarsia festiva ♀.—Ground colour of the left upper wing rather bright reddish, stigmata paler, especially the reniform, with the area between the two darker than the ground colour. Ground colour of the right upper wing smoky grey, stigmata barely distinguishable with the area between them pale reddish ochreous.

Figure (iii) shows the genitalia of the *Apamea secalis*, which have been dissected by Mr W. H. T. Tams, who was good enough also to take the photographs and prepare the diagram. The genital armature of both sexes is almost completely represented.

The two insects have been examined also by Dr E. A. Cockayne, who writes of the *Diarsia festiva* as follows:—

"There is no doubt that it is a somatic mosaic; the head, collar and thorax are beautifully divided with the two colours. Antennae, frenulum and (so far as I can see) genitalia are ♀ on both sides.

"I presume it arose from a binucleate ovum like the *secalis* gynandromorph. The colour and pattern (in both insects) of both sides is found in both sexes, and neither can be sex-linked, so that loss of an X-chromosome cannot be the cause of the gynandromorphism.

"Either the spermatozoa carried different genetic characters or the two nuclei in the ovum were genetically different. In the *secalis* one nucleus must have had an X- and the other a Y-chromosome."

Figure (iv) shows a hitherto unrecognised form of *Procus* (*Miana*) *versicolor*, kindly identified by Mr Tams, and taken with two other similar specimens in North Wales in June 1917. In this form the ground colour is pale brownish, the central band darker with a cherry reddish tinge, while the stigmata, being of the same tint as the ground colour, stand out distinctly from the central band. One of the three specimens was accepted for the British Museum collection by Mr Tams.

Fig. (v) shows a typical specimen of *Procus versicolor* for comparison.

Figure (vi) shows a specimen of *Notodonta camelina* bred from a larva taken in Anglesey in September 1907.

The general colour of the upper wing on the left side is a typical reddish brown but on the right side the colour is reduced to a pale buff with traces of reddish brown at the base. The reduction in colour on the right side extends to the hind wing and is presumably due to some fault in the pigment. The photograph is by Mr Tams.

DASYCHIRA PUDIBUNDA, L., AB. BICOLOR N.AB., AND AB. CONCOLOR, STDGR.

(Plate VI.)

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

Specimens of a very beautiful aberration of *Dasychira pudibunda*, L., were shown by the late Dr J. Hope at the Annual Exhibition of the South London Entomological and N.H. Society in October 1937. Five were bred by H. W. Head in June 1937 with a considerably larger number of normal specimens from eggs laid by a normal female taken by Mr Smith near York.

Unfortunately, the exact figures are not known, but the fact that they formed a small proportion of the brood suggests that the aberration is recessive.

Ab. **bicolor** n.ab. Male: The extreme base of the forewing proximal to the basal line is pale grey; between the basal and antemedian lines there is a broad black band 10 mm. wide at the costa, narrowing to about 5 mm. at the inner margin. The median band is pale grey with a slightly darker central shade, which becomes darker and broader so as to occupy the whole costal area, and there is a conspicuous black crescentic discoidal mark. The whole marginal area distal to the postmedian line is a deep blackish grey, nearly black. The distal half of the hindwing is dark grey. The fringes of the forewing are nearly black, those of the hindwing are dark grey and slightly chequered. The median part of the thorax is blackish grey.

Female: The markings are the same, but not so dark; the pale grey median band is much wider and the central shade is wider and paler; the discoidal mark is only faintly visible. The central part of the thorax is only a little darker than the rest.

The dark marginal band is much narrower on the underside of the forewings in both sexes.

Types: Male and female figured *Proc. South Lond. Ent. and N.H. Soc.*, 1937-38, plate vi. Paratype: Another female of the same brood. All three are now in my collection.

So far as I am aware this aberration has not been recorded before, but parallel forms in other species are well known, examples being *Ectropis consonaria*, ab. *waiensis*, Richardson, and *Entephria caesiata*, ab. *paradoxa*, Lange.

D. pudibunda, ab. *concolor*, Stdgr., which is depicted in Seitz, fig. 19e, has the forewings uniform dark grey with the transverse lines more or less distinct, but the hindwings are pale grey as in the type. I have two males with the forewings uniform brownish grey and the transverse lines indistinct. The hindwings are pale brownish grey, darker than the type. One is labelled " Sutton Coldfield, bred 1914, G. C. Alston Coll.," the other " New Forest, bred 1893, N. P. Fox Coll." I am informed that others have been taken in the latter locality.

D. pudibunda, ab. *fusca*, Lempke (*Tijdskr. v. Ent.*, 1937, lxxx, 278), with all four wings unicolorous sooty coffee colour, has not yet been recorded from Britain.

DASYCHIRA PUDIBUNDA, L., AB. BICOLOR, N. AB.
With kind permission of the S.L.E. and N.H. Society.

EARLY STAGES OF ORIENTAL PALAEARCTIC LEPIDOPTERA. IV.*

PART II.

THE OAK TREE TENT CATERPILLAR, ERIOGASTER PHILIPPSI, BARTEL.

Its Life History, Habits, and Parasites in Lebanon.

By Abdul Mun'im S. Talhouk.

It is scarcely possible to find a fair-sized Oak tree in the middle heights which contains less than three or four nests (tents) full of hundreds of gregarious larvae. The nests are situated on the outermost shoots of a branch, usually on the westward side of the tree. I shall here attempt to describe the life-history of the insect and its habits.

Distribution and Hosts. The Oak Tree Tent Caterpillar is found especially at middle heights, where it feeds on the foliage of trees of the genus *Quercus*, mostly *Q. lusitanica* and *Q. coccifera*.

Life History and Habits. This insect has one generation per year. It passes the winter in the egg stage.

THE EGG.

The egg is creamy white to pearly white, cylindrical in form, and measures 1.2 mm. in length and 0.5 mm. in diameter. The upper end has somewhat rounded edges. The head of the embryo can be seen through the shell with the help of a powerful magnifying glass.

The eggs are deposited in the form of a ring around a twig at the latter end of November and are coated with a gummy substance so as to solder them firmly to the twig and preserve them against adverse weather conditions.

The ring is composed of about 275-300 eggs, depending on the fertility of the individual female. They hatch about the middle of April, the incubation period being about five months.

THE LARVA.

The newly-born larvae are about 1.5-1.8 mm. in length. After they emerge they soon begin to construct a web (tent) in which they inclose newly-formed foliage to feed upon, since they do not leave their tents before they moult for the first time, which is usually about a week after emerging.

Then they begin to leave the tents to feed upon the tender leaves outside. This is done during the day. At night and whenever the weather is cold or rainy they do not leave the tents.

At about the 20th of May the larvae will have attained their full size and pupation follows after a period of wandering on the part of the larvae.

In captivity, the greater majority of the larvae spin their cocoons inside the " tent " and the rest under the moss in the cage. In nature,

*Previous articles in this series appeared in (1) *Ent. Rec.*, Vol. xlvii, July-August 1935 (No. 7-8); (2) *Ent. Rec.*, Vol. xlviii, October 1936 (No. 10); (3) *Mitt. Muench. Ent. Ges.*, e. V. xxix, Jahrgang 1939, Heft 1; (4) *Ent. Rec.*, Vol. lii, June 1940 (No. 6).

pupation takes place anywhere except in the " tents "! It may take place between bunches of twigs, under loose bark flakes, but the majority of the larvae spin their cocoons anywhere around the trees (between the stones of terrace walls, in the soil, under fallen leaves, etc., in houses and barns near Oak trees).

The caterpillar of this insect has the marked ability to flatten and squeeze out from between the gauze and the wood of the cage, though the space does not exceed 1 mm. in width. Also they spin threads which they use as paths to guide them home even when they are in the cage.

As to the markings, colour, and size of the larva of this moth, I refer the readers to Mr Wiltshire's description.

THE COCOON.

The male cocoon measures 13.5 mm. in length and 8.5 mm. in diameter, while that of the female measures 16 mm. in length and 9 mm. in diameter. These dimensions are for the ordinary forms. Sometimes there occur some distorted cocoons, triangular or shapeless. These never yielded any moths.

THE ADULTS.

I do not think it necessary to describe the appearance of the adults of this moth as this can be easily found somewhere else. Therefore, I shall restrict myself to the description of their habits only.

Male and female moths of *E. philippsi*, Bart., emerge on the same date, the earliest being on the 2nd of November and the latest on the 28th of the same month, but the majority in the last third of the month. Their time of emerging is between 12.30 p.m. and 1.30 p.m. It takes them about four hours before their wings dry and they begin to hover in the cage, when they readily copulate. The copulation period extends about 30 minutes, after which the male does not fly at all, but remains about 24-36 hours almost motionless, then dies from hunger. The female, after the end of the act, remains still for about two hours, then flies to a forked twig situated on the outside of an Oak tree and deposits its eggs in a ring, after which she too dies from starvation.

The female is much less active than the male, for it is about three times heavier, the individual female (turgid) weighing 0.233 gm. and the individual male weighing 0.083 gm.

After cutting open the abdomens of several turgid females I found out that the average number of ova in a female is 278.33, the maximum being 305 ova, the minimum 242.

As in other Lasiocampids, the males are attracted by the virgin females from fairly long distances (the nearest Oak trees being 600 feet distant), and on several occasions males were found flying around the cage trying to copulate with the imprisoned females though they were separated by a wire gauze. Only once was I able to find a female attracted to the cage, though there was only one male in copula inside.

The males are much more abundant than the females. Out of 144 larvae that pupated 106 were males and 38 females, the ratio being 2.79 : 1 in favour of males.

PARASITISM. The natural enemies of the Oak Tree Tent Caterpillar are very important in keeping this pest from being far more serious than it now is.

In the course of my breeding studies I obtained three different insect parasites and was also able to see a few larvae, in fact, only three, that were attacked by a fungous disease, which I was not successful in my attempts to have identified for me. I shall later describe the typical appearance of the diseased larvae.

That there may be more than three parasitic insects preying on the larvae of this moth is very likely to be the case, since the larvae that I have collected were in their second instar; that is, they were not subjected to the attacks of parasitic insects that may attack them in the later part of their larval stage.

The parasites are:—

Sturmia inconspicua.—A Dipteron which attacks the larvae of this moth only very rarely.

Ophion luteus, Linn.—A Hymenopteron which, with the following species, attack the larvae of this moth in considerable numbers; the wasps emerged in autumn, that is when the adults of *E. philippsi*, Bart., themselves emerge. This suggests to me that *Ophion luteus* has other host species than *E. philippsi.*

Metopius fulvicornis, Hoes.—Another Hymenopteron, which emerged in spring, that is when the larvae of the Oak Tree Tent Caterpillar show up.

All these parasites attack this insect in its larval stage.

I am indebted for the determination of the parasites to Dr Enderlein, of Berlin, for the Dipteron, and to Herr J. D. Alfken, of Bremen, for the two species of Hymenoptera. To these two gentlemen I wish here to express my thanks.

The diseased larvae had a peculiar appearance; their fourth, fifth, sixth, and seventh segments became swollen and black. Then they became motionless, fixed themselves to the wall of the breeding cage, and turned their heads and the two segments following it to one side, a position which they kept until they died. I have also noticed some larvae of *Papilio machaon*, L., and *P. podalirius*, L., attacked by the same disease.

A COLLECTING NOTE ON DIPTERA.

By H. W. Andrews, F.R.E.S.

Notes on Diptera are not too frequent in our magazines and usually consist either of lists of species taken in special localities or descriptions of new species. This present note, however, does not deal with either of these subjects, but is to comment on the spasmodic appearance of certain species, in comparatively large numbers, in places where they generally occur in small numbers only or not at all. To make quite sure of this would necessitate continuous observation, which I have not been in a position to carry out, but I have taken examples from my local North Kent district, in which I have collected since 1899; and as three of the species concerned are both large and conspicuous, I think I am safe in assuming that they do not occur normally in this district in sufficient numbers to attract a collector's notice.

Taking them in chronological order, the first species is *Tabanus autumnalis*, L. On the 12th July 1902 males of this species—which are

usually uncommon compared with females in all *Tabanidae*—occurred in large numbers on tree-trunks and a paling at Chattenden. I see from my diaries that I took 18 males and six females between 4 and 5 p.m. on that date. I did not come across this species on my subsequent visits to Chattenden up to 1914, since when I have not revisited that spot, and I have only one other record—of a single female—taken in N. Kent, in which district the larger Tabanids are distinctly scarce.

The next species is by contrast quite a small one, *Platypeza rufa*, Mg. For 6th October 1906 I have a note in my diary:—" At Darenth Woods I took some 28 *Platypeza rufa*." I can clearly recollect that it was swarming on leaves of the wild clematis growing over bushes at the side of the road. 1906 was a good year for *Platypezidae* generally, but neither before nor since have I seen any one species of that family in such numbers.

In June 1908 *Leptis lineola*, F., a species not usually common in the district, was very abundant on tree-trunks in the Bexley Woods, where I counted between 40-50 on a dozen consecutive trees.

On 21st May 1921 *Dioctria oelandica*, L., occurred commonly in a limited area in Farningham Woods. I took 20 specimens and could have taken more. This is a species which, both from its size and its wholly darkened wings, is not easily overlooked, but this was the first time I had taken it in N. Kent, and I have not seen it again in that district.

On the 16th August 1924 I took, also in Farningham Woods, 22 specimens of the rare Asilid *Eutolmus rufibarbis*, Mg. This species has occurred since in the same locality from time to time, but only in very small numbers.

Another Asilid, *A. crabroniformis*, L., one of the largest of our British Diptera, was very common in August 1926 on paths in some fields near Swanley; on the 22nd and 28th of that month I took 18 and could have taken more. Up to that time I had only seen one specimen (in the Farningham Woods nearby) and although I have in the last four or five years found odd specimens on the chalk downs at Eynesford and Shoreham (Kent), some half dozen miles away, I have not again met with it in any considerable numbers. [Common every year at Rodborough.—T.B.F.]

Two other records, although they do not come under the same category as those given above, are of a somewhat similar nature. On 30th July 1910 I took at Shoreham, on the southern side of the chalk downs, 10 specimens of the Asilid *Isopogon brevirostris*, Mg., the first time I had met with it in the district. I did not see a single specimen again until 1934, when on the 3rd June it was extremely abundant in a small area on the northern side of the same downs about three miles away from the Shoreham locality.

Again on 21st July 1934 I took in a lane near Farningham 8 specimens of that large and handsome Tachinid, *Echinomyia ferox*, L., of which I had only taken a single specimen (at Bexley, 20th September 1931), and in August of the same year it was quite common at Bembridge, Isle of Wight. I have not seen the species since in N. Kent, nor did I see any specimens when I revisited Bembridge in August 1935.

In a paper by Mr Collin in this magazine in 1915 on the Trypetid *Tephritis* (*Oxyna*) *flavipennis*, Lw., he says, of *Trypetidae* in general,

" the imagines in many cases are often sporadic in their appearance, so that a species which for many years may have been considered a great rarity suddenly turns up in considerable numbers . . . over forty years' collecting by the late Mr Verrall produced only two specimens (of *T. flavipennis*), but in June and July 1904 and 1911 Mr C. G. Lamb, of Cambridge, found the species in a very limited area in the parish of St Merryn (Cornwall) and could have taken any number of specimens." This seems to me a parallel case to those I have quoted, but apart from this instance I cannot recall comments in text books or monographs on such spasmodic appearances as I have given in this paper.

I have no explanation to offer as to the cause of this phenomenon unless it be that it is the result of the recent emergence of a brood which has not yet had time to disperse. This explanation might meet the cases of *Leptis lineola* and *Eutolmus rufibarbis*, as both these species may be met with any year in my district, though in small numbers; but it does not seem to meet the other examples.

Lastly, the moral to be drawn by the collector: Never, when coming across any species in large numbers, neglect to take it on the ground that being common it will recur another season. It probably won't.

ZYGAENA FILIPENDULAE, L., AB. BRUNNESCENS N.AB.

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

Ab. **brunnescens** n.ab. The red spots on the forewings and the red part of the hindwings replaced by pale brown. Types male and female, Orpington, Kent, July 17, 1937, R. Garner. Paratypes, two males and one female with the same data.

Oberthür (*Etudes d'Entomologie*, 1896, 20, Pl. 8, fig. 134) gives a figure of a specimen of *Z. filipendulae* from Paris and says that it is transitional to ab. *chrysanthemi*, Borkh., adding that he has two others from the same locality. The one figured is rather darker than the darkest from Orpington, which is a male, and much darker than the others. The specimen recorded by R. B. Robertson (*Entomol.*, 1893, xxvi, 131) as approaching ab. *chrysanthemi*, and taken by Holland near Swansea, may be an example of the same form. There is no evidence that ab. *brunnescens* has any genetic relationship to ab. *chrysanthemi*, unless it be an allelomorph, for I know of no record of such a specimen having been taken in any colony in which ab. *chrysanthemi* occurs, such as that at Birmingham or at Fleetwood. It is true that a " modified example " with spots and hindwings suffused with dark brown was bred from a Lancashire pupa by Baxter of St Anne's (*Entomol.*, 1882, xv, 39), but this probably falls within the limits of variation of ab. *chrysanthemi*. In the majority of ab. *chrysanthemi* from these localities and in the others recorded from this country the spots on the forewings are nearly black and the hindwings are a deep blackish brown, whereas in the new aberration the colour varies from light brown or smoky yellow, no darker than ab. *flava*, Robson, to medium brown. A similar form occurs in *Zygaena hippocrepidis*, Hbn., which is a subspecies of *Z. transalpina*. This has been named ab. *nigricans* by Ober-

thür and is depicted on the same plate as the transitional form of *Z. filipendulae*. It must not be confused with *Z. hippocrepidis*, Stephens, which is a form of *filipendulae*.

CURRENT NOTES.

The reviewer of Dr Malcolm Burr's book, "The Insect Legion," in a recent number of the "Daily Telegraph and Morning Post," speaks of the author as being far more accurate than Fabre. A subsequent writer in the same paper says, "I have always understood that Fabre was noted for his meticulous accuracy. How far, one wonders, are Fabre's observations regarded as reliable to-day?" Fabre undoubtedly made mistakes in recording some of his observations. It would be remarkable if in his multitudinous writings errors did not occur. When one finds that any of his observations do not agree with those appearing in English translations of Fabre, it is always advisable that reference should be made to the original "Souvenirs Entomologiques." Unfortunately, our translators were more literary than scientific or they would not have made the howlers that one comes across. In "Social Life in the Insect World," Fisher Unwin, p. 124, it is surprising to see a reference to "the Bousier (dung beetle) and the Necrophorus, those lively murderers." A naturalist would recognise at once the libel on these useful insects. Fabre referred to them as "precieux assainisseurs," translated by another author correctly as "invaluable scavengers."—Hugh Main.

In the *Proc. U.S. National Mus.* Nathan Banks has published a "Report on Certain Groups of Neuropteroid Insects from Szechwan, China," in which he summarises the results and indications of the numerous collections sent from the area during the past 15 years. He says:—"It has been extremely interesting to me to discover that there is a true Himalayan fauna, utterly different from the European, from the Mediterranean, and from the American, either North or South, a fauna that spreads south into at least Upper India (not Ceylon), down the Malay Peninsula, and often to some of the Sunda Islands, eastward over China, Burma, Siam, Indo China and even to Japan and Formosa." It would be most interesting to know if the extensive collections which have been made of Lepidoptera in this area for a much longer period afford any similar indication. The area to which the writer refers is, in the main, the northern portion of the Oriental Region as defined by Wallace, that portion dominated by more or less high mountainous areas of the eastern Himalaya Mountains and of Southern China, omitting the low tropical portions. In fact, an intermediate area between the true Palaearctic faunal districts and the actual tropical faunal districts.

We may now and again drop four pages owing to shortage of paper. Long articles must be divided in publishing.

Short notes (postage 1d unsealed) please; early to get in the next number.

larva, and he gave the same reference in all his subsequent writings.

When Fab. inspected the Schiff. collection, before the *Mantissa* was published in 1787, he must either have compared Rösel's figure with the specimens in the collection, or he did not do so. If he did he found the figure and insect identical, if he did not compare them he relied on his previously published statement in 1775. In this dilemma we must not accept *cerasi* as a name for *stabilis*. And the name should be *stabilis*, View. (Schiff.) and not as put above.

Illiger, *N. Ausg. Verz.*, I, 230 (1801), gave references to Brahm (1791), Borkh. (1792), Fab. (1794), the two former *stabilis* and the last *cerasi*. Brahm, *Ins. Kal.*, II, 12, said that he has no doubt of the identity of the two, but that Fab. had erred in his reference to Rösel's figure. Subsequently, *l.c.*, p. 347, he gave the result of the rearing of larvae like those figured by Rösel, which was a brood of *instabilis*! Bork., *Naturg.*, IV, 590 (1792), stated the same fact of discrepancy.

Tutt, *Brit. Noct.*, II, 151 (1892): Meyr., *Hand.*, 73 (1895): Barr., *Lep. Br. Is.*, V, 202, plt. 209, 2 (1899): Stdgr., *Cat.*, IIIed., 201 (1901): Hamp., *Lep. Phal.*, V, 419 (1905): Splr., *Schm. Eur.*, I, 240, plt. 45, 6 (1906): South, *Moth. B. I.*, I, 328, plt. 158, 1-2 (1907): Warr.-Stz., *Pal. Noct.*, III, 91, plt. 22e, f (1910): Culot, *N. et G.*, I (2), 64, plt. 50, 3-5 (1913): Meyr., *Rev. Hand.*, 143 (1928).

Villers, *Linn. Sys. Nat.*, II, 257 (1789), to his description of *obliqua* gave a figure in *l.c.*, IV, plt. 5, f. 7, which is quite unrecognizable.

Tutt gave Vieweg, *Tabell. Verz.*, II, 12 (1789), as the author for *stabilis* no doubt because the description in the *Verz.* was inadequate being practically non-existent, and because the description of View. was the first.

Ernst & Engram., *Pap. d'Europe*, VII, 13, figs. 412 (1790), 412b. Treit. call it *populeti*, but Wernb. remarked " although it has red-brown wings and distinctly depicts a *stabilis*;" and 415 a-b is *stabilis*. The figures are too vivid in the red coloration.

Hüb., *Samml.*, f. 171 (1802), gave a red-brown form of *stabilis* to which Tutt gave the varietal name of *suffusa*. Fig. 171 in my copy of Hb. does not agree with Tutt's description of the same fig. in the copy he used. Nor does Tutt's description of his *suffusa* agree with either the fig. 171 or his own description of it. Thus we have a figure, and two descriptions of the one insect all different. (1) *Suffusa* has " the whole area of the wing becomes suffused with black scales. The general colour is usually blackish-grey, but is sometimes brownish." (2) Tutt's description of the figure of Hb. 171 " dull dark greyish-brown." (3) The figure itself in my copy is of a red-brown (not grey) and not suffused the slightest with black scaling. There is little in common in the three.

Haw., *Lep. Brit.*, 123 (1803), described this species under the name *cerasi*, Fab., among the Bombyces, and *l.c.*, 243 (1809), removed it under the name *cerasus*, to the Noctuae. His description agrees with that of View. and the name *cerasi(us)* falls to a synonym of *stabilis*.

flavilinea, Haw., *Lep. Brit.*, 243 (1809) [Heinr., *Deut. ent. Zeit.* (1916), p. 518].

Orig. Descrip.—" Alis rufescentibus, striga postica obliqua rectissima flavicante intus rufa, punctoque basi fusco." This is now considered to be a *macilenta* form.

Dup., *Hist. Nat.*, VI, 127, plt. 81, 2 (1826). The figure is not good.

Frr., *Neu. Beitr.*, IV, 44, plt. 316 (1842), gave an excellent figure of a very slightly red tinted grey form in which the stigmata were very plainly white circled and with the white curve below the orbicular well marked, the white waved line, the marginal black dots, the slight central shade were all present but not too emphasized.

Gn., *Hist. Nat. Noct.*, V, 354 (1852), said that *rufangulata*, Haw., was not a variety but a *stabilis* which was described in comparing the species to his *flavilinea* (i.e., to *macilenta*, Hb.).

Splr., *Schm. Eur.*, I, 240, plt. 45, 6 (1906), gave an unusually dark figure, not recognizable as *stabilis* of any form usually met with.

South, *M.B.I.*, I. 328, plt. 158, 1-2 (1907), gave 2 figures, a very dark brown one and one of a pale dull sandy grey.

Warr.-Stz., *Pal. Noct.*, III, 91, plt. 22e, f (1910), treated *cerasi*, F., *cerasus*, Haw., as synonyms. He dealt with *pallida*, Tutt, as =*grisea*, Splr.; *obliqua*, Vill.; *suffusa*, Tutt, as the *stabilis*, Hb.; *rufa*, Tutt; *junctus*, Haw.; *rufannulatus*, Haw., and named the Japanese form ssp. *japonica*. The nine figures represent *stabilis* ♂ and ♀, *pallida* ♂ and ♀, *rufa*, *junctus*, *rufannulatus*, and *japonica* ♂ and ♀, all very poorly differentiated, the general brown tone of the whole plate being much too overwhelming.

Culot, *N. et G.*, I (2), 64, plt. 50, 3-5 (1913), as usual gave three very good figures. He repeats the observation that the species is very variable but without any strikingly characterized form.

Steph., *Ill.*, II, 143 (1829), said of the Variation:—" The varieties of this inconstant species are endless; in some examples the strigae are very distinct, in others completely obliterated; some have a broad, angulated dusky fascia between the stigmata, others want it; the stigmata are frequently remote, occasionally united, and a third situated in place of the teliform one of the Agrotes, is frequently indicated by a yellowish hook; the anterior wings are found of a dusky-ash, irrorated with pale and darker atoms, or of a plain hoary-ash; and the posterior margin is sometimes destitute of the row of black spots."

" Var. β. Anterior wings with the stigmata united, the pale margins forming a figure of 8."

" Var. γ. Anterior wings with the margins of the stigmata, and the posterior striga, more or less rufescent."

Barrett says of the Variation:—

" Variable in colour from the palest drab to red-brown, or to greyish-drab from a dusting of black scales."

He reports a specimen " Of a dark grey."

Others " Of a pale drab with no indication of stigmata, of which one has the transverse lines slenderly black."

A northern variation consists " In that the margins of the two large stigmata approach closely to each other, or in many cases actually coalesce, while in a very few the junction is so complete that the margins at that point have broken, and the two stigmata become a constricted loop having the figure of a prostrate cottage loaf of which the reniform is, of course, the base."

The Names and Forms to be considered are:—

[*cerasi*, Fab., *Syst. Ent.*, 600 (1775).]
[*stabilis*, Schiff. (1775), *Verz.*, 76.]
[*cerasi*, Fab. (1781), *Species Insect.*, II, 219.]
stabilis, View. (1789), *Tab. Verz.*, II, 12.
obliqua, Vill. (1789), *Linn. Sys. N.*, II, 257, IV, plt. 5, 7.
stabilis, Hb. (1800-3), *Samml. Noct.*, 171 fig.
cerasus, Haw. (1803), *Lep. Brit.*, 123.
junctus, Haw. (1803), *l.c.*, 123.
cerasi, Haw. (1809), *l.c.*, 243.
[*flavilinea*, Haw. (1809), *l.c.*, 243.]
rufannulata, Haw. (1809), *l.c.*, 243.
suffusa, Tutt (1892), *Brit. Noct.*, 151.
rufa, Tutt (1892), *l.c.*, 151.
pallida, Tutt (1892), *l.c.*, 151.
grisea, Splr. (1906), *Schm. Eur.*, I, 240.
dalmatica, Wagn. (1909), *Ent. Zeits.*, XXIII, 18.
japonica, Warr. (1910), *Pal. Noct.*, III, 91, plt. 22, e f.
tangens, Heinr. (1916), *Deut. ent. Zts.*, 518.
extincta, Heinr. (1916), *l.c.*
flavilinea, Heinr. (1916), *l.c.* (non Haw.).
cruda, Lenz (1927), *Ost. Schm. Sudbay.*, II (2), 314, plt. 15, 23.
fasciata, Lenz (1927), *l.c.*, p. 315, f. 22.
nictitans, Lenz (1927), *l.c.*, plt. 16, 6.
obsolescens, Lenz (1927), *l.c.*, plt. 16, 7.
variegata, Dnhl. (1929), *Mitt. Münch.*, XIX, 114.
violacea, Caradj. (1931), *Acad. Romana Mem. Soc., Stiint.*, 5, III, Tom. VII, Mon. 8.

Tutt dealt with: (1) *stabilis*, View., the type, "pale reddish-grey." (2) f. *obliqua*, Vill., "dark grey." (3) *stabilis*, Hb., "brownish or blackish-grey" (??). (4) ab. *junctus*, Haw., with united stigmata. (5) ab. *rufannulata*, Haw., "dark reddish." (6) ab. *suffusa*, Tutt, "whole wings suffused with black scales." (7) ab. *rufa*, Tutt, "bright red." (8) ab. *pallida*, Tutt, "pale stone-grey, sometimes slightly ochreous."

ab. *grisea*, Splr., *Schm. Eur.*, I, 240 (1906).
Orig. Descrip.—"Pure grey; rare."

ssp. *dalmatica*, Wagnr., *Ent. Zeits.*, XXIII, 18 (1909).
Orig. Descrip.—"The specimens lying before me have a warm reddish tone (somewhat as *Agrotis castanea*), while the colour of the typical form is a more or less pale grey-brown or brownish-grey, the hindwings are much darker, blackish, against which the reddish fringes stand out in contrast. This contrast in the typical form is not so evident. The wing markings are about the same as in typical *stabilis*." Dalmatia, Zaras.

ssp. *japonica*, Warr.-Stz., *Pal. Noct.*, III, 91 (1910).
Fig.—*l.c.* Plt. 22 f.
Orig. Descrip.—"The veins of forewing are not pale, and the hindwing shows more clearly a dark dotted median line; the apex of forewings is more acute."

ab. *tangens*, Heinr., *Deut. ent. Zt.* (1916), 518.

ORIG. DESCRIP.—" The two stigmata of the forewing, upperside, touch each other, without combining under a common marginal ring."

This is not the same as ab. *junctus*, Haw., in which the two stigmata are actually combined.

ab. *extincta*, Heinr., *l.c.*

ORIG. DESCRIP.—" The margining of stigmata not pale but of the ground colour so that it is only to be seen by examination with a lens. This particular appearance I have noted only on specimens with red ground colour."

ab. *flavilinea*, Heinr., *l.c.*, =Haw. (?).

ORIG. DESCRIP.—" The waved line of the forewing upperside, fairly wide, yellow and without the innerside shading." The author suggests that it may be the *flavilinea*, Haw., *Lep. Brit.*, 243 (1809). " The yellow line Quaker " = " striga postica flavicante," " alis rufescentibus." There seems no doubt that this is a name of Haworth for *macilenta*, Hb. (1808), as generally accepted (Gn., Warr.-Stz., etc.), and the reference to Haw. wrong.

ab. *cruda*, Lenz, *Osth. Schm. Sudbay.*, II (2), 314 (1927).

FIG.—*l.c.*, plt. 15, 23.

ORIG. DESCRIP.—" With sharply defined lines on the edges of the discal area."

ab. *fasciata*, Lenz, *Osth. Schm. Sudbay.*, II (2), 315 (1927).

FIG.—*l.c.*, plt. 15, 22.

ORIG. DESCRIP.—" With dark central band and the reniform similarly filled in."

ab. *nictitans*, Lenz, *Osth. Schm. Sudbay.*, II (2), 315 (1927).

FIG.—*l.c.*, plt. 16, 6.

ORIG. DESCRIP.—" With strikingly clear margining of the stigmata and similar lines before the outer margin."

ab. *obsolescens*, Lenz, *Osth. Schm. Sudbay.*, II (2), 315 (1927).

FIG.—*l.c.*, plt. 16, 7.

ORIG. DESCRIP.—" All the markings more or less lost in the ground colour."

ab. *violacea*, Caradja, *Acad. Romana Mem. Soc. Stünt.*, 5, III, Tom. VII, Mon. 8, 1931.

ORIG. DESCRIP.—" Among many examples of the typical form, a ♀ with the marginal area suffused with purple-violet, probably similar to var. *dalmatina*, Wgnr., which is unknown to me." The type in H. Alexinschi coll.

ab. *variegata*, Dnhl., *Mitt. Münch.*, XIX, 114 (1929).

ORIG. DESCRIP.—" Examples with strongly emphasised central shade, also the narrow band along the inner border of the reniform extends out to the inner margin."

Taeniocampa, Gn. (1839?) (1852), Barr., Stdgr., Splr., South, Culot, etc. [*Orthosia*, Ochs. & Tr. (1816-25), Dup., Steph., H.-S.: *Monima*, Hb. (1821), Meyr., Hamp., Warr.-Stz., Meyr.] (*cruda*, Schiff.) = *pulverulenta*, Esp.

This species and *miniosa* were originally placed in a genus by themselves by Hb. under the genus name *Monima*, and not associated with the other species which Gn. subsequently collected under the genus name *Taeniocampa*. From the species in this latter genus they are conspicuous by the absence of the extreme variation in ground colour and in markings found in them. In these circumstances it might be politic to retain the genus *Monima*, Hb., for these two species *pulverulenta* and *miniosa*, and other species of this little group to be retained in the genus *Taeniocampa*, Gn. The other species now included in our genus *Taeniocampa* were scattered in other genera by Hb. In *Orthosia*, 4, *munda*, *instabilis*, *opima* (*firma*) and *gracilis*; in *Episemia*, 1, *gothica*, and in *Cuphanos*, 1, *stabilis*.

I have gone into the question of *cruda* versus *pulverulenta* and although the name *cruda* was first used by Schiff. in the *Verz.* (1775) there was no description until that of Esper in *Abbild. Bomb.*, III, 356, plt. 77, 5-6, *pulverulenta* (1782-6?).

Esper gave two recognizable figures, with which his description was in accord. He named these figures *pulverulenta*, as a *Bombyx*. Werneburg, *Beitr.*, II, 33, said that this was the *cruda*, Schiff. Esper, *l.c.*, *Noct.*, IV, 73, plt. 152, 4, described and figured an insect he called *cruda*, but this was undoubtedly a form of *instabilis*.

Borkhausen (1792) and Illiger (1801) are both very confused and indeterminate in their contributions.

