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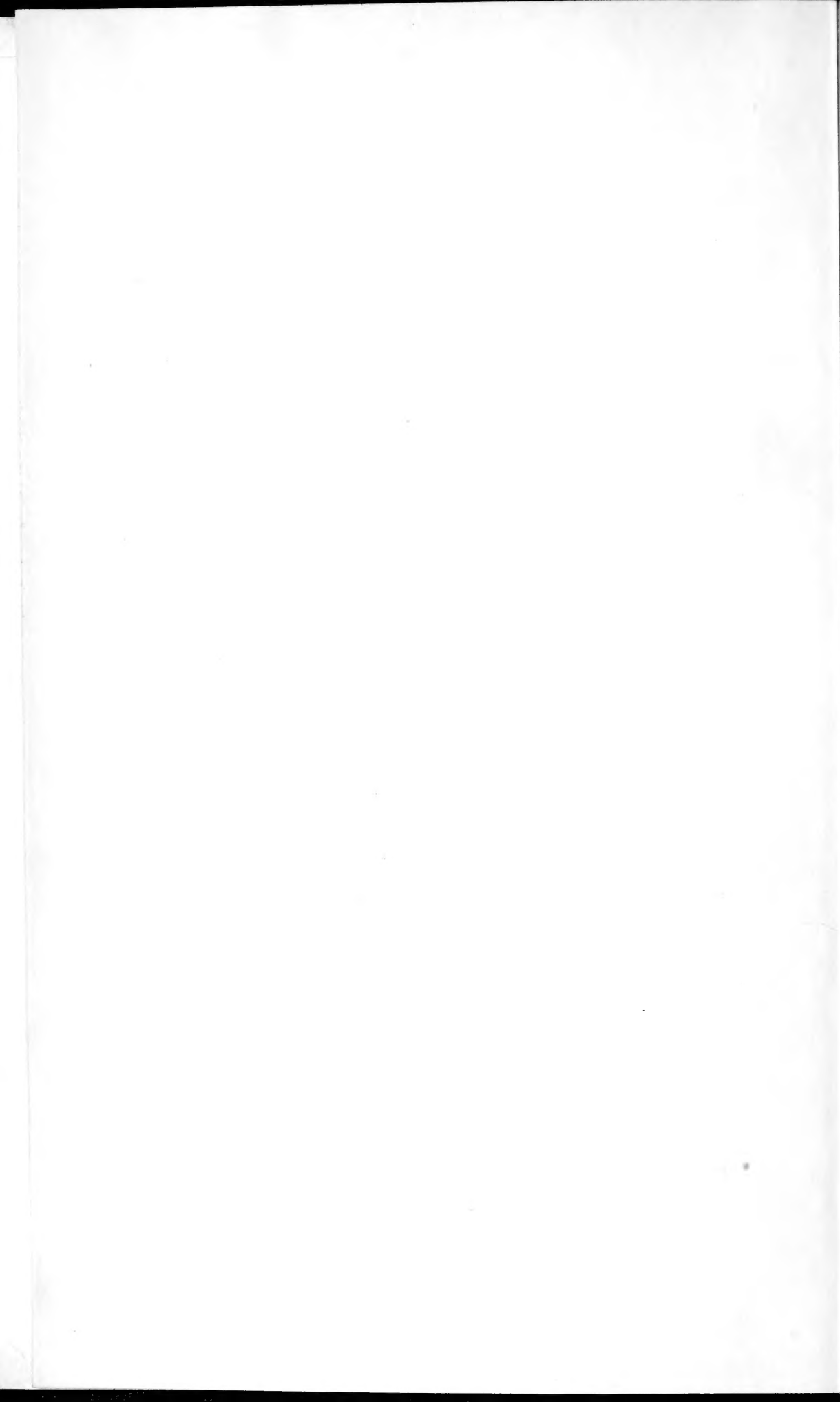


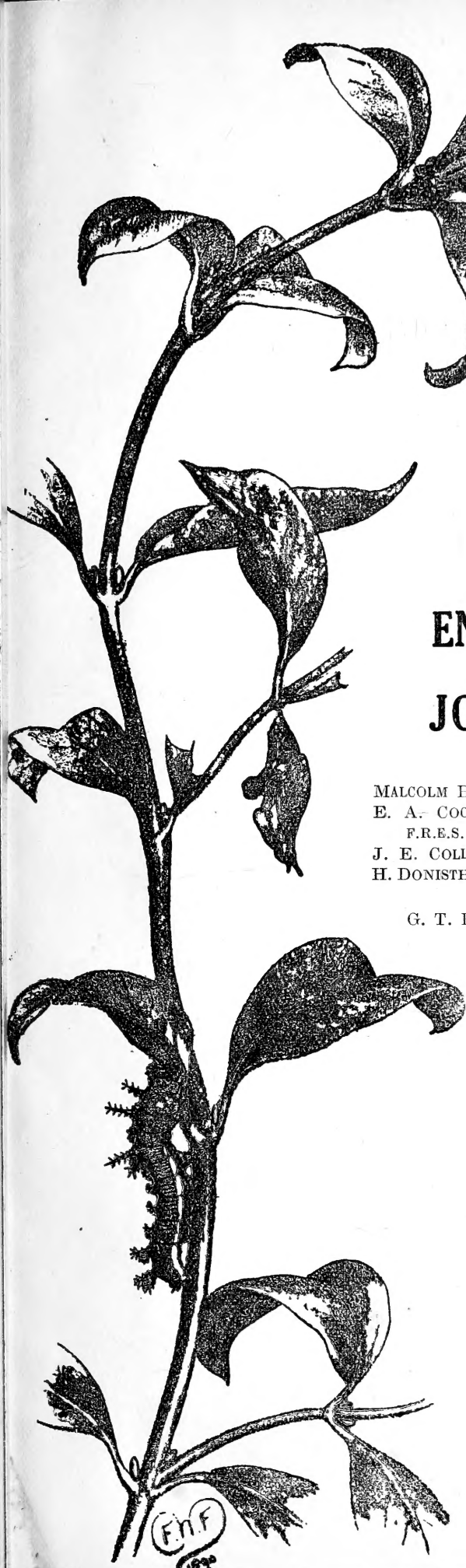
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THE
ENTOMOLOGIST'S RECORD
AND
JOURNAL OF VARIATION

EDITED BY

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F.R.E.S., F.R.C.P.
J. E. COLLIN, J.P., F.R.E.S.
H. DONISTHORPE, F.Z.S., F.R.E.S.

T. BAINBRIGGE FLETCHER, R.N.,
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H. E. PAGE, F.R.E.S.
ALFRED SICH, F.R.E.S.
Rev. G. WHEELER, M.A.,
F.R.E.S., F.Z.S.

G. T. BETHUNE-BAKER, F.Z.S., F.R.E.S., *Editor Emeritus*,
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HENRY J. TURNER, F.R.E.S., F.R.H.S.,
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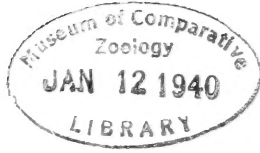
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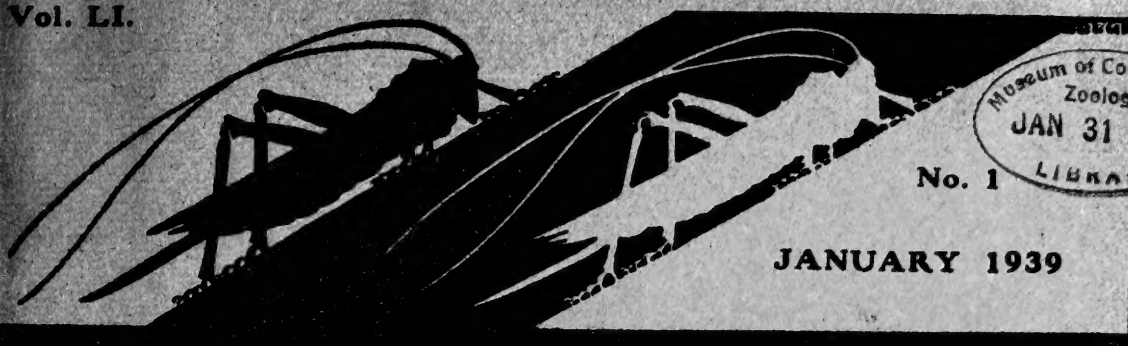


We carry on. We trust that all our subscribers also will carry on. May we urge that more of our readers send us notes on aught that may be entomologically interesting, and helpful to fellow readers, to give as well as to take.

Thanks are due to all who have helped in the past.

THE EDITORS.

Vol. LI.



JANUARY 1939

ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

2 pp. in preface

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By HENRY J. TURNER, F.R.E.S., F.R.H.S., Editorial Secretary.

CONTENTS.