Treit., *Schmett.*, V (2), 230 (1825), referred the name *cruda* to Schiff., *Verz.*, 77, the "Oak-bush Noctua," and also to the confusion among collectors and in collections as to this species. Treit. cited the *ambigua*, Hb., *Samml.*, 173, the *pulverulenta*, Esp., *Abbild.*, III, 386, plt. 77, 5-6, and Bork., *Naturg.*, IV, 611, and considered the references of Illiger, *Neu. ausg. Verz.*, as in error. He treated *pulverulenta*, Esp., as being the same as *cruda*, Schiff., "as then generally recognized."

Werneburg, *Beitr.*, I and II (1864), went thoroughly into this identification in his study of the old authors before 1800 and endeavoured throughout to establish the name *cruda*, Schiff., as the prior reference in spite of the complete absence of a description.

Tutt, *Brit. Noct.*, II, 153 (1892): Meyr., *Hand.*, 74 (1895): Barr., *Lep. Br. Is.*, V, 197, plt. 209, 1 (1899): Stdgr., *Cat.*, IIIed., 201 (1901): Hamp., *Lep. Phal.*, V, 420 (1905): Splr., *Schm. Eur.*, I, 240, plt. 45, 4 (1906); South, *M.B.I.*, I, 328, plt. 158, 9-10 (1907): Warr.-Seitz, *Pal. Noct.*, III, 91, plt. 229 (1910): Culot, *N. et G.*, I (2), 63, plt. 49, f. 18 (1913): Meyr., *Rev. Hand.*, 144 (1928): Drdt.-Seitz, *Pal. Noct. Supp.*, III, 116 (1931).

Ernst & Engram., *Pap. d'Eur.*, VII, 15, fig. 413 (1790), gave two figures of this species both with too much emphasis of the red colour and all the markings far too heavy, and on page 14 they stated that Schiff., *Verz.*, p. 77, had given it No. 10, fam. L., that is the *ambigua*, whose larvae feed on low-growing plants and not on oak like *cruda*, Schiff.

Hb., *Samml. Noct.*, 173 (1800-3), gave a very good figure under the name *ambigua*. Hb. named his figure 172 *cruda*, but this figure in no way resembled fig. 173, and was, according to H.-S., *dolosa* (1849).

Haw., *Lep. Brit.*, 124 (1803) and 244 (1809), treated it as a Bombyx as others of that period did but later when dealing with the Noctuae again referred to it. His *pusillus*, p. 124, as a dull grey form. His *nanus*, p. 123, is a pale reddish-grey form. He calls them the " Dwarf " quaker and the " Small " quaker. He refers to them again, p. 244, and says that *nana(us)* is the *ambigua*, Hb., and of Fab. This latter reference to Fab. is doubtless an error, as *ambigua*, Fb., is related to *blanda* and *cubicularis*, and the larva feeds on low plants, e.g. dandelion, not on oak, etc.

Dup., *Hist. Nat.*, VI, 61, plt. 76, 3 (1826), gave a good figure, but the black " atoms " were too much dot-like. He used the name *ambigua*, Hb. In his *Cat.*, 106 (1844), he placed it in the genus *Orthosia*.

Stephens, *Ill.*, II. 144, called it *cruda*, Schiff., in the genus *Orthosia*.

Freyer, *Neu. Beitr.*, IV, 86, plt. 341 (1842), gave two good figures under the name *cruda*, in the genus *Orthosia*.

Gn., *Hist. Nat. Noct.*, V (1), 357 (1852), accepted the *cruda*, Schiff., and treated *pulverulenta*, Esp., *ambigua*, Hb., *nanus*, Haw., and *pusilla*, Haw., as synonyms.

Gregson, *Young Nat.*, p. 121-2 (1888), named a form *irroratae*, which Haw. had long before called *pusilla* (see Tutt, *B. Noct.*, IV, 120).

Meyr., *l.c.*, in both editions used *Monima pulverulenta* as the name.

Hamp., *Lep. Phal.*, V, 42, called the species *Monima cruda*, Schiff.; thus he fully recognized the decision of Werneburg.

Splr., *Schm. Eur.*, I, 240, plt. 45, 4 (1906), gave a very fair figure under the name *pulverulenta*. He wrongly ascribed the figure 172 of Hb. as ab. *cruda* of this species, an undoubted error as that is *dolosa*.

South, *Moths B. I.*, I, 328, plt. 158, 9-10, ♂ and ♀ (1907), gave two very fair figures but somewhat too ochreous of the general colour of the plate.

Culot, *N. et G.*, I (2), 63, plt. 49, 18 (1913), gave a very good figure.

Warr.-Stz., *Pal. Noct.*, III, 91, plt. 22g (1910), gave six figures, typical ♂ and ♀, *pusillus* ♂ and ♀, *rufa* ♂ and ♀, treated *cruda*, Tr., as a synonym. and recognized *pallida*, Tutt, *nanus*, Haw., and *ambigua*, Hb. The figures are too much of the general colour of the plate and certainly quite large enough, and very little help for identification.

Barrett says of the Variation:—

" Not very variable, but rather so in the presence or absence of the reddish-brown dusting of the forewings, which sometimes is so dense as to obscure the drab colouring; in some specimens the subterminal line shows itself as a faint series of minute yellowish cloudy spots; in others the other lines, which are always obscure, disappear, and in those of darker dusting the reniform stigma becomes very indistinct."

He records a specimen " of which the thorax and forewings are dark greyish-brown."

Another " Nearly black."

Another having " The first and second lines strongly marked, composed of rows of black dashes on the nervures."

One from Neath, S. Wales, " When fresh flushed with a beautiful lilac tint."

The Names and Forms to be considered are:—

cruda, Schiff. (1775), *Verz.*, 77.
pulverulenta, Esp. (1782-6?), *Schm. Abbild.*, III, 356, plt. 77, 5-6.
[*cruda*, Hb., *l.c.*, 172] not this species.
ab. *ambigua*, Hb. (1800-3), *Samml. Noct.*, 173.
ab. *pusillus(a)*, Haw. (1903) (1909), *Lep. Brit.*, 124 and 244.
ab. *nanus(a)*, *Haw.* (1903) (1909), *l.c.*, 123 and 244.
[ab. *irroratae*, Greg. (1888), *Young Nat.*, 121-2.]
ab. *pallida*, Tutt (1892), *Brit. Noct.*, II, 154.
ab. *rufa*, Tutt (1892), *l.c.*, 153.
ab. *haggarti*, Tutt, *Ent. Rec.*, XIV (130), 183 (1902).
ab. *nigropunctata*, Whrli. (1917) [Drdt.-Stz., *Pal. Noct. Supp.*, III, 116 (1931)].

Note.—It may have been as Tutt suggested that the names were inverted and that 173 was *cruda* and 172 *ambigua* was Hb.'s intention. There is no doubt that fig. 173 is *cruda* = *pulverulenta*.

Note.—I presume in this case the brownish-grey form figured by Hb. 173 should be called ab. *ambigua* and not ab. *cruda* (a prior invalid specific name of the species).

Tutt dealt with (1) the dark reddish-grey *pulverulenta*, Esp. (type); (2) the dull grey *pusillus*, Haw.; (3) the pale reddish-grey *nanus*, Haw.; (4) the brownish-grey (*cruda*) = *ambigua*, Hb.; (5) the pale greyish or ochreous-white *pallida*; (6) the bright red *rufa*; (7) the *irroratae*, Greg., = *pusillus*, Haw.

ab. *haggarti*, Tutt, *Ent. Rec.*, XIV (130), 183 (1902).

Orig. Descrip.—" ♂ anterior wings uniform dark brown; the costal edge narrowly yellowish, the outline of the reniform and orbicular, and the hind marginal line yellowish, inclining to orange; the cilia distinctly divided into a dark basal area and a rather paler outer area by a longitudinal line. Posterior wings very dark grey, the basal area perhaps a little paler than the outer area; the cilia grey, intersected by a longitudinal line separating the inner and darker from the outer and paler part. Thorax almost of the tint of the forewings but with a number of grey scales intermixed; the abdomen of the same dark grey colour as the hindwings." Galashiels; four examples in all.

ab. *nigropunctata*, Whrli. [Seitz-Drdt., *Pal. Noct. Supp.*, III, 116 (1931)].

Orig. Descrip.—Reference in Seitz incorrect [" is a form with distinct transverse lines and dots." Switzerland.].

Taeniocampa, Gn. (1839?) (1852), Barr., Stdgr., Splr., South, Culot. [*Orthosia*, Ochs. & Tr. (1816-25), Steph., Dup., Frr., H.-S.: *Monima*, Hb. (1821), Meyr., Hamp., Warr., Meyr.] *miniosa* (Schiff.), Fb. (1787).

Schiff., *Verz.*, 88 (1775), was the first author to use the name *miniosa* for a *Noctua* with a larva feeding on oak: the "Galleichen-Eule." But in this there was no description nor even an "indication."

Fab., *Mant.*, II, 145 (1787), described this species from specimens in the Schiff. coll. under the same name, hence, this being the first description, has priority standing, the typical form being "pale reddish; unicolorous."

Illiger, *Neu. ausg. Verz.* (1801), said that the Noctuid described under the same name by Fab., *Ent. Sys. emend.*, III (2), 43, was the Noctuid referred to by Schiff.

Tutt, *Brit. Noct.*, II, 155 (1892): Meyr., *Handb.*, 74 (1896): Barr., *Lep. Br. I.*, V, 194, plt. 208, 2 (1899): Stdgr., *Cat.*, IIIed., 201 (1901): Hamp., *Lep. Phal.*, V, 418 (1905): Splr., *Schm. Eur.*, I, 239, plt. 45, 3 (1906): South, *M. Br. I.*, I, 328, plt. 158, 8 (1907): Warr.-Stz., *Pal. Noct.*, III, 91, plt. 22d, e (1910): Culot, *N. et G.*, I (2), 63, plt. 49, f. 17 (1914): Meyr., *Rev. Handb.*, 144 (1928).

Esper, *Abbild.*, III, 381, plt. 75, 3-4 (1781-?), described and figured as a *Bombyx* a species he called *rubricosa*. The figures are quite recognizable as a banded form of *miniosa*, pale reddish with darker reddish central band.

Ernst & Engr., *Pap. d'Eur.*, VII, 13, fig. 411 (1790), gave four figures much too ornate in marking and colour.

Hb., *Samml. Noct.*, 174 (1800-3), gave a good figure of a reddish-grey specimen with a red band, marking distinct, and a complete post-discal row of dots on the hindwings.

Dup., *Hist. Nat.*, VI, 138, plt. 81, 6 (1826), gave a good figure of a somewhat dark typical form. In his *Cat.* (1844) he gave the genus *Orthosia*.

Frr., *Neu. Beitr.*, IV, 85, plt. 340 (1842), gave a good figure, grey ground slightly reddish with a clearly marked reddish band, outlined by fine dark lines margined by a narrow white line; nearest perhaps to ab. *virgata*, Tutt.

H.-S., *Sys. Bearb.*, II, 201, fig. 637 (1852), gave a figure of a very pale ochreous form of this species with strong markings, referred to in the Appendix to vol. ii.

Gn., *Hist. Nat. Noct.*, V (1), 356 (1852), took the prior authority as Schiff.

Stdgr., *Cat.*, IIIed., 201 (1901), took the description of Fb. in the *Mant.* as typical.

Hamp., *Lep. Phal.*, V, 418 (1905), gave prior authority to Schiff., 1775, but used the genus *Monima*.

Splr., *Schm. Eur.*, I, 239, plt. 45, f. 3 (1906), gave an almost unrecognizable figure with very pointed forewings.

South, *M. Br. I.*, I, 328, plt. 158, f. 8 (1907), gave a pretty good figure of the unicolorous pinkish-red form with the band scarcely expressed.

Warr.-Stz., *Pal. Noct.*, III, 91, plt. 22d, e (1910). Authority, Fb. Genus, *Monima*. They recognized the *rubricosa*, Esp., *pallida*, Tutt, and *virgata*, Tutt. There are four figures—♂ and ♀ *miniosa*, ab. *rubricosa*, and ab. *pallida*, all of which are poor in colour, partaking too much in the general brown of the plate.

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.

REPRINTS of articles may be obtained by authors at very reasonable cost if ordered at THE TIME OF SENDING IN MS.

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

TO OUR READERS.—Short Collecting Notes and Current Notes. Please, Early.—EDS.

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.

Urgently Wanted for Experimental Purposes.—Pupae of *hirtaria* and *lapponaria*. I can offer duplicates of very many species in return.—*Harold B. Williams, Croft Point, Bramley, Surrey.*

Desiderata—British *dominula* varieties with full data other than var. *lutescens* and var. *lineata*. Other vars. acceptable. *Duplicates*—British *L. l-album, exigua, cribrum, ocellaris*, and *intermedia*, etc.—*Dr H. B. D. Kettlewell, Cranleigh, Surrey.*

Wanted—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Estación Experimental, Casilla Correo 71, Tucuman, Republica Argentina.*

Duplicates.—Several thousand British Macro-Lepidoptera in perfect condition; full data. *Desiderata.*—British Micro-Lepidoptera in similar condition.—*S. C. S. Brown, Kingsholme, 454 Christchurch Road, Boscombe, Bournemouth.*

New Address—Kenneth J. Hayward, F.R.E.S., F.R.G.S., F.Z.S., Estación Experimental Agricola, Casilla Correo 71, Tucuman, Republica Argentina.

New Address—Bernard Embry, Esq., 23 Mill Drove, Uckfield, Sussex.

MEETINGS OF SOCIETIES.

WAR-TIME ARRANGEMENTS.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON : 41 Queen's Gate, S.W.7. October 2nd, at 5 p.m.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—2nd and 4th Thursdays from April onwards, 6 for 6.30 p.m., Chapter House Hall, St Thomas Street, S.E.1. *Hon. Sec., S. N. A. Jacobs*, Ditchling, Hayes Lane, Bromley, Kent.

THE LONDON NATURAL HISTORY SOCIETY.—Fixtures as printed in current syllabus cancelled. Members will be notified of further arrangements. *Hon. Sec., A. B. Hornblower*, 91 Queen's Road, Buckhurst Hill, Essex.

ENTOMOLOGICAL SECTION, BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—Evening Meetings. On the third Monday of each month, 7 p.m., at 55 Newhall Street, Birmingham. Visitors welcomed. Those who would like to attend or exhibit please apply to *G. B. Manley*, 72 Tenbury Road, King's Heath, Birmingham.

SOCIETY FOR BRITISH ENTOMOLOGY.—All meetings suspended till further notice. *Hon. Sec., E. Rivenhall Goffe*, 102 High Street, Southampton.

Communications have been received from or have been promised by T. Bainbrigge Fletcher, A. J. Wightman, W. P. Curtis, H. Willoughby-Ellis, E. Ernest Green, H. Donisthorpe, S. C. Brown, P. B. M. Allan, H. W. Andrews, Dr E. A. Cockayne, Zool. Socy. Appeal, the late Rev. C. N. Burrows.

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

Printed by T. Buncle & Co. Ltd., Arbroath.

Vol. LII.

No. 9

SEPTEMBER 1940.

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

CONTENTS.

Subscription for Complete Volume, post free,
TEN SHILLINGS,
to *The Hon. Treasurer*, H. W. ANDREWS, F.R.E.S.,
6 Footscray Road, Eltham, S.E.9.

This number, Price ONE SHILLING AND SIXPENCE (net).

THE BUFF FORMS OF BISTON BETULARIA, L., AB. LOMASARIA, COTTAM, AND AB. DECOLORATA N.AB. THEIR HISTORY AND GENETICS.

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

The original account of the buff forms of *Biston betularia* is worth reading again in the light of modern genetics. A correspondence in the *Entomologist* of 1889, initiated by J. T. Rodgers (p. 49) and continued by Joseph Chappell (p. 162), resulted in an account of the origin of the strain and its subsequent history, which was written by John Thorpe. I give most of it in his own words.

"In 1874 Thomas Lomas and Jonathan Fielding captured near Heaton Park a buff female in cop. with a black male. After depositing ova the female was sold to a London dealer, the ova being taken great care of, and the larvae fed up well. Many buff forms were expected to turn up from the brood that emerged from the pupae in 1875, but the breeders were disappointed, for not a single buff variety turned up, all being black or ordinary forms. Being thus disappointed and having no idea the buff forms might reappear, they gave to several collectors virgin females to cross with black males, which were being bred very freely at the time in Middleton. This cross was so favourable to the buff variety that no less than seven collectors, who had had virgins given to them to cross with black males, produced the buff variety in 1876, the proportion being about 10 per cent.

"Many of these collectors crossed them again with poor success. Lomas and Fielding, who had the greatest number, did not try crossing again, but bred them in and in, and from this breeding no less than 80 per cent. of buff moths turned up in 1877. In these moths of 1877 there was every form of variation, from pure buff to the ordinary type. After that year they gradually grew weaker, and in the course of three years following, the strain was totally lost, and not a single buff variety has been produced since.

"These varieties were exhibited at the monthly meetings of the Middleton Society in May and June for several years, many of them being alive and in copulation. Any amount of evidence can be obtained from collectors who saw them while being bred and exhibited alive as proof of their genuineness. They were never kept secret, every specimen being shown to any entomologist who wished to see them. Mr C. S. Gregson of Liverpool came several times.

"After some time a certain London dealer came over very late one Saturday evening; the day following I myself took him to see Fielding's lot of buff varieties. At this time the great bulk were in the hands of Fielding and Lomas. After much persuasion and promises of some extraordinary foreign butterflies for "picture making" the dealer got every specimen that Fielding had got, but when the case of foreign butterflies arrived they were not worth the cost of carriage. This so disgusted Fielding that he gave up collecting.

"Some years after I purchased Lomas' collection, including every specimen of the buff variety, with the exception of two I understood he had sold to Mr Bond. With the exception of two or three specimens in several collections in Middleton and a few I have given to entomological friends in different parts, including two to the British Museum

collection, I have the whole of what remains of these varieties. This form has not since been bred and seems to be quite lost." (*Entomologist*, 1889, 162). In 1923 R. Cottam obtained an independent account from John Taylor of Oldham, which differs in some respects from that of Thorpe. He says that from the original pairing typical, intermediate, and black specimens were bred in 1875, but no buff ones. The individuals of this brood were allowed to pair up amongst themselves as they liked, with the exception of a few females, which had been taken out and mated with black males brought specially by Taylor for the purpose of strengthening the strain. The female specimens, which had been mated, were taken to a meeting of the local entomological society by Lomas, and he allowed certain members to take some of them away. Nothing came from a specimen taken by Rodgers, but some time after he raised two buff examples from larvae, which had been given to him. Only three buff examples appeared from Taylor's brood, while Lomas failed to produce any from his specimens. A large number of buff specimens were bred by Fielding and Scholes (brother-in-law of Lomas) and these would appear to have come from females that had been allowed to interbreed. This rearing of *betularia* took place in 1876, and after that year no further examples were bred because that particular strain had died out. Specimens of *betularia* from buff and melanic strains were exhibited periodically at monthly meetings for many years, but it must be noted that no living examples of the former were shown after 1876.

Taylor says that Gregson failed to obtain any from collectors in Middleton and later showed a box full of *betularia* bleached by chlorine. Although he did not say that the Middleton specimens were faked, suspicion fell on them; the strain was allowed to die out in consequence, and Fielding himself gave up collecting.

The accounts given by both Thorpe and Taylor effectually dispose of any doubt about the genuineness of the buff forms.

The genetics of the buff forms have never been dealt with, and it is interesting to see how far these two accounts written before Mendel's Law was rediscovered elucidate them. Taylor's statement that all three forms of *betularia*, black, ab. *carbonaria*, Jordan, intermediate, ab. *insularia*, Th-Meig., and typical *betularia*, appeared in the first generation is difficult to accept. These three forms are allelomorphs, *carbonaria* dominant to both the others, and *insularia* to typical *betularia*. The genes for two only can be present in one individual. The result can be explained only if the buff female was *insularia* and both it and the black male parent were heterozygotes. Using the symbols C = *carbonaria*, c′ = *insularia*, and c = *betularia*, Cc × c′c would give 2 *carbonaria* (Cc′, Cc). 1 *insularia* (c′c), and 1 *betularia* (cc). Both accounts, however, say that the original buff female was typical in markings. Another objection to Taylor's account is that so far as I know no buff intermediates were bred later, though they should have been as numerous as typical ones from the indiscriminate pairings obtained. Thorpe's statement that the first generation consisted of *carbonaria* and typical *betularia* is much more likely to be true.

In any case buff appears to be recessive to black coloration, and there are two buff forms, one in which buff replaces the black speckling of the typical form, and the other, in which it replaces the black of *carbonaria*, giving a unicolorous buff insect. The buff colour is due either

to a great diminution of the melanin content of the scales or less probably to the substitution of some other pigment. It is determined by a gene independent of the one which governs the number of black scales.

Accepting Thorpe's account and using the following symbols:— C = *carbonaria*, c = typical *betularia*, B = black scaling, and b = buff scaling, the original pair captured by Lomas and Fielding were CcBB, the black male, and ccbb, the buff female. From this pairing the expectation is that the brood would consist of equal numbers of *carbonaria*, CcBb, and typical *betularia*, ccBb, but all would be heterozygous for buff. Coming to the next generation there is a serious discrepancy between the two accounts. Thorpe states that virgin females were given away to be paired with black males. If that were true no buff forms would have appeared in this generation. Taylor's account is much more likely to be the correct one. He says that the members of the first generation paired indiscriminately amongst themselves and presumably some eggs were laid in the cage and the broods must have been mixed. If both parents were black, CcBb × CcBb, the offspring would show a 9 : 3 : 3 : 1 ratio, 9 *carbonaria*, 3 unicolorous buff, 3 typical *betularia*, and 1 speckled buff. With one parent black, CcBb × ccBb, a quarter of the offspring would be buff, half of them unicolorous and half of them speckled. From these two pairings all four forms would be produced, *carbonaria*, typical *betularia*, unicolorous and speckled buff, which agrees with Thorpe's account. The fact that only 10 per cent. were buff instead of the 25 per cent. expected in the F_2 generation may be due to the greater delicacy of the buff forms, if the figures are correct. According to Taylor, some females were taken away and paired with unrelated black males, which would account for the failure of Lomas to breed any buff forms, but, on the other hand, Thorpe says he did breed buff ones. Both agree that Fielding was successful, and Taylor says he appears to have used inbred specimens. Taylor himself only bred three buff specimens but he may have had eggs from both sources, inbred and crossed with an unrelated black male. Both Thorpe and Taylor agree that the buff form reappeared in 1876, but Thorpe says that the strain was carried on and gave 80 per cent. of buff specimens. Two buff moths paired should give all buff ones in the third generation, but it is not unlikely that he had some eggs from pairings between buff ones and heterozygous normal ones. Such a mixture of broods might well give 80 per cent. of buff forms. It must be remembered, however, that the account was written twelve years after the event, and Thorpe's memory may have been faulty. Taylor indeed says that no such broods were ever reared.

Whether the strain was carried on or not is relatively unimportant from the genetical aspect. There can be no doubt that none of the offspring of the original pair, the black male and the buff female, were buff, but that paired *inter se* they gave buff forms, speckled and unicolorous and a much larger number of typical *betularia* and *carbonaria*. This is quite in accord with expectation, if buff is recessive. I accept Thorpe's account of the four forms appearing in the 1876 generation and Taylor's statement that they were produced from pairings between male and female offspring of the original pair. Since heterozygous *carbonaria* and typical *betularia* were present in the brood the pairings may have been of three kinds.

Cottam (*Lancs. and Cheshire Nat.*, 1923, 21) figures a buff *betularia* (fig. 2) and a buff *carbonaria* (fig. 4) and names both forms ab. *lomasaria*. Although buff is determined by a single gene, if my explanation is correct, it seems advisable to restrict the name ab. *lomasaria* to the typical *betularia* with buff instead of black speckling and to give a separate name to ab. *carbonaria* with the black replaced by buff. For this unicolorous form I propose the name ab. **decolorata** n.ab. Ochraceous buff (Ridgway) matches the colour most closely, though by no means perfectly.

Ainslie Hill (*Entomol.*, 1901, 180) attempted with little success to make a census of the buff forms in various collections. The following list gives those of which I know: —

4 (2 Rodgers Coll.) Taylor Coll.
2 Thorpe Coll. (Corporation of Middleton).
2 Ainslie Hill Coll.
2 *lomasaria* (R. Adkin Coll.), 1 *lomasaria* (Bankes Coll.), 2 *lomasaria* (Christy Coll.), 1 *lomasaria* and 1 *decolorata* (Stephens Coll.), 4 *lomasaria* and 3 *decolorata* (Rothschild Coll.), all 12 in the British Museum.
2 (R. South Coll.).
2 *lomasaria* and 2 *decolorata* (F. J. Hanbury Coll.), the former, I believe, were purchased by Burton and the latter by Barrett.
7 *lomasaria* and 5 *decolorata* (Baldock Coll.) and 1 *lomasaria* and 2 *decolorata*, all 12 in my collection.

This gives a total of 43. There are none in the National Museum of Wales, the Porritt collection in Huddersfield, or in the Rait-Smith collection, and very few are mentioned in the catalogues of the big sales. Although the list is incomplete, it shows that the number in collections is by no means large and supports the story given by Taylor rather than that given by Thorpe.

OXYNA (TEPHRITIS) PARIETINA, L., IN N. KENT.

By H. W. Andrews, F.R.E.S.

In November last I went to the Thames Marshes at Stone, near Dartford, to search for galls of the Trypetid fly, *Paroxyna misella*, Lw., on *Artemisia vulgaris*, L. (mugwort). I did not find the particular galls for which I was looking but on slitting up some of the stems of the *Artemisia* I found Trypetid larvae which I suspected might be *Oxyna parietina* (although there was no trace of any gall or swelling on the stems), as *Artemisia* is one of the host plants of this species. I took some stems home and my anticipations were realised when *O. parietina* began to emerge at the end of May this year. As they did not come out in any numbers and I wanted examples for my correspondents I went again to Stone on June 1st and found the flies out in abundance. They were not obvious either on the *Artemisia* or on neighbouring leaves and flower-heads and those taken were all obtained by sweeping.

Although *parietina* has been on our British List at least from the days of Walker's *Insecta Britannica* (circa 1852), which states " not

rare," I have only been able to find one authentic record of its occurrence in this country, given me by Mr Collin, who has in his collection a single female taken by Dr W. J. Fordham at Clifton, Yorks, on 6.vi.19. It has been recorded in local lists from Somerset by Mr Audcent, and from Warwickshire by Mr Saunt, but both these gentlemen after comparing examples of *parietina* I sent them, tell me that their records should have been referred to *Oxyna proboscidea*, Lw. (*nebulosa*, Wied.) and not to *parietina*. I also wrote to the British Museum authorities as to Walker's record and Mr R. L. Coe has kindly looked into the matter and found in the " general " collection 3 ♂♂ and 1 ♀ under the name of *parietina*, presented to the Museum by the Entomological Club in 1844 and labelled " England." He refers to a further record by Walker in a paper " Descriptions of the British Tephritites " (*Ent. Mag.*, III, 57, 1836), where the species is stated as occurring in the " South of England during the summer and autumn," and thinks that this statement probably refers to the Entomological Club examples. On a re-examination of these specimens, however, he finds that they are not *parietina*, but *O. flavipennis*, Lw., as " they agree completely with Collin's diagnosis of that species " (*Ent. Record*, Vol. XXVII, p. 57, March 1915), thus leaving Mr Collin's 1919 specimen from Yorkshire the solitary record.

Both *Oxyna flavipennis*, Lw., and *proboscidea*, Lw., closely resemble *parietina*. In Mr Collin's 1915 paper referred to above (" Variation in the Wing-markings of *Tephritis* (*Oxyna*) *flavipennis*, Lw.," illustrated with plate) he gives, among other characteristics, the following useful distinctions for separating the three species: —

flavipennis has three pairs of dorso-central thoracic bristles and normally four scutellar bristles, one lateral pair and one apical pair:

proboscidea, two pairs of dorso-centrals and one pair lateral scutellars, the apical pair being absent in this species.

parietina, two dorso-centrals and four scutellars, lateral and apical as in *flavipennis*.

Variation in the intensity of the wing-markings of *flavipennis*, illustrated by the plate accompanying Mr Collin's paper, is also noticeable to a certain degree in *parietina*.

The larvae of *parietina* are recorded as living in the stems of various species of *Artemisia* (in the case of *A. vulgaris* from which my flies were bred, without any external signs of habitation): those of *flavipennis* in fleshy galls on the roots of *Achillea millefolium*, L. (Milfoil or Yarrow): and those of *proboscidea* (*nebulosa*) in galls on the root-stocks of *Chrysanthemum leucanthemum*, L. (Ox-eye daisy). *Proboscidea* is, I believe, fairly widely distributed in this country, but both *flavipennis* and *parietina* are normally very rare. In Mr Collin's paper he states that over forty years' collecting by the late Mr Verrall produced only two specimens of *flavipennis*, but in 1904 and again in 1911 Mr C. G. Lamb found the species in abundance in a limited area at St Merryn, Cornwall; and as stated above, I was fortunate enough to find *parietina* also in abundance this year at Stone. Seguy, in " *Dipteres acalypterates*," records all three species as common in France.

ON TRAVELLING LARVAE.

By An Old Moth-Hunter.

July 14th. To-day I found, on a piece of waste ground, a larva of *Amphidasys betularia*, L., feeding upon Spotted Persicary (*Polygonum persicaria*, L.). It was a marshy spot of some five acres between a river and the goods yard of a railway station. The plant was some ten yards from the river, which is about sixty feet wide, and on the far bank were a pollard willow and two hawthorn bushes. I searched the persicary thoroughly and then the adjacent plants; but there were no more larvae—of that I am certain.

A. betularia is a prolific egg layer. Recently a large black female was brought to me—she had fluttered down to the pavement in our little town from a lime tree, having been disturbed, possibly, by a bird. I put her in a cage lined with oak bark, and for five nights she laid eggs. She laid an incredible number. Never would I have believed that a moth could lay so many. It was impossible to count them, for they were packed in clumps, I might even say lumps, in holes, cracks, fissures, chinks, crevices—in fact in every concealed spot into which she could insert her ovipositor. There must have been thousands of them.

How, then, did the larva which I found to-day come to be all alone, and on Spotted Persicary? In other years I have found the caterpillars of this moth on oak, elm, birch, sallow, blackthorn, hawthorn, apple, and wild rose, and I have heard of them occurring on beech, poplar, bramble, and goodness knows what other deciduous trees and shrubs. But Spotted Persicary—I refuse to believe that any self-respecting female *betularia* would condemn its larvae to eat such a lowly plant.

Then how did this highly original larva come to be feeding in solitude on persicary?

I doubt if it crossed the river unaided. The Elephant Hawkmoth is said (*teste* Albin) to be a strong swimmer; but then, *elpenor's* food-plant often overhangs a stream, therefore swimming is a necessary accomplishment for one who risks a ducking whenever the stormy winds do blow. *A. betularia* afloat—and I'm not sure he would float—would be merely ridiculous. No: I'm sure he didn't cross the river under his own motive power. A boat? There are very few boats and they don't stop at this unsalubrious spot. I could wish there had been an ash on the opposite side of the river, shedding its whirligig seeds; for then I could well have believed that my larva had been practising as a parachutist. But there were only willow and hawthorn, and neither of these plants could provide an apparatus capable of wafting a half-grown *A. betularia* larva for thirty-five yards and more. Surely a bird could not have played the part of a Daedalus?

The station goods yard, then? That must be ruled out, because there was a wide water-filled ditch in between; and there are no trees or shrubs on that side. The five acres of waste ground is virtually an island.

Let me hark back for a moment to those piles of eggs laid by the black female moth. Several thousand of them hatched simultaneously, having been subjected to mechanical shock (*that* is a matter I am not going into here), and started out to see life on my writing table. In a

brace of shakes the table was covered with minute *A. betularia*, going flat out, in different directions. I timed one over a measured inch. He covered the course in 5 1/5th secs. Six inches took him (he ran wide four times, and once, when I applied the whip in the shape of a camel hair brush, he turned on his back and kicked) exactly 35 seconds. If he could have kept up this rate of progress he would have covered more than fifty feet in an hour. In six hours he would have travelled a hundred yards—and he was only 3 mm. long. But as to how far he could actually have travelled without refuelling is another matter; his output of energy was so great that he must have been burning fuel rapidly. However, that is a physiological problem and outside the scope of this paper.

The newly hatched larvae of certain species must cover considerable distances before they reach their fodder. Recently I dropped two baby *Liparis salicis*, L., on the carpet of my dressing-room (I keep larvae everywhere). Two days later I found one on my bedroom ceiling twenty feet away. He must have traversed sixteen inches of woolly carpet before he reached the wall. He was none the worse for his journey, except perhaps that he was a little footsore. He ate a good meal and went to sleep. Next day he was as active as ever.

I sometimes find ova of *Himera pennaria* L., on the trunks of large oaks, from five to seven feet from the ground. These young larvae must be as active as *A. betularia* (and indeed they are) if they are ever to reach the leaves. Even slugs like *Thecla quercus*, L., cover the ground, or rather branches, at a surprising rate. I say "surprising" because if you take your eyes off a full-fed one that is on the move and busy yourself elsewhere for a few minutes, then turn to look at *T. quercus*, you will probably be surprised to find that he has disappeared. A search will reveal him several inches away. He is a stealthy beast, is *T. quercus*, and for all his dignified progression he is a bloodthirsty brute where his brethren, pupating, are concerned. Trust him not a yard.

Some day, if I can overcome my incorrigible laziness, I shall buy a stop-watch and time larvae over a measured mile, so to speak. The results would I am sure be interesting. *Arctia villica*, L., in their third stadium would hold their own against all comers—provided you could induce them to keep up the short sharp rushes in which they indulge when you try to push them into a teaspoon. Greased lightning is not the word for it. Even *Cosmia trapezina*, L., scenting blood, could not hold his own with *A. villica*, and as for that Jack the Ripper, *Scopelosoma satellitia*, L., who in the dark of night rushes with terrible swiftness along a branch searching for his meat—he would be left far behind.

S. satellitia is the only larva I am acquainted with who is conscious that he bears the brand of Cain. Flash a torch on him while he is slithering along with uncanny lubricity of foot and he will stop dead in his tracks, looking at you with an air of injured surprise. And if you don't put out the torch he will turn, offendedly, and retire with dignified steps. "I may be a cannibal," he seems to say, "but dash it all I don't eat caterpillars in broad daylight, like *trapezina*; one must draw the line somewhere."