VARIATION IN THE WING MARKINGS OF THE TRYPETID FLY, EURIBIA (UROPHORA) STYLATA, F., H. W. Andrews, F.R.E.S. (Plate)	1
NOTES ON PYRAUSTA NUBILALIS, HUBN., S. Wakely	3
ANTS IN THE NORTH OF SCOTLAND, L. H. Weatherill	5
CONTINUOUS BREEDING. II.—LASIOCAMPA TRIFOLII, ESP., H. B. D. Kettlewell, M.A., M.B., B.Chir.	7
COLLECTING NOTES:—Hadena pisi, L., ab. striata, ab. nov., E. A. Cockayne; The Flight of Forficula auricularia, L., Bernard Embry; A Note from Mid-Wales, P. B. M. Allan; Sugaring in a Bishop's Stortford Garden, Chas. S. Colman	8
CURRENT NOTES	10
SOCIETIES	11

SUPPLEMENTS:

The British Noctuae and their Varieties, Hy. J. Turner, F.R.E.S., F.R.H.S.	(161)-(164)
"Butterfly Races and Zygaenae of Macedonia," Roger Verity, M.D., F.R.E.S.	(17)-(20)

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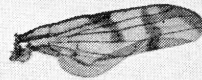
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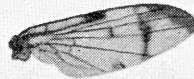
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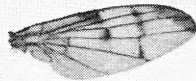
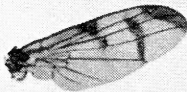
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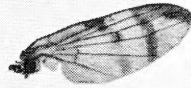
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D 2

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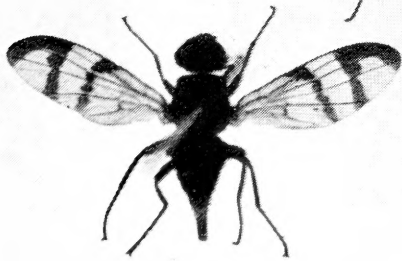
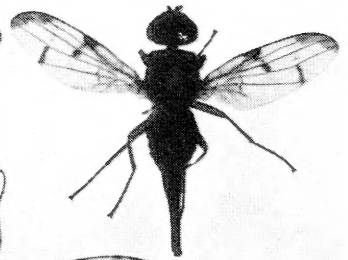
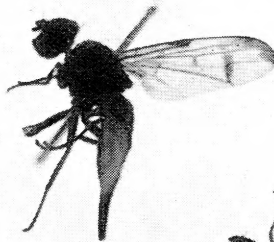


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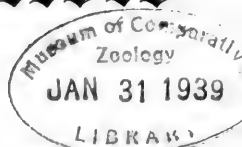
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VOL. LI.

JANUARY 15, 1939.

No. 1

VARIATION IN THE WING MARKINGS OF THE TRYPETID FLY, *EURIBIA (UROPHORA) STYLATA*, F.

By H. W. ANDREWS, F.R.E.S.

Plate I.

It is well known to Dipterists that certain species of Trypetids show considerable variation in their wing-markings.* *Euribia stylata*, F. is one such species, and from specimens in my collection added to a long series bred this year (1938) from galled seed-heads of the Spear Thistle (*Unicus lanceolatus*) I have attempted to work out the main lines of its variation. The wing-markings of *E. stylata* as given in Wingate ("Durham Diptera") are:—"Wings with only three bands, the basal band absent: the X5² band (my sub-apical) and the tip band united at the fore-margin." Seguy ("Muscides acalyptères") says:—"Three dark transverse bands: bands reduced: the two apical joined at the edge." He adds in his detailed description: "Wings clear with three brown bands: the two apical sometimes separated at the edge in the males." Hendel (in "Lindner's Palaearctic Diptera") says:—"Wings with only three dark cross-bands, of which the first spreads out at the tip as a stripe. The basal band at most is vestigial . . . third and fourth (my sub-apical and apical) more or less broadly joined at the costal margin. Stigma (Cse) always dark brown."

I may mention here that the word "band" in descriptions of Trypetid wing-markings does not imply that it extends right across the wing; in the case of *E. stylata* only one of the three (my sub-apical) extends normally right across.

The above brief descriptions may be amplified as follows:—

(1) *The Apical Band* consists of a darkened area at the wing tip, starting at a point on the costal margin above the outer cross-vein (t-p) and extending down as a rule to the third longitudinal or radial vein (r 4+5), but at the outer margin extending further down to a little below the fourth longitudinal or median vein (m 1+2).

Variation.—This band is very constant at the outer margin but it varies in depth along the costa, thinning out until in rare cases only a costal rim is left (Fig. K).

(2) *The Sub-apical Band* extends normally right across the wing: it merges with the apical band at the costal margin, and this junction of the two bands is one of the characters that differentiates *E. stylata* from *E. affinis*, Frauenfeld, where the two apical bands are described as "widely separated."

*Vide *E. Record*, Vol. XXVII, p. 57. "Variation in the Wing-markings of *Tephritis (Oxyna) flavipennis*, Lw. J. E. Collin. (With plate)."

Variation.—The constant feature in this band is its coincidence with the outer cross-vein (t-p), it continues upwards in varying degrees of thickness to its junction with the apical band, and in extreme cases it practically fades out above the outer cross vein (Fig. I). In Group C. where the clear spot has extended laterally this band does not quite reach the costal margin, nor does it always do so in Form D. (Fig. D1).

A study of the material in my possession (73 ♂♂ and 54 ♀♀) as regards the apical and sub-apical bands shows a wide range of transitional forms merging one into another, which can be divided into four main groups A-D applicable to both sexes.

Group A, ♂♂ 49%, ♀♀ 48%. The typical form with apical and sub-apical bands joined at costal margin (Fig. A 1 and 2).

Group B, ♂♂ 17%, ♀♀ 22%, varying from Group A by the presence of a small or large clear spot at the junction of the apical and sub-apical bands (Fig. B 1 and 2). This spot may be only just visible or so large that it merges into the next group. This is the form that is figured in Loew's "Bohrfleigen."

Group C, ♂♂ 21%, ♀♀ 11%. The clear spot by enlargement merges laterally into the clear area of the wing. (Fig. C 1 and 2).

Group D, ♂♂ 10%, ♀♀ 18%. In this form the sub-apical band is separated from the apical band, the clear spot expanding vertically up to the costal margin and down into the clear area of the wing. (Fig. D 1 and 2).

In all four groups the intensity of colouring in the wing bands varies also, from dark black-brown to light smoke colour.

(3) *The Median Band*: starts from the apical end of the stigma and coincides with the inner cross-vein (t-a), where as a rule it ends.

Variation.—This is the most variable of the wing bands, the only constant feature being the stigmatic spot and the clouding of the inner cross-vein, though in extreme forms even one or other of these may be absent (Figs. G and H). In its most usual form (♂♂ 41% and ♀♀ 64% of those examined) it consists of two spots, one at the apex of the stigma and the other coinciding with the inner cross-vein. These spots may be united or separated and vary both in size and intensity of colour (Figs. A 1 and 2, C 2, and E 2). In 16% of the ♂♂ and 11% of the ♀♀ the band reached below the fourth longitudinal vein (m 1+2) (Fig. B 1). In a few cases there was a faint spot on the lower margin of the wing (Figs. E 2 and C 2), and very rarely the band reached right across the wing (var. *venabulata*, Rondani) (Figs. F 1 and 2 and Fig. J).

(4) *No Basal Band*. The absence of this band differentiates *E. stylata* from *E. solstitialis*, L., *E. cuspidata*, Mg., and *E. jaceana*, Hering.

Both sexes are equally variable and the transitional forms, as I have said, merge gradually one into another and vary among themselves in the shape and density of colouring of their wing bands; but when a long series is studied it can usually be divided as above, although occasional unsymmetrical specimens occur with the two wings showing markings of different groups.

E. stylata is one of our commoner Trypetids and can easily be bred from the galled heads of the spear-thistle; it has also been bred by Mr Niblett from galled heads of the musk-thistle (*Carduus nutans*).

EXPLANATION OF PLATE.

Figs. A to F: see text.

Figs. G to K: extreme forms.

G. Median band reduced to inner cross-vein only.

H. Median band reduced to stigma only.

I. General reduction of apical and sub-apical bands.

J. General intensification of all bands.

(=var. *venabulata*, Rondani).

K. Apical band reduced on costal margin.

Magnification $\times 5$.

Right-hand figures, A 2 - F 2, taken from female specimens.

Left-hand figures, A 1 - F 1, taken from male specimens.

I have to thank Messrs V. Siviter Smith & Co., Ltd., for the considerable trouble they have taken to obtain a satisfactory plate.

NOTES ON PYRAUSTA NUBILALIS, HUBN.

By S. WAKELY.

As far as Britain is concerned *Pyrausta nubilalis* has always been considered to be a casual immigrant. It is, therefore, of interest to record the discovery of a small colony of this species established at Benfleet, Essex.