But what about that *betularia* larva which I have just found feeding on Spotted Persicary: how the dickens did he come to be there? [Wind blown as a very young larva on a silk thread.—E. A. C.]

AN APPEAL FOR THE INSECT HOUSE AT THE ZOOLOGICAL GARDENS.

The Zoological Society, in pursuance of its policy in keeping the amenities of the Gardens available to the public as fully as possible during the war, in spite of operating at a serious loss, has now re-opened the Insect House, which was closed on the outbreak of hostilities. This involves an additional burden of approximately £250 per annum, but Council felt that the educational value of an insect collection warranted this.

In regard to the larger animals in the Zoo, an Adoption Scheme is now in operation by which the cost of feeding a particular animal is defrayed by a well-wisher, and material help has been obtained in this way. This would clearly be impracticable with insects, and it is accordingly suggested that entomologists might be interested in helping to " adopt " the Insect House as a whole. One well-wisher has already given £25 for this purpose.

Anyone interested in helping further with this scheme should send contributions to Mr N. D. Riley, Keeper of Entomology, British Museum (Natural History), Cromwell Road, London, S.W.7, who will transmit them to the Zoo authorities.

PHILOPHYLLA HERACLEI, L. (DIPTERA, TRYPETIDAE), BRED FROM SMYRNIUM OLUSATRUM, L. (ALEXANDERS).

In his " Notes on the Food Plants of British Trypetidae," Mr Niblett gives five host plants, all Umbelliferae, for *P. heraclei*. This year another Umbellifer, " *Smyrnium Olusatrum*," has been added to the list by Mr Audcent who towards the end of May took mined leaves from a patch of this plant at Clevedon, Somerset. Mr Audcent also sent some of the leaves to Mr Niblett and myself and we both bred the fly from them, the dates of emergence ranging from 18th June to 3rd July.

Three points of interest in connection with this record are:—

(1) The fact that although those specimens of *heraclei* originally captured by Mr Audcent on the plants of *Olusatrum* which led him to look for mined leaves later, comprised both the light and dark forms, yet out of about 100 specimens bred between the three of us, only one could be considered as definitely of the dark form (*centaurae*): a certain number might be termed intermediates, but the majority obviously consisted of the light form (*onopordinis*). This suggests an interesting line of investigation as to different species of host plants producing differing forms of a given species. Mr Niblett tells me that he has not had much experience of breeding *P. heraclei*, but that a few bred from *Heracleum Sphondylium* were again all of the light form.

(2) The unusually long time it took for the colouring of the wing pattern to develop. Mr Audcent writes, " On emergence the wings were almost clear, the markings appeared gradually but were never so dark as in the captured specimens." I had the same experience though I kept my specimens 12 hours before killing them. Mr Niblett also

noticed the long time the wing pattern took to develop, but he kept his specimens 48 hours before killing, and says "some retained light markings, others had them very intense." He also suggests that this delay in development of markings may be due to the larvae leaving the mines before they were full fed.

(3) The larvae seem impatient of confinement. To quote Mr Audcent again, "When the leaves were placed in a glass covered jar many left their mines and crawling up the sides of the jar gradually shrivelled and died." I had had a similar experience once before when trying to breed this species, and this time when I opened the tin in which Mr Audcent sent me the leaves, I found a large number of larvae out of the mines and on the sides of the tin. I then put the leaves on a layer of bulb-mould in a cardboard box covered with leno, and though they quickly dried up I bred some 30 specimens of the fly mostly from pupae on the dried up leaves. Mr Audcent's larvae mostly pupated on the soil in the jar where they were kept, some on the leaves, none buried themselves.—H. W. Andrews.

IODIS LACTEARIA, L.

By (the late) Rev. C. R. N. Burrows, F.R.E.S.

Although I am calling the species under consideration *Iodis lactearia*, it is only right to point out that Staudinger, in his *Catalog* (1901, p. 264), has rejected the genus *Iodis* and placed *lactearia* in *Thalera*. Hübner with *fimbrialis* and certain other "Emeralds," which do not occur in Britain. Mr Prout writes me: "You have probably noticed that Staudinger has now merged the genus *Iodis* in *Thalera* (type *fimbrialis*) though Lederer, whose system he usually follows, maintained them as distinct. . . . But the union is clearly impossible even on imaginal characters—leg structure, wing form, I think antennae—probably neuration, etc., etc." Upon this point I can give no opinion, as I do not know the details which constitute or rather differentiate either genus, and not possessing a specimen of *Thalera fimbrialis*, I am not able to examine and compare the structural differences or agreements existing between them. I notice also that Meyrick in his *Handbook*, p. 249, likewise rejects *Iodis*, and places *lactearia* in *Euchloris* with *Phorodesma smaragdaria*, *Comibaena pustulata*, and *Geometra vernaria*, a position which may appear reasonable from the writer's point of view, but yet most unsuitable from my own. Leaving the question of genus with a humble suggestion that many entomologists would probably welcome an up-to-date Catalogue of Genera, with a diagnosis table, I must pass on to the specific name.

Again I am indebted to Mr Prout for kindly giving me the information upon which he is an expert and a master. He writes, "Linné's type specimen is extant but—as you can guess—hopelessly discoloured. Yet it seems that authors have correctly determined it. Moreover, his disciple Clerck in 1759 figured the same species under the same name. It must have been one of the usual whitish specimens even to begin with as no mention is made of any green shade. Werneberg (*Beiträge*, I, p. 253) maintains that Linné himself, in the *Fauna Suecica* of 1761,

redescribed his *lactearia* from a greener specimen as *vernaria*, and that, therefore, that name should be preferred as drawn from the original (? natural) condition of the species. But I more than doubt whether Linné's *vernaria* was *lactearia*, and in any case, the law of priority is inexorable and Werneberg's proposal has met with the neglect it merited. At any rate the early authors on the Continent muddled up the ' Emeralds ' well, failed to recognise one author's description and so on, and this species (*lactearia*) was long known by Schiffermüller's (and Hübner's) name of *aeruginaria*."

Beautiful though this little Emerald is on its first appearance from the pupa, it is unfortunately the more liable to fade of the eight species of the group commonly (for we must not ignore *Thalera fimbrialis*) found in Britain. The delicate blue-green is the most fugitive of all and differs from the rest in becoming absolutely white. Would that someone could find a method of preserving the delicate colour unchanged. I suppose the only remedy at present is to renew one's series year by year (if one can), and on no account to subject the specimens to any treatment which can possibly affect the colour. I would therefore suggest chloroform (some samples of chloroform are sometimes likely to be injurious) and prick with tobacco juice. I say " renew if you can " advisedly, for although a common species, whose food plants are universal, it is not in all places. During the ten seasons I have collected in Mucking and neighbourhood I have only recorded it twice. In 1906 not more than two specimens, and in 1907 only one. This, when I was keenly desirous to get eggs, shows how rare it must be with me. Meyrick gives for its range " Britain to the Clyde. Ireland. Common." I have but one record for my six seasons at Rainham. So putting two and two together I have come to the conclusion that it is more of a wood than a marsh insect, thus verifying the note of Linné's commentator, " Habitat in Europae *nemoribus*." I have gathered together a large number of records from the magazines, etc., and I see that my idea is strongly supported, as the only capture I have so far found noted which suggests the species frequenting marshes is a note by Mr A. J. Hodges, who took it in such a locality in the Isle of Wight, 20th June 1891 (*Entom. Record*, Vol. II, p. 160). Probably in this case the woods were not far off, and the marsh not such in the Mucking sense. Mr Edelsten says " common in the Norfolk Fens." One other fact seems to show that it is not always " common everywhere " as Stainton would say (which, however, he does not say of this species); this is, that though I have begged for eggs for two years or more, only one friend, Mr Edelsten, has been fortunate enough to secure some, and kind enough to send them on to me. A further difficulty arises in inducing females to lay, as a passage in a letter of Mr Prout's would suggest, " I have long been meaning to rear this insect, but have never induced a female to lay more than two or three eggs, so have not thought it worth while; I wonder whether my experience is general with this species." The habits of the female are seemingly very retired for the vast proportion of the insects captured are males.

Thanks to Mr Edelston I received some newly laid upon hawthorn leaves, which were, I believe, laid the day they were posted to me: at any rate I dated the oviposition as follows:—

Ova laid, 4th July 1907.
Hatched, 14th July = 10 days.
1st Moult, 20th July = 6 days.
2nd Moult, 30th July = 10 days.

. . . . . .

Pupated, 20th August = 37 days from hatching. As the larval life is so short there is no apparent reason why, as suggested by Mr C. Nicholson, the species may not be double-brooded in favourable seasons (*Entom. Record*, 1896, p. 200). Yet amongst all the notices of captures I have collected, the latest date is 9th July 1899, at Dorking, by Mr Carr (*Entom. Record*, 1900, p. 23).

This is an exceedingly pretty and easy larva to rear, which process can be well carried out in a large sized glass-topped metal box. It feeds quietly and contentedly upon hawthorn, and its own old skins, I suppose, for I could never find one about, and had to give up recording the moults for this reason. Stainton and St John give birch as the only food-plant, and were this so, the fact would sufficiently explain or account for its rarity here at Mucking, where birch scarcely occurs. Newman gives oak only. Quail (*Entom. Record*, Vol. II, p. 232) supposes that he beat the larvae from oak in Epping Forest, and Birchall (*Entom.*, 1868, p. 127) definitely states that he beat them from this food-plant. I do not know from where I got my information but I find in the margin of my Stainton a note of Hornbeam as pabulum. On the strength of this I offered my larvae some leaves of this plant, which they ate without much demonstration of delight or the reverse. As Meyrick adds "etc." to birch and oak, it is quite possible that hornbeam is a known food of the insect. It seems that the larva is not at all freely beaten even in its chosen haunts. Possibly it attaches itself too tightly to its food-plant.

The full grown larva is wonderfully protected by its colour—peculiarly stick-like, and rigid when on guard. Meyrick's description is good as far as it goes. "Larva dark green, 5-9 (1 being the head) with purple posteriorily ochreous-edged dorsal diamonds. 10-13 with purple dorsal line. Head red-brown, bifid." Feeding completed, the larva draws together a leaf or leaves quite loosely, and pupates protected by a few threads attached by anal hooks to a rather large pad of silk. Pupa bright green, slender, antenna cases, one pair of legs, eyes, palpi, and some of the veins of forewings olive brown. Thus it remains, as far as we know, all the winter, emerging at the end of May and onwards.

To be continued.

COLLECTING NOTES.

Early Stages of a British Earwig, Apterygida albipennis, Megerle.—As so little is known about the early stages of our earwigs the following may be of interest. In November 1939 Mr R. M. Greenslade, of the East Malling Research Station, Kent, sent me five females of the local earwig *Apterygida albipennis*, Megerle. Each earwig was placed in a cage with earth at the bottom and was given pieces of apple for food. Early in February they dug into the soil, constructing

a cell about one inch below the surface, slightly longer than the earwig itself, and about ⅜ inch diameter. Above the cell the earth was solid, there being no passage leading to the soil surface. In March these cages were opened and only two of the earwigs were found alive; these were replaced and they dug themselves in again. One cage was carefully opened and I was able to watch developments. On 19th April ova were first seen (about 15) and the female watched over and cleaned them. These ova hatched on 3rd May. The second earwig also hatched ova and the young ones were seen crawling about the cage on 6th May. From these observations it is clear that pairing takes place in the autumn and ova are deposited in April.—E. E. Syms.

Delayed Emergence of Hyloicus pinastri, L.—A female of this species emerged in my cages on 30th May. It had lain three winters in the pupal state, the larva having gone to earth in August 1937. From twenty ova (the product of a Hampshire female and a Suffolk male) given to me by my friend, Mr Clifford Craufurd, I obtained nineteen pupae, one larva becoming a casualty. Sixteen moths emerged from these in 1938, two in 1939, and the last one as above. I found this species very easy to rear—possibly the Hampshire-Suffolk cross ensured robust offspring—and if my solitary experience is usual, with care one should obtain one hundred per cent. of imagines. But I have not yet succeeded in equalling Tutt's record (*Ent. Rec.*, iv, 117)—from a dozen eggs of *A. saucia* he bred 13 moths!—P. B. M. Allan.

The Distribution of Gonia fasciata, Mg. [Dipt. Tachinidae].—In view of Mr H. W. Andrews' note *ante* p. 81, I feel that I ought to record the capture of an individual of this species on 15th April 1934 at High Halstow, Kent (WK). The fly was seen slowly walking across the road in the late afternoon sunshine. I have also in my collection two specimens taken by my friend Mr K. M. Guichard at Mill Hill, Middlesex (MX) on 19th March 1938. C. Morley and E. A. Atmore record the capture of *G. fasciata* in Suffolk by Lt.-Col. C. G. Nurse at Tuddenham, Timworth, Culford, and Ampton in the months of April and May in *Trans. Norfolk and Norwich Nat. Hist. Soc.*, 1915 Sup., p. 98.—L. Parmenter (F.R.E.S.), 94 Fairlands Avenue, Thornton Heath, Surrey.

Psyche villosella, Ochs., at Poole, Dorset.—Having been evacuated from Southampton to Poole since the beginning of the war, my attention has naturally been drawn to the local fauna, and especially to the insects on the vast heaths that lie to the north and west of Poole. If I have failed completely to find cases of *Psyche opacella*, H.-S., which species surely must still occur in this district, I have none the less succeeded in finding *Psyche villosella* cases in far greater numbers than I have ever known them to occur in the New Forest. Unfortunately, every heath I have visited so far has been extensively burned in past years, and it is a common sight this year also to see a vast pall of smoke rolling over the heathlands, where yet another fire has been started by irresponsible youths.

I began my search for cases of *Psyche villosella* in the autumn of 1939 and found a few in scattered localities still unburnt. However,

towards the end of April I searched a very broken piece of ground near the Kinson potteries and quite close to rows of new bungalows. Here the cases were in large numbers and at the end of April the males began to fix their cases for pupation. The sites chosen were very varied. Sometimes a piece of dead heather or bracken was selected, sometimes the tip of a dwarf gorse shoot or a spray of living heather, frequently a piece of old iron among the many such that litter the neighbourhood of human habitation—at least in these parts. Several times I found two cases fixed on the same twig and twice three close together were found. I estimate the number of male cases seen on six visits to this restricted piece of ground alone at more than three hundred. The female larvae were to be seen feeding all this time and did not begin to fix their cases for pupation until about May 14th, a full fortnight after the males. By this date all the male larvae had finished their feeding. Presumably, since emergence of males and females must coincide, the males need a longer period for their development than do the females.

It is quite easy to differentiate male and female cases, for the latter are cylindrical and longer, with a less hirsute appearance, and lack the long silken tube that serves to grip the male pupa when emergence takes place. Moreover, the males fix their cases low down, while the females prefer a fence or tall stem, and are often to be found four feet above ground level.

Much has been written about the difficulty of breeding good male specimens for the cabinet. My own solution of the difficulty has been to keep male pupae separate and in the dark, so that the freshly emerged insects do not at once begin to fly and to batter themselves to pieces. Even so a careful watch must be kept, especially in the early evening, from about 5 to 8 p.m. summer time, when males usually emerge.—Wm. Fassnidge (M.A., F.R.E.S.), at 127a Longfleet Road, Poole, Dorset.

Mnesipatris filicivora, Meyr., in England.—On the evening of 26th May 1940, in my garden in Bournemouth, I netted a species of Tineina which was new to me. Next evening a more detailed examination of the spot revealed the moth in abundance flying around a clump of male ferns, *Dryopteris filix-mas*. This fact narrowed down its identification, and I was able to identify the moth as *Mnesipatris filicivora*, Meyr., named and described by E. Meyrick in the *Entomologist*, Vol. LXX, p. 194, from specimens taken in Co. Dublin, Ireland. At the time of writing, 26th June, the larvae are abundant mining the fern leaves, and if any reader would like some larvae I shall be pleased to send some. —S. C. Brown, Bournemouth. [Delayed in publication.]

Chrysoclista rhamniella, Zell., in Hants and Dorset.—The distribution of this species is greater than that given by Meyrick (*Rev. Handbook Brit. Lep.*, p. 654). He gives East England to Sussex and Westmorland. I have bred it from larvae found in the Southampton district and from Cranborne and Parley in Dorset.—S. C. Brown, Bournemouth.

Coleophora conyzae, Zell., in Devon.—While on a holiday at Torquay in early May, I found a few larvae of *C. conyzae* feeding on *Inula*

conyza, DC. This appears to be a new record for the county, as Meyrick (*Revised Handbook British Lepidoptera*, 1927, p. 761) only gives Kent to Dorset and Oxford for its distribution.—S. C. Brown, Bournemouth.

A Collecting Note on Diptera.—In connection with my note in the July-August number of this magazine, I have had the following interesting confirmation from my friend Mr Audcent, who wrote to me as follows:—

"My experience confirms what you say, though I cannot give precise details except in one case. In 1919 we spent part of a summer holiday at Tickenham, close to Clevedon. The place was swarming with *Asilus crabroniformis*; I have seen as many as six at a time on a patch of cow-dung. My sons, lads of 7-9 years of age, caught them by hand and our host, a market gardener, brought them to me in numbers. Since then I have re-visited the spot and have seen either none or just an odd one. Last August I called on the market gardener, and he said "Do you remember them big waspies? I dunno as I have seen one since." Another case which comes to mind is *Eulalia* (*Odontomyia*) *tigrina*, which were so plentiful on Shapwick Moor in June 1921 that I ceased catching them. Since then I have re-visited the spot several times in June, and have come across odd specimens only."—H. W. Andrews.

CURRENT NOTES.

Mr B. J. Lempke (Amsterdam) has sent part IV (recently published) of his "Cat. of Netherland Macrolepidoptera." This comprises the *Noctuidae* and all the species have a few notes and references attached to each of the forms which have been recognised in Holland so far. These aberrations are shortly diagnosed. There are also a considerable number of newly-recognised forms and in some species the nomenclature is criticised strongly; some names in general use are rejected and new ones inserted. This pamphlet of 68 pp. is very well produced and thoughtfully worked out and should prove of great value for future workers.

The Society for Brit. Entomology continues to issue its *Transactions* very regularly, and demonstrates the great amount of investigation which the younger students of Biology are giving to the "other Orders," as they used to be called by those wedded to the more popular Orders, Lepidoptera and Coleoptera. Part 5 consists of Notes on "Insects associated with cultivated forms of *Rubus*," by G. H. L. Dicker. Part 6, by J. L. Williams (Pennsylvania), "The Occurrence of Spermatophores and their measurement in some British Lepidoptera." About 30 species are dealt with, well distributed over the Order, from *P. rapae* to *Borkhausenia pseudospretella*, and with numerous diagrams. Part 7. The Rev. E. J. Pearce and G. A. Walton have a paper, "A Contribution towards an Ecological Survey of the Aquatic and Semi-aquatic Hemiptera-Heteroptera (water-bugs) of the British Isles."

The *Journal*, Vol. II, 1, of this Society contains a large number of small contributions covering most Orders, with four plates and a number of text figures.

We cull the following extract from a letter recently received:—" Is the Swallowtail butterfly about to emulate the Comma and extend its range? A pupa found near Tilford was bred out here two days ago, and I have this morning (5th August) been informed by a correspondent that two were seen yesterday on the South Downs ' settling upon a round barrow just above the Long Man of Wilmington.' "—E. W. Swanton, Haslemere Educational Museum, Surrey.

The first Paper in the Report of the International Congress of Entomology at Madrid deals with the evolution of wing-pattern in the Palaearctic Satyridae. The author, B. N. Schwanwitsch, of Leningrad University, endeavours to establish two principles:—(1) Dimorphic radiation, by which any single pattern diverges in different directions in different species; (2) Parallelism, by which the occurrence of a given modification in different morphological environments is meant. The combination of these two principles, it is suggested, is responsible for the existing diversity of wing patterns. Diagrams illustrate these two principles. In the former case the position and variation in the first media (transverse line) and the latter the oblique position of the media and also by the basipetal dislocation of the 5th eye spot, in the various species.

In the same Report L. Berland, of Paris, refers to the little work which has been done in ascertaining the fauna and flora of the atmosphere by airplane and anticipates a surprising record if suitable methods of research are adopted and more continuous investigation carried on.

OBITUARY.

Sir Thomas Hudson Beare, B.A., B.Sc., LL.D., M.Inst.C.E., F.R.S.E., D.L., F.R.E.S., etc.

On 10th June last Sir Thomas Beare died at his residence in Edinburgh, at the age of 81. He was born at Adelaide, South Australia, on 30th June 1859, being a younger son of the late Mr Thomas Hudson Beare, of Netley, Adelaide, Australia. Educated at Prince Alfred College, and the University of Adelaide, he was awarded the Fife (Australia) Scholarship in 1880, and came to University College, London. In 1885 he married a daughter of the late Mr Alexander Newman, who survives him, and to whom we tender our deepest sympathy. In 1887, when only 29, he became Professor of Engineering in Heriot Watt College, Edinburgh. Two years later he obtained the oldest engineering chair in Britain—that of Mechanical Engineering in University College, London. In 1901 he was awarded the Regius Professorship of Engineering in the University of Edinburgh, and in 1914 he became Dean of the Faculty of Science. He was knighted in 1926, and in 1936 he was given the honorary degree of LL.D.

To mention only a few of Beare's numerous activities—many years ago he was a Captain in the Forth Volunteer Division of the Royal Engineers, and in 1914 he did a great deal to encourage recruiting; for many years he was Chairman of the North Edinburgh Unionist Association; an original member of the Miners' Welfare Committee; and

a member of the Sanitary Protection Association. He was elected a Fellow of the Royal Entomological Society of London in 1896, of which he was a Vice-President in 1910, 1932, and 1934, and was three times elected on the Council; he was also a Vice-President of the Royal Society of Edinburgh.

I first met Hudson Beare nearly 50 years ago when he was living at Richmond; and we spent very many happy days together in the past collecting beetles all over England and Scotland. He was an authority on the British Coleoptera and also studied a group of the *Scarabaeidae*. He wrote many notes and papers on Coleoptera to the various Entomological publications, and was the author of the latest Catalogue of British beetles—" A Catalogue of the recorded Coleoptera of the British Isles," London, 1930. The one before that, " Catalogue of British Coleoptera," London, 1904, he wrote in collaboration with the writer. He amassed a fine collection of British Coleoptera in which, like the writer, he only kept his own captures. He was instrumental in adding the following species of Coleoptera to the British List:—

Thanasimus rufipes, Brahm, which he was the first to capture in Britain in some number at Nethy Bridge [*Ent. Mo. Mag.*, **48**, 255 (1912)].

Aulonium trisulcum, Geoff., first taken by C. J. C. Pool at Enfield [*Ent. Record*, **16**, 310 (1904)].

Amischa scotica, Elliman [*Ent. Record*, **21**, 33 (1909)], and

Olophrum assimile, Pk. [*Ent. Record*, **20**, 255 (1908)], taken in company with the writer (the last named species in some numbers) in flood-refuse on the banks of the Spey near Nethy Bridge in 1908.

Aulonium ruficorne, Ol., and *Hypophloeus fraxini*, Kug., also in company with the writer in Dean Forest in 1922 [*Ent. Mo. Mag.*, **58**, 193 (1922)].

Anaspis hudsoni, Donis., was named after him by me on a beetle taken by me when staying with him at Nethy Bridge in 1908 [*Ent. Record*, **21**, 60 (1909)]. Further specimens were subsequently taken by himself.

It were difficult to find many people who have spent a more useful, energetic, or fuller life. Farewell!

HORACE DONISTHORPE.

CORRECTIONS.—Page 18, line 13, for " *stagnota* " read " *stygnota*."
Page 80, line 8, for " *Papilis* " read " *Papilio*."
Page 85, line 10, for " ♂ " read " ♀."

We hope by the close of the present year to have finished dealing with the last 6 species in Tutt's Vol. II of *British Noctuae* and in the new year to add the original descriptions of the new forms which have been announced since the revision has been in progress. It would be very helpful if our readers who know of any aberrations not dealt with in our notes would forward the references and (or) the descriptions for our use. The 6 species to complete are *Orthosia lota*, *O. macilenta*, *Anchocelis helvola* (*rufina*), *A. pistacina*, *A. lunosa*, and *A. litura*.

There will be a diagrammatic plate to illustrate the article on *Iodis lactearia*.

Culot, *N. et G.*, I (2), 63, plt. 49, f. 37 (1914), gave an excellent figure of an almost unicolorous red form. Prior authority Fb.

Draudt-Stz., *Pal. Noct. Supp.*, III, 115 (1934), used the genus name *Monima* and gave the aberration *rufa*, Dnhl.

Of the Variation Barrett says:—

"Usually but little variable though occasional specimens are paler or have the reddish tint over the buff partially replaced by a greyish shading; but in the West and particularly in Herefordshire, the opposite tendency is displayed, so that specimens are not only of a deeper red but have the colouring of the central band coarser and deeper, and the upper stigmata darker and more conspicuous, especially where, in some specimens, the squared spot between them is of a pale orange colour; in these there is a waved, slender, smoky-black line across the hind-wings."

He reports a specimen "Having the thorax and forewings entirely of a pale ochreous yellow."

Another "Having them of a smooth, brownish-slate colour tinged in the middle of the wings with orange."

Another "Wholly of a rich, deep brick-red, except that the lines and stigmata are faintly outlined with orange."

A New Forest specimen "Is darker, and the orange lines are broad and distinct."

Another "Has the central band of the forewings broadly and strongly dusted with smoky-black, the first and second lines more distinctly tinged with the same, and a small degree of similar dusting over the remainder of the forewings."

The Names and Forms to be discussed are:—

miniosa, Schiff. (1775), *Verz.*, 88.
miniosa, Fb. (1787), *Mant.*, II, 145.
ab. *rubricosa*, Esp. (1782-?), *Abbild.*, III, 381, plt. 75, 3-4.
ab. *virgata*, Tutt (1892), *Brit. Noct.*, II, 155.
ab. *pallida*, Tutt (1892), *l.c.*, 156.
ab. *rufa*, Dnhl. (1925-6), *Ent. Zts.*, XXXIX, 180.

Tutt dealt with (1) *miniosa*, pale reddish, unicolorous; (2) *rubricosa*, Esp., pale reddish, with dark red central band; (3) *virgata*, dull greenish-grey, with red central band: (4) *pallida*, pale ochreous-grey, unicolorous.

ab. *rufa*, Dnhl., *Ent. Zts.*, XXXIX, 180 (1926).

Orig. Descrip.—"Uniformly dark red-yellow, not only the central area." S. Tyrol.

Dyschorista, Led. (1857), Barr., Stdgr., Splr., Sth., Culot. [*Orthosia*, O. & Tr. (1816-25), Frr., Gn., Meyr., Meyr.: *Caradrina*, Ochs. & Tr. (1816-25): *Amathes*, Hb. (1821), Hamp., Warr.] *suspecta*, Hb. (1814-7).

Tr., *Schm.*, V (2), 271 (1825), described a species under the name *iners*, but certainly not a *suspecta* as most authors agree. It was placed

in the genus *Caradrina*, with *blanda*, *alsines*, *ambigua*, etc., and it is not the *iners*, Dup.

Gn., *Hist. Nat.*, V, 360 (1852), discussed the figures, names and descriptions, *congener*, Hb., 617 and 862, *iners*, Tr. & Dup., and *suspecta*, Hb., 633, which last figure he called the type, and *congener*, Hb., 862 (non 617) as a form (A), and which =*iners*, Dup. (nec Tr.). He said that *congener* differed from the type, being testaceous and more uniform, scarcely tinged with reddish; and the markings less clear except the stigmata, which are well marked.

Hamp., *Lep. Phal.*, VI, 487, treated the *iners*, Germ., *Fn. Ins. Eur.*, XVI, 24 (1837 corrected), as prior to *suspecta*, Hb. (1827), with *congener*, H.-G., and *laevis*, Dup., as synonyms, and *suspecta* he placed as an ab. of *iners*, Germ. He placed it in the genus *Amathes*, Hb. Hamp. gave the wrong date for *iners*, Germ., viz. 1817.

Warr.-Stz., *Pal. Noct.*, III, 153, plt. 37k and 38f (1910), treated this species as *iners*, Germ. (=*congener*, H.-G.). In this he followed Hampson and also in his treatment of *suspecta*, Hb., as an aberration of *iners*. [Hampson took the wrong date for Germ., XVI. It should be 1837 and not 1817. Hb. 633 *suspecta* is 1814-17, hence much prior. Hence the *iners*, Dup. (1836), should not be *iners*, Germ. (1837).] (Teste *Index Litterae* of Horn, etc.)

Tutt, *Brit. Noct.*, II, 156 (1892): Meyr., *Hand.*, 64 (1895): Barr., *Lep. Br. Is.*, V, 304, plt. 222, 2 (1899): Stdgr., *Cat.*, IIIed., 204 (1901): Splr., *Schm. Eur.*, I, 245, plt. 45, 29 (1906): Hamp., *Lep. Phal.*, VI, 487 (1906): South, *M.B.I.*, II, 7, plt. 7, 2-3 (1908): Warr.-Stz., *Pal. Noct.*, III, 153, plt. 37k, 38f (1910): Culot, *N. et G.*, I (2), 74, plt. 52, f. 12 and 13 (1914): Meyr., *Rev. Hand.*, 124 (1928).

Dup., *Hist. Nat.*, VI, 65, plt. 76, 5 (1826), described an insect under the name *laevis*, which is a *suspecta* form. Tutt said in his short diagnosis that this figure had its central area grey. This is not so. The figure in my copy is a more uniform blackish-red with marking tending to suppression in the ground colour, but Tutt is correct to the text of Dup., p. 65.

In *l.c.* Supp., III, 293, plt. 27, 2a-2b (1836), Dup. described another insect as *iners*. Each figure depicts a form of *suspecta*. Neither figure is "pale ochreous, almost unicolorous," as Tutt said. Fig. 2a agrees better with the text of Dup., but the forewing is divided into two areas, costal and inner marginal areas, the latter quite pale grey ochreous, the former dark clouded.

In *l.c.*, f. 2b, there are slight light bands on the inner margin with ground more or less otherwise unicolorous red, marking not emphasized, cf. *laevis*.

Hb.-G., *Samml. Noct.*, 862 (1836-8). This was called *congener* but is a *suspecta* form, very clearly marked on a mixed grey and red ground, the red being irregular transverse band-like on a grey ground: h.w. very blackish-grey.

Hb., *l.c.* (618 error), 617 (1814-7), *congener* is usually recognized as a *festiva* form. It is certainly not *suspecta*.

Hb., *l.c.*, 633 (1814-7), *suspecta*, practically unicolorous dull brown with marking almost suppressed: h.w. slightly lighter at base.

Frr., *Neu. Beitr.*, III, 26, plt. 209, figs. 2-3 (1839), gave 2 figs. certainly wrong in shape of wings, one a grey form the other with partial red colouring.

H.-S., *Sys. Bearb.*, II, 267 (1847), said that Hb., fig. 862, was very good for *congener* but the wing was a little short; he said that Frr., *Neu. Beitr.*, fig. 209, 2-3, *congener* was incorrect in shape, but not unrecognizable. H.-S. put a query before *suspecta* in his list doubting the identity of the two forms. The *badiago*, Tr., is given by H.-S. as a *congener*.

Stdgr., *Cat.*, IIIed., 204 (1901), noted that the *congener*, Frr., was not the *congener*, H.-G., 862, which was a paler grey *suspecta*.

Splr., *Schm. Eur.*, I, 245, plt. 45, fig. 29 (1906), has an irregularly banded figure comparable to that of Hb.-G. 862.

South, *M.B.I.*, II, 7, plt. 4, figs. 2-3 (1908), gave two good figures, fig. 2 has blackish-red coloration in the costal half of the forewing.

Warr.-Stz., *Pal. Noct.*, *l.c.*, took his aberrations from Tutt, viz., *pallida*, *grisea*, *nigrescens*, *rufa* and *variegata*.

Culot, *N. et G.*, I (2), 74, plt. 52, 12-13 (1914), gave 2 very good figures, 12 a red-banded form and 13 a more uniform grey figure " somewhat violet " and considered *iners*, Germ., as a form, pale ochraceous with markings only just traceable.

Of the Variation Barrett says:—

" Variation is considerable, the ground colour of the forewings ranging to rich, dark purple-brown and blackish-purple, and, on the other hand, to a mixture of purple-brown with tawny-red, or chestnut, or reddish drab; while the forms having the costal half of the wings of the darker colour are shaded over the dorsal and hinder portion with these paler tints. The most extreme variation in both directions seems to occur in Scotland, some examples from that country being of a brilliant light chestnut-red, or of a mixture of black and glowing red, or orange-red, or even silvery-grey. In S. Yorkshire, forms almost or quite as richly coloured are found, and some even pale yellowish-brown marbled with bright light red."

He records specimens, " Of a pale rosy-grey mottled with dark rosy-grey."

Another " Head, thorax, abdomen and forewings sooty-black, with only the edges of the stigmata paler."

Another " Has the basal half of the forewings buff with dark markings and the stigmata and hind margin equally pale."

Another " Of a brilliant glowing dark red, with black marbling and pale hind margin."

The Names and Forms to be considered:—

suspecta, Hb. (1814-7), *Saml. Noct.*, 633.
iners, Ochs. & Tr. (1816-25), *Schm.*, V (2), 271.
ab. *laevis*, Dup. (1826), *Hist. Nat.*, VI, 65, plt. 76, 5.
iners, Dup. (1836), *Hist. Nat. Supp.*, III, 293, plt. 27, f. 2a.
iners, Germ. (1837), *Fn. Ins. Eur.*, XVI, 24.
congener, Hb.-G. (1836-8), *Saml. Noct.*, 862.
congener, Frr. (1839), nec Hb., *Neu. Beitr.*, III, 26, plt. 209, f. 2-3.
ab. *pallida*, Tutt (1892), *Brit. Noct.*, 157.

ab. *variegata*, Tutt (1892), *l.c.*
ab. *nigrescens*, Tutt (1892), *l.c.*
ab. *nigrescens-variegata*, Tutt (1892), *l.c.*
ab. *rufa*, Tutt (1892), *l.c.*
ab. *grisea*, Tutt (1892), *l.c.*, cf. Dup., *Hist. Nat. Supp.*, III, plt. 27, f. 2b. [Tutt had Vol. IV, f. 26, in error.]