A single specimen of the moth, taken by myself at Benfleet on 10th July, was identified by Mr H. C. Huggins (*Entom.*, lxxi, p. 241). It was a female, and I obtained ova. During the next fortnight Mr Huggins visited the locality and was lucky enough to take about a dozen specimens, mostly rather worn. On 24th July I managed to get down to Benfleet again, accompanied by Mr L. T. Ford, and was able to net one more specimen—taken a few minutes before having to hurry away to catch the train home. This was another female and, as Mr Ford had a convenient plant of hop growing in his garden, I passed it on to him. He obtained several batches of ova, and I also sent him the ova laid by my first capture. Regarding foodplants, Meyrick mentions only hop and hemp.

Mr Ford wrote to me later and said the ova had hatched and the young larvae were thriving on the hop stems, into which they burrowed. The stems were changed as required, and as the larvae got larger the heaps of frass and material excavated by the larvae were very noticeable.

On 8th October Mr Ford and I again visited Benfleet, and spent a day collecting larvae of various species of Lepidoptera in seed-heads and stems on the salterns and along the sea-wall. Returning to the Station in the late afternoon, we found there was nearly an hour to wait for a train, so we decided to visit the locality where the *nubilalis* were taken and look for the larva. Mr Ford was lucky in finding a larva almost at once in a stem of *Artemisia vulgaris*, among clumps of which the moths had been taken. It was identical with those he had at home feeding on hop, so we set to work and found about a dozen each in the few minutes at our disposal. A few weeks later we collected some more. They were not really common, but enough were found to show that it was a thriving little colony. A broken stem was the best guide to locating the larvae. The stem frequently snaps at the hole made by the larva where it enters the stem. This spot was

usually well above ground-level, but occasionally a larva had tunnelled its way downwards almost to ground level. One larva to an affected stem was most usual, but occasionally two larvae were found in a stem, and once or twice as many as three larvae in the same stem, but in the latter case they were separated by several inches of stem.

The larvae of *Eucosma foenella*, L., make a noticeable heap of frass around their mines, but these are usually almost on the ground-level. The larvae of *nubilalis* are greyish in colour with brownish markings and darker heads.

Wishing to know if *Artemisia vulgaris* was known on the Continent as a foodplant of *nubilalis*, I wrote to Mr Bainbrigge Fletcher asking if he had any knowledge of its known foodplants. He very kindly sent me half-a-dozen booklets concerning *Pyrausta nubilalis*. It was news to me that this species is a notorious pest on maize, etc., in North America and in the Philippines, and some of its history might be of interest to entomologists in this country.

The "European Corn Borer" (as it is known in North America) was first noticed as a pest in the vicinity of Boston, Mass., in 1917.* The probable carrier of the larvae was broomcorn—a species of millet used for manufacturing brooms—imported from Hungary and Italy. It is estimated that at the end of 1924 there were nearly 25,000 square miles in the U.S.A. where the moth was prevalent, and another 18,000 square miles in Canada. Indian corn or maize is the plant to which most damage is caused, and the larvae are equally at home in the stem or feeding on the grain in the cob of the ear. In badly infected areas 100 per cent. of the plants are attacked by the larvae, with an average of eight larvae to a stalk. It was also found that many other plants were subject to attack, over 200 different species having been named. Among these might be mentioned asters, beet, beans, celery, chrysanthemums, cotton, dahlias, gladioli, potatoes, rhubarb, tomatoes, and zinnias, as well as oats and a number of species of grasses. In one case larvae were found in numbers in windfall apples.

The larvae hibernate when full grown in the autumn, and if the foodplant is not suitable for winter shelter the larvae seek any plant of woody growth, into which they burrow, or will use crevices in walls, buildings, or posts. The severe winters of Canada and the United States do not appear to cause any noticeable mortality among the larvae. Pupation takes place in late Spring a few weeks before the moths emerge.

In the New England district the species has two broods in a year, the first moths flying in May-June, while the next brood emerges in August.† The Lake Erie race is, however, single-brooded, the moths being on the wing in June-July. It has been suggested that the insects introduced to New England came from a section of Europe where the moth has two generations, while those in the Lake Erie area were introduced from a part of Europe where the insect is single-brooded.

*"A Progress Report on the Investigations of the European Corn Borer." By D. J. Caffrey and L. H. Worthley. *United States Department of Agriculture, Department Bulletin No. 1476*: February 1927.

†"Remarks on the Number of Generations of the European Corn Borer in America." By G. W. Barber. *Journal of Economic Entomology*, Vol. XVIII, No. 3: June 1925.

In Belgium and Northern France it is interesting to note that the chief host-plant is *Artemisia vulgaris*—the same plant the larvae were found feeding on at Benfleet. Other foodplants noted in Europe and Asia are *Clematis vitalba*, hop, *Inula conyza*, *Phragmites communis*, stinging nettle, sunflower, teasel, thistle, etc.

Pyrausta nubilalis is unlikely to become a serious pest in Britain, especially as the larvae seem to prefer *Artemisia vulgaris* in this part of the World. In the Isle of Wight, where most of the British examples have been captured, maize is grown regularly as a crop to be cut green and fed to farm stock in the autumn, and it would be interesting to know if the larvae can be found on maize growing in our southern counties.

ANTS IN THE NORTH OF SCOTLAND.

By L. H. WEATHERILL.

Two years ago, in September 1936, I took a few specimens of *Formica fusca*, L., in Hoy Island, Orkney, and also one *Leptothorax acervorum*, F., worker. A week or two later I took several *Formica fusca* workers beside Loch Linnhe, in Argyllshire. Unfortunately, these ants were killed in ammonia and kept in screws of tissue paper. Three or four months ago I sent them to Mr Donisthorpe, who stated that the *fusca* had bristles on the thorax, a thing new to his experience. He thought they might be *Formica rufibarbis*, F.; but their state was not such as to make identification certain. Rather earlier in September that year I visited the Mainland Island of Shetland and found there only *Myrmica ruginodis*, Nyl., which alone has been seen in Shetland. *M. ruginodis* I found in Hoy also.

In September this year I was again in Hoy. In spite of bad weather I found many colonies of *M. ruginodis*, though it appeared to be local in its occurrence. Near Rackwick I found two colonies of *Formica fusca*, L., on 19th September, but, despite diligent search that day and also on the 20th, could find no more. Neither colony was populous. I was able to send some specimens from one of the colonies to Mr Donisthorpe, and a female is, I believe, still alive. Nearly all the ants were noticeably hairy, especially the females. In some cases the hairs on the thorax were reddish in colour. Mr Donisthorpe had no doubt the ants were *fusca*. He has subsequently kindly shown me various specimens of *rufibarbis*, and I am certain none of the ants I saw in Scotland was of this species. Owing to the exceptionally wet summer in Orkney it is possible some of the *fusca* had already gone down for the winter; but I have little doubt they are very uncommon on Hoy.

On the 20th I discovered six colonies of *L. acervorum*, F., and sent some from one nest to Mr Donisthorpe. On the Mainland Island of Orkney, North of Stromness, I found a number of colonies of *ruginodis* on 18th September, but could find none in other localities. I was quite unable to find *acervorum* or *fusca*. Previously *ruginodis* was the only ant that had been found in the Orkneys.

On the 23rd September, at Dunnet Head—the most northerly point on the mainland of Britain—I was surprised to see several thriving

colonies of *M. ruginodis*, Nyl., in some very wet moss. These were the only ants I found in Caithness.

Afterwards I spent several days in Strathglass and the valleys running out of it. This area is richly forested, and is at the North-west of Inverness-shire, almost on the border of Ross-shire. It is roughly fifty miles North-west from Aviemore, which is, I believe, the most northerly place at which several of the species of ants I found have previously been seen.

On 25th September in Glen Cannich I found *Myrmica ruginodis*, Nyl., *M. lobicornis*, *M. laevinodis* (var. *ruginodo-laevinodis*), *M. scabrinodis* (var. *sabuleti*, Mein), *Acanthomyops niger*, L., *A. flavus*, *Leptothorax acervorum* and *Formica fusca*. The *laevinodis* were large and the epinotal spines were notably long, but the space between was smooth and shining and the ants were themselves shiny and very sparsely covered with hair. The *sabuleti* had the groove in the antenna very deep. They were the first I have found of this variety. Mr Donisthorpe tells me some he has had from Norway were unusually well marked, and possibly this is a northern characteristic. I noticed that the *niger* were almost invariably in hillocks, whereas the *flavus* were under stones. Neither ant seemed particularly common. *Fusca* is extremely abundant over most of the area. I examined a large number. The degree of hairiness varied greatly even in the same colony, but the majority had at least some outstanding hairs on the thorax. The females were invariably very thickly bristled. I noticed occasional workers in which the gaster was reddish-brown in colour, but these were not necessarily in colonies where most of the ants were particularly hairy.

On 26th September, in Glen Strathfarrar, I found *M. ruginodis*, *A. niger*, *F. fusca* and *F. rufa*, L. The latter were not numerous by the road, but were probably abundant in the woods at the sides. At no time did I stop to examine many ants, with the exception of the *fusca*.