Tutt dealt with the forms:—(1) Pale reddish-grey, almost unicolorous, *pallida*. (2) Pale reddish, outer area and inner margin ochreous, *congener*, Hb.-G. (3) Bright red, almost unicolorous, *rufa*. (4) Bright red, with central area grey, *laevis*, Dup. (5) Bright red, outer area bright ochreous, *variegata*. (6) Dark blackish-red, almost unicolorous, *nigrescens*. (7) Blackish-red, with the outer area pale, *nigrescens-variegata*. (8) Pale ochreous, almost unicolorous, *iners*, Dup. (9) Dull brownish, almost unicolorous, *suspecta*, Hb. (10) Dark grey, almost unicolorous, *grisea*.

Tutt remarked, *l.c.*, 157, "an attempt to classify the principal varieties." Everyone who has dealt with it has found the species very difficult to deal with.

Dyschorista, Led. (1857), Barr., Stdgr., Splr., South, Culot. [*Hadena*, Shrnk. (1802), Dup.: *Polia*, Och. & Tr. (1816-25), H.-S.: *Orthosia*, O. & Tr. (1816-25), Tr., Frr., Gn., Meyr., and others: *Sidemia*, Stdgr. (1892), Hamp., Warr.-Stz.] *fissipuncta*, Haw. (1809): *ypsilon*, Schiff. (1775): *corticea*, Esp. (1788-?).

Hufn., *Berlin Mag.*, III (1766), described a species of Noctuid under the name *ipsilon*, which Rott. (1776) and all subsequent authors wrote as *ypsilon*. Schiff., *Verz.* in section N. (1775), referred to a species under the name *suffusa*, which Borkhausen fully described, *Naturg.* (1792). This was the Agrotid; which has been dealt with under the name *ipsilon*, Hufn. (ante II, p. 11). But Schiff., *l.c.*, section M. (1775), dealt with a Noctuid, whose larvae were attached to the "white poplar" (and other poplars and willows) under the name *ypsilon* (nec Rott.).

Illiger, in the *Neu Ausg.* of the *Verz.* (1801), called attention to the statement made by Schrank in Fües, *N. Mag.*, II, 212, in which he said that *ypsilon* in the Schiff. collection was the female of *dissimilis*, Knoch. *Beitr.*, I, plt. 4, f. 4 (=*suasa*, Bork., IV, 457). Illiger goes on to say that a certain amount of trust must be placed on this statement as Schrank himself saw the Schiff. collection.

Esper, *Abbild.*, IV, 463, plt. 145, figs. 2-3, gave two figures which he labelled *corticea*. These have been doubtfully considered to be the *ypsilon*, Schiff., by some authors, particularly by Werneberg, *Beitr.* The figures, in my opinion, are not to be recognised as a form of what we now call *fissipuncta*. It is said that fig. 2 shows the curious bifurcation of the claviform extension and that fig. 3 is a *variegata* form with scattered lighter spots and marks. In view of the opinion of Schrank and the remarks of Illiger, it seems better to ignore *corticea* or, as others (e.g., Tutt, Warren-Stz.) have done, to give it only a limited recognition.

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.

REPRINTS of articles may be obtained by authors at very reasonable cost if ordered at THE TIME OF SENDING IN MS.

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

TO OUR READERS.—Short Collecting Notes and Current Notes. Please, Early.—Eds.

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.

Urgently Wanted for Experimental Purposes.—Pupae of *hirtaria* and *lapponaria*. I can offer duplicates of very many species in return.—*Harold B. Williams, Croft Point, Bramley, Surrey.*

Desiderata—British *dominula* varieties with full data other than var. *lutescens* and var. *lineata*. Other vars. acceptable. *Duplicates*—British *L. l-album, exigua, cribrum, ocellaris*, and *intermedia*, etc.—*Dr H. B. D. Kettlewell, Cranleigh, Surrey.*

Wanted—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Estación Experimental, Casilla Correo 71, Tucuman, Republica Argentina.*

Duplicates.—Several thousand British Macro-Lepidoptera in perfect condition; full data. *Desiderata.*—British Micro-Lepidoptera in similar condition.—*S. C. S. Brown, Kingsholme, 454 Christchurch Road, Boscombe, Bournemouth.*

New Address—Kenneth J. Hayward, F.R.E.S., F.R.G.S., F.Z.S., Estación Experimental Agricola, Casilla Correo 71, Tucuman, Republica Argentina.

New Address—Bernard Embry, Esq., 23 Mill Drove, Uckfield, Sussex.

MEETINGS OF SOCIETIES.

WAR-TIME ARRANGEMENTS.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON : 41 Queen's Gate, S.W.7. October 2nd, at 5 p.m.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—2nd and 4th Thursdays from April onwards, 6 for 6.30 p.m., Chapter House Hall, St Thomas Street, S.E.1. *Hon. Sec., S. N. A. Jacobs*, Ditchling, Hayes Lane, Bromley, Kent.

THE LONDON NATURAL HISTORY SOCIETY.—Fixtures as printed in current syllabus cancelled. Members will be notified of further arrangements. *Hon. Sec., A. B. Hornblower*, 91 Queen's Road, Buckhurst Hill, Essex.

ENTOMOLOGICAL SECTION, BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—Evening Meetings. On the third Monday of each month, 7 p.m., at 55 Newhall Street, Birmingham. Visitors welcomed. Those who would like to attend or exhibit please apply to *G. B. Manley*, 72 Tenbury Road, King's Heath, Birmingham.

SOCIETY FOR BRITISH ENTOMOLOGY.—All meetings suspended till further notice. *Hon. Sec., E. Rivenhall Goffe*, 102 High Street, Southampton.

Communications have been received from or have been promised by T. Bainbrigge Fletcher, A. J. Wightman, W. P. Curtis, H. Willoughby-Ellis, E. Ernest Green, H. Donisthorpe, S. C. Brown, P. B. M. Allan, H. W. Andrews, Dr E. A. Cockayne, Zool. Socy. Appeal, the late Rev. C. N. Burrows.

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

Printed by T. Buncle & Co. Ltd., Arbroath.

Vol. LII.

No. 10

OCTOBER 1940.

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

CONTENTS.

Subscription for Complete Volume, post free,
TEN SHILLINGS,
to *The Hon. Treasurer*, H. W. ANDREWS, F.R.E.S.,
6 Footscray Road, Eltham, S.E.9.

This number, Price ONE SHILLING AND SIXPENCE (net).

NEW GENERIC NAMES FOR MICROLEPIDOPTERA.

By T. Bainbrigge Fletcher, R.N., F.R.E.S., F.L.S., F.Z.S.

(*Continued from page 19.*)

The following new generic names are required to replace homonyms and are now given:—

Pelochareila (Oecophoridae) for *Pelochares*, Meyrick, Exot. Micr., iv, 367 (1933), type *dryophthalma*, Meyrick, nec *Pelochares*, Mulsant and Rey, Hist. Nat. Col. Fr., Piluliformes, p. 161 (1869), Ann. Soc. Linn. Lyon, xvii, 361 (1869) (Coleoptera).

Petalostomella (Oecophoridae) for *Petalostoma*, Meyrick, Exot. Micr., iv, 123 (1931), type *lygrodes*, Meyrick, nec *Petalostoma*, v. Lidth de Jeude, Rec. fig. Vers. intest., Preface, p. 2 (1829) (Verm. Cest.), nec *Petalostoma*, Keferstein, Zts. wiss. Zool., xv, 438 (1865) (Verm. Geph.).

Philagraulella (Tineidae) for *Philagraula*, Meyrick, Exot. Micr., iii, 554 (1930), type *punica*, Meyrick, nec *Philagraula*, Hulst, Tr. Amer. Ent. Soc., xxiii, 310 (1896) (Lep. Uraniadae).

Pompostolella (Tineidae) for *Pompostola*, Meyrick, Exot. Micr., iii, 325-326 (1927), type *charipepla*, Meyrick, nec *Pompostola*, Hübner, Verz. bek. Schmett., p. 120 (1819) (Lepidoptera).

Sphenaspella (Oecophoridae) for *Sphenaspis*, Meyrick, Iris, xlviii, 38 (1934), type *droseractis*, Meyrick 1934, nec *Sphenaspis* (pro *Sternaspis*, Otto 1820), Verrill, Proc. Amer. Assoc., xxii (1873), No. 2, p. 367 (1874) (Verm. Polych.), nec *Sphenaspis*, Jakovlev, Trudui Russ. Ent., x, pp. 68, 72 (1877) (Hemiptera).

Syncrotaulella (Yponomeutidae) for *Syncrotaula*, Meyrick, Exot. Micr., v, 142 (1937), type *strepsicentra*, Meyrick, 1937, nec *Syncrotaula*, Meyrick, Exot. Micr., iv, 378 (1933) (Crambidae).

Taeniostolella (Glyphipterygidae) for *Taeniostola*, Meyrick, Exot. Micr., ii, 326-327 (1920), type *celophora*, Meyrick, nec *Taeniostola*, Bezzi, Mem. Ind. Mus., iii, 119 (1913) (Diptera).

Xylodryadella (Cryptophasidae) for *Xylodryas*, Meyrick, Exot. Micr., iii, 151 (1925), type *cryeranthes*, Meyrick, nec *Xylodryas*, Turner, Tr. R. Soc. S. Austral., xlvi, 285 (1922) (Geometridae).

Corrigendum.—Page 18, line 13, for "*stagnota*" read *stygnota*.

IODIS LACTEARIA, L.

By (the late) Rev. C. R. N. Burrows, F.R.E.S.

Concluded from page 103.

(Plate VII.)

The perfect insect is taken quite commonly at light, but I can find no record of its attraction by sugar, although I cannot convince myself that I have not taken it thus. Birchall records its capture at dog-wood flowers (*Entom.*, 1883, p. 186). But the net is the usual instrument of capture—as it flies freely at dusk, and is easily beaten out in daytime.

It is however but rarely that captured specimens are worth boxing. As to the variation to which the species is subject, I know little. The Linnean type is described thus: "Linn. (1758, *Sys. Nat.*, 519) Phalaena Geometra pectinicornis, alis angulatis albis immaculatis, antennis apice setaceis. Habitat in Europa.

Staudinger gives but one ab. *norbertaria*, Rössl, and describes it as "densius squamata, viridior." It came from Bilbao. I can learn nothing more about it. The description would probably apply to a bred specimen. The lined form becomes a good aberration:

1. *lactearia*, L. = without markings.
2. ab. *linea* n.ab. = with 2 distinct pale transverse lines on both fore and hindwings.

But I really know so little about the species—having met with it so seldom of late years—and question so much whether, if bred on a large scale, more definite forms of variation might be discovered, that it is impossible for me to presume to say more about the matter. It is to be noticed that this little Emerald shows both the transverse lines upon the under wings.

My diagram will explain itself. My specimens are this time suffering a little from one of the mistakes into which the most careful will sometimes fall. The pickle in which they were preserved had too much ammonia and this has distended, and somewhat disorganised the structure. This indiscretion on my part is not altogether to be regretted, as this distension has served the purpose of bringing out details. The egg is large as usual—coarsely reticulated, but, I think, much flatter than those which I have previously had before me. Our observation, when examining the young larva of *Nemoria viridata* is borne out in that of *Iodis lactearia*. When first hatched (Figure I) there is again the complete absence of the special organs, which in *Phorodesma smaragdaria* and *Comibaena pustulata* led me first to study this group of insects. The lateral flange is present but much less developed than in the species we have previously examined. The hairs or processes are much more uniform in shape and size and belong mostly to the balloon type, though here and there appear departures from the general form, which the material at my disposal is insufficient to investigate thoroughly. In the specimen which I have depicted, the first abdominal segment bears upon its lower edge posteriorly—a divided process, and the sixth, in the same position, one which appears to be more solid and darker than the rest. These hairs are enlarged on my plate (f. 1). The tactile hairs upon the second thoracic and eighth abdominal segments are highly developed, while the strong hairs or spikes which we observed in *Hemithea aestivaria* project from the forward edge of the first thoracic segment, in the direction of the eyes, and are not visible to me here. Otherwise there seem to be no points about this larva which call for attention. The evident unfitness of the rounder processes to hold silken threads or clothing is borne out by the habits of the larvae, which do not spin threads about their bodies, nor do such attach itself to them. Precisely the same observations hold good as to the larva in its second instar (Fig. II). Everything is as regular and orderly as could be. I have for the sake of uniformity drawn three of the most

marked hairs from this stage (f. 2), which may be accepted as samples of the whole. There is but the slightest trace in the thickening of the lower hair on 6th abdominal. The larva has throughout appeared somewhat granular in surface structure, but not until the third instar (Fig. III) has there been any marked development. Now, however, we perceive a resemblance to the same stage in *Nemoria viridata*, with a difference. There we saw ridges of plates or leaflets of clear skin or chitin, here we have to do merely with small points or roughnesses, varied here and there with tables or flattened surfaces. The side view (h) strikingly recalls a South African landscape with its "Table Mountains" on the horizon. The frontal projection on the first thoracic segment is very marked and strikingly bifid, and the division of the head extreme.

There again the hairs are strikingly uniform in shape. That upon the sixth abdominal, which I noticed previously is still abnormal, being now a beautifully developed γ, darker and stronger than its neighbours. Reversing the slide I find that the corresponding hair has the same shape, so that I must not regard it as a mere deformity. I have drawn three hairs—one being the last mentioned, from this instar also (f. 3). On the whole I fear that I have come to the conclusion that this is a most uninteresting larva. Perhaps I am tired of the group, perhaps as my larvae become less specialized I lose interest. Yet I shall always be grateful to *lactearia* for putting me on a new " track."

It will be noticed that in each of my figures of the whole larva—in each stage I have shown, above the anal claspers, an organ which I think deserves attention. Its presence naturally excited a good deal of interest and prompted more careful investigation. This organ is most delicate, jointed, pointed, perhaps with one or two hairs upon the apex. It is situated centrally beneath the anal passage. Measurements are not possible without special preparation—perhaps dissection of the larva, but comparison with the scale attached will give an idea of the size. I have (8) drawn these objects on a larger scale from each of the three instars. I have no knowledge whether attention has been drawn to this organ previously. That it is present in all Lepidopterous larvae I cannot assert, but that it is general in some groups is certain. I have carefully examined my whole stock of mounts of young larvae, 54 species, often several mounts of each, with this result:—

Butterflies, 2 species, no organ detected.
Bombyces, 6 species, no organ detected.
Noctuae, 8 species, no organ detected.
Geometrae, 38 species, organ detected in 13 species.

Of these 13 Geometrae possessing the process or organ, 6 belong to the group which I am studying, namely, *Nemoria viridata*, *Hemithea aestivaria*, *Geometra papilionaria*, *Iodis lactearia*, *Pseudoterpna pruinata* and *Hemistola chrysoprasaria*. That is to say, in 6 of our *Hemitheinae* out of eight. I have not detected it so far in *Euchloris smaragdaria* or *Comibaena pustulata*. The other species in which I have found it are *Rumia luteolata* (*crataegata*), *Angerona prunaria*, *Biston* (*Amphidasis*) *strataria*, *Erannis marginaria* (*Hybernia progemmaria*), *Oporinia dilutata*, *Phigalia pedaria* (*pilosaria*), and *Biston* (*Amphidasis*) *betularia*.

I should take more interest in these observations did I know that I was treading upon new ground. We know that considerable pains have been given to the study of larval structure, and even to the detection of rudimentary imaginal organs therein. I can scarcely imagine that these have escaped notice. I have read over carefully Tutt's remarks upon the sexual organs in Lepidopterous larvae (*Brit. Lepidoptera*, Vol. I, p. 59), the latest authority to which I have access, if any later exist. I find that the rudimentary organs are detected in certain species, and read " but up to the present time there appears to have been no external openings, in connection with the sexual organs, discovered in any Lepidopterous larvae." The species examined were the larger Bombyces and *Pieris brassicae*, not a single Geometer. The conclusions to which I have myself come with regard to these organs are : —

1. That absence from my mounts does not of necessity prove absence from a species, inasmuch as the organ may be withdrawn, or concealed in a particular specimen.
2. That though the organ is sometimes absent from one mount of a species and present in another, it is not safe, for reason 1, to conclude that this is a sexual organ. (In my mounts of *Nemoria viridata* it is not to be detected in all of 1st instar.)
3. That although only detected in the Geometrae, there is no reason to infer its absence from the rest of the Lepidoptera.
4. That while one is forbidden to think the organ sexual, there exists no reason why it should not prove urinary.

As I am now happily drawing near to the end of my assigned task there can be no harm in " showing my hand." Therefore for my own satisfaction (being, like the novel-reading lady, too impatient to wait for the end) I have drawn carefully to one scale the first abdominal segments of each of our 8 " Emerald " moths in the 1st instar. The result to me is startling. I had no idea, until I started the work, what my measurements really meant. I can understand now the reason of my difficulty when I took in hand *Hemithea aestivaria* after the larger larvae. I was so startled with these drawings that I imagined at first that I had been led astray by shifting of the instruments, and was not content until I had again measured the first drawing and convinced myself that no error had thus arisen.

I must finally note that I have had this time to depend largely upon free-hand drawing, an art in which I am not an expert. This may atone for the errors as well as account for the greater tidiness of the drawings.

COLLECTING NOTES.

Euphydryas aurinia, New to Snowdonia.—On 28th September last my wife, Mr A. J. Merchant, Mr S. H. Brocklersby, and myself were collecting on one of the more Southern mountains of the Snowdon range. At an elevation of 750 feet my wife found a nest of *E. aurinia* larvae. Further search by the four of us produced about a dozen nests confined to an area of not more than half an acre. As the only other

North Welsh locality is over fifty miles away, on low-lying ground, we hope this discovery may yield a new local form of this Butterfly. Is it possibly the highest recorded altitude for *aurinia*?—J. Antony Thompson, M.A., F.Z.S., F.R.E.S., Roe Wen, October 1.

For those who are so situated as to be able to communicate or obtain more recent biological facts of *Iodis lactearia* than those in the belated account given in the Burrows paper we are publishing, we give the following list of references, localities, etc., from the copious notes compiled by the author. Burrows and Raynor took this species at Brentwood from the beginning of May to mid July. Burrows reported ova laid 7th July which hatched 14th July. He also took it at Wanstead, Bentley, Rainham and Mucking on various dates in June and his last date for Mucking was 8th July. Among localities within reach of the Metropolis are Epping Forest, Chingford, Loughton, Bushy Heath, Horsley, Dorking, Oxshott, Reigate, Bexley, Ashdown Forest, Guildford, Wimbledon, Darenth, and, further afield, New Forest, S. Devon, I. of Wight, Abbots Wood, Winchester, etc. In 1901 Dollman recorded it at the end of May and again on 13th September. This is suggestive of a second brood, as is Nicholson's observation.

October is the time when the lepidopterist perforce has to limit his activities mainly to the three major methods of collecting—Sugar, Ivy, and Pupa-digging. In present circumstances the two former are precluded and the last is so limited by chance and ill fortune that many will not risk the discouragement of oft repeated failure for one long-delayed lucky dig. Not only does chance determine results, but mice, etc., are often active competitors in the search and usually early on the job. Abundance of many species of *Eupithecia* can be obtained now by beating the flowering stalks of ragwort, yarrow, golden-rod, Angelica, etc., into an umbrella. Where plenty of garden aster, michaelmas daisy, is grown, one can be sure to get larvae in plenty. For the micro-lepidopterist, this is the time to collect seed heads of many plants—wild carrot, rush, yarrow, *Suaeda maritima*, Umbellifer heads, *Hypericum* stems, sea aster, *Artemisia*, *Luzula*, golden rod, *Centaurea*, etc. Mined leaves of many trees and shrubs should be obtained now. The mines of the beautiful Lithocolletids can be obtained in quantities in leaves of oak, elder, birch, poplar, sallow, etc., and are easy to breed if put into a large flower pot covered with leno and placed outdoors with very little shelter, exposed to all weathers. The *Nepticula* mines can be collected in a similar way, but require a certain amount of shelter from the direct influence of the weather. Birch, oak, beech, nut, hawthorn, rose, *Pyrus*, *Rubus*, elm, agrimony, poplar, etc., will give plenty of mines, but as pupation does not take place in the mines the leaves must be obtained early, just before they fall.

CURRENT NOTES.

The Hon. Treasurer thanks those subscribers who have paid as a result of his recent circular, but would urge those whose subscriptions are still outstanding to help him in the increasingly difficult matter of

financing the magazine by forwarding their subscriptions as soon as possible. Circulars were sent to all outstanding subscribers at their last known address.

In the *Trans. Amer. Ent. Soc.*, xiv, 117 (1887), the late Dr Holland, in a note on *Pyrameis cardui*, wrote:—" The primal decree on account of sin was that the earth should bear ' thorns and thistles,' and so wherever there is earth there are thistles, and wherever there are thistles there is the thistle butterfly."

It is a pleasure to record the wonderful care of our postal officials in dealing with communications of various kinds. The other day I received a small consignment of papered moths captured at light by my friend Mr Sneyd Taylor, of Graef Reinet, S. Africa. They were packed in a thin cardboard box suitable for handkerchiefs, gloves, etc., and measuring 7 in. by 9 in., with a layer of wool and thin paper covering them. There was an outer covering of brown paper and thin string. In fact, the package was so frail that one could crample it with one's hand. Yet there was not the slightest harm to any of the 35 specimens contained. This is not an isolated case, as other similar consignments have reached me equally cared for from time to time. It is really wonderful.

Until quite recently one of the most neglected sections of the Rhopalocera was that of the *Hesperiidae* of the Neotropical Region. This Family is exceptionally abundant in species in the Americas, especially some of the groups which contain numerous species whose facies are marked by characters greatly similar. Thus, while the other families of Rhopalocera in America contained some of the most attractive insects of the globe, collectors could not be induced to obtain the unknown less outwardly attractive species of the " skippers." Less than twenty years ago our cherished friend and correspondent, Kenneth J. Hayward, after several years residence in Aswan, where in the intervals of his professional work he studied the scanty local lepidopterous fauna, accepted an engagement in a firm in the Chaco forest region of the Argentine Republic. There he took the opportunity to work at the Lepidoptera in an area which contrasted strongly with the desert around Aswan. Gradually he has taken up the problem of the *Hesperiidae* and we have received from him during the last few years quite a number of separates describing many new species and forms, and containing figures of some species with many diagrams of the critical portions of the genitalic structures. Lately Hayward has gone outside the Argentine for his material and our Ecuador correspondent, Mr Clarke MacIntyre, has sent him new species for study, and other consignments have reached him from Paraguay and Brazil. The three separates lying before us deal with about twenty new species with taxonomic notes on many others.

The Royal Entomological Society of London continues to publish a large amount of matter each year. For the present year so far there lies before us thirteen numbers of the four series that are brought out. The *Transactions* consist of 4 parts (4 separate papers), of which " A Comparative Study of the Larval Morphology of Leaf-mining Lepidoptera in Britain " is the most interesting to us. Species from 10 Fami-

lies are discussed, illustrated by many diagrams. Of the *Proceedings* A, "The insect fauna of the waste area of Tilbury Dock," by H. M. Edelsten, is a very useful record of natural colonisation on made-up waste ground. Mr Edelsten also announced the occurrence of a new British species of *Coleophora*, *C. otitae*, on *Silene nutans* in Kent. Dr Blair recorded the history of the excessively rare black form of *Cicindela campestris*, of which one of the British examples was taken by the late Dr Chapman in 1858. Mr C. N. Hawkins discussed the occurrence of ventilation (?) holes in the cocoons of *Eriogaster lanestris* and of *Hipparchus papilionaria*. Of the *Proceedings* B (Taxonomy), there are 6 parts, with 26 items mostly of Exotic interest, including the decription of a new S. American Plume-moth, by T. B. Fletcher. Then we have part 7 of "Generic Names," comprising those of the British Hydradephaga (Col.) by Prof. W. A. F. Balfour-Browne.

The *London Naturalist* for 1939 appeared in 1940. The entomological items in this Annual are rather less in quantity than in previous reports and are contained in about 8 pages. Mr Burkill gave his usual survey on British Butterflies in 1939. There is a useful series of Notes on British *Asilidae* ("robber flies") in Surrey by L. Parmenter and H. Oldroyd, and Notes on two species of *Dolichopodidae*, by L. Parmenter. Mr Burkill contributes Records of Plant Galls for 1939, and Mr R. W. Robbins the Lepidoptera of Limpsfield Common. This last-mentioned area is being surveyed in all its aspects during the past three years as a definite item of the Society's work, and many members are taking part individually and by various field meetings of the Society. The whole report, as usual, is admirably produced.

An abbreviated Congress of the S. Eastern Union of Scientific Societies was held in July this year in London in the rooms of the Linnean Society. The only entomological item was the Annual Report of the Insect Immigration Committee to the Zoological Section. The main item of this report was the remarkable influx of *Pieris brassicae* and *P. rapae* in 1939 into southern England, the "larvae of which caused more extensive damage than for the past 20 years; but so large a percentage of the larvae were parasitized that past conditions are not expected to result this year."

The Annual Report of the S. London Entomological and N.H. Socy. for the year 1939-40 was issued in July. It consists of a volume of 104 + xx pp. and 6 plates. The Proceedings—Reports of the 18 evening meetings—occupy 24 pages and contain records of the exhibits and short notes. The Reports of Field Meetings, of which there were 15, are contained in 15 pages of additional records of observations and captures made at the places visited. The Annual Address by the President, Harold B. Williams, LL.D., F.R.G.S., was devoted to "Preliminary Observations on the Genus Gonepteryx," well illustrated by specimens and drawings. Perhaps the most outstanding Memoir in the Transactions section was that on "Hybrids" by Dr E. A. Cockayne, a masterly summary of what is known of hybridization from a deeply scientific point of view, with an appendix containing a list of purely British hybrids and another list of hybrids of species on the British List having one or both parents of Continental origin. Gynandromorphs,

Parthenogenesis, Prothetely, Cytology, Mendelian Segregation, etc., are some of the detailed subjects comprised. Dr Cockayne in another paper described two new species of British Geometers with a plate. Mr C. N. Hawkins gave detailed records of two broods of the *Lycia* hybrid *wallacei*, illustrated by two plates. The interests of the Micro-lepidopterist are not overlooked for there is a most useful and practical article on " Breeding and Setting Micro-lepidoptera," by L. T. Ford. Baron de Worms discussed " Sugaring." Mr C. Niblett recorded Gall-causing Insects and their Parasites. The whole Report affords a volume of valuable material in the study of entomological science and a fine continuance of the long period of such work from the year 1872. The frontispiece is an excellent picture of the ova of *Aglais urticae* by A. W. Dennis. There is a beautiful plate of aberrations in the collection of Rev. J. N. Marcon, and another of a striking aberration of *Polyploca flavicornis* in the de Worms collection.

Dr Karl Jordan contributed an attractive article to the International Congress of Entomology held at Madrid in 1935, of which the Report has only recently been published. " Where Subspecies Meet " contains thoughts induced while on the excursion to the Picos de Europa, arranged under the auspices of the Congress committee. While some enjoyed the scenery of, to them, a new country, others took the opportunity to collect and observe, the actions of the members being inexplicable to the native people. He goes on to say, " The reason for the inquisitiveness of the excursionist goes back to the far-away time when Adam, young and inexperienced, lost his estate in consequence of a confidence trick, and all the contents of the Garden of Eden became scattered over the Earth; some species, too weakly after the soft life in the garden of plenty and too disgruntled with the rough conditions they encountered outside, died out, while others, of a more robust nature, or more cunning and accepting the new life as they found it, appropriated the various countries in which they happened to settle and became the founders of new races, as did Noah's sons, Shem, Ham, and Japhet. The story must be true in the main, for we find indeed that the majority of species consist of two or more, sometimes dozens of races each living in its own country, and that every district has its own races." The author goes on to record the gradual increase in the number of races and subspecies in proportion to the number of new species described, and to the general acceptance by biologists of this line of research, and also to record the results achieved by this more intensive study of geographical variation. Finally the author's study of the mouse-flea in various more or less closely joined Continental areas is brought in to aid in the reply to his title statement " Where Subspecies Meet."

In the *Report of the Madrid Meeting of the International Congress of Entomology* there are in English, in addition to the two papers which we have already dealt with, five others: 1. H. F. Barnes, " Fluctuations in Insect Numbers." 2. F. S. Bodenheimer, " The Ecology of Aphids in a Subtropical Climate." 3. C. H. Kennedy, " Definitions of the Animal Family and the Animal Society." 4. E. P. Mumford, " Taxonomic Notes on Insects of the Marquesas Islands." 5. W. Pospelov, " Fertility of certain obnoxious Lepidoptera in connection with Meteorological Conditions."

Borkhausen, *Scriba Beitr.*, II, 128, plt. 9 (not 8 as Werneb. said), fig. 6 (1791), described a species as *ypsilon*, which was figured under the name *nunatrum*. The figure is that of *hepatica*, L., as is the description. The colour is certainly *hepatica* as well as the marking. Cf. Werneb., *Beitr.*, II, 258 (1864). This, Bork. admits, *Naturg.*, IV, 505, when he redescribed *ypsilon*, Schiff. (1792).

Haw., in *Lep. Brit.* (1809), described this species under the name *fissipuncta*, which name, in place of the confused and uncertain use of the name *ypsilon*, has been used by many authors, including Warr.-Stz., *Pal. Noct.*

Tutt, *Brit. Noct.*, II, 158 (1892): Meyr., *Hand.*, 64 (1895): Barr., *Lep. Br. Is.*, V, 299 (1899): Stdgr., *Cat.*, III ed., 204 (1901): Splr., *Schm. Eur.*, I, 246 (1906): South, *M.B.I.*, II, 8 (1908): Hamp., *Lep. Phal.*, VII, 445 (1908): Warr.-Stz., *Pal. Noct.*, III, 179 (1911): Culot, *N. et G.*, I (2), 74 (1933): Meyr., *Rev. Hand.*, 124 (1928).

Hüb., *Samml. Noct.*, 136, gave a figure of *ypsilon* which is not readily recognized as such, although H.-S. (*Bearb.*, II, 262) considered it good. It is one of those forms which may come under ab. *variegata*, although not a pale example.

Dup., *Hist. Nat.*, VI, 135, plt. 81, 5 (1826), gave a fairly large good figure of *ypsilon*. In his *Cat.*, 131 (1844), he placed it in *Hadena*, Bdv.

Frr., *Neu. Beitr.*, IV, 64, plt. 329 (1842), gave a figure of this species, which H.-S. (*l.c.*) described as "quite unrecognizable." Shape and arch of forewing are correct, and the bifurcation of the claviform is well developed, as well as the submarginal line. Otherwise the figure is bad.

Gn., *Hist. Nat.*, V, 361-2 (1852), took the name *ypsilon*, Schiff. (1775) for this species.

Splr., *Schm. Eur.*, I, 246, plt. 45, f. 30 (1906), gave a good figure showing a well developed bifurcation of the claviform and the *ypsilon* mark quite plainly.

South, *M.B.I.*, II, 8, plt. 4, figs. 4-5 (1908), gave two figures of the nondescript, indefinitely marked examples of this species, in which the usual characteristic markings are present, but more or less indefinite in expression and hidden by absence of portions and irregular expansion and suffusion. A most difficult species to delineate.

Hamps., *Lep. Phal.*, V, 445 (1908), adopted the name *ypsilon*, Schiff. (nec Rott.) (1775).

Warr.-Stz., *Pal. Noct.*, III, 179, plt. 41i (1911), treated *ypsilon*, Schiff., and *nun-atrum*, Scriba, as synonyms. They placed Tutt's *nigrescens* as var. A of Haw., and gave six figures, *fissipuncta*, ab. *corticea* ♂ and ♀, ab. *orenburgensis*, and ab. *conjuncta* ♂ and ♀.

They used the genus *Sidemia*, Stdgr., placed next to *Crymodes*, the genus of *exulis*.

Culot, *N. et G.* (1913), I (2), 74, plt. 52, figs. 14 *fissipuncta*, 15 *orenburgensis*, gave two excellent figures. 14 is darkish grey-brown, 15 has a very pale ground with well expressed marking.

Of the Variation Barrett says:—

"There is variation of the ground colour of the forewings to paler brown, more rarely to light yellowish-brown, and still more in the various

black markings, which sometimes are much emphasised, in others are partially or wholly obliterated."

He records a specimen "Combining both phases, being of a pale tawny colour, with no trace of the black markings about the claviform stigma and at the back of the subterminal line, and is only with difficulty recognized as belonging to this species."

Another whose "Colour is pale and the central black markings are absent, but along the hind margin is a row of black bars arising from the submarginal black spots, and of these, one arising at the anal angle runs far into the wing."

Another pale specimen from Shoreham "Is shaded with yellow and in some degree with red."

The Names and Forms to be considered are:—
[*ipsilon*, Hufn. (1766), *Berlin. Mag.*, III, 416.]
ypsilon, Schiff. (1775), *Verz.*, 78 (nec Rott.).
[*ypsilon*, Rott. (1776), *Naturforsch.*, IX, 141, No. 99.]
ab. ? *corticea*, Esp. (1788?), *Abbild.*, IV, 463, plt. 145, 2-3.
[*nunatrum*, Bork. (1791), *Scriba Beitr.*, II, 128, plt. 9, f. 6.]
ypsilon, Bork. (1792), *Naturg.*, IV, 503-4.
fissipuncta, Haw. (1809), *Lep. Brit.*, 197.
ab. *nigrescens*, Tutt (1892), *Brit. Noct.*, 160.
ab. *variegata*, Tutt (1892), *l.c.*
ab. *obscura*, Favre. (1899), *Fn. Macr.-Lep. Valais*, 188.
ssp. *orenburgensis*, Bart. (1902), *Iris*, XV, 211.
ab. *conjuncta*, Warr.-Stz. (1911), *Pal. Noct.*, III, 179, plt. 41.
ssp. *oberthüri*, Roth. (1920), *Nov. Zool.*, XXVII, 38.
ab. *cinerea*, Heinr. (1923), *Deutsch. ent. Zt. Beih.*, 87.
ab. *obsolescens*, Lenz. (1927), *Schm. Sudbay.*, II (2), 321.