In Glen Affric, on 27th September, I found *M. ruginodis*, *L. acervorum*, *A. niger*, *F. fusca* and *F. rufa*. On the 28th there I found also *A. flavus* and *F. sanguinea*, Latr. On that day, too, at the Plodda Falls on the Upper Glass, I saw what had every appearance of being a *Formica exsecta*, Nyl., nest. The colony was at the side of a dangerous bridge, and the opportunity to examine the ants was not good. Besides this. I had not seen the species before. From looking at specimens in the Museum since, I think it probable that this was *exsecta*. The whole time I looked closely at very few *F. rufa*, but did not see any which seemed to be var. *alpina*, Sants. It is most likely, though, that both this ant and *F. pratensis*, Retz., are present in the district. The *sanguinea* colony was the only one I found. In spite of the lateness of the season the ants were very active. They were mainly under a stone. The apparent absence of slaves attracted my attention; but later I saw a few very small specimens of *F. rufa* which were acting as slaves. There were no *F. fusca*. It was curious to note that these *rufa* slaves did not raise the gaster when angered, though they were fierce enough. There did not appear to be any colonies of *fusca* near.

It is likely that this district, with its grand natural forests, is one of the richest in ants in the country. Unfortunately I was this time visiting it primarily to see and photograph the wonderful scenery.

CONTINUOUS BREEDING. II.
LASIOCAMPA TRIFOLII, ESP.

By H. B. D. KETTLEWELL, M.A., M.B., B.Chir.

The continuous breeding of *L. trifolii* is difficult and in order to get good results it is essential to adhere to certain small points. Even with these a high mortality rate cannot be avoided but it is one which compares favourably with Nature's inevitable 96 to 98 per cent. mortality.

The eggs are laid in August immediately after pairing. Ninety per cent. of total eggs are usually laid in the first few minutes of flight following copulation. The eggs are laid while the moth is on the wing and fall free and loose to the ground beneath. In captivity these eggs are best stored in ordinary round cardboard cartons and must be kept at normal warm temperatures till winter, because the larva rapidly develops inside and hibernates within the egg-shell throughout winter. About November transfer the boxes to cool cellar temperature [47° F.] and leave here till the first week in March. Now bring them up into warmth, the object being to precipitate the immediate hatching of all eggs together. In Nature they emerge in ones and twos throughout March but in large scale breeding this is hopeless. At this time also I usually allow the cardboard boxes to be surrounded with damp cotton wool with the idea of softening the dry shell of the eggs. I get a larger percentage of hatchings by doing this.

The larvae are immediately transferred to round glass-topped tins, about 12 per tin, and blotting paper placed in the bottom. They undoubtedly feed best on a mixture of heather and small sprays of hop-headed clover. The former need not be changed for a week, the latter every third day.

I allow mine an hour's shaded (with white paper) sunlight or pale electric light each day, hence the need of blotting paper to absorb the water droplets. Feeding is undertaken at its full at this time.

At the end of the 2nd instar I transfer the larvae to biscuit tins which have previously been planted with a central plant of dwarf heather and surrounded with plants of hop-headed clover. The tin is placed out of doors in the sun, protected from too much rain by glass propped up, and covered with muslin. They remain here till they are about $\frac{3}{4}$ of an inch long. I then remove them to specially prepared boxes or tea chests.

These must face South and are again planted out, clover (but not the coarser red and white species), heather and thrift and odd pieces of grass are not discouraged. I pour in dry sand to the depth of about four inches around these plants. The boxes are covered with muslin. It is essential to cover at least one edge with glass with the object of keeping the sand dry in one place. They feed up rapidly in here and the balance of plants to larvae is about twelve per tea chest.

The surprising habit of *L. trifolii* at pupation time was first noticed by me in 1936. The full grown larva buries itself sometimes to a depth of two inches in the dry loose sand and here forms its cocoon. I have little doubt that this is the usual procedure in Nature and that it is only when no sand or shingle is provided they pupate above ground. It

is essential that at least some sand in each box remains dry; permanently undrained wet sand is fatal and they always make for the dry places. To make sure of the sand being dry full grown larvae can be removed to any meat safes with glass on top and sand inside and hand fed, the food now being stood in water in glass jars. This obviously necessitates a change of diet as clover is impossible to deal with this way. I find a mixture of montbretia and raspberry excellent, the former especially so. I mention this as an alternative method giving good results to keeping them in their original cages and recommended in extra wet seasons.

In both cases the food plant must occasionally be sprinkled with water containing ordinary cooking salt (tablespoon to pint).

The moths emerge in August, usually the second and third weeks, and hatch in the late afternoon, when selected pairings can be chosen. The female calls between 8.30 and 9 p.m. and pairing lasts from four to ten minutes. As I have already stated that ovipositing immediately follows this, it is obviously essential that pairing should take place in a roomy and airy cage with the bottom clean to enable the finding of eggs afterwards.

Besides at least two well-known varieties in the species there exists the most extreme geographical range of colour, from the pale yellow easterly (Dungeness) forms to the dark mahogany brown forms found in the west (Cornwall).

Pairings obtained from these along with other geographical crosses have produced a great range of variation, along with two intersexes and other interesting results, but there is a great deal more still left to be done.

COLLECTING NOTES.

HADENA PISI, L., AB. *striata*, AB. NOV.—Fore-wings light red-brown with the dark markings nearly obsolete; interneural spaces ochreous almost to the termen contrasting with the dark nervures; ochreous subterminal line and mark at anal angle distinct; hindwings much paler than usual with dark nervures, the outer part of the interneural spaces pale ochreous forming a border 2 mm. wide. Type, female, from the Howard Vaughan and Hanbury collections.

Tutt (*Brit. Noct.*, p. 90) says he has occasionally noticed a tendency for longitudinal ochreous streaks to be developed between the nervures in the red forms of *pisi* between the subterminal and elbowed lines, and compares it with *Agrotis (Euxoa) nigricans* ab. *striata*. Of this form, which is transitional and may be the heterozygote of that described above, I have a male bred from about 150 wild larvae collected on Barnes Common.—E. A. COCKAYNE, 16 Westbourne Street, W.2.

THE FLIGHT OF *FORFICULA AURICULARIA*, L.—There are so few, if any, published records of the flight of the Common Earwig that Dr Malcolm Burr has asked me to record the following observation.

It is impossible now to say exactly when it happened; it was certainly in pre-war days when I was living at Gloucester, and may well

have been in 1910, when an Earwig alighted in front of me with its wings extended. The wings were immediately folded with great rapidity and the elytra closed over them. It was not actually seen in flight, and it is unlikely that the occurrence would have made any impression on me had it not been for the fact that, when a small boy, I had been told that the Earwig used its forceps for folding its wings after flight. I remember most distinctly that this Earwig did not do so; the wings were folded entirely under their own power.—BERNARD EMBRY, St Bartholomew's Vicarage, Dover, Kent.

A NOTE FROM MID-WALES.—Last August I found a pupa of *Polia chi*, L. under moss on the trunk of an aspen, five feet from the ground, in Central Wales. The moth emerged on 23rd August. Is this an unusual pupation site? Barrett states that the larva forms "a tough cocoon of silk and earth, under the surface of the soil (W. Buckler)," and Messrs Newman and Leeds say: "pupates just below surface of ground."

Incidentally, I found very few pupae by digging, but a fair number (including *C. xerampelina*, Hüb., *C. glabraria*, Hüb., and *Munia maura*, L.) under moss on tree trunks, from three to seven feet from the ground. This hint may prove useful to others who go entomologising in mid-Wales at a height above 1200 feet.

The only interesting butterfly I saw (and, having no net, could not catch) was an albino *Argynnis aglaia*, L., which twice flew past my legs, then settled on a *Centaurea* flower almost within touch. These hills are barren ground for the Lepidopterist.—P. B. M. ALLAN.

SUGARING IN A BISHOP'S STORTFORD GARDEN.—Sugaring in 1938 was here rather more productive than the average from mid-June onwards. September was rather fruitful, but after the first week in October tree trunks and patches of bark on posts were poorly attended. On 10th October I splashed the remnant in the treacle tin on a *Macrocarpa* hedge and that proved far more attractive. Since that date, though I have sugared trees, only the hedge has been really successful. The shrubs are close cut, about five feet high, and the length treated about ten yards. It is just outside a constantly used sitting-room. These are the chief records up to 15th November.