Tutt dealt with (1) the pale greyish *fissipuncta*, Haw. (*ypsilon*, Bork.); (2) the reddish-ochreous *corticea*, Esp.; (3) blackish fuscous *nigrescens*; and (4) dark, variegated with paler *variegata*.

ab. *obscura*, Favre., *Fn. Macro-Lep. Valais*, 188 (1899).
Orig. Descrip.—"Much darker and more brown." Martigny, etc.

race *orenburgensis*, Bart., *Iris*, XV, 211 (1902).
Orig. Descrip.—"Ground colour of forewings very light, grey, suffused reddish, with black, distinctly prominent markings. (These consist of a basal streak and a marginal line to the neighbourhood of the stigmata, which line in the reniform is only rarely very weakly produced in black, while in v. *orenburgensis* it mostly stands out very strongly and only in one single specimen is it weak.) The hindwings also are paler especially at the base. Colour of body grey, not brown, as in the typical form. V. *orenburgensis* shows a much greater contrast to the type form than the ab. *iners* to *D. suspecta* and must therefore with much more reason be designated by a special name. It is interesting that in the Volga-Ural neighbourhood, according to Eversman, the usual brown form occurs; Herr Lief collected in the Orenburg Government only the grey form, which here is therefore treated as a variety."

ab. *conjuncta*, Warr.-Stz., *Pal. Noct.*, III, 179 (1911).
Fig.—*l.c.*, plt. 41.

Orig. Descrip.—" Purplish fuscous, the veins and stigmatal annuli whitish, the upper stigmata strongly conjoined."

subsp. *oberthüri*, Roth, *Nov. Zool.*, XXVII, 38 (1920).

" Differs from *fissipuncta* in being much paler, in the markings being less pronounced, in the submarginal band being much straighter and less sinuate, and in the postmedial band being well developed in most specimens and much nearer the reniform." Algeria.

f. *cinerea*, Heinr., *Deut. ent. Zeitschr. Beih.* (1923), 87.

Orig. Descrip.—" Of a pale ashy-grey ground colour, without any admixture of yellow." Digne.

ab. *obsolescens*, Lenz., *Schm. Sudbay.*, II (2), 321 (1927).

Fig.—*l.c.*, plt. 16, 13.

Orig. Descrip.—"Of the markings only the traces of the stigmata and of the submarginal line remain."

Orthosia, Ochs. & Tr. (1816-25), Steph., Gn., Meyr., Barr., Stdgr., Splr., South, Culot, Meyr., etc. [*Amathes*, Hb. (1821), Hamp., South, Warr.] *lota*, Clrck. (1759).

Clerck, *Icones*, plt. 8, fig. 1 (1759), gave a quite recognizable figure without text, with the name *lota* attached. The colour is dark grey, lead colour, with the conspicuous black spot.

Linné, *Fn. S.*, gave the first description, No. 1137 (1761), and a further description in *Sys. Nat.*, Ed. XII, 830 (1767).

Orig. Descrip.—" Alae superiores cinereae atomis aliquot nigris, maculisque duabus obsoletis solo margine conspicuis: anteriore orbiculari, postiore cordiformi, ut in rusticis; in macula posteriore ad latus interius punctum magnum atrum. Striga fulva f. purpurascens latere postiore albida; striga haec versus posteriora semel diffracta est. Subtus alae pallide cinereae cum puncto atro et striga fusca, obsoleta, armata," p. 302.

Tutt, *Brit. Noct.*, II, 160 (1892): Meyr., *Handb.*, 63 (1895): Barr., *Lep. Br. I.*, V, 351, plt. 229, 1 (1899): Stdgr., *Cat.*, IIIed., 206 (1901): Splr., *Schm. Eur.*, I, 248, plt. 46, 8 (1906): Hamp., *Lep. Phal.*, VI, 479, f. (1906): South, *M.B.I.*, II, 12, plt. 7, 5-6 (1908): Warr.-Stz., *Pal. Noct.*, III, 151, plt. 37 d, e (1911): Culot, *N. et G.*, I (2), 78, plt. 53, 11 (1914): Meyr., *Rev. Hand.*, 124 (1928).

De Geer, *Mem. Ins.*, II (1), 419, plt. 7, f. 16 (1771), described this species *lota* under the title " Phalene de l'hippophäe," " d'un brun luisant roussâtre avec une ligne transverse rousse, et un gros point noir" (Goeze, *Beitr.*, III (3), 252).

Schiff., *Verz.*, p. 76, Fam. L. (1775), called it the " Water-willow Noctua."

Esper, *Abbild.*, III, 335, plt. 67, fig. 1 (1783 ?), gave a recognizable fig. rather too large; among the Bombyces.

Ernst. & Engr., *Pap. d'Eur.*, VII, 5, fig. 400 a, b, c, gave a very fair figure of *lota* under that name. They point out that the specimens

figured have purplish edging to the stigmata, they differ from others that have been figured and are probably figures of a varietal form.

Hb., *Samml.*, 166 (1800-3), figured *munda* under the name *lota*, and 167 *lota* under the name *munda*. The *lota* (167) was too large, too dark and not leaden at all and had the two stigmata completely filled in with black, and thus was hardly recognizable.

Haw., *Lep. Brit.*, 122 (1803), described *lota* as a *Bombyx* as did most of his predecessors. However, in (1809) *l.c.*, 242, he placed it as a *Noctua*.

Frr., *Beitr.*, III, 60, plt. 111 (1830), gave a figure much better than all of his contemporaries, with perhaps too distinct marking, particularly on the underside.

Dup., *Hist. Nat.*, Supp., III, 298, plt. 27 l (1836), gave an unrecognizable figure of rich red-brown ground, with two dark transverse bands, one each side of the black spot. In vol. VI, 80, plt. 111, 3 (1826), Dup. described and figured (poorly) *T. munda* under the name *lota*, influenced by the errors of Linn. referred to above.

Gn., *Noct.*, I (5), 362, gave plt. 131 reference to Frr. It should be plt. 111.

Splr., *Schm. Eur.*, I, 248, plt. 46, fig. 8 (1906), gave a bad figure labelled ab. *rufa*, Tutt, quite unrecognizable as *lota*.

Hamp., *Lep. Phal.*, VI, 478, f. (1906), gave the reference "Linn., *Sys. Nat.*, Xed., 513 (1758)." This is *iota*, a *Plusia* (*Phytometra*), and placed between *interrogationis* and *festucae*. It is impossible to suggest how this error arose. Linn., *Sys. Nat.*, XIIed., 830 (1767) gave the correct description (as a *Bombyx*) and referred to Clerck's *Icones*, plt. 8, f. 1 (1759). Perhaps Hamp. followed Gn., *Noct.*, V, 362 (1852), who ignored Clerck. It was then usual to take the XIIed. of Linn., *Sys. Nat.* (1767), as the official commencement of the Linn. nomenclature.

South, *M.B.I.*, II, 12, plt. 7, f. 5-6 (1908), gave two dark leaden-grey figures probably referable to the ab. *suffusa*, Tutt.

Warr.-Stz., *Pal. Noct.*, III, 151, plt. 37 d, e (1910), treated *hippophaes*, Rossi, as a synonym, added the name *subdita* for a form from Amasia, and gave five figures, none of which had the usual dull grey leaden ground so familiar in Britain, *lota* ♂ and ♀, *rufa*, Tutt, and *subdita* ♂ and ♀, all poor figures.

Of the Variation Barrett wrote:—

"Not very variable, but the general colour of the forewings ranges from pale grey to dark slate-brown and to red-brown, specimens from western districts being especially liable to red variation; sometimes the hindwings have a paler tone from the base to beyond the middle, in which case there is usually a dark transverse band bounding this pale colouring, and sometimes a grey-white margin outside it. Rarely the black spot in the base of the reniform stigma is quite obsolete."

The Names and Forms to be considered are:—
lota, Clrck. (1759), *Icones*, plt. 8, f. 1 (no text).
lota, Linn. (1761), *Fn. S.*, 302.
hippophaes, D. Gr. (1771), *Mem. Ins.*, II (1), 419, plt. 7, f. 16.
munda, Hb. (1800-3), *Samml. Noct.*, 167.
ab. *pallida*, Tutt (1892), *Brit. Noct.*, II, 161.

ab. *suffusa*, Tutt (1892), *l.c.*
ab. *rufa*, Tutt (1892), *l.c.*
ab. *subdita*, Warr.-Stz. (1910), *Pal. Noct.*, III, 151, plt. 37 e.
ab. *bipuncta*, Whrli. (1911) [*Vorb. et M.-R.*, I, 378].
ab. *pallida*, Heinr. (1923), *Deut. ent. Zt.*, 88.
ab. *frigga*, Skala (1929), *Zt. Oestr. ent. Ver.*, XIV, 54.

Tutt dealt with (1) *lota*, and "*munda*," Hb.; (2) *pallida*, a pale whitish-grey form; (3) *suffusa*, blackish; (4) *rufa*, reddish.

ab. *subdita*, Warr.-Stz., *Pal. Noct.*, III, 151 (1910).

Fig.—*l.c.*, plt. 37 e.

Orig. Descrip.—"The grey ground is duller and paler in both wings, and the black in lower lobe of the reniform is much reduced." Amasia. The figure is poor.

ab. *bipuncta* (Wehrli, i.l.), Vorbrodt., *Schm. der Schw.*, I, 378 (1911), Frauenfeld.

Possesses a double black, brown margined spot, which lies on the basal line between the two stigmata. The bordering joins the two stigmata together.

ab. *pallida*, Hein., *Deut. ent. Zeitschr., Beih.* 88 (1923).

Orig. Descrip.—"Of a very pale grey colour." Digne. This is no doubt the *pallida*, Tutt.

ab. *frigga*, Skala, *Zt. Oestr. ent. Ver.*, XIV, 54 (1929).

Orig. Descrip.—"With a broader, paler marginal band on the hindwing upperside." Austria.

Orthosia, Ochs. & Tr. (1816-25), most authors [*Amathes*, Hb. (1821), Hamp., Warr.-Stz., Drdt.-Stz.] *macilenta*, Hb.

Tutt, *Brit. Noct.*, II, 161 (1892): Meyr., *Handb.*, 63 (1895): Barr., *Lep. Br. Is.*, V, 354, plt. 229, 2 (1899): Stdgr., *Cat.*, IIIed., 206 (1901): Splr., *Schm. Eur.*, I, 249, plt. 46, f. 9 (1906): Hamp., *Lep. Phal.*, VI, 479 (1906): South, *M.B.Is.*, II, 13, plt. 7, 7-8 (1908): Warr.-Stz., *Pal. Noct.*, III, 151, plt. 37 e (1911): Culot, *N. et G.*, I (2), 79, plt. 53, 12 (1914): Meyr., *Rev. Handb.*, 123 (1928): Draudt-Seitz, *Pal. Noct. Supp.*, III, 152 (1934), 258 (1937).

Hüb., *Samml. Noct.*, 418 (1808-9), the type figure is of a "brownish (almost reddish) ochreous," Tutt. His fig. 688, labelled *macilenta*, is a form of *circellaris*.

Ernst. & Engr., *Pap. d'Eur.*, VII, 12, fig. 409 (1790) gave two figures, of which the forewings of 409 b are good as to marking, size, etc., but by far too deep (bright) in colour. 409 a, and the hindwings of 409 b, are "roh u. grell" as Werneburg says.

Dup., *Hist. Nat.*, VII, 64, plt. 104, 5 (1827), gave a good figure of typical *macilenta*.

Steph., *Ill.*, II, 148, described this species, and on the same page dealt with the *flavilinea*, Haw., which he figured, plt. 19, 1 (1829), and

which he suspected to be a form of *macilenta*, and in *l.c.*, III, 68 (1829) is sure of their specific identity.

Frr., *Beitrage*, III, 150, plt. 141, f. 1 (1830), is not a good figure in that all the markings are much too emphasised both on upper and undersides. In the text, p. 151, Frr. referred to Treit's conclusion that Hb. 688 was not *macilenta*. His figure in *Neu. Beitr.*, III, 80, plt. 251 (1839), is much better but still too strongly marked.

Frr. here referred to Treit, who had described the larva in error, *Schm.*, V (2), 215 (1825), but subsequently corrected his description, VI (1), 407 (1827), with which Frr.'s figure of the larva 251 agreed well.

Wood, *Ind. Ent.*, 41, plt. 10, 147-148 (1834), figured both *flavilinea* and *macilenta* as practically identical.

Splr., *Schm. Eur.*, I, 249, plt. 46, 9 (1906), gave a much too deeply coloured figure, in fact of little use for identification.

South, *M.B.I.*, II, 13, plt. 7, 7-8 (1908), gave two figures of good colour but marking should be more apparent for ordinary British specimens.

Hamp., *Lep. Phal.*, VI, 479 (1906), quotes Haw., *Prod. Lep. Brit.*, 15 (1802), the name *unimaculina* for this species. Haw. did not use this name as he had proposed, and there being no description or figure it is not valid.

Warr.-Stz., *Pal. Noct.*, III, 151, plt. 37 e (1910), Genus *Amathes*, gave only one aberration, *nigrodentata*, Fuchs. They illustrated a light male and a darker female.

Culot, *N. et G.*, I (2), 79, plt. 53, 12 (1914), gave an excellent figure with fitly emphasised black dot and outer submarginal line.

Draudt-Corti-Stz., *Pal. Noct.*, III, 152 (1934), added two aberrations, *immaculata*, Gauckler, and *pallida*, Höfer, a brown form and a very pale form respectively, and on p. 258 was added the ab. *rufa*, Hörhm. (1937).

Of the Variation Barrett writes:—

"Rather variable in the ground colour, from dull pale yellow to light fulvous or reddish-ochreous; also in the presence or absence of the black spot in the reniform stigma, and of the central shade, these being most frequently obliterated in specimens from the North of England and South of Scotland."

He records one example "Which has the first line distinct, black, broadly bent, and excessively indented, and the second line also distinctly black and disposed in sharp crescents, the more usual markings all present."

In all variations the subterminal line remains fairly distinct.

The Names and Forms to be discussed are:—

macilenta, Hb. (1808-9), *Samml. Noct.*, 418.
flavilinea, Haw. (1809), *Lep. Brit.*, 243.
ab. *obsoleta*, Tutt (1892), *Brit. Noct.*, II, 162.
ab. *straminea*, Tutt (1892), *l.c.*
ab. *straminea-obsoleta*, Tutt (1892), *l.c.*
ab. *nigrodentata*, Fuchs. (1899), *Jahrb. Nass.*, LII, 135.
ab. *immaculata*, Gauckl. (1909), *Iris*, XXII, 136.
ab. *pallida*, Höfer (1913), *Ent. Zt.*, XXVII, 16.
ab. *rufa*, Hörhm. (1936), *Ent. Zeit.*, L, 359.

Tutt dealt with (1) the deep yellow or reddish-ochreous with central dot, *macilenta*; (2) ditto, without the central dot, *obsoleta*; (3) pale straw with distinct central dot, *straminea*; (4) ditto, without the central dot, *straminea-obsoleta*.

ab. *nigrodentata*, Fuchs., *Jahrb. Nass. Ver.*, LIII, 135 (1899).

Orig. Descrip.—" Forewing with 3 black spots at the base and two emphasised black transverse lines, the inner irregularly toothed, the outer regularly and sharply toothed. In ordinary specimens the transverse lines are only very wavy, the outer parts of the waves marked by fine black points on the veins which become the points of the teeth, but they do not coalesce at all."

Hamp., *Cat. Lep. Ph.*, VI, 479 (1906), describes it thus: " Forewing with the sub-basal, ante-, and post-medial lines black and strongly dentate."

ab. *immaculata*, Gauckl., *Iris*, XXII, 136 (1909).

Orig. Descrip.—" Forewing upperside almost without marking; the reniform stigma with the dark spot wanting; also the reddish on the inside whitish margined straight line before the outer margin is wanting. The rest of the normal colour." Hardtwald near Karlsruhe, 1903.

ab. *pallida*, Höf., *Ent. Zts.*, XXVII, 16 (1913).

Orig. Descrip.—" The ground colour of the upperside of the forewing is a pale ochre-yellow, without reddish suffusion. The fringes of all the wings, the thorax, and body are of the same colour, in each of which the absence of the reddish tinge is wanting. The markings are the same as in the typical form." Near Vienna.

ab. *rufa*, Hörham, *Ent. Zeits.*, L, 359 (259) (1936).

Orig. Descrip.—" In this species there are two distinct forms. The commoner is leaden brownish. The rarer of a bright reddish-ochre. In this latter ground colour the distinctly brownish median and marginal lines disappear, while the marginal band following the yellow line stands out stronger." S. Bavaria.

Anchocelis, Gn. (1852), Stdgr. (1) [*Orthosia*, Och. & Tr. (1916-25), Meyr. (1), Barr., Stdgr. (2), Splr., Sth. (2), Culot, Meyr. (2): *Xanthia*, Ochs. & Tr. (1816-25), Dup., Steph., Wood: *Amathes*, Hb. (1821), Hamp., Sth. (1), Warr.-Stz.] *helvola*, Linn. (1758).

In his " Essai " in *Ann. S. ent. Fr.*, viii, 483 (1839), Gn. wrote *Anchoscelis*, which some authors have adopted.

Linn. described this species under two names. In *Sys. Nat.*, Xed., 507 (1758), *helvola*, and three years later under the substituted name *rufina*, *Fn. S.*, 1142 (1761). He treated it as a *Bombyx*, next to *russula*.

Esper, *Abbild.*, IV, p. 327, plt. 123, 1 (1786-?), described and figured a species under the name *catenata*, as a Noctuid. In a foot-note the author gives the references to *helvola*, L., and *rufina*, L., and stated that in dealing with *russula* he considered *rufina* to be the ♀ of that species. But since Schiff., *Verz.*, 86 (1775), dealt with it as a Noctuid, he (Esper) followed him.

Tutt, doubtless influenced by Esper's figure and description, which gave a definite diagnosis to the second name of Linn., viz., *rufina*, used it as a varietal name on account of the rich red coloration of the anterior wings with reddish fuscous fasciae inclining to purplish (cf. the figure of Esper), while he took the first name, *helvola*, L., as the type name.

[Until late in the last century it had been usual to consider the beginning of the binomial nomenclature to be the XIIed. of the *Sys. Nat.* of Linn., 1767. The change to the Xed. of the *S.N.* of Linn. has been the cause of many troublous tangles with our names.]

Tutt, *Brit. Noct.*, II, 162 (1892): Meyr., *Hand.*, 62 (1895): Barr., *Lep. Br. Is.*, V, 335, plt. 226, f. 2 (1899): Stdgr., *Cat.*, IIIed., 206 (1901): Splr., *Schm. Eur.*, I, 249, plt. 46, f. (1906): Hamp., *Lep. Phal.*, VI, 482 (1906): South, *M.B.I.*, II, 15, plt. 9, 1-2 (1908): Culot, *N. et G.*, I (2), 79, plt. 53, 15 (1914): Meyr., *Rev. Hand.*, 123 (1928).

Ernst. & Engr., *Pap. d'Eur.*, VII, 12, f. 410 a, b, c (1790), gave fairly good figures; b, a well-marked form with the purplish tinge, and a, a bright red form with less marking.

Bork., *Naturges.*, IV, 687 (1792), described a form of this species as a Noctuid under the name *punica*, saying that it was the *catenata*, Esp., and in a note on the synonymy said that the ending of Esper's name *-ata* was a Geometrid ending and for that reason he had called his insect *punica*. This form was characterized by " yellowish-purple colour or a mixture of purple and yellow." Bork. subsequently dealt with *rufina*, L., *l.c.*, 751, and pointed out that Linn. described it as " affinis Bomb. russulae," but that this could not be as the female of the latter did not have three transverse bands.

Hb., *Samml. Noct.*, f. 184 (1800-03), gave a good figure of the deep red *rufina*.

Dup., *Hist. Nat.*, VII (1), 473, plt. 130, 3 (1827), described and figured this species under the name *rufina*. The figure is much like a copy of Hübner's 184. The central band is not elbowed enough nor does it show the usual break near the dark bottom end of the reniform. It is included in the genus *Xanthia*.

Wood, *Index.*, 68, plt. 15, f. 376 (1834), gave a grey-brown figure with no suggestion of red, except that the body was pink!!

Gn., *Hist. Nat. Noct.*, V (1), 364 (1852), considered *helvola*, L., *catenata*, Esp., and *punica*, Bork., as synonyms of *rufina*.

Splr., *Schm. Eur.*, I, 249, plt. 46, f. 11 (1907), gave a good account of the variation in the species and a very fair figure of a ruddy-brown form, somewhat dark. He introduced two new forms, *extincta* and *uniformis*.

South, *M.B.I.*, II, 15, plt. 9, f. 1-2 (1908), gave a figure of the deep red, with distinct bands typical form, and an almost unicolorous red form, ab. *rufa*, Tutt. Both are good figures.

Warr.-Stz., *Pal. Noct.*, III, 152, plt. 37 f g (1910), gave a good account of the variation including ten named forms, of which ab. *pallescens* was new. Seven figures were given on the plate, of which none show the beauty of the fresh coloration: *Helvola*, *catenata*, *ochrea*, *unicolor*, *sibirica*, and ♂ and ♀ of the new *pallescens*. The colour of r. *sibirica* is shown of a slightly ochreous pale grey with no trace of the reddish (purplish) tinge, and with marking absent or only just traceable.

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.

REPRINTS of articles may be obtained by authors at very reasonable cost if ordered at THE TIME OF SENDING IN MS.

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

TO OUR READERS.—Short Collecting Notes and Current Notes. Please, Early.—Eds.

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.

Urgently Wanted for Experimental Purposes.—Pupae of *hirtaria* and *lapponaria*. I can offer duplicates of very many species in return.—*Harold B. Williams, Croft Point, Bramley, Surrey.*

Desiderata—British *dominula* varieties with full data other than var. *lutescens* and var. *lineata*. Other vars. acceptable. *Duplicates*—British *L. l-album, exigua, cribrum, ocellaris,* and *intermedia,* etc.—*Dr H. B. D. Kettlewell, Cranleigh, Surrey.*

Wanted—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Estación Experimental, Casilla Correo 71, Tucuman, Republica Argentina.*

Duplicates.—Several thousand British Macro-Lepidoptera in perfect condition; full data. *Desiderata.*—British Micro-Lepidoptera in similar condition.—*S. C. S. Brown, Kingsholme, 454 Christchurch Road, Boscombe, Bournemouth.*

New Address—Kenneth J. Hayward, F.R.E.S., F.R.G.S., F.Z.S., Estación Experimental Agricola, Casilla Correo 71, Tucuman, Republica Argentina.

New Address—Harold B. Williams, from Bramley, to 2 Mitre Court Buildings, Temple, E.C.4.

New Address—J. Antony Thompson, from Rhas School, to Roe Wen, near Conway.

MEETINGS OF SOCIETIES.

WAR-TIME ARRANGEMENTS.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON : 41 Queen's Gate, S.W.7. (Nearest stations : S. Kensington and Gloucester Road.) General Meetings at 3 p.m., on the first Wednesdays of the month, February-June; October-December. Annual Meeting, third Wednesday in January.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—2nd and 4th Thursdays from April onwards, 6 for 6.30 p.m., Chapter House Hall, St Thomas Street, S.E.1. *Hon. Sec., S. N. A. Jacobs*, Ditchling, Hayes Lane, Bromley, Kent.

THE LONDON NATURAL HISTORY SOCIETY.—Fixtures as printed in current syllabus cancelled. Members will be notified of further arrangements. *Hon. Sec., A. B. Hornblower*, 91 Queen's Road, Buckhurst Hill, Essex.

ENTOMOLOGICAL SECTION, BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—Evening Meetings. On the third Monday of each month, 7 p.m., at 55 Newhall Street, Birmingham. Visitors welcomed. Those who would like to attend or exhibit please apply to *G. B. Manley*, 72 Tenbury Road, King's Heath, Birmingham.

SOCIETY FOR BRITISH ENTOMOLOGY.—All meetings suspended till further notice. *Hon. Sec., E. Rivenhall Goffe*, 102 High Street, Southampton.

Communications have been received from or have been promised by T. Bainbrigge Fletcher, A. J. Wightman, W. P. Curtis, H. Willoughby-Ellis, E. Ernest Green, H. Donisthorpe, S. C. Brown, P. B. M. Allan, Dr E. A. Cockayne.

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

Printed by T. Buncle & Co. Ltd., Arbroath.

Vol. LII.

No. 11

NOVEMBER 1940.

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

CONTENTS.

Subscription for Complete Volume, post free,
TEN SHILLINGS,
to *The Hon. Treasurer*, H. W. ANDREWS, F.R.E.S.,
6 Footscray Road, Eltham, S.E.9.

This number, Price ONE SHILLING AND SIXPENCE (net).

RANDOM NOTES ON BRITISH NOCTUAE.

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

Cucullia absinthii, Linn.—In 1938 I had the pleasure in taking some full-fed larvae of this species in Dorset.

Apparently this species is not greatly troubled by parasitic flies. At least none of mine were stung.

It appears to average 1½ in. full in expanse of forewings when bred from wild full-fed larvae.

There are two somewhat different forms of wing pattern:

a. Only one dark transverse band reaches inner margin.

b. Both dark transverse bands reach inner margin.

The ground colour varies a good deal. Pale grey and slate-grey examples occurred, the vast majority of insects being of an intermediate shade.

Leucania l-album, Linn.—I have bred this species in bulk and find there is a very fair amount of variation.

There are several very different shades of ground colour in bred examples and the markings may be much increased or reduced from the average, while the *l-album* mark is in some examples twice as long as in others. I failed to breed any examples in which this mark is absent or reduced to a dot (*o-album*, Milman).

I have selected the following four examples as representative of what is apparently the ordinary variation one may expect to meet with when this species is bred in numbers.

A. Ground colour pale bright whitish-ochreous; markings confined to a dark suffused streak along the median nervure. Some dark shading on the lower part of outer margin and an acute triangular patch on the upper part of outer margin. Some small streaks in area of apical patch. Slight darkened area along inner margin; this is a very yellow looking example although all these markings, such as they are, are deep brown tinted grey.

B. Ground colour rather deeper in shade than in A. above. Markings occupy almost whole area of forewings; the only pale areas being the costa, a small patch in lower half of basal area, two short pale longitudinal lines in upper part of submarginal area and two longer and brighter lines along the nervures from the *l-album* mark to the outer margin; markings in deep hard grey-brown.

This is a dark grey-brown looking insect.

C. Ground colour pale ochreous-grey; marking pale grey, very flat, and without any contrast; *l-album* mark very short.

This is a very matt-grey looking insect; if faded or worn it would be nearly unicolorous.

D. Ground colour pale ochreous-brown, marked heavily in red-brown; short *l-album* mark, rather wide pale diagonal streak at apex.

This is a warm red-brown insect.

Bred *l-album* tend to be larger than caught ones. 1½ in. expanse of anterior wings not unusual.

Heliothis peltigera, Schiff.—This species was again about around the Dungeness area of Kent in 1938 in enormous numbers.

I bred several hundred and again failed to get any specially pale forms.

I did, however, get several which were nearly unicolorous mahogany-brown and one which is unicolorous blackish-brown.

This species is in some years free or nearly free from the attacks of parasitic flies. In other years it has been well stung but Dungeness seems to be an area where it is largely free from attack, while at Gastbourne, in Sussex, I have found it to be attacked not only by small flies but by a large wasp-like species.

From the way in which these larvae feed in company and exposed one would suspect a much larger number to be stung.

Plusia chryson, Esper.—This species has in the past been recorded from various parts of the County of Sussex.

Having had good experience in recent years of finding these larvae in Hampshire both in the autumn before hibernation and in the spring when full fed I have tried to use the knowledge so gained to find the species in Sussex, but without success.

The variation, as far as I can see, is confined to the metallic patch in forewings which is sometimes more green than gold and sometimes more gold than green in bred examples; in this the species is like its congener *chrysitis*, which also has gold and green patch forms, but, unlike *chrysitis*, *chryson* seems to be otherwise very constant.

Agrotis vestigialis, Rott.—This species is easy to take as it emerges and before it has developed its wings, once the breeding ground is known.

I have now had a good number of insects through my hands in the course of the last four or five years, and find that as is the case with *A. cinerea* and other allied species each year produces some fresh form not previously met with in the locality.

It is not surprising to have taken nearly all the forms mentioned by Tutt, *Brit. Noctuae and Vars.*, Vol. II, 16-20, but I have also found in this single locality a number of forms described in recent years from far distant Continental places, such as *albidior*, Petersen, *olivacea*, Hartig, *violascens*, Heydemn, and *amniensis*, Stgr., suggests that the species produces many forms wherever it occurs and that probably few forms are confined to special areas. However, I have never found in the locality I work in Hampshire examples belonging to Tutt's group D, page 18, *Brit. Noc. and Vars.*, Vol. II.

Heliophobus oditis, Hb. (hispida, Hb.-Gey.). I was lucky enough to take a nice freshly emerged series of this species by searching in its haunts during a flying visit to Portland in September 1938, and was given others taken the same night in a moth trap.

I have for some time had a special desire to find this insect before it has flown, in order to see if I could detect a violet bloom or tinge, such as I have been told is present before flight, and also to try and reconcile the statement in Tutt, *British Noctuae*, Vol. I. 126, that Portland forms are pale (compared with those from Torquay) and the rather opposite statement by R. P. Demuth quoted by W. Parkinson-Curtis in *Trans. Soc. for British Entomology*, Vol. I, Part 2, page 252, that Portland forms are dark compared with those from Southants and Studland,

which would suggest a very great difference between Torquay and South Hants and Studland forms.* The 14 insects taken before they had flown are very varied in colour and include dark blackish-grey forms, both with brown-tinged narrow sub-marginal band and the same ground colour with wide very white sub-marginal band. Many which have flown and lost scales are of this pattern, but it does occur naturally, as is proved by the above.

There are also two ab. *argentea*, Tutt, both ♂♂, and a number of intermediate forms, all but one of these are ♀♀.

None of mine is or was violet in the pale areas, but the colouration of some is such that it is easy to imagine a purplish tint is present, but a magnifying glass will dispel this idea. The darker markings are purple-brown, the pale areas ochreous.

It would, therefore, seem that Portland produces both light and dark abs.

Mr H. J. Turner, in *Noc. and Vars.*, Vol. I, 126, quotes Count Turati (*Nat. Sicil.*, Nos. 7-12) as having distinguished three species, *oditis*, Hb., *hispida*, Hb.-Gey., and *intermedia*, Tutt, chiefly on the evidence of the differences in the genitalia. This author also says the fig. of *oditis*, Seitz, *Pal. Noc.*, III, 29c, is, in fact, *hispida* and not *oditis*, but Dr Zerny has questioned the accuracy of Turati's findings.

I have seen a note somewhere by Mr Richardson of Portland saying that he had not noted violet-tinted *hispida* there until 1889 and had failed to find any in 1890, so that the violet colour was seasonal. I quote this from memory. I cannot trace it now. But it may have been his fancy. Personally, I should have thought that Seitz, fig. 29c, did in fact represent our species. It is almost exactly the colour of Torquay specimens and certainly is not violet on the pale areas as *hispida* should be. I am, therefore, disposed to think that the differentiation of our species as *oditis* and not *hispida* is not proved, and that it is at least possible that *oditis* and *hispida* are forms of a single species and that both forms occur in these islands. Where do the violet marked insects come from and just how violet are they? Can any one tell me where I can obtain an example?

Noctua castanea, Esp.—This species is very plentiful in the larval stage around Pulborough, and in late May after a shower of rain after a sunny day hundreds of larvae come up to drink, when they may be taken just after dark on the heather.

I have bred large numbers and find bred examples definitely larger than those taken wild in spite of the fact that larvae were full fed when taken. This must in some way be connected with the fact that the larvae go down in sandy soil and do not pupate until this dries out (just as with *A. ripae*).

Wild larvae may be longer getting the right dryness and shrink in the waiting. This is the only way I can see to account for the larger size of bred insects.

I found that kept exposed to the sun, the sandy soil soon dried out

*Richardson stated (*Proc. Dorset Field Club*, XI, 59, 1890) that "dark and light forms occur in Portland and figured such forms on his plate (opp. page 47).—T. B. F.

and pupation took place in June. Kept in covered tins, pupation took place in August, but when the soil was too damp the larvae died.

All our forms are much alike on the underside, but the upper surface of anterior wings may be grey, pinkish-grey, pale pinkish-lilac, dull red, bright red, deep red.

The reds are in the majority and the pinkish-lilac form the rarest; the nearest forms I have seen from elsewhere to this colour are from Aberdeen, but there the colour is more lilac and less pink.

So far I have failed to find a yellow form, but one red one I bred had a yellow streak along the left-hand forewing along the inner margin.

PSYLLIODES NAPI, KOCH, VAR. HIGNETTI, VAR. NOV. (COL. CHRYSOMELIDAE), A VARIETY NEW TO SCIENCE.

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

Blue, base of antennae and legs yellow, posterior femora black, last 5-6 joints of the antennae blackish. The thorax is furnished with a distinct tooth at apex of anterior angles, and is covered with fairly close, small, shallow punctures, the spaces between being distinctly alutaceously punctured. Elytra with the usual punctured striae. Long, 2.7-3 mm. Described from seven specimens (six taken by Mr J. Hignett, and one taken by myself) swept off watercress at Oswestry, Shropshire. Type in B.M. Coll.

This variety differs from the typical form in the possession of the tooth to the anterior angles of the thorax. Moreover, in *P. napi* the punctures on the thorax are more sparing and not as close together, and the spaces between are much less alutaceously punctured; this puncturation being practically wanting in some specimens. On the average *napi* is larger, and 6-8 of the last joints of the antennae are blackish.

On 1st June last, when in company with my friend, Mr J. Hignett, I swept a specimen of a *Psylliodes* off watercress growing in a small stream by the side of a road in Oswestry. When set I found it did not agree with any of the species of *Psylliodes* in the B.M.; neither in my own collection, nor in the British and general collections there. Having written to Hignett about it, he sent me up six specimens of the form with the tooth (which agree with mine in every particular), which he had taken in previous years off watercress (*Nasturtium officinale*) in this district, and six specimens of *P. napi*, which he had swept off hedge mustard (*Sisymbrium officinale*).

It is just a point whether this insect should be treated as a good species or not. Perhaps it is safer to describe it as a variety until more has been learnt about the habits and dissection made of the genitalia of freshly captured insects, etc.

I have pleasure in naming it var. **hignetti** in honour of Mr J. Hignett who has done, and is doing, such good work with the beetles of Shropshire.

Department of Entomology,
British Museum (Nat. Hist.), 24.x.40.

PSEUDOTERPNA PRUINATA, HUFN.

By (the late) Rev. C. R. N. Burrows, F.R.E.S.

(Plate VIII.)

I would preface my remarks with an apology for the brevity of my tale about this species, and reminding my readers that I have been so deeply interested in other kinds of Tails for the last few months, as to have seriously curtailed my observations on this species.