Very abundant:—*Phlogophora meticulosa*, *Agrotis saucia* (usually very scarce), *A. segetum*, *Orrhodia ligula*, *Scopelosoma satellitia*, *Miselia oxyacanthae*, *Triphaena pronuba*. Fairly frequent:—*Agrotis suffusa*, *Amathes lychnitis* (*pistacina*), *A. litura*, *Amphipyra pyramidea*. Others of more interest were:—*Xylina semibrunnea* (4), *X. ornitopus* (7), *Amathes lota*, *A. macilenta* (1, very uncommon here), *Catocala nupta* (1 on 18th October), *Polia flavicincta* (usually common but scarce this year), *Plusia gamma*, *Gonoptera libatrix* (one or two), *Omphaloscelis lunosa*, *Sarothripus revayana*, and a few *Orrhodia vaccinii*. Faded and ancient specimens of species like *Noctua c-nigrum* and *N. xanthographa* turned up occasionally with one or two common Geometers.—CHAS. S. COLMAN, "Meadow Dyke," Maze Green Road, Bishop's Stortford.

CURRENT NOTES.

In the *Stett. Ent. Zeitg.*, pt. I, 1938, p. 149, the complicated nomenclature of *Procris globulariae* is further discussed.

The *Zeits. Oestr. Ent.-Ver.* for June has a plate of Abnormalities of Lepidoptera.

Of the Main Volumes of Seitz Macro-lepidoptera seven further parts have recently come to hand, 628-634. Of Vol. VI, American Bombyces 1 sheet of the conclusion of the *Hepialidae* and two plates with 111 figures. Of Vol. VIII, American Geometers, 6 sheets. Of Vol. XI, Indo-australian Noctuae, 6 sheets and 6 plates with about 170 figures. The genera most likely to be familiar to English lepidopterists are *Acontia*, *Catocala*, *Ephesia*, *Nyctipao*, *Speiredonia*, *Phyllodes*. Such volumes are, of course, necessary for the use of students in all universities where zoology is a feature, and in all important museums they are also a necessity.

We have received from our honoured correspondent, Dr Skat Hoffmeyer, a copy of a work on the Macro-lepidoptera of Denmark, *De Danske Storsommerfugle*, written by himself and Sigfred Knudsen. It is illustrated by 8 plates with many figures and with a few additional figures in the text. As a record of what species of Lepidoptera occur in this small and peculiarly situated country, an area influenced on all sides by close proximity of ocean and of sea, it is most enlightening, although for many of us the Danish language is a difficulty. Enthusiastic work has been carried on in amassing the detailed references and localities, which all such books, to be of use, should include. An adequate map of the country is added with well-defined areas. The introduction contains a list of the available literature on the Danish lepidopterous fauna. So far 837 species are enumerated as occurring in this limited area. The print is clear and good and the whole volume is a credit to all those who have had a hand in its production.

The West China Union University, Chengtu, Szechuen, China, is trying to maintain its scientific work under the present difficult conditions, but nearly all their books have been lost. An appeal has been made for entomological literature, especially journals (of any sort), and pamphlets and reprints, especially such as deal with insects affecting rice, tea, sugar-cane, mulberry, cotton, citrus. Anyone who is willing to help them in this matter can send books to *Mrs K. J. Richardson, F.R.E.S., c/o The West China Union University, Chengtu, Szechuen, China.*

La Biologie des Orthoptères, par L. Chopard, is a very important book recently published in Paris by Lechevalier. The price is 250 francs, which is not dear, for it runs to 541 pages, with 453 figures and five plates. It is far more than a mere book for orthopterists, for it embraces every aspect of their study, not merely as Orthoptera, but as Insects. It is a compendium of modern knowledge, with full bibliography of each subject. Every biologist will read with profit the chapter of autotomy and regeneration, the account of the reflexes, homochromism, heredity,

and variation. An important work has been done upon these subjects, for which some Orthoptera provide convenient material, especially the *Phasmodae*.—M. B.

The Society for British Entomology has issued five further parts (5-9) of their Vol. V. *Transactions*. Four of these parts deal respectively with Coleoptera, Diptera, Hemiptera and Orthoptera, the remaining part is a History of the occurrence of the "Comma" Butterfly in this island by J. J. Walker, M.A., R.N., F.R.E.S. Coleoptera associated with cultivated plants is a useful classified summary of facts by A. M. Masee; Description of the puparia of fourteen British species of Borboridae (Diptera) with numerous figures is by W. H. Goddard; The British Species of Micronecta (Corixidae, Hemipt.) with 5 excellent plates chiefly diagrammatic is by G. A. Walton and will be very useful to all Hemipterists; a very interesting account is given by L. A. Harvey, M.Sc., on the relation between grasshoppers and the recolonisation of denuded heath and moorland vegetation.

We congratulate our contemporary, *The Microscope*, on the enlargement of its sphere, for the New Year starts with a fresh series, to include a branch of our own science, under the title *The Microscope and Entomological Monthly*. As it is freely illustrated, it fills a gap in current entomological literature, and for this reason, and also because it leans towards the microscopic side, especially morphology and histology, it in no ways clashes with the old-established magazines. The first number has an article by our colleague, Dr Burr, on a hitherto undescribed structure in the Common Earwig. We wish the new venture the success it deserves.

Dr Wm. Junk, the publisher of many of the most useful books of reference for science workers, has recently issued Part I of the second yearly volume, entitled *Scientiae Naturalis Bibliographia*. It consists of 80 quarto pages. The two parts of Vol. I contained about 1200 items. The present Part I of Vol. II contains at least 900 titles. The yearly subscription is small, 6/9, while the use to really scientific institutions, libraries and universities is overwhelmingly incommensurate with this small cost. The learned editor asks for prospectuses and lists of all new publications relating to all branches of the natural sciences.

SOCIETIES.

A meeting of THE ENTOMOLOGICAL CLUB was held at 65 Lee Road, Blackheath, on 8th October 1938, Dr Richard R. Armstrong in the chair. Members present in addition to the chairman—Mr H. St J. K. Donisthorpe, Mr H. Willoughby Ellis, Mr James E. Collin, Dr Harry Eltringham, Mr W. Rait-Smith.

The guests were received at 1 o'clock by Dr and Miss Armstrong. Luncheon was served at 1.30. After luncheon the chairman selected a number of genera of foreign butterflies for exhibition; notably *Delias*, *Dismorphia*, *Colias* and the *Callithea-Catagramma* group. Owing to lack of time the general collection of *Pieridae* could not be seen. A tour

of the gardens was shortened by rain, but the chairman's stud of coloured-lace fantails was inspected. The lace-fantail, in common with the silky-fowl, has the barbules missing from the feathered strand so that the feathers do not "web" and the birds cannot fly. The coloured varieties were produced by crossing plain-feathered, coloured (yellow) birds with the original stock white-lace. Self-coloured blue laces result and these, paired to the desired plain-feathered coloured bird, in this case yellow, produced yellow laces, etc., in more than half the offspring. Lace is feebly dominant to plain feather. The first cross blues are completely heterozygous for colour.

After tea the guests left about 6 o'clock; a very entertaining afternoon.—H. WILLOUGHBY ELLIS, Hon. Secretary.

FOLKESTONE NATURAL HISTORY SOCIETY.—The Entomological Section of this Society opened the winter session with an Exhibition at the Public Library, Folkestone, on 3rd November. The evening was given up to a review of the more notable captures during the year and exhibits were so numerous that the President of the Section (Mr A. M. Morley) decided to limit the review to the Moths only. Reference to the Butterflies was, therefore, deferred until the January meeting.

Mr Morley mentioned that thirty-eight specimens of *Aplasta ononaria* had been seen this year, so it seemed that the species had succeeded in re-establishing itself. He remarked that the season of 1938 had been a good one for immigrant species and for aberrations and drew attention to several exhibits of *Sideridis albipuncta*, *S. vitellina*, *Laphygma exigua*, *Athetis ambigua*, *Heliothis peltigera*, and his own specimen of *Sideridis unipuncta*, which was an addition to the Folkestone List.

He then invited members to say a few words about the things they had brought for exhibition. It is impossible to give details of all that was shown or to repeat the interesting facts given concerning them but the following were noteworthy:—

Mr E. D. Bostock: *Dilina tiliæ* bred from Folkestone larvae.

Mr M. Chalmers-Hunt: *Madopa salicalis* and an unicolorous dark brown specimen of *Ematurga atomaria* from E. Kent; *Celaena haworthii* and *Nonagria cannae* from Norfolk.

Mr Bernard Embry: *Oeonistis quadra* and *Hama furva* from Dover, and *Rhodometra sacraria* from Hailsham, Sussex.

Mr A. M. Morley: *Spilosoma lubricipeda* (*menthastri*) ab. *godarti* and pupae of *Acherontia atropos* from E. Kent; varieties of *Abraxas grossulariata* bred from wild larvae found in Folkestone, and specimens of all the migrant species mentioned above.

Mr A. G. Peyton: *Notodonta cuculla* and *Cidaria* (*Orthonama*) *abstipata* from E. Kent; *Endromis versicolor* and *Noctua depuncta* from Aviemore; and *Acidalia immorata* from Sussex.

Dr C. G. M. de Worms: *Ptilophora plumigera* and *Noctua stigmatica* from E. Kent; *Leucania l-album* from Devon; *Hydroecia petasitis* from the West of England; and *Crymodes exulis*, *Noctua primulae*, f. *thuiæi* and *Hepialus humuli*, f. *hethlandica* from the Shetlands.