However, I feel that my readers will bear with me when they reflect that I have been contributing my little mite to the "Tale of Tails" which has so recently been published. [*The Genitalia of the Noctuidae of the British Isles*, F. N. Pierce.] Indeed, had it not been for Mr Prout's usual kindness and helpfulness, I should feel entirely helpless, for the common insect, which is my theme, has been strangely neglected by me.

The type description of Hufnagel's *pruinata* reads as follows: "*Phalaena pruinata*, Die Reifmotte. Whitish-green, dusted with dark green, and a white crenulated transverse stripe. In woods. July and August. Of the second size. Rather rare" (*Berl. Mag.*, IV, p. 520, 1767). "Second size." (Hufnagel roughly groups the Geometers by three sizes) = intermediate between large and small.

On p. 625, a note is added:—"I have sometimes found specimens of this species which have no green colour, this being replaced in them by whitish, or even by reddish-grey, but the markings are just the same, hence I take them to be merely aberrations."

Phalaena prasinaria, Fab. (*Syst. Ent.*, p. 626, 1775), not of Hufnagel, was this species, and has always been recognised as such. The Fabrician name was retained by Schwarz as recently as 1793, and he figures it as *prasinaria* in his work (*Beitrage*, Pl. IV, figs. 8-9).

Geometra immaculata, Thunberg (*Diss. Ent.*, I, p. 8, 1784). Werneburg (*Beitrage*, II, p. 200, 1864) determines this for a small markingless var. of *pruinata*, and says that he has himself taken such a form on the Isle of Sylt. The type specimen of Thunberg is still extant at Stockholm, and Lampa (*Entom. Tidskrift*, VI, p. 87) states that this specimen is not in good condition. At any rate, he says that he cannot venture to determine the species, but redescribes it, and shows from the neuration that it cannot be a *Pseudoterpna*, but should be referred to *Phorodesma*. Later, Aurivillius (*Nordens. Fjärilar*, p. 198), having also studied the type specimen, places it in *Nemoria*, says it is a separate species, the type specimen remaining unique, and suggests that though Thunberg supposed it came from Upsala, it may really have been an accidental introduction. For myself I am content to let *immaculata* go, whether as a synonym, aberration or variety of *pruinata*, or as a distinct species.*

The variation noticed in Staudinger's *Catalog.* (1901) is as follows:—

1. Ab. (et var.) *agrestraria*, Duponchel is defined thus: "al. ant. unicolor. viridibus, tantum antice albo-strigatis," which, being trans-

*Prout-Seitz have determined this as a form of *Phorodesma smaragdaria*, IV, 27. But in IV, Supp., 219 (1938) it was definitely determined as = *chrysoprasaria*, Esp. = *vernaria*, Hb.

lated, reads: Forewings unicolorous green, lined with white (or white lines on the costa).

"The British Museum Collection," writes Mr Prout, "has a pretty, almost white ♀ from Dantzic," thus labelled. It is in exquisite condition (?bred) and certainly not solely a discoloured specimen. The lines and discal mark are normal. The sub-terminal, faintly discernible, being clearer white. A Dantzic ♂ would also belong to the same form, though slightly more tinted with green, and one or two more, without precise locality ("Europe") are mixed in the series.

2. Var. *simplex*, Alphéraky.*

3. Var. *virellata*, Krulikowsky (*Soc. Ent.*, XXIII, p. 11 (1908)), described from Eastern Russia as "larger, darker, more unicolorous, or less speckled with white than the type."

I have not myself been very happy in my dealings with the species—although so common and generally distributed. I have, therefore, reason to thank Messrs Harrison and Main for the opportunity of examining the very fine series which they bred, and noting the various forms exhibited by the 37 specimens to the best of my ability.

a. Forewing pale bluish-green; the two transverse lines darker. The subterminal line pale, ... 5 specimens.
H.w. central dark line and discal lunule; subterminal line pale.

b. Darker, bluish-green. The two transverse lines darker, enclosing darker band, ... 8 specimens.
A banded specimen was sold at Machin's sale and, with 5 *smaragdaria*, brought £2. *Entom.*, 1895, p. 132.
Mr Nicholson records the capture in Epping Forest of another banded specimen, *Ent. Record*, 1895, p. 68. One does not know the extent of this aberration and is unable to compare the specimens with those in Harrison and Main's series.

c. Almost unicolorous blue green.
1. With pale subterminal line.
2. Without pale subterminal line.

d. Almost unicolorous dark green.
1. With pale subterminal line.
2. Without pale subterminal line.

e. Olive green, ... 3 specimens.

f. Discoidal cell comparatively pale.

Besides these forms, which I think include all that I have observed, I find certain others recorded.

g. Brown. Bred by Mr Goulton, from Ranmore (*Entom.*, 1905, p. 30).
Rich yellow-brown. Bred by the Rev. E. Tarbat, from Mortehoe, Devon (*Entom.*, 1905, p. 318).
Brown. Taken by Mr Cockerell at light at Chislehurst, 13.vii.83 (*Entom.*, 1885, pp. 20-56).
Arkle (*Entom.*, 1889, p. 292) refers to the idea that this brown colour is brought about by emergence in wet weather, and Cockerell

*A species, Prout-Seitz.

(*Entom.*, 1889, p. 3) says, "We know that the green pigment in *Geometra papilionaria* is first brown, and in *Pseudoterpna pruinata* the final change to green frequently does not occur, producing the well-known brownish form of the species."

h. Unusually green. Taken by Mr Heasler in the New Forest. It would be interesting to know whether this specimen is still in existence. The intensification of the green is not unusual in the "Emerald" group.

i. Blue. Major Robertson records (*Entom.*, 1893, p. 132; *Ent. Record*, 1893, p. 48) the capture of some "quite blue" specimens at or near Swansea. No further information is given as to whether the specimens were pure blue—as appears to be implied—or only blue-green. This appearance of blue in the "Emeralds" is quite usual; there appears to be a bluish form of most of the species.

j. Grey. *Pseudoterpna coronillaria*.*

As I have remarked before, I must for the present leave the division or separation of these forms or aberrations for further study.

But for convenience, I transcribe Meyrick's description, which I consider correct and as concise as can be needed.

"Head, white mixed with green, face black. Forewings dull green, sprinkled with white, first and second lines dark green, waved, irregular, subterminal line cloudy whitish, a darker green, discal mark, tips of cilia whitish. Hindwings as forewings but paler, more whitish basally, markings more indistinct, first line absent, termen rounded." I would add that, as is so usual, the lines vary much from mere dotted threads to distinct waved bands, and that the outer dark line in waving invades the outer margin and tends to throw out dark lines along the nervures.

P. pruinata is another species in which the pattern of the forewings is more or less continued on the lower wings. The outer dark line is generally distinctly continued, and there is generally a similar darker discal mark. The whitish subterminal line is also when present on the forewings also found on the lower. I have remarked with some surprise how clearly the outer dark line is shown on the underside.

When dealing with "Emeralds," it is always necessary to speak about the fading. I have three ancient specimens of *pruinata*, which will, I think, convince the greatest sceptic that this species does not fade to a brown or yellow.

The larva is said to be described by E. Newman in the *Entomologist* (1865, p. 223). But one notices that he does not republish the description in his *British Moths*, so I give Meyrick's description: "Larva green, white spotted, dorsal line darker, subdorsal pale yellowish-green, spiracular rosy-white, purple edged beneath, with a branch down the third leg. Head and second segment bicuspidate, tips dark red."

Edward Newman gives the oval period at 15 days, and I have a note of 11 days. The only food plants I can find recorded are *Genista anglica*, Furze and Broom, though one would expect the larvae to take to allied species. As a rule the young larvae hibernate, but I find one record of a larva feeding up bagged in the open, and producing an imago on 6th September (Taylor, *Entomologist*, 1896, p. 315). Normally the larvae

*A species, Prout-Seitz, IV, 14.

lie up when, I suppose, in the third instar, and begin feeding again in late April or early May. They pupate in a slight cocoon amongst the twigs of the food-plant, or even upon the ground. Mr Bell, proving the response of the pupae to these surroundings, exhibited at one society's meeting, 5th June, 1894, three pupae, one of a greenish tint, the larva having spun up in a leaf; one suffused with very dark grey, the larva having pupated in a cocoon on the surface of the earth; the third, normal (?), although the larva had mingled particles of earth in its cocoon.

The imago appears from the end of June right on into August (17th, Mucking; 21st, Newlyn, Penzance). I have found no second brood record of the wild insect. It flies at dusk, comes persistently to light and even to sugar. This is my experience, and it is recorded by Mr L. S. Hodson (N.F., *Entom.*, 1904. p. 119).

It appears to be generally distributed, if not always common, throughout Britain. Meyrick says: "Britain to the Clyde—Ireland, rather common." I have found records from Kirkcudbrightshire, Isle of Man, Kerry, North and South Wales, North Cornish coast, Mortehoe, North Devon, South Dorset, Co. Cork, Ashdown Forest, Hawick, Mucking, and S.E. London.

The egg, Figs. I and II, which is laid upon the food-plant, or as one observer says, even upon the grass leaves growing amongst the food-plant (J. H. Burnett, *Ent. Record*, 1898, p. 229) is as usual in this group. (My measurements are .66 × .45 mm., oval and flattened.) I have not detected the micropyle. It is covered with the roughly hexagonal sculpturings, which in this species appear to contain an irregular ornamentation of dots, Fig. III. When freshly laid the egg is dark, becoming darker before the emergence of the larva.

The young larva upon emergence (Fig. IV) is pale yellow. It measures 1.9 × .23 mm. Whether I have kept my specimens too long, and whatever may be the cause, I found the greatest possible difficulty in making out its characteristics. I cannot even detect anything particularly instructive except that the subsegments (a) are unusually distinct and appear to intersect the lateral flange, which is here broken up and shows transversely to the body. Each segment appears to exhibit a more or less circular enclosed space alongside but not encircling the spiracle, and lying between the sub-segmental ridges. There are no special organs—for the attachment of covering materials—and the hairs whether tubercular or not are small and difficult to distinguish. They appear, however, to belong to the more or less bulbed form, but squared off at the top, which feature I have scarcely done justice to in my drawing. I have drawn the first abdominal segment, Fig. V, to a larger scale in order to make my remarks about the sub-segmental arrangements plainer. It will here be seen how the lateral flange (b) is broken up or modified by the transverse ridges. I have also represented the anal segments, Fig. VI, on a larger scale to show the presence of the sub-anal organ (c), which I introduced to notice in my paper on *Iodis lactearia*.

The tactile hairs upon the second thoracic (d) and eight abdominal (e) are very distinct.

The bifurcations of the head and first thoracic segment are not very distinct at this stage, but in the anal segments are quite extensively

developed. My Figure VII represents the young larva well-developed in the second instar and quite arrived at its adult form. Again the hairs are small and not remarkable, still retaining the truncated bulbed shape. The two exquisitely fine tactile hairs (f) upon the first thoracic segment which we observed in the larva of *Iodis lactearia* are again in evidence, while the second and third thoracic also have single and coarser hairs of the same description. I appear to have missed that upon the eighth abdominal—if it exists.

There are now distinct bifurcations of the head and first thoracic segments—the cleft being deep and well marked. Fig. VIII.

The drawing of the first abdominal segment, Fig. IX, gives an impression of the general appearance. The granules, or spicules, are again represented (g), but are much smaller and more insignificant than in any species before examined. Moreover, they appear to be more or less yellow, instead of, as usual, pure white. These, I imagine, produce the lateral stripes of the larva.

I have drawn Fig. X, a portion of the dorsal margin of my specimen, to show how markedly this differs from the irregular plates of *Nemoria viridata* and the special and tabular elevations of *Iodis lactearia*. I regard the clear semi-circles (h) upon the margin itself as side-views of some of these yellow spots, and as such contributing to the subdorsal line. And this view is supported by my drawing of a portion of the spiracular region of the first abdominal segment, Fig. XI. These spots, under higher amplification, appear to be (i) irregular circles of highly transluscent and thickened chitin, in the centre of each of which lies a slightly opaque spot.

I have not carried my investigation of the larvae further than this.

A PSYCHID PROBLEM.

By Hy. J. Turner, F.R.E.S., F.R.H.S.

Sometime before his death, Rev. C. R. N. Burrows handed me the following notes appertaining to his study of the Psychides.

It may be remembered that in his early youth he was practically an invalid and went out to the Cape to collect Lepidoptera and for health reasons. The results of his stay in the Colony were published in the *Ann. and Mag. of Nat. Hist.*, December 1875, "On a collection of Lepidoptera from Southern Africa, with new Genera and Species," by A. G. Butler, F.L.S., etc.

One of the descriptions of new species was that of a supposed Psychid to which the name *Cryptothelea tuckeri*, n. sp. was given.

Mr Burrows note was as follows:—

"I captured the specimen on the inside of a shop window in West Street, Durban, on March 10th, 1875, just before my return. I was struck by its resemblance, although on a larger scale, to our *Epichnopteryx pulla* (*radiella*), but had not at that time come across so large a species. I, perhaps naturally, considered it a Psychid. I deposited my South African captures at the British Museum on my return to England the same year. A. G. Butler, it is shown by the paper quoted,

adopted my opinion, accepting it as a Psychid. When at the Museum at different times I have had a look at the specimen, which for a time stood alone. Later I found that it had been joined by several others, and by females. These proved to be fully winged, and as far as my memory serves, resembled the females of *Zeuzera*. I naturally foresaw a modification of Butler's decision, but am unable to find a record of such. I should be very glad to be informed as to what has been done in the matter, as it trenches upon my enquiry as to the affinities of the *Psychidae*. The placing of the genera *Cossus*, *Zeuzera*, etc., at the end of the Tineina, may be connected with this question, and perhaps confirm my suspicions that this may be the true relationship of the Psychides.—C. R. N. B."

Subsequent to receiving the above note I visited the Museum and with the help of Mr West and the remarkably correct and perfect Museum records the actual specimen, was found under the name *Metarbela tuckeri*, Btlr., with the subsequently obtained females from Natal. It was not a Psychid, but had been placed between the Psychids and the Cossids in the Fam. *Teragridae* (*Arbelidae*).

One would like to know upon what basis the present position was arrived at.

HARMODIA (DIANTHOECIA) LEPIDA, ESP. (CARPOPHAGA, BORK.).

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

I have recently rearranged the material I have bred from the county of Sussex and the adjoining area of Dungeness, Kent, during the last 20 years, and the following notes are an attempt to give an idea of the variation occurring in these areas.

The species is plentiful in many localities, especially on the coast and among the downs, and is easy to breed from ova or small wild larvae, while in some areas the pupa may be dug during the winter.

The variation is so great that I am only able to deal with it in a very general way.

The forms vary from examples marked as, or as much as, in the typical form through a number of less heavily marked forms to examples in which the markings are largely absent.

In all forms the true ground colour is either white, pale ochreous, or ochreous.

The markings vary in colour from palest ochreous through yellow, reddish-ochreous and brown to deep hard brown, and from palest grey through many phases to deep slate. All Sussex browns are rather hard, due probably to some grey in the make up.

Normally the markings in any given example are of one colour in various shades, but in some cases several colours are found in the same insect.

From first to last I have never found, in Sussex, examples which agree exactly with the deep ochreous brown forms which are normal in parts of Devon, or the grey-brown forms from Wales (*capsophila* or *capsophila*-like): our colours are as deep, but not of the same shade.

I have divided the Sussex material into the following groups:—

A. Marked as in the typical form ("dark ochreous, mottled with darker").

B. Marked as in the typical form, but central facia darker than rest of wing, giving a slightly banded appearance.

C. Marked as in the typical form, but markings less heavy (dense) and so more true ground colour showing, giving a variegated appearance.

D. As above, but the markings reduced to skeleton form, the ground colour much in evidence.

E. Certain areas of wing devoid or almost devoid of markings, and bars in cilia and dots on outer margin absent, giving the insect a most specialized appearance.

This last Group, E, is the only Sussex one of which I propose to give further detailed description.

E1. Marking apparently entirely absent, but under a lens slight markings are seen to be present in a shade of colour hardly deeper than ground colour.

E2. Only markings outlines of reniform and orbicular, dot representing claviform. Three longitudinal wedge-shaped marks in area of submarginal and oblique mark on the costa in apical patch region.

E3. As above, but fine lines representing the inner and outer lines present.

E4. As above, but inner and outer lines now strongly marked and heavy.

E5. As above, but whole area between inner and outer lines deeper in shade than ground colour (pale band).

E6. As above, but band now in sharp contrast to inner and outer areas (dark band).

E7. As above, but some mottling on inner and outer areas, the only unmarked area being submarginal and cilia.

E5 and E6 differ more than in depth of colour contrast. E5 has dark markings of central facia enveloped in pale shading, which is itself much deeper than ground colour. E6 has an almost solid and one-colour dark central band.

The greatest contrast is in examples with white ground colour, when band may be red-brown or grey-brown. In examples with ochreous ground colour, the dark band is usually pale purple-brown.

Examples belonging to all the Sussex groups occur in all localities in the county, but some localities are specially prolific in the more striking forms (Group E).

The only area I can deal with out of Sussex is that of Dungeness, as I lack the necessary material from other areas.

From what I have seen in other hands I imagine that, while few areas give anything like as wide a range as Sussex, variation in this species is very great in many other areas, where many forms not found in Sussex occur.

In the Dungeness area of Kent, a most peculiar form occurs. In its most highly marked examples it is very similar in appearance to typical *lepida*, but it produces many ill-marked forms in which the true markings are similar in quantity and design to the Sussex Group E, but here the areas, which in the Sussex specimens would exhibit the ground colour (white, pale ochreous, or ochreous), are much peppered with the finest possible atoms in grey, greenish-grey, or metallic bronze. Those with white true ground colour are silvery in appearance, those with pale ochreous ground colour appear greenish, while the ochreous ground colour examples appear golden.

Another peculiarity of this group is the fact that the central area is never darker than the rest of the wing and is often the palest area. An opposite tendency to that found in Sussex. Also in this group the cilia bars and dots on outer margin are strongly marked. There is no tendency to obsolescence as in Sussex, Group E.

I always find reference to published figures helpful, and so give the following:—

Ed. Newman's *British Moths*, page 385.

Fig. 1. If the dark shading on and from costa, the veins and the line along outer margin be deleted, this figure is a good one of E2 Group with white ground colour.

Fig. 3. If the area from submarginal to outer margin were free from any shading or marking this would represent E7 with white ground colour, but if this figure were without the shading in basal and outer areas it would represent E6.

Fig. 4. If central fascia a little darker it would belong to Group B.

Figs. 2 and 5 belong to Group A.

South's *Moths of British Isles*, Vol. I. Plate 124, Fig. 9, represents a Group B form with less than usual contrast.

Fig. 10 represents a Group C form.

Seitz *Palaearctic Noctuae*, Vol. III, Plate 17.

Fig. i — 1, 2, 3 and 4. Group A (typically marked).

Fig. 5. A small example of E3 with pale ochreous ground colour. Usually in these forms the markings are sharp and clear and much darker than in this figure.

Fig. 6. If this were peppered with fine bronze coloured atoms and the markings proper, more in contrast to ground colour, and the cilial bars present and strong, it would come near the Dungeness form, of which I have never seen an illustration.

COLLECTING NOTES.

Note from North Cumberland.—1940 has in some respects been a wonderful season in this Easton area. Sunday, 12th August, was an outstanding day. We had friends from Tyneside and went for a stroll in the afternoon. It was a fine, hot day, and in a dip of the road we saw on the wide road verges 12 peacock (*io*) butterflies, 5 *cardui*, dozens of *phlaeas*, wall (*megera*), whites (*Pierids*), and small tortoiseshell (*urticae*). It was a wonderful sight for Cumberland. *V. io* has been, I

believe, unknown here for over 20 years, and *cardui* is very rarely met with. We have had a good season for Lepidoptera though *Euchloë cardamines* was rather scarce, and I never came across the common blue. The Red Admiral (*atalanta*) was late and not so numerous as usual. I saw the small blue (*minima*) twice. This and *io* are new to my Easton List. The water ermine (*Spilosoma urticae*) turned up again in the same place in which the caterpillar was found last year. Hemiptera have been plentiful. *Picromerus bidens*, the Shield bug, was common all over the area, and *Tettigonia viridissima*, L. and *Euacanthus nervosus*, L., both scarce in former years, were got commonly when sweeping. *Sirex gigas*, the " wood wasp " was again plentiful in the Border woods. I have quite a lot of Hymenoptera as yet unidentified, together with numerous Diptera. I had almost forgotten to add *Hipparchus papilionaria* (the "large emerald moth") to my list. Curiously enough, Coleoptera have not been found in numbers and I do not think I have taken anything new to the area. *Chorthippus bicolor* was the commonest grasshopper, and two *Aleurodidae—Aleurodes rubicola* and *A. phillyrae*—were fairly common.—T. Fred Marriner.

Collecting at Light during Moonlight.—On 30th and 31st May 1939, I went to my *cinerea* ground, in spite of a full clear moon, to search for ♀s. I put a lamp and sheet at dusk and then began my search. I was amazed on returning to the sheet to find that although the full clear moon made night almost like day ♂ *cinerea* were coming freely to the light. The time was 11.30-0.30 (summer time); the weather was calm and, for a moonlight night in May, very warm—49°.—A. J. W.

Heodes phlaeas in the Isle of Colonsay.—For many seasons I have collected Lepidoptera in the Inner and Outer Hebrides, but never until this year have I seen the " Small Copper " on any of them. However, whilst studying the Flora of Colonsay during September, I captured a single example near Scalasaig. This, I believe, supplies the first record of the species from any Hebridean island, either Outer or Inner. The only other species of Lepidoptera noted were larvae of *Bombyx rubi*, which really swarmed, and of *Acronicta rumicis*, which occurred sparingly.—Jack Heslop Harrison, Gavarnie, Birtley, Co. Durham.

The Occurrence of Miana (Procus) versicolor, Bkh., in Coll.—In the February number (page 19) of the *Entomologist's Record* I drew attention to the fact that I had captured specimens of this species in the Isle of Raasay in 1935-6. Although the bulk of the examples taken by myself and others occurred at rush flowers, odd individuals were found on ragwort. At that time I was unable to report the occurrence of the species in any other Hebridean island. This year, however, my father, Professor J. W. Heslop Harrison, secured an additional example, also from ragwort, near Arinagour on the Isle of Coll.

In connection with this, I should like to draw attention to a paper in the *Entomologist* (Vol. lxxiii, March 1940) entitled " A New British Noctuid: *Procus versicolor* Bkh." May I point out that this species was not then new to the British list as my specimens had already been recorded: (1) in 1937 in the *Proceedings of the University Philosophical Society*, Vol. x, page 314, (2) in 1940 in the *Ent. Record*, Vol. lii, page

19? Both of these records antedated Dr de Worms' record, the former by three years. Further, I should like to emphasize the fact that my father supplied the necessary references to pertinent continental literature. The failure to note my previous captures, and the earlier record, seems difficult to understand, as all the persons concerned had been supplied with copies of the 1937 paper.—JACK HESLOP HARRISON.

MANIOLA JURTINA REGAINS ITS OLD GROUND IN DURHAM.—When I first began to take an interest in the Lepidoptera, this species failed entirely in large areas in North and Mid Durham, although it still occurred on the coast. Gradually, however, it began to appear as isolated individuals in stations where, my father assured me, it had once possessed strongholds. This year, it has been observed in large numbers in habitats, well worked in the past, where it certainly was not to be taken by collectors who worked these counties forty years ago, when many of our then-existing grass-feeding butterflies began to show signs of decadence.—JACK HESLOP HARRISON.

DIANTHOECIA CUCUBALI, FUESL., IN THE ISLE OF GREAT BERNERA.—Owing to the fact that there are several Bernerays and Berneras in the Outer Hebrides, it is necessary to point out that the present Bernera is that lying to the west of the Isle of Lewis. In July 1939 Dr W. A. Clark and myself camped on Great Bernera to work its Flora when, incidentally, I also collected Insecta. Late one evening a specimen of the present species flew into our tent, thus providing the second Outer Hebridean record. The first recorded capture was made by my brother. Dr G. Heslop Harrison, in Mingulay in 1937.—JACK HESLOP HARRISON.

FURTHEST NORTH FOR EUMENIS SEMELE IN BRITAIN?—In 1937 I spent a considerable time investigating the Flora and Fauna of Sutherlandshire, when I camped out near Durness on the northern coast, no great distance from Cape Wrath. There magnificent sand dunes occur which I feel certain will produce much more than my limited efforts secured. The most interesting butterfly I captured was *Eumenis semele*, which flew in small numbers with a fine form of *Maniola jurtina* and occasional *Pieris brassicae* and *Aglais urticae*.—JACK HESLOP HARRISON.

NYSSIA ZONARIA SUBSP. ATLANTICA, HARRISON, IN THE ISLE OF GUNNA.—Last year I recorded this interesting race of *Nyssia zonaria* from several new stations in various islands in the north of the " Long " Island. This season (1940) one of our parties observed larvae on Gunna. Gunna is a peculiar island, famous for its grazing (and its wild birds!) lying between Coll and Tiree. It is broken into two distinct ecological divisions, one wholly heather moorland and the other providing extensive sand dunes. In spite of careful sweeping, no larvae were found in the former area, all being restricted to the mats of *Lotus corniculatus* found growing amongst the dunes. This is the more surprising as in some of the Islands, for instance, on the Isle of Rhum, the species passes to the moorlands, and may be found in such areas up to a considerable height as on Ard Nev and Ruinsival, in the latter case reaching 1300 feet above sea level.—JACK HESLOP HARRISON.

CURRENT NOTES.

The Short Notes in our present number, in answer to our appeals, we gratefully welcome. Other Notes have just come in and we hope that many readers will furnish such for each number during the coming year.

The South London Entomological and N.H. Society has cancelled its Annual Exhibition but wishes to obtain particulars from all those, who would have exhibited, so that there may be no break in the yearly records of varieties and important captures. Last year the records were published in this magazine and subsequently in the Transactions of the Society. In the circular just issued by the Society it is stated that " it is hoped to do the same again." Details of these proposed exhibits can be sent to Mr H. G. Denvil (Minuting Secretary), 4 Warwick Road, Coulsdon, Surrey, or to Mr S. G. Castle-Russell, " Cotswold," Forest Gardens, Lyndhurst, Hants. The latter gentleman will again prepare the matter for publication.

May we again ask for short notes from our subscribers' note books, memories, collections, observations, any special characteristics of their own locality, comparisons of localities, etc., etc. Also " Current Notes " of interest to others.

The Royal Entomological Society of London issued in September the second portion of its usual yearly output. Parts 5-14, completing the *Transactions* for the year, comprise over 600 pages with numerous plates and a large number of text figures. Parts 7-9 of the *Proceedings*, A, General Entomology, 32 pages; and *Proceedings*, B, Taxonomy, 52 pages, contain the chief items in the routine work of the Society's activities up to mid-September.

The outstanding Memoir is that by Dr Roger Verity, " Revision of the *athalia* group of the genus *Melitaea*, Fb., 1807 (*Nymphalidae*)," 112 pp., with 14 plts. There are 253 figs. of imagines on 9 plates and 90 figs. of genitalia on 5 plates. For years Dr Verity has been working at this group. Readers of this magazine will recall an article he wrote for us on this group in 1930 pointing out various facts and errors which had been corrected by careful examination of the structure of the genitalia. In his general remarks he writes, " The male genitalia afford in no way always an infallible method of determining single specimens or of distinguishing between groups of races. As a rule they do so, but there are species and races which constitute exceptions." " They must not be considered without reference to the other organs of the insect and the evidence which can be drawn from these and biological data."

The opinion of Dr Verity that there are comparatively few cases to which the term " subspecies " can be applied is quite in accord with our own view. This term has been grossly misapplied in the past on the most meagre evidence, often based on the few or very few examples of a species found in a restricted locality, it may be an oceanic island. Whereas the term " race " adequately designates any colony, which may contain examples with some special facies not found in other colonies, local populations, or " races."

The author is very definite in his dealing with the terms " race "

and "subspecies." He writes, "I continue to use the term 'race' employed in my previous papers to designate the variations, which have been recorded in the general, average, aspect of populations from different regions or localities, not because I am convinced it defines at all exactly the nature of those variations in the hereditary sense, similarly to the one of 'breed' usually attributed to it, but because the term 'subspecies,' used in the more recent original descriptions and in the latest catalogues, seems to me still less appropriate in the great majority of cases. A few of these populations are, no doubt, really *species in the making*, as the meaning of 'subspecies' should imply, but many are, no less certainly, of a totally different nature, which has nothing to do with hereditary differences, and with sterility *inter se*, necessarily connected with the tendency to specific distinctness, if the term 'species' is to have any definite meaning."

This remark suggesting that the genitalic structure should not be the dominating factor (although a strong factor) in the determination of specific distinction is a most reasonable statement. The genital structure must be looked upon as only *one* of the biologic factors, and not worshipped as the only criterion by which species can be separated with absolute certainty.

Thirteen species are recorded as members of this Group:—

1. *Melitaea pacifica*, Vrty. Transbaikal.
2. *M. ambigua*, Ménét. Japan, Amur.
3. *M. deione*, Geyer. S. Europe.
4. *M. athalia*, Rott. Europe, etc.
5. *M. coreae*, Vrty. Corea.
6. *M. mayi*, Gndr. Alberta.
7. *M. britomartis*, Assm. S.E. Europe, Russia, Asia, Amur.
8. *M. parthenia*, Bork. Alps, etc.
9. *M. veronicae*, Dorfm. Styria.
10. *M. asteria*, Freyer. Alps.
11. *M. parthenoides*, Keferst. Alps, Pyrenees, Spain.
12. *M. alatauica*, Stdgr. Alatau.
13. *M. varia*, H.-S. Alps.

Each of these species is dealt with in detail with all the "races" hitherto recorded. No less than fifty-three "races" are accorded to *M. athalia* above, arranged in three sections, which are again divided up into groups, and even sub-groups. The figures for the most part are from examples in his own collection. To *M. athalia* 93 figures of imagines and 37 figures of the genitalia are given. The figures are all very good indeed and will be of the greatest use to students who come after.

Dr C. B. Williams presents the second part of "Analysis of Four Years Captures of Insects in a Light Trap," of which the first part was in the *Transactions* for 1939. The matter is largely statistical and deals with "The effect of weather conditions on insect activity." Some of the statistics are astounding. We read "The number caught per night varied from zero on many nights in the winter months to a maximum of approximately 73,000 on one night at the end of June 1935. There were, however, only 13 occasions when the catch was over 10,000 insects and these were all in 1935 and 1936."

Culot, *N. et G.*, I (2), 79, plt. 53, f. 15 (1914), gave a good figure of the dull reddish form with darker fasciae, *helvola*, L.

Barrett's remarks on the Variation are:—

"Rather variable in the tint of the transverse bands and central shade, paler to rust-red, darker to very deep purple-red; and in the colour of the central portion of the hindwings from smoky-white to smoky-black. In S. Yorkshire this becomes of a dull uniform reddish-buff, of coarse texture, and with only faint traces of the usual beautiful transverse bands; yet even in this district well-marked individuals sometimes occur, and farther north, in Cumberland and in both the east and west of Scotland, the normal brilliant colouring of the bands is resumed or even exceeded. Specimens also occur in which the ground colour has a more yellow tint, even almost to pale yellow."

He records an example "Of this shade, but with the transverse bands pale purple."

Hoffman, *Schm. Stierm.*, III, 148 (1915), after discussing the various forms speaks of the variation: "Other unnamed forms are somewhat paler or darker than the typical form with more or less strongly emphasized dark markings. The beautiful brown-red of the fresh insect disappears in the dried example."

"Examples with particularly dark marginal area, discal area, and basal area I have seen from Guggenbach."

The Names and Forms dealt with are:—

helvola, L. (1758), *Sys. Nat.*, 184.
rufina, L. (1761), *Fn. S.*, 1142.
catenata, Esp. (1788-?), *Abbild.*, IV, 327, plt. 123, 1.
ab. *punica*, Bork. (1792), *Naturg.*, IV, 637.
r. *sibirica*, Stdgr. (1882), *Stett. e. Ztg.*, XLIII, 46 [See Tutt, *l.c.*, IV, App.].
ab. *pallae*, Greg.-Robs. (1888), *Young Nat.*, IX, 122.
ab. *ochrea*, Tutt (1892), *Brit. Noct.*, II, 163.
ab. *unicolor*, Tutt (1892), *l.c.*
ab. *rufa*, Tutt (1892), *l.c.*
ab. *cinnamomea*, Fuchs. (1903), *Soc. Ent.*, XVIII, 3.
ab. *extincta*, Splr. (1907), *Schm. Eur.*, I, 249.
ab. *uniformis*, Splr. (1907), *l.c.*
ab. *pallescens*, Warr.-Stz. (1910), *Pal. Noct.*, III, 152, plt. 37 g.
v. *cinerea*, Obthr. (1918), *Lep. Comp.*, XVI, 118, plt. 493, f. 4088.

Tutt dealt with (1) *helvola*, the dull reddish with three dark fasciae; (2) *rufina* (*catenata*), bright red, with fasciae distinct (purplish); (3) *punica*, ochreous, with dark purplish bands; (4) *unicolor*, dull reddish, indistinct fascia, almost unicolorous; (5) *ochrea*, ochreous, with greenish tinge and reddish fasciae; (6) *rufa*, bright red, fascia indistinct, almost unicolorous; (7) *sibirica*, paler and lighter, forewing yellowish; (8) *pallae*, pale straw colour, indistinct bands, almost unicolorous.

Tutt gave the Orig. Descrip. of r. *sibirica*, Stdgr., in the Appendix to Vol. IV.

Of the form Hampson said, *Cat. Lep. Ph.*, VI, 482 (1906), "Paler, forewing yellowish." Altai, W. Turkestan.

ab. *cinnamomea*, Fuchs., *Soc. Ent.*, XVIII, 3 (1903).

ORIG. DESCRIP.—" Forewing uniform cinnamon-red with no emphasized markings. A strong colour aberration, which is distinguished from other *helvola* by its very cinnamon-red, bright forewings. Only slight traces of the markings are present, which the red colour of the uniform characteristic has not altered."

ab. *extincta*, Splr., *Schm. Eur.*, I, 249 (1907).

ORIG. DESCRIP.—" The marking can be almost obsolete."

ab. *uniformis*, Splr., *Schm. Eur.*, I, 249 (1907).