Mr G. H. Youden: *Xylophasia scolopacina*, *Apamea ophiogramma*, *Aporophylla lutulenta* and *Acrionicta ligustri* from Dover.—JOHN W. WALTON, Hon. Secretary, Folkestone N.H.S.

ab. *arenoflavida*, Schaw., *Int. Ent. Zt.*, XXVIII, 425 (1934).

FIG.—*l.c.*, 3.

ORIG. DESCRIP.—“ Wholly light sand-yellow and without marking. Only the basal and post-basal black spots and on the costa of the forewing a few pre-apical minute dots are present. The post-median and pre-marginal transverse bands are obsolescent. The transverse row of very fine black points standing between the two on the veins is scarcely visible. These distinctions separate the moth with reliable certainty from the grey very similar *glareosa*, flying at the same time and locality, which does not possess these small points. The reniform is not to be seen. The hindwings are pure white without darker margins.” Albaracin, Spain.

Noctua, L. (1758), Ochs. & Tr. (1816-25), Gn., Barr., Newm., etc. [*Agrotis*, Ochs. & Tr. (1816-25), Stdgr., Hamp., Meyr., Splr., Culot, etc.: *Rhyacia*, Hb. (1822), Warr.-Stz.: *Graphiphora*, Steph. (1829), Steph., Wood., Meyr.] *triangulum*, Hufn. (1766).

Tutt, *Brit. Noct.*, II, 109 (1892): Barr., *Lep. Brit. Is.*, IV, 46, plt. 142, 2 (1897): Stdgr., *Cat.*, III ed., 138 (1901): Hamps., *Lep. Phal.*, IV, 687, fig. 76 (1903): Splr., *Schm. Eur.*, I, 147, plt. 32, 26 (1905): South, *M. B. I.*, I, 223, plt. 113, f. 1 (1907): Warr.-Stz., *Pal. Noct.*, III, 44, plt. 9i (1909): Culot, *N. et G.*, I (1), 40, plt. 6, f. 11 (1910).

Ernst & Engr., *Pap. d'Europe*, VII, 30, fig. 427 (1790), give two figs. with desigus well done, but with much too pale ground colour. Under the name *sigma*.

Bork., *Naturg.*, IV, 489 (1792), describes it under the name *sigma*, of Schiff., Knoch, and Fab. with *triangulum*, de Vill. of Berlin Mag., *Naturf.*, Göze, Jung., etc., as a synonym.

Hüb., *Samml.*, 497 (1808-18), figures a dark insect under the name of *sigma*, which is not in any way comparable with the figure, *l.c.*, 122, and probably represents a form of *triangulum*. The figure in my copy is certainly dark. Tutt says that “ this is the palest form of the species.”

Godt., *Hist. Nat.*, V, 174, plt. 60 (1824), gives a dark figure of this species under the name *sigma*, and on plt. 61 gives a very dark figure as a variety, but suggests it may be the *ditrapezium*, Hb., or the *tristigma*, Ochs.

Treit, *Schm. Eur.*, V (1), 240 (1825), distinguishes *triangulum* and *ditrapezium*.

Freyer, *Beitr.*, II, 49, plt. 64 (1829), gives a good figure.

Wood, *Ind. Ent.*, 38, f. 162 (1834), a poor figure.

H.-S., *Bearb.*, II, 357 (1849), says of Hübner's fig. 497, “ shape quite incorrect, forewing too variegated.” It is the *ditrapezium* of the *Verz.* and the *sigma* of Bork.

Newman, *Brit. Moths*, 347 (1868), gives a very poor indistinct figure.

Meyr., *Hand.*, 100 (1895), *Agrotis*. *Rev. Hand.*, 106 (1928), *Graphiphora*.

Barrett, *l.c.*, IV, 48 (1897), gives *normanniana*, Grote, as a variety; *obtusa*, Splr., has also been given, but both these are American species, and distinct.

Brown, *Dobr. Eur. Noct.*, 58 (1905), all Brit. examples are *intermedia*, Tutt (*sigma*, Haw.).

Splr., *Schm. Eur.*, I, 147, pl. 32, 26 (1905), gives a very good figure of *triangulum*, well distinctive from *ditrapezium*.

South, *M. B. Is.*, I, 223, pl. 113, f. 1 (1907), a good figure for marking, but ground not grey enough.

Warr.-Seitz, *Pal. Noct.*, III, 44, pl. 9i (1909), give *sigma*, Esp., and *intermedia*, Tutt, as type synonyms. They mention no variation. The figure is good but somewhat darker than average.

Culot, *N. et G.*, I (1), 40, pl. 6, 11 (1910), stresses the great similarity between *triangulum* and *ditrapezium*. "The ground colour varies in similar ways but the specific markings are less liable to vary. *Triangulum* is generally a little smaller, and its forewings appear to be more triangular, less parallel than in *ditrapezium*. The markings of *triangulum* are neater, which thus makes *ditrapezium* have a smoother appearance. The reniform is almost always shaded with violet grey externally in *ditrapezium*, while it is generally of a uniform colour in *triangulum*. The costal spots above the stigmata are the more definite in *triangulum*, while the hindwings, as well as the abdomen, are yellower and less deep in colour in *ditrapezium*."

Of the variation Barrett says:—

"Usually very constant in colour and markings, but there is a little variation in the degree of reddish shading, which sometimes is almost absent or replaced by smoky-brown; the dark markings in the discal cell also vary from light chocolate colour to deep black."

Barrett, *l.c.*, 46, reports a specimen "in which the first and second lines are unusually black and the former rather broad and shaded into the central space, which is altogether clouded with blackish."

Barrett, pl. 142, has two good figures, but hardly the usual tint for the ground colour.

The Names and Forms to be considered:—

triangulum, Hufn., *Berlin Mag.*, III, 306 (1766).

f. *sigma*, Hb., *Samml. Noct.*, 497 (1808-18).

f. *sigma*, Haw., *Lep. Brit.*, 225 (1809).

f. *intermedia*, Tutt, *Br. Noct.*, 109 (1892).

ab. *avellanea*, Hirschke, *Verh. z.-b. Gesell. Wien.*, LX, 413 (1910).

ab. *obscurior*, Sälzl., *Mitt. Münch. Ent. Ges.*, XVII, 62 (1928).

Tutt dealt with (1) the typical red-yellow form, rare; (2) grey tinted red or purplish = *sigma*, Haw., i.e. *intermedia*, Tutt; (3) the pale grey with no red, the *sigma*, Hb.

ab. *avellanea*, Hirschke, *Verh. z.-b. Gesell. Wien.*, LX, 413 (1910).

ORIG. DESCIP.—"The ground colour of the upper side of the forewings and of the fringes is like beautifully coloured drapery instead of being yellow-brown and purple-reddish mixed, while the marking remains invariable. The clear marginal marking in the typical form here stands out more strongly. But the colour of the upperside of the hindwing as well as of the underside of all the wings is lighter than in the typical form." ♂ bred from a larva found at Bruck (Austria).

ab. *obscurior*, Sälzl., *Mitt. Münch. Ent. Ges.*, XVII, 62 (1928).

ORIG. DESCRIp.—“ A bred example notable from its chocolate-coloured ground; the dark shade and light areas on the costa and hindwings in a striking way resemble *Agrotis stigmatica*, Hb. It is distinguished from this by the well known black long streak by which the orbicular and reniform stigma are united, and by the outer waved line, which is almost obsolete and not so toothed as in *stigmatica*.” Regensburg.

Noctua, L. (1758), Ochs. & Treit (1816-25), Barr. and others. [*Agrotis*, Ochs. & Tr. (1816-25), Meyr., Stdgr., Splr., Culot, etc.: *Rhyacia*, Hb. (1822), Warr.-Stz.: *Graphiphora*, Ochs. & Tr. (1816-25), Steph., Meyr.] *c-nigrum*, L. (1758).

Tutt, *Brit. Noct.*, II, 110 (1892): Barrett, *Lep. Brit. Is.*, IV, 53, plt. 142, 3 (1897): Stdgr., *Cat.*, IIIed., 139 (1901): Hamp., *Lep. Phal.*, IV, 389 (1903): Splr., *Schm. Eur.*, I, 149, plt. 33 (1905): South, *M. B. I.*, I, 221, plt. 110 (1907): Warr.-Stz., *Pal. Noct.*, III, 43, plt. 9g (1909): Culot, *N. et G.*, I (1), 45, plt. VII, 3-4 (1910).

The name *nun-atrum* was used in the *Verz.*, Schiff., for the *gothica*, L. Esper pointed out the error of Schiff. in renaming *gothica*, and he then used the name *nun-atrum* for another insect, which he took to be a form of *gothica*, but on the plate (*Schm. Abbild.*, III, 383, plt. 76, 3) called it *singularis*. This figure is really of a form of *c-nigrum*.