ORIG. DESCRIP.—" Forms occur with markings almost run together but very indistinct and without differentiation in colour from either the central or the marginal area."

ab. *pallescens*, Warr.-Stz., *Pal. Noct.*, III, 151 (1910).

FIG.—*l.c.*, 37 g.

ORIG. DESCRIP.—" Specimens from Amasia, though reddish in a few cases, mostly ♀♀, are generally much paler than European, dull brownish or ochreous-grey, with indistinct or obsolete markings; in particular the hindwings are much whiter with the grey and rufous suffusions usually slighter and more restricted in area."

var. *cinerea*, Obthr., *Lep. Comp.*, XVI, 118 (1918).

FIG.—*l.c.*, plt. 493, f. 4088.

ORIG. DESCRIP.—" The forewings above are unicolorous and without markings; the coloration varies from brick-red to ashy-grey." Algeria.

The figure has two transverse lines of deeper grey and thus is *not* unicolorous without markings.

Anchocelis, Gn. (1852), Newm. [*Orthosia*, Ochs. & Tr. (1816-25), almost all authors: *Amathes*, Hb. (1821), Hamp., South, Warr.] *pistacina*, Fb. = *lychnidis*, (Schiff.) Fab.

This species was first indicated by Schiff. in the *Verz.* (1775), *lychnidis*, L, 5, on p. 76, and *pistacina*, M, 1, on p. 77, but without any description. Fab., *Mant.*, II (1787), gave inadequate descriptions of both, on p. 146 and p. 175 respectively. In fact, Bork., *Naturg.*, IV, p. 598, *lychnidis*, and p. 523, *pistacina*, gave the first adequate descriptions. However, Fb. must be considered the prior author. Although his descriptions were very meagre they were descriptions, and the first, hence we have *lychnidis*, (Schiff.) Fab., and *pistacina*, (Schiff.) Fab.

Early authors made several species from diverse forms of this insect; all but the two main forms were gradually absorbed into these two, *lychnidis* and *pistacina*. Among early post-Linnaean lepidopterists a tenet of their nomenclature was that the typical form must be a ♂ (teste *janira* versus *jurtina* of Linn.), and as the *pistacina* form was considered to be ♂ and the *lychnidis* ♀, although *lychnidis* was first described at the end of the last century, the ♂ *pistacina* form was taken as the typical one just as the ♂ *janira*, although not the prior named form of the species in each case. Thus we have Tr. treating *lychnidis*

as a var. of *pistacina* in Vol. V of his *Schm. d'Eur.* in 1825, among other similar cases. It is only quite recently that the principle of priority in nomenclature has become generally apparent and we get such amendments as this.

Tutt, *British Noct.*, II, 164 (1892): Meyr., *Handb.*, 63 (1895): Barr., *Lep. Br. Is.*, V, 341, plt. 227 (1899): Stdgr., *Cat.*, IIIed., 206 (1901): Hamp., *Lep. Phal.*, V, 475 (1906): Splr., *Schm. Eur.*, I, 250, plt. 46, 12 a, b (1907): South, *M.B.I.*, II, 16, plt. 9, 3-6 (1908): Warr.-Stz., *Pal. Noct.*, III, 150, plt. 36 k and 37 a, b (1910): Culot, *N. et G.*, I (2), 81, plt. 54, 1-6 (1914): Meyr., *Rev. Hand.*, 123 (1928).

Esp., *Abbild. Noct.*, IV (1), 522-4, plt. 156, 1-6, 157, 2-3 (1788-?). The first three ♂ and ♀ of each species (form) are quite recognizable and distinct, *serena*, *rubetra* and *canaria*; the last, *schoenobaena*, 157, 2-3, is not so definite for identification.

Ernst. & Engr., *Pap. d'Eur.*, VII, 2 figs, 397=2 and 398=2 (1790), gave four figures quite good; the 397 figs. are referred to *pistacina*, Fb., by Werneburg, and although the authors referred 398 a and b to *lychnidis*, Fb., Werneburg did not agree because of the large orbicular stigmata, but Werne. considered 399 c as *pistacina*, which seems probable.

Donovan, *N.H. Brit. Ins.*, X, plt. 360 (1801), figured an insect under the name *lineola*, which Haw., *Lep. Brit.*, 231 (1809), placed among what we may term his *pistacina* group.

Hb., *Samml. Noct.*, 131 (1800-3), 464 (1809-13), 707 (1823-24), gave figures of three forms. 131 a somewhat light ruddy brown form, well marked, *pistacina*. 464 a darker well-marked form, *lychnidis*. 707 a more uniform deep red almost devoid of marking, *pistacina*. H.-S., *Bearb. Noct.*, II, 200 (1849), remarked on these figures:—131, appeared to be a worn example, f.w. too wide; 464, aberrant in shape, the veining no lighter than the ground as it should be for *lychnidis*; 707, poor shape, seldom so red.

A very difficult species to figure on account of its unstable shape, marking and colour.

Haw., *Lep. Brit.*, 230-2 (1809), placed six forms as six species with the remarks "precedenti nimis affinis," and "they may eventually prove to be one species." The form of *venosa*, Haw., "of a dirty reddish-brown" appears to be very local, as an extreme form. The term *venosa*, Haw., would apply to several other forms in which the veins are picked out in a lighter shade.

Dup., *Hist. Nat.*, VI, 113, plt. 80, 5 (1826), *lychnidis* and *pistacina*, gave a very good figure of the former, treated both forms as one species but did not mention the variability.

Steph., *Ill.*, II, 146 (1829), called this multiple formed species *pistacina*, Fb., indicated five forms which had hitherto been considered distinct species, refused to describe other forms of which he had bred several from similar larvae.

Tr., *Schm.*, V (2), 239 (1825), treated *lychnidis* as a var. of *pistacina*.

Gn., *Hist. Nat. Noct.*, V (1), 364-6 (1852), stated that the type (meaning *pistacina*) had not been adequately described by Fab. from the Schiff. collection and expressed the opinion that Hübner's figure of it was only poor. He considered that the blackish forms spoken of by

Tr., and reported from Italy by Dahl, were undoubtedly the form *canaria*, Esp.

Tutt gave Haw. as the author of f. *lineola*. It was Donovan (1801) as given by Haworth himself.

South, *M.B.I.*, II, 16. plt. 9. figs. 3-6 (1908), gave five figures all spoiled by the general colour of the plate, which is far from reddish, but all forms recognizable by marking; 3, a well-marked *lychnidis*, with veins marked; 4, a *serina*, an ochreous form without the grey mixture; 5, a *ferrea*, almost uniform, which should be reddish.

Splr., *Schm. Eur.*, I, 250, plt. 46, f. 12a-12b (1907), gave a good account of the variation with two figures so bad that the author himself criticises them strongly.

Warr.-Stz., *Pal. Noct.*, III, 150, plt. 36 k, 37 a, b (1910), took the *lychnidis*, Fb., *Mant.*, 146, as the prior name, considered *schaenobaena*, *lineola* and *sphaerulatina* as synonyms; the *venosa*, Haw., as the form *pistacina*; the *pistacina*, Haw., as the *obsoleta*, Tutt; and gave 16 figures, all good; *lychnidis*, ♂ and ♀, the latter a shade darker all wings, *pistacina* ♂ and ♀, the former with lighter venation, *rubetra*, *ferrea*, *obsoleta* ♂ and ♀, *serina* 2 ♂ and 2 ♀, *canaria* ♂ and ♀, *caerulescens* ♂ and ♀.

Culot, *N. et G.*, I (2), 81, plt. 54, f. 1-6 (1914), took *pistacina* as the typical form and *lychnidis* as an ab. in which the veining is just apparent although not emphasised in his f. 4. The figures are all really excellent. He figured *pistacina*, ab. *canaria*, ab. *serina*, *lychnidis*, ab. *rubetra* and a beautiful *caerulescens*, and in the text he remarked on the fact that he had figured the chief forms which were connected with every gradation the naming of which he strongly condemned.

Of the Variation Barrett says:—

" Always and everywhere variable in colour of the thorax and forewings—very pale drab, grey-drab, brown-drab, pale brown, and every shade of red-drab and red-brown to light or dark tawny and brick-red; also in the distinctness of the markings, which fade out in every degree until they become almost or quite imperceptible; or occasionally become intensified, the central shade in particular until the latter sometimes forms a black cloud across the wing; far more frequently, however, it is only the two stigmata and the costal wedge that become distinct, the lines and shades remaining obscure. Another phase of variation occurs in the blackening of the dorsal half of the wing, or portions of it, by smoky-black clouds."

He records a specimen which has " The stripe before the subterminal line composed of regular black sections divided by the pale nervures." Plymouth.

A delicate form " Of a very soft grey-buff, with the transverse markings faintly purple-brown." Essex.

Another " Has the ground colour creamy-white, with the lines bright pinkish-fulvous, and the hinder area clouded with a more dull tint of the same."

Another " Is almost uniformly deep mahogany-brown so far as the thorax and forewings are concerned."

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.

REPRINTS of articles may be obtained by authors at very reasonable cost if ordered at THE TIME OF SENDING IN MS.

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

TO OUR READERS.—Short Collecting Notes and Current Notes. Please, Early.—EDS.

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.

Urgently Wanted for Experimental Purposes.—Pupae of *hirtaria* and *lapponaria*. I can offer duplicates of very many species in return.—*Harold B. Williams, Croft Point, Bramley, Surrey.*

Desiderata—British *dominula* varieties with full data other than var. *lutescens* and var. *lineata*. Other vars. acceptable. *Duplicates*—British *L. l-album, exigua, cribrum, ocellaris,* and *intermedia,* etc.—*Dr H. B. D. Kettlewell, Cranleigh, Surrey.*

Wanted—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Estación Experimental, Casilla Correo 71, Tucuman, Republica Argentina.*

Duplicates.—Several thousand British Macro-Lepidoptera in perfect condition; full data. *Desiderata.*—British Micro-Lepidoptera in similar condition.—*S. C. S. Brown, Kingsholme, 454 Christchurch Road, Boscombe, Bournemouth.*

New Address—Kenneth J. Hayward, F.R.E.S., F.R.G.S., F.Z.S., Estación Experimental Agricola, Casilla Correo 71, Tucuman, Republica Argentina.

New Address—Harold B. Williams, from Bramley, to 2 Mitre Court Buildings, Temple, E.C.4.

New Address—J. Antony Thompson, from Rhas School, to Roe Wen, near Conway.

MEETINGS OF SOCIETIES.

WAR-TIME ARRANGEMENTS.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON : 41 Queen's Gate, S.W.7. (Nearest stations : S. Kensington and Gloucester Road.) General Meetings at 3 p.m., on the first Wednesdays of the month, February-June; October-December. Annual Meeting, third Wednesday in January.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. —Winter meetings, second Saturday of each month from 9th November to 8th March, 2 p.m. for 2.30 p.m., Chapter House Hall, St Thomas Street, S.E.1. *Hon. Sec., S. N. A. Jacobs*, Ditchling, Hayes Lane, Bromley, Kent.

THE LONDON NATURAL HISTORY SOCIETY.—Fixtures as printed in current syllabus cancelled. Members will be notified of further arrangements. *Hon. Sec., A. B. Hornblower*, 91 Queen's Road, Buckhurst Hill, Essex.

ENTOMOLOGICAL SECTION, BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—Evening Meetings. On the third Monday of each month, 7 p.m., at 55 Newhall Street, Birmingham. Visitors welcomed. Those who would like to attend or exhibit please apply to *G. B. Manley*, 72 Tenbury Road, King's Heath, Birmingham.

SOCIETY FOR BRITISH ENTOMOLOGY.—All meetings suspended till further notice. *Hon. Sec., E. Rivenhall Goffe*, 102 High Street, Southampton.

Communications have been received from or have been promised by T. Bainbrigge Fletcher, A. J. Wightman, W. P. Curtis, H. Willoughby-Ellis, E. Ernest Green, H. Donisthorpe, S. C. Brown, P. B. M. Allan, Dr E. A. Cockayne.

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

Printed by T. Buncle & Co. Ltd., Arbroath.

Vol. LII.

No. 12

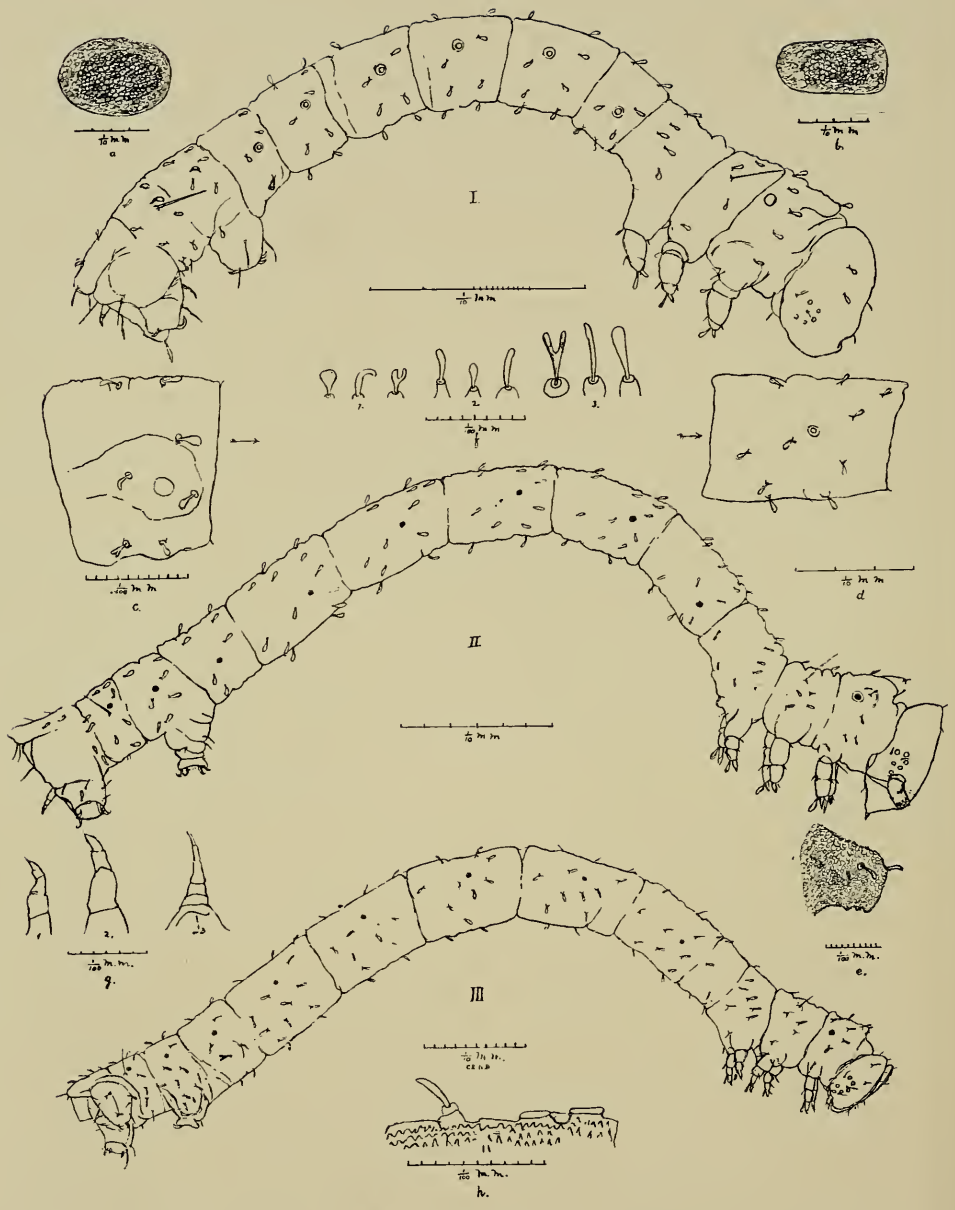
DECEMBER 1940.

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

CONTENTS.

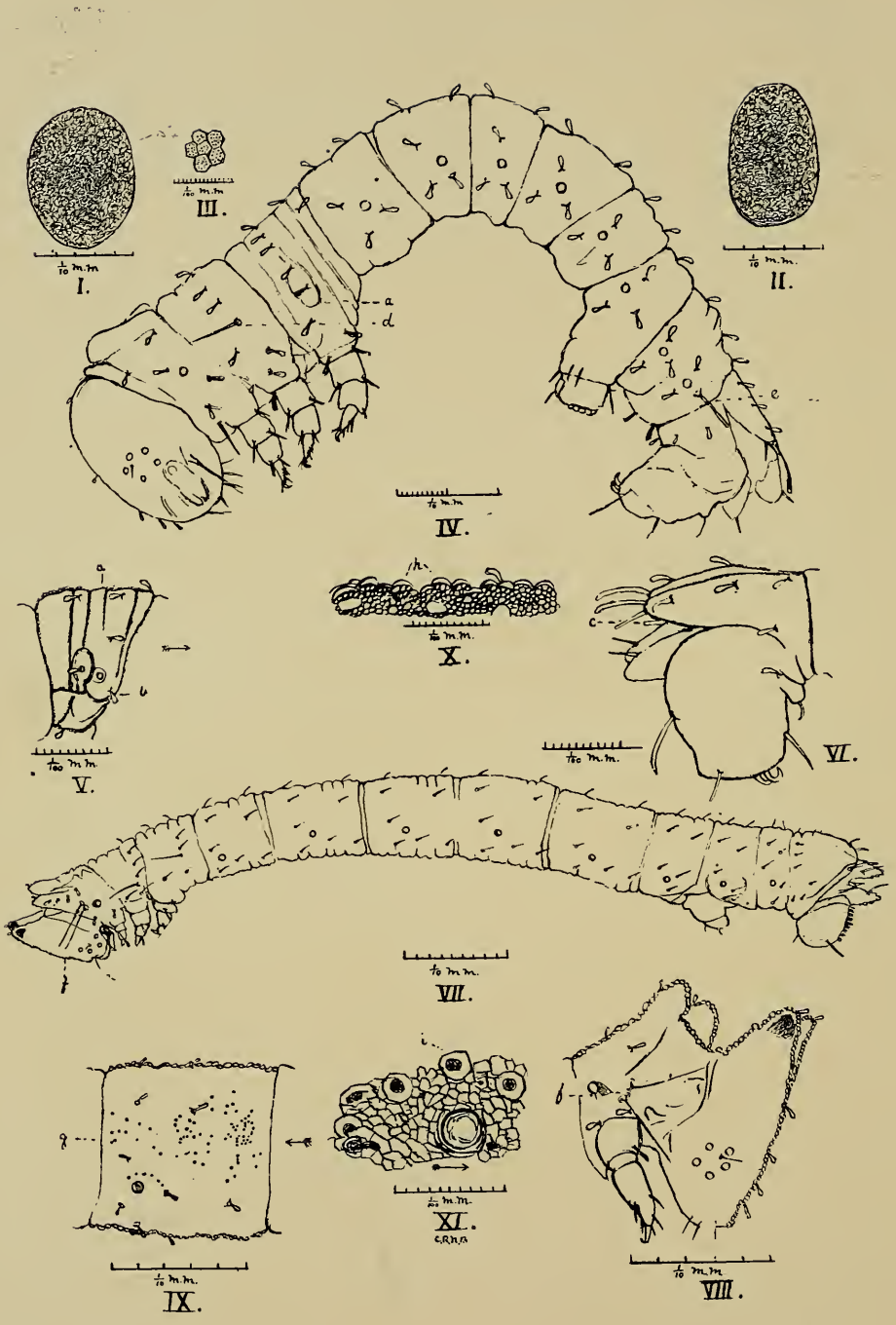
Subscription for Complete Volume, post free,
TEN SHILLINGS,
to *The Hon. Treasurer*, H. W. ANDREWS, F.R.E.S.,
6 Footscray Road, Eltham, S.E.9.

This number, Price ONE SHILLING AND SIXPENCE (net).



P. 101. *Del. C. R. N. Burrows.*

IODIS LACTEARIA, L.



P. 121. *Del. C. R. N. Burrows.*

PSEUDOTERPNA PRUINATA, Hufn.

IODIS LACTEARIA.

EXPLANATION OF PLATE VII.

a. The egg.
b. The egg, lateral view.
I. The larva, just hatched.
c. The larva, the 1st abdominal segment.
II. The larva, 2nd stadium.
d. The larva, 2nd stadium, the 3rd abdominal segment.
III. The larva, 3rd stadium.
e. The larva, 3rd stadium, frontal projection.
f. Hairs from larvae at each stadium.
g. Anal organ of larvae at each stadium.
h. Dorsal margin, 3rd stadium.

PSEUDOTERPNA PRUINATA, HUFN.

DESCRIPTION OF PLATE VIII.

Fig. I. The egg.
II. The egg, side view.
III. The egg, portion more highly magnified.
IV. The larva, first instar.
V. The larva, first instar, 1st abdominal segment.
VI. The larva, first instar, anal segments.
a. The sub-segmental divisions.
b. The lateral flange.
c. The anal organ.
d. and e. Tactile hairs.
VII. The larva, second instar.
f. The fine tactile hairs.
g. The spicules.
h. Plates on subdorsal margin.
i. Plates on spiracular region.
VIII. The head and first thoracic segment.
IX. The first abdominal segment.
X. The subdorsal margin
XI. The spiracular region, first abdominal segment.

NOTES FROM AN ENTOMOLOGICAL DIARY.

By A. Breeder.

The larva of *Xylina semibrunnea* can be beaten from the branches of ash. If ash tree branches are sugared in early October this species is sometimes quite plentiful in open marshy country.

Agrotis vestigialis breeds in sand where a carpet of bedstraw and tangled grasses covers the surface. The main emergence is in September, the 1st-15th, but a few are out in July and August.

The larva of *Apamea unanimis* is abundant among *Phragmites* and *Phalaris* in marshy ground in September and can be beaten out of the undergrowth until late in October. It pupates under lichens on fences and tree trunks or in hollow stems in early spring, March and April.

The larva of *Monima* (*Taeniocampa*) *gracilis* is easy to find until the penultimate instar is reached, tented up in the food-plant, but hard to find even after dark when nearly full fed. The Red, New Forest *gracilis* are ten days earlier in all stages than the Grey forms in the South of England.

Tholera cespitis, *Charaeas graminis*, and *Anchocelis lunosa* all breed high up in the Downs in dry situations, but also breed in the marshes.

The larvae of *Plusia chryson* and *Cosmia affinis* have prolegs of a green colour like the rest of larva normally. Both species, however, have black prolegs occasionally.

The larva of *Abrostola tripartita* in the wild state is 99% green and 1% purple. In captivity it soon becomes purple up to 80%, even when taken wild up to three-quarter grown.

The larva of *Acronicta aceris* occurs in nature on oak, but less often than on horse chestnut and sycamore.

Plusia festucae comes to the flowers of *Silene* and *Lychnis* before it is too dark to recognise it. *P. chrysitis* is 15 minutes later. If no *Silene*, etc., occurs near the *festucae* breeding ground, cut flowers hung on barb-wire fences will do.

Larvae of *Senta maritima* will eat dead pupae, mutton fat, etc., but must be given water to drink or will go cannibal. The pupa of this species shows the wing pattern and the form to come can be foretold a few days before emergence.

The larva of *Caradrina ambigua* will neglect green food for dead pupae in which the moth was well formed up, thus behaving much like that of *Senta maritima*.

The larva of *Dicycla oo* feeds in a tight " tent " of oak leaves closely drawn together and sealed up and is impossible to beat except when changing from an old and emptied " tent " to a fresh one, and this it does after dark. It is not a cannibal; it pupates in earth just below the surface and emerges in a few days. It is on the wing within an hour of emergence.

The usual food in nature of *Cucullia umbratica* is *Crepis*. The larva when half-grown leaves the plant and hides till dark.

The pupa of *Cucullia lychnitis* may lie for one to three years. The first year emergences are later than those of the second year, and the third year emergences are sometimes as early as May.

The pupa of *C. gnaphalii* never lies over as some books say it does.

THE GENUS ZYGAENA IN THE WESTERN ISLES OF SCOTLAND.

By Professor J. W. Heslop Harrison, F.R.S.

In 1934, when we first commenced our researches in connection with the Flora and Fauna of the Inner and Outer Hebrides, we were greatly surprised to find *Zygaena filipendulae* occurring in some plenty on the south-eastern and southern coasts of Raasay. Later, our surprise

diminished when we began to realize that Raasay and its southern neighbour, Scalpay, for floristic and faunistic purposes, were parts of the mainland. They have, in fact, been quite recently, geologically speaking, detached therefrom. However, as our work proceeded, two other species of the genus, *Zygaena achilleae* and *Z. purpuralis* came under observation, and, moreover, we discovered *Z. filipendulae*, not only in the Outer Isles, but also in certain members of the Inner group where its presence was of considerable zoogeographical importance. It is now proposed to give some account of the various species as they occur in the Hebrides, and of their ranges.

Zygaena filipendulae, L.—As already indicated, this species was originally found on the sea coast of Raasay at Fearns and Eyre Point. Later, however, it was proved to occur along the whole of the south coast almost to the pier. From South Fearns, it strikes inland up a narrow gorge leading to Inverarish, failing on the higher ground to recur on the moorlands east and north of the Raasay House area toward Brochel. On Scalpay, it may be noted along the Torridonian Conglomerate formation in the north. The nearest station to this known to us on other islands is on Skye near Kyleakin.

Our next encounter with *Z. filipendulae* was in 1937 on the Isle of Rhum, where we have described it elsewhere as "not very common" on grassy sea banks between Shamnan Insir and Kilmory. Subsequently, in 1938, when we stayed on Rhum for three weeks, it appeared in thousands in very many habitats. In fact, only on the Torridonian Sandstone in the northwest, and in the higher mountains, was it rare. South of Loch Scresort, the species becomes really plentiful on the coast near the Bagh na h-Uamha, and then follows a band around the 200 foot contour line until Dibidil is reached, where it penetrates a considerable distance up the "dil" or dale. Southward, it occurs sparingly on the cliff tops as far as Papadil where, in a cliff-enclosed suntrap, on red-hot thyme-clad and Lotus-clad slopes, it buzzes in endless numbers. West of this, it ascends the crags to about 1000 feet on Ruinsival, later descending to the grassy slopes of Harris at which station once again its numbers increase enormously. From Harris, northwest to Bloodstone Hill, the insect flies in sparse numbers. Inland, we only know it on grassy slopes on Ard Nev.

Throughout Rhum, the form is very large, and many examples are characterised by the last pair of red spots being confluent.

In the Isle of Canna, it may be found in meadows and elsewhere near the church, whilst on Eigg we have taken it in quantity on the moorlands on each side of the path leading from Cleadale to the Harbour. Again, in the Isle of Muck, it was equally plentiful, chiefly in hollows near the coast, but often enough extending some distance inland. Jutting out to the north-west of Muck extends Eilean nan Each, and here once again *Z. filipendulae* occurs freely.

In the Coll group of islands we have only detected it on ledges covered with luxuriant vegetation near Rudha Ban on Coll itself. On Gunna, a very peculiar fact about the species emerges. Although it feeds there, as elsewhere, on *Lotus corniculatus*, it shuns the well-developed sand-dunes with their mats of the food plant, and prefers the

scattered Lotus plants growing on the rolling moorlands and cliffs in the west. So far as we know, the insect fails in Tiree.

In the Outer Isles, we have collected it from Pabbay (Barra Isles), where it favours the sand-dunes and flies in myriads in a really magnificent form. Next, it was taken on Sandray on which island it neglects the dunes to turn up on the rocky, heather moorlands near Loch na Cuille. On Vatersay, where it is catholic in its tastes, it flies on the dunes and machair as well as on the rocky Meall and in damp grassy hollows on the sea coast. Eastward, where the massive rock of Muldoanich looms high, of necessity the steep moorlands support it, whilst to the south west it ekes out a precarious existence on the spray-drenched Flodday. For Barra itself Campbell (*Scott. Nat.*, November-December 1938) gives only Ben Erival as a locality, and states that it is not very common. We found it plentiful and far from local, for it occurred at Castle Bay, Borve, Brevaig, Loch nam Faoileann, etc. Further, this author adds the lesser islands of Hellisay and Orosay; we can supplement these with Fiaray and Fuday.

Further north, our expedition picked it up on South Uist from Daliburgh to Howmore, always on the transition zone between the machair and the moorlands. As far as we can say, it avoids the machair and dunes proper.

Lastly, one of our parties captured it much further north on the Isle of Berneray in the Sound of Harris. Here the form is exceedingly tiny.

It seems necessary to emphasise that everywhere the insect appears at a much earlier date than in the North of England, the earliest we have seen it on the wing being June 6th, 1940, in the Isle of Gunna.

Zygaena achilleae, Gn.—Our first encounter with this species was on Raasay on the southward slopes of Beinn na Leac where a series of cocoons attached to the rocks attracted our attention in 1934. No imagines were at first available, so dead pupae were dissected to reveal that the insects they enclosed were *Z. achilleae*. After this, two very worn examples were captured and submitted to Dr Cockayne for his confirmation of our identification. These were more blurred in pattern than the usual Oban examples, and even than the extracted specimens.

Next, when we visited Eilean nan Each in June 1938, cocoons were brought home, and these yielded a single *Z. achilleae*, the majority being *Z. filipendulae*.

Finally, in July 1938, on the banks of the Allt Mor na h-Uamha, Isle of Rhum, two further specimens were captured, followed by a third on the opposite side of the island between Glen Shellesder and Kilmory. The facies of all of these, as well as of that from Eilean nan Each, was the same as that of the Oban insects.

Zygaena purpuralis, L.—When we landed on Rhum in July 1938, the islanders reported that, whilst working in some districts of the island, they were being pestered with masses of strange-looking insects. Their descriptions were such as to suggest that the insect concerned was a "Burnet" and, needless to say, we set it down in our minds as *Z. filipendulae*. Nevertheless, to make sure of its identity, we asked

them to bring us specimens. Our surprise may readily be imagined when the inevitable match box produced *Z. purpuralis*!

This necessarily provoked a journey to Harris which, tedious and rough enough in any case, became perfect torture in climbing boots. However, just about the 1000 foot contour line between Ard Nev and Ard Mheall, we had our reward, for there appeared countless swarms of the insect which persisted until Harris was reached, and as far as we explored east thereof.

Later, as with *Z. filipendulae*, we proceeded to determine its range, when we found it to commence on the east near Lochan Dubh at 750 feet, thence to pass to Dibidil and up the slopes of Sgurr nan Gillean. At Papadil it abounded in the suntrap and westward to Harris again. On Ruinsival, it ascended high to about 1300 feet. North-west of Harris, along the cliffs, it was very rare, but its numbers increased on Bloodstone Hill, after which we found it no more.

It seems well worth noting that the inhabitants of Rhum insisted that its advent to the islands was very recent indeed, and nothing we could say would alter this opinion.

In 1939, one of our expeditionary force was on the Isle of Eigg in June, and, although not an entomologist, had been well drilled by our enthusiasm on Rhum. Thus, when she saw a *Zygaena* flying on that island she brought specimens home for our inspection. They proved genuine *Z. purpuralis*, and of the form prevalent in Rhum. She observed them freely on thyme-clad banks.

Lastly, on 6th June 1940, also on a flowery slope in the Isle of Gunna, we were delighted to see the insect flying in the sunshine.

It should be made clear that we feel reasonably certain that, if we could get to Muck, Canna and the southern members of the Outer Island chain in late June, we could demonstrate its presence there.

COLLECTING NOTES.

Euphydryas aurinia New to Snowdonia.—With reference to Mr J. Antony Thompson's query in the October number of the *Record*, page 113, as to the highest altitude at which *E. aurinia* occurs, Colonel C. Donovan in his Catalogue of the Macro-lepidoptera of Ireland records it from Mount Gabriel (1300 feet) in County Cork, and the larvae have been found on some of the foothills of the Sperrin Mountains at over 800 feet; an isolated colony of *Polyommatus icarus*, ssp. *clara* is found in the same district, which is remarkable for the number of forms that have been observed in this high habitat.—Thomas Greer, Sandholes, Dungannon.

The Season in Co. Tyrone.—The season here has been fairly good after a hard winter. *Plusia bractea* was common at honeysuckle and I again met with *Selidosema ericetaria* on the Lough Neagh bogs, but not the melanic forms *intermedia-fumosa* and *fumosa*, which, I am afraid, are now gone owing to all the heather on the bogs on which they occurred being burnt during a very dry spring a few years ago.—Thomas Greer.

Callophrys rubi, L., in the Isle of Coll.—Early in our Hebridean investigations my son, Dr G. Heslop Harrison, detected the Green Hair

Streak in Coll, when he took it in April. Later, in 1939, I noted it on the same island in early June. However, both of us imagined it to be restricted to the moorland scars lying between Arinagour and Arnabost. This year, in the last week in May, I broke my outward journey to stay for a short period on Coll. Then I found that the species was widely spread in the island, occurring wherever *Vaccinium myrtillus* grew on sheltered rocky masses. In particular, the insect was in real abundance everywhere just behind Arinagour between the village and Loch Airidh Meall Bhreide.—Professor J. W. Heslop Harrison, King's College, University of Durham, Newcastle-upon-Tyne.

Coccinellidae in the Isle of Benbecula.—Considerable attention has from time to time been directed to the possibility of utilizing the Outer Hebrides as sources of virus-free potato strains. In connection with this, opinions have often been expressed that these islands are free from Aphidids. This is very far indeed from the truth, for many species occur, often abundantly. This, in turn, means that insects holding Aphidids in check must be there too. However, of the Coccinellidae, I have only seen two species, both of which occur on the Isle of Benbecula; these are *Adalia bipunctata*, L. and *Coccinella 11-punctata*, L. —Prof. J. W. Heslop Harrison, University of Durham.

Plusia moneta, L., in the Inner Hebrides.—I have already indicated the presence of this species in many Scottish counties as far north as Inverness-shire, but no record exists for the Western Isles. Moreover, although its food plants, Monkshood and Larkspur, are grown on the Isles of Eigg and Muck, search on these very promising islands proved fruitless. In spite of this, odd specimens were noted on the Isle of Rhum in 1938 near Kinloch. In addition, in 1939, further examples were found at Arinagour on the Isle of Coll. During the same year, on the more favourable Isle of Tiree, much time was wasted in searching various plants of *Aconitum napellus* without success. This season, the same plant on Coll was quite free from larvae.—Prof. J. W. Heslop Harrison, King's College, University of Durham.

Beetles New to the Isle of Canna.—In 1939 (*Proc. Roy. Phys. Soc. Edinb.*, Vol. xxiii, p. 49-56) parties from the University of Glasgow published an excellent list of the Coleoptera of the Isle of Canna, an island lying west of Rhum. For the most part, that list covers our captures, but we can, nevertheless, supply three additional species, *Philonthus decorus*, Grav., *Bembidion mannerheimi*, Sahl., and *Agonum gracilis*, Gyll., all taken in the area between the Sanday bridge and the pier. For the determination of these and our other Coleoptera we have to thank my friend, Mr G. B. Walsh.—Prof. J. W. Heslop Harrison, King's College, University of Durham.

A Few Lepidoptera from Loch Eriboll, Sutherlandshire.—At the head of Loch Eriboll there are several dense thickets of birch and sallows from which we beat quite an interesting series of larvae; of these *Cerura furcula* was the most important as providing the most northerly record for the species in the British Islands. Late as it was, a parasitized specimen of *Polyploca flavicornis* demonstrated the occurrence of that species

on the northern shore of Sutherland. Other species represented were *Hydriomena ruberata, Gonodontis bidentata, Cabera pusaria, C. exanthemata, Hadena pisi, Polyploca duplaris, Demas coryli, Pheosia dictaeoides, Notodonta dromedarius, Lophopteryx camelina,* and *Acalla* [*Peronea*] *hastiana*.—Jack Heslop Harrison, Gavarnie, Birtley, Co. Durham.

Vespa austriaca, Panz., at Forres.—Amongst a crowd of *Vespa rufa* found working on a pine stump on the Culbin Sands near Forres the slimness of certain queens and the clearness of their yellow caused me to single them out for capture. These, on examination, turned out to be the allied parasitic *V. austriaca*.—Prof. J. W. Heslop Harrison, King's College, University of Durham.

CURRENT NOTES.

A pamphlet has recently come into our hands written some ten years ago by G. V. Hudson, F.R.E.S. (New Zealand), on "Some Aspects of Modern Methods of Entomology," from which one or two items may well be reproduced here.

He repeats the warning of Darwin that "the characters of larvae, being highly adaptive, should never be used for purposes of classification." And yet on such inadequate bases the Order Neuroptera has been split up into small Orders for Stone-flies, Lace-wings, Mayflies, etc., all still referred to as "Neuropteroid Insects." He states that far more alteration in Nomenclature is made by conferences and committees than were done when individual authorities were followed. He considers that the least interesting features in modern entomology are descriptions and figures of genitalia, "figures of insects were intelligible to all, figures of genitalia now substituted interest to but few." He strongly deprecates the modern tendency to use highly technical terms, where the meaning can easily be expressed in simple language. An "author tries to impress the reader with the profundity of his own knowledge." He is strongly of opinion that it is necessary that properly to study specimens they must be set and not merely mounted anyhow as many workers in the smaller Orders do.

Finally he compares "the present-day paid professional entomologist of the American type" with the "old-time unpaid British entomologist, the amateur." He goes on, "I think I am right in saying that the main ideal of the amateur entomologist was the advancement of the science for its own sake, irrespective of any economic gain to himself or others. This ideal was materialized in such objects as the formation of extensive and beautiful collections of insects; the publication of splendid illustrated books on various branches of entomology, intelligible to the general reader; the formations of societies for the exchange of views between advanced workers and beginners, and above all, the enlistment of entomological recruits, and the fostering and encouragement of a love of nature for the pleasure it brings to mankind in general. Stainton may well be taken as typical of the best entomologists of the old school." On the other hand, the modern professional entomologist has none of

these characteristics or aims, he has no " appreciation of the philosophical and aesthetic side of the science, he carries on in the stereotyped groove of his early and special training, his work is restricted to problems of economic importance, he is often subservient to a chief whose opinions, etc., are usually dominant and he fears to criticize the work selected for him and soon takes but little interest in natural problems and loses the charm of the study of nature." A report has come to my table recently of a Society which for years was of the old type, but which has been " captured by the modern professional entomologists and the Society instead of now being adequately supported by its members has to rely upon a Government Department and functions wholly (from the Report) for economic, business purpose. Let us hope that our glorious old Royal Entomological Society of London, which its members in the past could handsomely support and have thus supported for a century and more, will still attract the lovers of Science and Nature and will not be captured by the paid professional, whose disabilities arising from his professional outlook and limitations arising from his personal resources must influence his attitude towards the broad aims of a Society thus founded.

" Nature never did betray
The breast that loved her; 'tis her privilege
Through all the years of this our life, to lead
From joy to joy." *Wordsworth.*

Hy. J. T.

[The adults of Stone-flies, Lace-wings, Mayflies are easily separable.

1. Mouth-parts—rudimentary ..... Mayflies.
   Mouth-parts—well developed 2
2. Tarsi with 5 segments ..... Lace-wing Flies.
   Tarsi with less than 5 segments ..... Stone-flies.

The Mayflies and Stone-flies are both primitive groups, whilst Lace-wing Flies (and other true Neuroptera) belong to a more recent group.]—T. B. F.

May we remind our readers of the request published in the November number of this magazine asking for full details of the exhibits which it was intended to bring to the Annual Exhibition of Varieties of the South London Entomological Society had it been possible to hold it as it was proposed. It will be remembered that last year a full report was published of some very fine varieties, some of which it was possible to exhibit at other meetings of the S. London Society and illustrations were also added in the Society's Proceedings issued later in the year. Particulars should be sent either to Mr H. G. Denvil, 4 Warwick Road, Coulsdon, Surrey, or to Mr S. G. Castle-Russell, " Cotswold," Forest Gardens, Ringwood, Hants, who will edit the matter received as he did last year.

Correction.—On p. 120 for the references to " watercress " substitute " on *Cruciferae* " in each case.

CONTENTS OF VOLUME LII.

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

LIST OF CONTRIBUTORS.

LIST OF ILLUSTRATIONS.

SUPPLEMENTS.

Another " Thorax and forewings wholly spotless white with a reddish tinge, and the hindwings also are nearly white, so that it quite resembles *Leucania pallens*."

The Names and Forms to be considered are:—

lychnidis, Schiff. (1775), *Verz.*, L, 5, p. 76. No description.
f. *pistacina*, Schiff. (1775), *Verz.*, M, 1, p. 77. No description.
lychnidis, Fab. (1787), *Mant.*, II, 146.
f. *pistacina*, Fab. (1787), *Mant.*, II, 174.
ab. *serina*, Esp. (1788-?), *Abbild.*, IV (2), 522, plt. 156, 2.
ab. *rubetra*, Esp., *l.c.*, 523, plt. 156, 3-4.
f. *canaria*, Esp., *l.c.*, 524, plt. 156, 5-6.
ab. *schaenobaena*, Esp., *l.c.*, 525, plt. 157, 2-3.
lychnidis, Fab. (1793), *Ent. Sys. Aug.*, III (2), 45.
f. *pistacina*, Fab. (1793), *Ent. Sys. Aug.*, III (2), 109.
ab. *sphaerulatina*, Haw. (1809), *Lep. Brit.*, 230.
ab. *ferrea*, Haw. (1809), *l.c.*, 231.
ab. *lineola*, Don. [Haw. (1809), *l.c.*] Don., *Brit. Ins.*, X, plt. 360 (1801).
f. *pistacina*, Haw. (1809), *l.c.*
ab. *venosa*, Haw. (1809), *l.c.*, 232.
lychnidis, Hb. (1809-13), *Samml. Noct.*, 464.
ab. *rufina*, Hb. (1823-4), *l.c.*, 707-8.
ab. *caerulescens*, Calb. (1884-8), *Iris*, I, 254.
ab. *metallica*, Ckll. (1889), *Ent.*, XXII, 3.
ab. *pallida*, Tutt (1892), *Brit. Noct.*, II, 166.
ab. *obsoleta*, Tutt (1892), *l.c.*
ab. *brunnea*, Tutt (1892), *l.c.*, 167.
ab. *unicolor-brunnea*, Tutt (1892), *l.c.*
v. *silesiaca*, Schultz (1905), *Jahr. Wien ent. Ver.*, 35.
ab. *sobria*, Schwrd. (1921), *Verh. z. b. Wien*, 157.
ab. *alba*, Porritt (1923), *E.M.M.*, LIX, 87.
ab. *nigra*, Salz. (1934), *Mitt. Münch.*, XXIV, 56.

Tutt dealt with (1) *lychnidis*, the typical form, bright red with distinct markings and pale nervures; (2) ab. *lineola*, bright red, with distinct costal streaks and stigmata; (3) *ferrea*, bright red, almost unicolorous; (4) f. *pistacina*, pale reddish-ochreous, with distinct markings and pale nervures; (5) ab. *sphaerulatina*, pale reddish-ochreous, with distinct costal streaks and stigmata; (6) ab. *obsoleta*, pale reddish-ochreous, unicolorous; (7) ab. *serina*, pale greyish-ochreous, with distinct costal streaks and stigmata; (8) ab. *pallida*, pale greyish-ochreous, with faint transverse, costal streaks and stigmata; (9) ab. *unicolor-brunnea*, brown, slightly ochreous, almost unicolorous; (10) ab. *brunnea*, brown, with distinct costal streaks and stigmata; (11) ab. *venosa*, brown, with distinct markings and pale nervures; (12) f. *canaria*, blackish-grey; (13) ab. *metallica*, each forewing with large blotch of a metallic cast (cf. *Plusia* sp.) near the hind margin, reaching from the costa to the inner margin.

ab. *schaenobaena*, Esp., *Abbild. Noct.*, IV, 522-4 (1788-?).
Fig.—*l.c.*, plt. 157, 2-3.

Orig. Descrip.—♀. "Deep mahogany-red, veins showing light as well as transverse markings and surround of the reniform; h.w. deep uniform black, no veins apparent, lighter at base; shoulders red."

♂. "Ochreous, very faint suggestion of red; mottled somewhat; veins apparent but not light as in ♀; h.w. light fuscous, black veining, not lighter at base.

ab. *caerulescens*, Calb., *Iris*, I, 254 (1884-8).

Orig. Descrip.—"The forewings bluish-grey or reddish-grey coloured; in them are wanting always any brown or greenish tinge; the colour of the forewing resembles that of *litura*."

[The markings and stigmata in some cases distinct, in others washed out, and the veins are in some cases the colour of the wings and in others brighter.]

Hamp., *Cat. Lep. Ph.*, VI, 475 (1906), "Forewings bluish-grey."

Hamp. then sums up the variation:—

ab. *canaria*—Darker; forewing more or less suffused with black.
ab. *serina*—Forewing paler and almost unicolorous.
ab. *rubetra*—Forewing almost uniform rufous.
ab. *rufescens*—Forewing bluish-grey.

var. *silesiaca*, Schultz, *Jahr. Wien ent. Ver.*, XVI, 35 (1905).

Orig. Descrip.—A very long detailed description in comparison with ab. *canaria*, Esp., was given by Schultz which he summed up as follows:—"Forewings above black-fuscous, stigmata, longitudinal striae and transverse markings yellow; hindwings black; below all the wings very black with yellow fringes; abdomen deep black." Near Heinrichau, Central Silesia. A number of examples.

ab. *sobria*, Schwrd., *Verh. z.-b. Gesell. Wien*, LXXI, 156-7 (1921).

Orig. Descrip.—"It has the purple-brown suffused colour of *Agrotis sobrina* or *Pachnobia rubricosa*. The stigmata are not darkened blackish, not even the costal spot, they are of a darker tone of the purple-red ground colour. The nervures and transverse lines are not yellow, but of the ground colour, only somewhat lighter. The transverse band is present a dark red-brown." Mostar, Bosnia.

ab. *alba*, Porritt, *E.M.M.*, LIX, 87 (1923).

Fig.—Barr., *Lep. Brit. Is.*, V, plt. 227, 1 g.

Orig. Descrip.—"The entire insect—head, thorax, and body and all the wings—white, with the faintest tinge of pink. No markings whatever." Paignton, at sugar.

ab. *nigra*, Salz., *Mitt. Münch. Ent. Gesell.*, XXIV, 56 (1834).

Orig. Descrip.—"The forewings are similarly very dark black-brown, the nervures, the margins of the stigmata, the cross lines standing out ochre-yellow. The hindwings are darker black-brown than in normal specimens and in the aberrations known up to now. Head, neck, and thorax are the colour of the forewings, definite black-brown, but very little paler. The abdomen is almost black. The two examples came nearest to the ab. *canaria*, Esp., from which they differ by their particularly dark ground of wing and the emphasized yellow-marking." Regensburg.

Anchoscelis, Gn. (1839) (1852) (Sth.), Stdgr. [*Orthosia*, Ochs. & Tr. (1816-25), Curt., Barr.: *Amathes*, Hb. (1821): *Aporophyla*, Gn. (1841-1852), Meyr., Meyr.: *Omphaloscelis*, Hamp. (1906), South]: *lunosa*, Haw. (1809).

This species is a purely Western European species: Britain, France, Spain, Algeria.

Tutt, *Brit. Noct.*, II, 168 (1892): Meyr., *Handb.*, 58 (1895-6): Barr., *Lep. Br. Is.*, V, 348, plt. 228, 2 (1899): Stdgr., *Cat.*, IIIed., 206 (1901): Hamp., *Lep. Phal.*, VI, 469, f. 161 (1906): Splr., *Schm. Eur.*, I, 247, plt. 46, 6 (1907): South, *M.B.I.*, II, 11, plt. 7, 1-4 (1908): Warr.-Stz., *Pal. Noct.*, III, 149, plt. 36h (1910): Culot, *N. et G.*, I (2), 76, plt. 53, f. 4-6 (1914): Meyr., *Rev. Hand.*, 117 (1928).

Curtis, *Br. Ent.*, V, 237 (1828), gave a beautiful figure of one of the lighter forms.

Steph., *Ill.*, II, 147 (1829), said "both sexes vary immensely." He possessed "one specimen with posterior wings nearly fuscous with the central lunule darker; and another nearly white."

H.-S., *Sys. Bearb.*, II, 199 (1849), f. 94 (1845), f. 289 (1847), gave a good clear figure, 94, under the name *neurodes*, and a very poor shaped and marked f. 289 under the same name ♀. He used the name *subjecta*, Dup. in his letterpress. He attributed *lunosa* to Curtis. Asserted his f. 94 was *agrotoides*, Gn., *Ess.* (1839) and the *humilis*, H. & Wwd. The *neurodes*, Hb., 568, is *dolosa*, Hb. Apparently H.-S. knowledge of this species was very limited as it was then only known from Britain. It had just been discovered in France.

Gn., *Hist. Nat. Noct.*, V=(1), 367 (1852), when dealing with *lunosa*, said that "having reared the species in quantity, he saw that it differed considerably from *humilis*, Hb., with which everyone confounded it and of which Bdv. in his *Index* (1829) considered it a variety." He then, *Essai Am. S. Ent. Fr.*, 485 (1839), gave it a new name *agrotoides*, which appeared almost simultaneously with the description and figure of *subjecta*, by Dup. to whom he had sent examples. He went on to say that the name given by Haw., viz., *lunosa*, should stand. Thus both *agrotoides* and *subjecta* are synonyms of *lunosa* in his opinion. He understood that the type was of a grey-black with nervures clearly picked out with yellow, the two stigmata filled in with black and the abdomen similarly tinted. In this he overlooked the fact that Haworth's type was red or reddish-grey without pale nervures. In fact Gn. described one of his bred forms devoid of red or reddish, and not Haworth's form, for which we must keep his name *agrotoides*, summed up by Tutt, "blackish-grey, with pale nervures."

Turning now to the *subjecta*, Dup., *Hist. Nat. Supp.*, III, 295, plt. 27, f. 3 (1836). There are two very good figures neither of which is typical *lunosa* or *agrotoides*, Gn. They are said to be ♂, dark grey, and ♀, fawn-grey, quite distinct forms. The striking character of 3a (♂) is the conspicuous submarginal dirty white narrow band and no trace of a rufous tinge, with veins slightly marked. Dup. makes no mention in his description of this light band. This should be included as one of the named forms of *lunosa*.

Newman, *Brit. Moths*, 368-9, 2 figs. (1869), gave two good b. and w. figs. One a pale form, the other a dark form with nervures showing well.

Meyr., *Handb.*, 58 (1895), and *Rev. Handb.*, 117 (1928), used the genus *Aporophyla* for *lunosa* with *australis*, *lutulenta* and *nigra*. He remarked that *Aporophyla* was "a true European genus of comparatively recent origin."

Stdgr., *Cat.*, 206 (1901), placed *lunosa* as the only species in *Anchocelis* (*Anchoscelis*).

Hamp., *Lep., Phal.*, VI, 469, fig. 161 (1906), gave a good b. and w. figure and erected the genus *Omphaloscelis* for this species alone. In his synonymy he added *s* to *Ancho(s)celis*, Gn., probably following Stdgr., *Cat.*, who put *Anchoscelis* (r. *Anchocelis*, Gn.).

Splr., *Schm. Eur.*, I, 247, plt. 46, 6 (1907), gave a very fair figure of the *agrotoides* form of *lunosa* and renamed the *humilis*, H. & Wwd. by *pallida*, for the yellowish olive-grey form with pale nervures. It is the only species he placed in the genus *Anchocelis*, probably following Stdgr., *Cat.*

South, *M.B.I.*, II. 11, plt. 7, f. 1-4 (1908), gave four figures. F. 4, *agrotoides*, is a good figure of the blackish-grey form; f. 2 is a good figure of *humilis* but with veins hardly enough expressed; f. 1 and f. 3 are typical *lunosa*, the red (1) and reddish-grey (2) without pale nervures are quite good.

Warr.-Stz., *Pal. Noct.*, III, 149, plt. 3h (1910), considered the *pallida*, Splr., as *humilis*, H. & Wwd.; accepted *subjecta*, Dup., to which they placed *neurodes*, H.-S.; considered the blackish-grey *agrotoides*, Gn., as an extreme form of the dark brown *subjecta*, Dup. They gave five figures of their opinion of what they considered the forms to be., viz., (1) *lunosa*, the reddish-grey form of Haw., but with very pale nervures; (2) *humilis*, the brownish-grey with pale nervures; (3) *subjecta*, Dup., which Tutt rejects for the later described *neurodes*, H.-S. Tutt gave a difference between these two, the former has slatey nervures, the latter white ones. At any rate the earlier name *subjecta* should be treated as a recognised form instead of *neurodes*, which name may perhaps be retained for the white-veined form; (4) *agrotoides*, the blackish-grey with somewhat pale nervures comparable to the figure by Dup. of the ♂ of his *subjecta* and with the light submarginal band; (5) *brunnea*, Tutt, dark red brown with well developed pale veins. All these figures are good.

Culot, *N. et G.*, I (2), 76, plt. 53, f. 4-6 (1914), gave a very good summary of the named variations of this species, and gave three excellent figures of more extreme forms: f. 4, the *obsoleta*, Tutt; f. 5, *agrotoides*, Gn.; f. 6, *rufa*, Tutt, and remarked on the fact that scarcely ever did one find two examples exactly alike. He followed Stdgr. in placing it alone in *Anchocelis*, Gn.

The identification of the various descriptions and figures is most confusing and in no way satisfactory; further confusion arises from authors placing more than one form under a single name, e.g., *lunosa*, Haw.; *subjecta*, Dup.; *rufa*, Tutt; and still further by the irregular presence or absence of the marked nervures.

It would seem that Tutt's analysis with which Warr.-Stz. closely agreed, is the best practical identification so far.

The *humilis*, Fb., figured by Hb., *Samml. Noct.*, 170, is not the *humilis*, H. & Wstw., but a Central European *Amathes* species.

Barrett says of the Variation:—
Its variations are to a great extent the described forms and that intermediates between these forms seem to be of rare occurrence, though in western districts the rich dark forms certainly preponderate.

The Names and Forms to be dealt with are:—
lunosa, Haw. (1809), *Lep. Brit.*, 230.
f. *subjecta*, Dup. (1836), *Hist. Nat. Supp.*, III, 295, plt. 27, 3a.
ab. *humilis*, Humph. & Ww. (1841), *Br. Moths*, I, 139, plt. 27, f. 7-8 (nec Hb.).
ab. *neurodes*, H.-S. (1840), *Sys. Bearb.*, II, 199, f. 94, 289 (nec Hb.).
ab. *agrotoides*, Gn. (1852), Gn., *Ann. S. Ent. Fr.*, VIII, 486 (1839).
ab. *lunae*, Greg. (1888), *Young Nat.*, IX, 122.
ab. *obsoleta*, Tutt (1892), *Br. Noct.*, 169.
ab. *rufa*, Tutt (1892), *l.c.*, 170.
ab. *brunnea*, Tutt (1892), *l.c.*, 170.
ab. *olivacea*, Vazq. (1905), *Bol. Hist. Nat. Espana*, V, 121-2.
ab. *rubra*, Vazq. (1905), *l.c.*, 122.
ab. *pallida*, Splr. (1907), *Schm. Eur.*, I, 247 = ? *humilis*, H.-S.
ab. *intensa*, Turn. (1938), *Ent. Rec.*, L., p. 22.

Tutt dealt with (1) *lunosa*, Haw., the red or reddish-grey, without pale nervures; (2) *rufa*, ditto, with pale nervures; (3) *brunnea*, dark red-brown with pale nervures; (4) *humilis*, brownish-grey, with pale nervures; (5) *neurodes*, dark grey-brown, with pale nervures; (6) *agrotoides*, blackish-grey, with pale nervures; (7) *obsoleta* (slightly reddish), pale ochreous, without pale nervures; (8) *lunae*, Greg., a reddish form, with poorly shown veining (this is in *Br. N.*, Appendix, IV, 120).

ab. *lunae*, Greg., *Young Nat.*, IX, 122 (1888).
Orig. Descrip.—" A reddish form with veins, not so distinctly paler as in the type, which is a cold dark brown." N. England.

ab. *olivacea*, Vazquez, *Bol. Hist. Nat. Espana*, V, 121-2 (1905).
Fig.—*l.c.*, 5a.
Orig. Descrip.—" Differs from the type in the colour of the forewings, which is that of yellow-grey oil, almost uniform. There exists in the type form a very fine white line bordered by a wide black margin, which is very little marked in the aberration, in some examples, it is just traceable, and in others not at all. The well developed light lines corresponding to the nervures, which are present in the typical form, have completely disappeared in the aberration as well as the fringes, and the light lines parallel to the outer margins. The hindwings differ little from the normal. The thorax and abdomen are of the same colour as the forewings. The antennae are lighter than in the typical form and almost of the colour of the wings." Madrid and near neighbourhood.

ab. *rubra*, Vazquez, *Bol. Hist. Nat. Espana*, V, 122 (1905).
Fig.—*l.c.*, 6a.

ORIG. DESCRIP.—" This aberration shows similar characters and differences from the normal as in the previous form, but the predominant colour is a very marked reddish-ochre. The antennae are also somewhat reddish. It is much more rare than the previous form." Madrid, etc.

ab. *pallida*, Splr., *Schm. Eur.*, I, 247 (1907).

ORIG. DESCRIP.—" Pale yellowish-olive-green and pale reddish-ochre-yellowish forms with pale veins." Spuler wished to substitute this name for *humilis*, H. & Wstw., which Tutt used.

ab. *intensa*, Turnr., *Ent. Rec.*, L, 22 (1938).

ORIG. DESCRIP.—" A very dark, almost blackish, red-brown forewing, without the light outermarginal band, with stigmata black, but almost obsolescent on account of the dark ground colour, and without conspicuous veining as in *agrotoides* and the hindwing evenly dark blackish suffused." Chelston, Devon (captured and communicated by Capt. C. Q. Parsons).

Anchocelis, Gn. (1852) [*Orthosia*, Ochs. & Tr. (1816-25), H.-S., Meyr., Barr., Stdgr., Splr. (South), Culot, Meyr. : *Amathes*, Hb. (1821), Hamp., South, Warr.-Stz.] *litura*, L (1761).

Tutt, *Brit. Noct.*, II, 170 (1892): Meyr., *Hand.*, 63 (1895): Barr., *Lep. Br. Is.*, V, 344, plt. 228, f. 1 (1899): Stdgr., *Cat.*, IIIed., 207 (1901): Hamp., *Lep. Ph.*, VI, 483, f. 164 (1906): Splr., *Schm. Eur.*, I, 251, plt. 46, f. 18 (1907): South, *M.B.I.*, II, 16, plt. 9, f. 7-9 (1908): Culot, *N. et G.*, I (2), 84, plt. 54, f. 15-16 (1914): Meyr., *Rev. Hand.*, 123 (1928).

Esper, *Abbild.*, IV (2), 383, plt. 127 (1787-?), gave a dark almost unrecognizable figure under the name *polluta*, which is considered to be a *litura* form. It is of good size. And *l.c.*, IV (2), 686, plt. 177, f. 4-5 (1790 ?), gave a small dark figure (5), very poor, and fig. 4, a larger figure with the stigmata very conspicuously outlined in white.

Ernst & Engr., *Pap. d'Eur.*, VII, 4, f. 399 (1790), gave a rough and too much marked figure, which Wern., *Beitr.*, II, determined as *litura*. Otherwise a good passable figure with lighter basal area.

Hb., *Samml. Noct.*, 127 (1800-3), gave a good figure of *litura*, with considerable marking, and Hb.-G., *l.c.*, f. 813 (1827), gave a dark form as *ornatrix*; both good figures.

Dup., *Hist. Nat.*, VI, 104, plt. 79, f. 6 (1826), gave a fairly good figure somewhat too dark to be typical. In the text he called attention to the chief characteristics of the species.

Frr., *Neu. Beitr.*, I, 147, plt. 95, f. 1 (1833), gave a good dark figure labelled *ornatrix*. This he afterwards, *l.c.*, II, 159 (1836), corrected to " a small dark *litura*." Subsequently, *l.c.*, IV, 76, plt. 335 (1842), he gave another dark fig. of *litura*, and referred to his previous notes, and to Esper's figure of *polluta*, IV, 127, which he quoted to *litura* with doubt, and to fig. 187 as *litura*, ab.

Gn., *Hist. Nat. Noct.*, V (1), 369, considered *ornatrix* and *polluta* as the same form, and referred to Freyer who at first treated *polluta* as a distinct species but later altered his opinion (cf. appendix).

Splr., *Schm. Eur.*, I, 251, plt. 48, f. 18 (1907), gave an almost unrecognizable figure, which he himself said was bad. He described a northern form, *ochreata*, from Scandinavia, ochreous in general tone (figured by Stz.).

South, *M.B.I.*, II, 16, plt. 9, f. 7-9 (1908), gave three good figures as regards marking and size, but the red-brown tone of the plate is too dominant. Fig. 8 shows the paler basal portion of the forewing which characterizes f. *borealis*, while f. 7 may best represent ab. *rufa*, Tutt.

Warr.-Stz., *Pal. Noct.*, III, 152, plt. 37gh (1910), gave 7 figures, *litura* ♂ and ♀, *polluta*, *ornatrix* ♂ and ♀, *rufa*, and added a new one, *luteo-grisea*, from Amasia. They considered that the *saturata*, Schultz was the *borealis*, Spr.-Schn. The figures are passable as to markings, but the basal colour has not the natural delicacy.

Culot, *N. et G.*, I (2), 84, plt. 54, f. 15-16 (1914), gave 2 excellent figures, 16 being *meridionalis* from Digne. This form is of a pale uniform lilac-grey with a strongly emphasized ferruginous shade and apical spot.

Barrett remarked on the Variation :—

" Variable in the tone of colour of the forewings to paler or darker purple-brown, and still more in that of the basal portion, which is often paler and sometimes pale drab, this frequently extending to the angulated central shade; occasionally the latter is blackened and thrown strongly into relief, while in other cases it is nearly or quite obliterated."

He recorded a specimen which " Has the pale blotch yellowish and divided into two parts."

Another " Has it almost ashy-white, and the central area rosy-purple."

" Scottish specimens often are very richly coloured."

The Names and Forms to be dealt with are :—

litura, L. (1761), *Fn. Suec.*, 320.
ab. *polluta*, Esp. (1788-?), *Abbild.*, IV (2), 383, plt., 127, f. 5.
ab. *ornatrix*, Hb.-G. (1834), *Samml. Noct.*, 813.
race *meridionalis*, Stdgr. (1871), *Cat.*, IIed., 117.
race *borealis*, Sp. Schn. (1885), *Ent. Tids.*, 74.
ab. *rufa*, Tutt (1892), *Brit. Noct.*, II, 170.
ab. *rufa-pallida*, Tutt (1892), *l.c.*
ab. *saturata*, Schltz. (1900), *Ill. Zeit. Ent.*, V, 349.
ab. *ochreata*, Splr. (1907), *Schm. Eur.*, I, 251, plt. 46, f. 18.
ssp. *luteo-grisea*, Warr.-Stz. (1910), *Pal. Noct.*, III, 152, plt. 37h.
ab. *conjuncta*, Hofm. (1920), *Verh. z.-b. Ges. Wien*, LXX (173).

Tutt dealt with (1) the typical form described in the *Fn. Suec.*, p. 320 (1761), by Linn. "alis canis fascia fusca liturisque quattuor marginalibus nigris," as " whitish (hoary) with dark transverse lines," and expressed the opinion that it does not occur in Britain as he had never seen one. He said it must be " An extreme northern form, foreshadowed by the strong pale base in some of our Scotch specimens (f. *borealis*), the pale colour extending over the whole wing in still more northern localities;" (2) the purplish fuscous, pale based form, *borealis*; (3) ditto, without pale base, *ornatrix*, H.B.; (4) bright red, no pale base, ab. *rufa*; (5)

bright red, with pale base, ab. *rufa-pallida*; (6) the purely continental dark form of somewhat larger size, *polluta*, Esp., which Gn. considered a large *ornatrix*; (7) *meridionalis*, Stdgr. Tutt gave the phrase description from *Cat.*, Hed. (1871). We now know this remarkable form from Culot's excellent figure of the example in his collection.

ab. *saturata*, Schultz, *Illus. Ent. Zeit.*, V, 349 (1900).

ORIG. DESCRIP.—" While the typical examples of this species are marked from the costa to the inner margin of the forewings by the stigmata within a darker shade of a curved shape, which, above wide, thins out below the stigmata; in a few Bohemian specimens this shade is extended to the outer margin so that the whole of the middle and marginal area are distinctly contrasted with the prominently pale basal area by the darker colour."

ab. *ochreata*, Splr., *Schm. Eur.*, I, 251 (1907).

ORIG. DESCRIP.—" In Central Europe there occur yellowish violet-grey examples which often towards the base of the central shading are strongly marked with ochreous-white."

ab. *luteo-grisea*, Warr.-Stz., *Pal. Noct.*, III, 152 (1910).

FIG.—*l.c.*, 37h.

ORIG. DESCRIP.—" From Amasia, is pale stone colour, with distinct but not prominent markings, the underside paler."

ab. *conjuncta*, Hofr., *Verh. z.-b. Ges. Wien*, LXX (173) (1920).

ORIG. DESCRIP.—" In which the orbicular and reniform at their lower portions are united by a cross bar." Klosternenburg, Vienna.

In 1941 Vol. III will be begun and the Appendix to Vols. I and II will be dealt with. Possibly these may appear in alternate parts.

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.

REPRINTS of articles may be obtained by authors at very reasonable cost if ordered at THE TIME OF SENDING IN MS.

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

TO OUR READERS.—Short Collecting Notes and Current Notes. Please, Early.—Eds.

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.

Urgently Wanted for Experimental Purposes.—Pupae of *hirtaria* and *lapponaria*. I can offer duplicates of very many species in return.—*Harold B. Williams, Croft Point, Bramley, Surrey.*

Desiderata—British *dominula* varieties with full data other than var. *lutescens* and var. *lineata*. Other vars. acceptable. *Duplicates*—British *L. l-album, exigua, cribrum, ocellaris,* and *intermedia*, etc.—*Dr H. B. D. Kettlewell, Cranleigh, Surrey.*

Wanted—American Hesperiidae, especially from Costa Rica, West Indies, the Guyanas, Guatemala, Honduras, Nicaragua, Venezuela, Colombia and Bolivia. Write *K. J. Hayward, Estación Experimental, Casilla Correo 71, Tucuman, Republica Argentina.*

Duplicates.—Several thousand British Macro-Lepidoptera in perfect condition; full data. *Desiderata.*—British Micro-Lepidoptera in similar condition.—*S. C. S. Brown, Kingsholme, 454 Christchurch Road, Boscombe, Bournemouth.*

New Address—Kenneth J. Hayward, F.R.E.S., F.R.G.S., F.Z.S., Estación Experimental Agricola, Casilla Correo 71, Tucuman, Republica Argentina.

New Address—Harold B. Williams, from Bramley, to 2 Mitre Court Buildings, Temple, E.C.4.

New Address—J. Antony Thompson, from Rhas School, to Roe Wen, near Conway.

MEETINGS OF SOCIETIES.

WAR-TIME ARRANGEMENTS.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON : 41 Queen's Gate, S.W.7. (Nearest stations : S. Kensington and Gloucester Road.) General Meetings at 3 p.m., on the first Wednesdays of the month, February-June; October-December. Annual Meeting, third Wednesday in January.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. —Winter meetings, second Saturday of each month from 9th November to 8th March, 2 p.m. for 2.30 p.m., Chapter House Hall, St Thomas Street, S.E.1. *Hon. Sec., S. N. A. Jacobs*, Ditchling, Hayes Lane, Bromley, Kent.

THE LONDON NATURAL HISTORY SOCIETY.—Fixtures as printed in current syllabus cancelled. Members will be notified of further arrangements. *Hon. Sec., A. B. Hornblower*, 91 Queen's Road, Buckhurst Hill, Essex.

ENTOMOLOGICAL SECTION, BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.—Evening Meetings. On the third Monday of each month, 7 p.m., at 55 Newhall Street, Birmingham. Visitors welcomed. Those who would like to attend or exhibit please apply to *G. B. Manley*, 72 Tenbury Road, King's Heath, Birmingham.

SOCIETY FOR BRITISH ENTOMOLOGY.—All meetings suspended till further notice. *Hon. Sec., E. Rivenhall Goffe*, 102 High Street, Southampton.

Communications have been received from or have been promised by T. Bainbrigge Fletcher, A. J. Wightman, W. P. Curtis, H. Willoughby-Ellis, E. Ernest Green, H. Donisthorpe, S. C. Brown, P. B. M. Allan, Dr E. A. Cockayne.

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

Printed by T. Buncle & Co. Ltd., Arbroath.