Ernst. & Engr., *Pap. d'Eur.*, VII, 27, f. 424 (1790), give 2 figures; one is quite good, but the other is much too variegated.

Hübner, *Samml.*, III (1800-3), figures a specimen in which the stigmata are yellow-red and not a cream white as usual in specimens. Other markings are of the same brown-red colour. The shape and display of all marking are that of *c-nigrum*.

H.S., *Bearb.*, II, 356 (1847), says of Hüb.'s fig. 111, “ a very small example, the orbicular is always lighter, the reniform darker towards the margin. Collar yellow in front, the apex of the sagittate mark often distinct and beyond it a blacker longitudinal streak.” Esper's plt. VI, 3, “ v. *gothica*, useless.” The *nun-atrum*, Bork.

Wood, *Ind. Ent.*, p. 38, f. 166 (1834). A by no means clear figure.

Newman, *Brit. Moths*, 346 (1868), gives an indistinct, poor figure.

Splr., *Schm. Eur.*, I, 149, plt. 33 (1905), gives an excellent figure of *c-nigrum*.

South., *M. B. Is.*, I, plt. 110, fig. 8, gives a good average figure.

Brown, *Dobr. Eur. Noct.*, 58 (1905), 4 Amur specimens “ deep purplish black.” *suffusa*, Tutt.

Warr.-Stz., *Pal. Noct.*, III, 43 (1909), treat *nun-atrum*, Esp., *gothica* var. *singularis*, Esp., as type synonyms and give no variation. It is well figured on plate 9g.

Culot, *N. et G.*, I (1), 45, plt. 7, 4, 5, gives a good figure of the typical form and figures the ab. *fritschi*, which he has described.

Barrett says of the variation:—

“ Irregular in size and expanse of wings; also variable in the colour of the forewings, from rich reddish-grey through pale reddish-grey to purplish-grey and slate-grey (darker or paler) and with the subcostal triangle varying from yellowish to white, or almost to orange.”

The Names and Forms to be considered are:—

c-nigrum, L., *Sys. Nat.*, Xed., 516 (1758).

f. *nun-atrum*, Esp. = ab. *singularis*, Esp., *Schm. Abbl.*, III, 385, pl. 76, 3 (1777).

ab. *degenerata*, Stdgr., *Stett. e. Zeitg.*, 26 (1889).

ab. *suffusa*, Tutt, *Brit. Noct.*, II, 110.

ab. *rosea*, Tutt, *l.c.*

ab. *umbrata*, Schultz, *Soc. Ent.*, XXII, 185 (1908).

f. *fritschii*, Obthr.-Culot, *N. et G.*, I (1), 45, pl. 7, 4 (1909).

ab. *deprivata*, Bng.-Hs., *Iris*, XXVI, 139 (1912).

ab. *nigrescens*, Bursch., *Trans. Soc. Bulg. Sci. Nat.*, VII, 100 (1915).

ab. *maerens*, Dnhl., *Ent. Zeits.*, XXXIX, 123 (1925).

Tutt dealt with (1) the typical form with very complete C around the orbicular; (2) with Esper's *nun-atrum* = *singularis* with the ordinary lines obliterated, a row of interrupted black dots, terminal space very black; (3) *suffusa* of a deep violet-black = var. A. Guenée; (4) *rosea*, var. B. of Gn. slightly rosy.

f. *degenerata*, Stdgr., *Stett. ent. Ztng.*, L, 26 (1889).

ORIG. DESCRIP.—“The antennae are feathery, extremely short, but definitely ciliated, more so than in *c-nigrum*. The body, particularly the abdomen, is in *degenerata* far more slender, and is in all examples pressed together sideways. The genitalia (valves) seem larger than in *c-nigrum* and also to be quite different. Size and wing-shape is as in *c-nigrum*. The forewings are light brown-grey, still lighter in one male, sand grey (darker in one female) almost as light *c-nigrum*. The chief marking is met with only in the discoidal cell which with the exception of the basal portion is filled with dark brown-black, whereby the first stigma (orbicular) attached to the subcostal as in *c-nigrum* and also the second, the reniform, are emphasised very distinctly. The latter is also somewhat blackish on the outside. Further, one notices a short blackish mark in the basal area, and before the apex on the costa a dark streak-spot, as well as a darkening before the outer margin itself. Before the fringes, which are coloured like the wings and which have an obsolescent dark basal portion line, there stands a moderately light (yellowish) limbal-line, which also is margined with blackish on the inside. The black grey underside has a narrow light costa and a more or less wide, white-grey powdered outer marginal part (in one ♂ wide white-grey).” Central Asia. Described as a species, but treated as a form of *c-nigrum* by Corti-Drdt.-Stz. (1933).

ab. *umbrata*, Schultz, *Soc. Ent.*, XXII, 185 (1908).

ORIG. DESCRIP.—“The ground colour of the forewings is in this form so strongly darkened that the characteristic costal markings scarcely stand out from the more dusky underground. The underside is also much darker than in the typical form.” Captured in 1907 in Lower Silesia. Diagnosis “al. ant. ubique nigricantibus.” ab. *umbrata*.

ab. *fritschii*, (Obthr.) Culot, *N. et G.*, I (1), p. 45, pl. 7, f. 4 (1909).

ORIG. DESCRIP.—“This aberration, remarkable on account of the clear space in the middle of the forewings, has been discovered in the Doubs by M. René Fritsch.”

Race *narenta trans. ad tusca*, Frhst.-Vrty., II gen. **postnarenta**, nom. nov.:—Further specimens, obtained at S. Dionisio, 800 m., on 17th and 18th August, 1936, have revealed differences between the II generation of the Olympus and the *emipauper*, Vrty., one of Italy, to which I had referred it in my previous paper; some specimens of the two are alike, but some of the Olympus, apparently, betray an oriental strain, which one never sees in the Italian series; as a matter of fact, they recall, more or less strongly, the aspect of *telona*, Frhst., the very characteristic form of Syria and Palestine, which must be grouped with *ogygia*, as a close ally, in that they have much shorter and rounder wings than one ever sees in *emipauper* and paler and duller colours, as well, on both surfaces. I, therefore, think that, to be quite correct, this summer form of the Balkans should be designated by a name of its own. Some males also quite resemble *emipauper*, but have a much thicker pattern than is ever seen in Italy, evidently because they belong to race *narenta*. The size of this II generation is: length of forewing 20 mm.; expanse 32; that of the I, from the same locality: 23 (but rarely as small) to 27 and 39 to 45. I propose calling it *postnarenta*.

The *phoebe* of Macedonia, thus, exhibit a dualism of form, which is very marked and constant racially, on contrasting the races of Salonika and of the Olympus, but which is detectable, to a lesser degree, also individually, in the II generation of the Olympus.

The first of these forms is characterised by its smaller size, shorter and more rounded shape of wings, duller and more yellowish tone of fulvous, more even thickness of black pattern, like a net-work, which is often very thin and partly even obliterated; to this may be added that, as a rule, the premarginal russet spots of the underside of the hindwing are very large and fill entirely the black arch, which surrounds them, whilst the little, flatter, marginal arches are thicker, as compared with the rest of the pattern, than in the other form.

The other form is characterised by its larger size, when the corresponding generations are compared, by its more elongated wings, especially in the male sex, in which they are more falcated, much more irregular black pattern, much warmer tones of fulvous.

The difference is so striking that, if it were not for the individuals of the second group, mostly, if not exclusively, of the female sex, which are very similar to the first, and even a few exceptional Italian females, which partially recall them, one might have been led to suspect a specific distinction between them.

The first form consists, fundamentally, in *telona* and *ogygia*, besides a few races of Anterior Asia, which stand very close to them. Its most western and northern limit, as far as I have been able to make it out, is the southern shore of Istria, whence I possess, from Abbazia (15th May), an interesting race, exactly similar to *ogygia* of Greece by all the features mentioned above, but different from it and from all the races of Asia, I have seen, in that the black pattern is very thick and covers the whole wing with a regular net-work; also the one of the underside is unusually thick. I name it **nigrogygia**, nom. nov. Here, too, then, as in Macedonia, there is racial dualism, for, on the northern side of Istria, on the Carso, above Trieste, there is a race belonging entirely to the second form of the species described above and very similar to *rovia*, Frhst. of Tessin, with transitions to *tusca*, Vrty.

of Italy and with a II generation agreeing exactly with the one of the latter: *emipauper*, Vrtý. In my previous paper on Macedonia (*Ent. Rec.*, 1937, p. (20)) I have already given the reasons which seem to me to suggest that the Carso race, as well as *rovia*, are of a synexergic nature and that the race of the Olympus is of the same kind, whereas *ogygia* would be the pure Miocene strain of the Central exerge and the various very different forms, which inhabit, apparently quite similar, dry and hot surroundings in Sicily, Africa, and the Iberic peninsula, would be the older Miocene strain of the Southern exerge. There is a remarkable similarity between the distribution of these exerges and the corresponding ones of *Coenonympha pamphilus*, L.; *marginata*, Rühl and true *lyllus*, Esp.; it is particularly noteworthy that, in Italy, in both species the Central exerge does not develop fully its most characteristic features, as *emilyllus*, Vrtý. and *latenigrata*, Vrtý. are only lesser degrees of the *marginata* facies, just as, in *phoebe*, *tusca*, and *emipauper* or *pauper* are only a slight approach to the *ogygia* aspect and very rarely produce the female form, which resembles it more, as stated above.

M. athalia, Rott. race *limera*, Frhst. and race **parthenoidemima**, nom. nov.:—In my paper of 1937, p. (20), I have applied the name of *mehadiensis*, Gerh. to the race of Prionia and the name of *suessula*, Frhst. to the *athalia* of low altitudes (300 m.) on Mt. Olympus. Since then I have, however, made a special study of the races and forms of this species, for a Monograph, in which I have endeavoured to clear up the confused state of our knowledge, in connection with this difficult group of *Melitaea*, and I have obtained from Querci a further set of specimens, of both sexes, from Prionia and from Skala, which are an instructive addition to those he had sent me before.

The result is I must cancel completely the two aforesaid names for the forms of Mt. Olympus. Taken as a whole, I, now, see that they resemble the peculiar mountain race of the Balkans, which I have recorded, in my Monograph, also from western Bulgaria (Rilo Dagh, Kiri-lowá Pol., 1500 m., and Mon. Rilski, 1200 m.) and I name **parthenoidemima**, nom. nov., because it looks remarkably like a *parthenoides* Kef. = *parthenie*, auct. nec Bork., on account of the hard-looking and sharp underside pattern of the hindwing, characteristic of the latter species and only seen, in *athalia*, in a few races of eastern Europe, such as this one and race *lachares*, and in *anatolica*, and on account of the nearly total obliteration of the black markings on the underside of the forewings and of their even and low premarginal arches, whilst on the upper surface of the wings the marginal and the outer premarginal band are thick and contrast with the rest of the pattern, which is thinner and even partly obliterated. Size usually large and reaching, in some individuals, the largest attained anywhere by the species (length of forewing, in the male, 22 mm., and expanse 40, between the apexes; in female 21 and 35, in my largest specimens from both Prionia and Skala). All the Prionia specimens I have seen belong, in both sexes, to this form, but at Skala, as in Bulgaria, the greater number do not exhibit the *parthenoidemima* facies fully, but are transitional to, or belong entirely to, *limera*, Frhst., the most widespread mountain form and race of the northern Balkans, of a rich fulvous, with a thick and even black pattern over all the wings, on both surfaces. Therefore, I think the

Prionia race should be named, as a whole, *parthenoidemima*, and the Skala one *limera-parthenoidemima*, Frhst.-Vrty.

Argynnis aglaja, L.:—A few more specimens of both sexes from Prionia (16th July), obtained in 1936, and in very fresh conditions, now enable me to confirm that the race is, undoubtedly, *emilocuples*, Vrty.

Aglais urticae, L. race *urticae trans. ad opima*, Vrty.:—New materials from S. Dionisio show that I was right in saying it was somewhat surprising the race of the Olympus should be a pure strain of the Northern exerge, as one might, rather, have expected it to be *turcica*, Stdgr., or, at least, its preceding degree *opima*, Vrty. of the Central exerge, as in peninsular Italy. It has, now, become clear that the *opima* form exists there and is well characterised in some individuals and chiefly in the female sex, so that the race is, presumably, a synexerge, like those of many other species in this locality.

The following *Zygaenae* have been found by Querci on Mt. Olympus in June. Part of the specimens are in my possession and the bulk of the collection was purchased by the late Lord Rothschild.

Z. purpuralis, Brunn. race *hellena*, Bgff. = *graeca*, Tutt (homon.): From Skala, 300 m.

Z. fulvia, F. = *achilleae*, Esp. race *balcanica*, Reiss:—The race found from Skala to S. Dionisio, at 800 m., agrees with this one, described from Istria, Bosnia and Herzegowina, and is, therefore, quite different from *macedonica*; Bgff., described from Lake Dojran.

Z. carniolica, Scop. race *graeca*, Stdgr. (= ? *paeoniae*, Bgff.):—Burgeff does not compare his *paeoniae* of Southern Macedonia with *graeca* and I fail to find any character by which to separate them, so that, to my mind, the race of Skala agrees with both.

Z. flipendulae, L. race ***praeochsenheimeri***, nom. nov.:—From Skala and S. Dionisio. It is rather remarkable that, amongst the large number of races described, this one should have, hitherto, remained undetermined, whereas it is decidedly handsome and distinct, so that it is very striking. All authors refer the *flipendulae* of the Balkans, in a general way, to *ochsenheimeri*, Z., and furnish no further information about it, since Staudinger applied that name to the race of Greece in 1871. Now, as I have pointed out, in the *Ent. Rec.* of 1921, p. 113, that this omnibus name should be restricted to the hot valleys of the Upper Adige (S. Tyrol), that the race of S. France should be called *maior*, Esp. (spelt with an *i* in his text and plate) and that the six-spotted races of Peninsular Italy are again different and must be known as *campaniae*, Stdgr. and *microchsenheimeri*, Vrty. (the latter also existing in some valleys of the Alps), it is time to distinguish also the race of the Balkans, as represented by the Olympus series, which does not agree exactly with any of these. In size it is equivalent to the largest of them, which is *maior*: the length of the forewing in Esper's figure is 19 mm. and this is a female; the Olympus females nearly all measure 17 to 18 and a few reach 19; the males measure 16 and 17 and only exceptionally are smaller. The characteristic of this race is the constantly extensive red markings in both sexes; the spots of forewing are large, the two outer ones, being nearly confluent; the black marginal band of the hind-

wing is very thin and even and often extremely so, very much as in nominotypical *filipendulae*, whereas none of the other races, which used to be called *ochsenheimeri*, have this aspect; the red suffusion, on the underside of the forewing, also recalls *filipendulae* and differs from all the latter by its distinctly greater extent. On account of this facies, intermediate between true *filipendulae* and *ochsenheimeri*, I propose naming it *praeochsenheimeri*. I abstain from any geographical name, because I see that a race similar to it exists also in Northern Italy, on the south side of the Po basin, at the foot of the Apennines, whence I have a large series of specimens from Reggio Emilia. It will be interesting to make out what connections it has, there, with the *stocchadis*, which inhabit the mountains, just above it, and why they keep distinct when it is an established fact that there is no sterility at all between them.

Z. lonicerae, Schv.:—The race of S. Dionisio and Skala affords a certain amount of individual variation, in connection with size, length of antennae, extent of red spots, breadth of marginal band on hindwing, and, furthermore, in connection with the shape of the forewing, but, on the whole, they are similar to the nominotypical race and to its near ally *linnei*, Reiss, as represented by a series from Scania, I have in my collection, in that the wings tend to be elongated and pointed, the red colour to be of a rather light tone and the spots to be rather small. They, therefore, have the extreme *lonicerae* structure and aspect, as contrasted to the *trifolii* ones, much more markedly than the Italian races of the Peninsula, but one of my S. Dionisio males does, distinctly, vary in the *trifolii* direction, like the latter usually do.

Z. angelicae, O. race *baleani*, Bgff.:—The specimens collected at Skala agree with Burgeff's description and would, according to it, be different from the more extreme and specialised *herzegowinensis*, Reiss, which the latter author, in his Supplement to Seitz, does not, on the contrary, consider distinct from *baleani*, so that he sinks this name in synonymy.

Z. ephialtes, L. race *medusa*, Pall.:—Found at Skala and at S. Dionisio. Only 7% of the specimens exhibit a slight trace of the 6th white space on the forewing and 20% belong to the yellow, *trigonellae*, Esp., form, so that the race, on the whole, can well be called *medusa*.

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CONTENTS.

LEPIDOPTERA OF A BAGDAD ORCHARD, <i>E. P. Wiltshire, F.R.E.S.</i>	13
NAMES OF MICROLEPIDOPTERA, <i>T. Bainbrigg Fletcher, R.N., F.L.S., F.R.E.S., F.Z.S.</i>	18
NOTE ON SUMERIA DIPOTAMICA, TAMS, <i>E. P. Wiltshire, F.R.E.S.</i>	20
WEESEN AND PONTRESINA, <i>H. G. Harris, M.D., and E. Scott, D.M. (with Plate)</i>	20
COLLECTING NOTES:—Notes on the Larvae of British Moths, <i>E. E. Green;</i> A New Genonym, <i>Lophosetia</i> , in <i>Tineidae</i> , <i>T. Bainbrigg Fletcher;</i> <i>Cata-</i> <i>bomba pyrastris</i> L., var. <i>unicolor</i> , Curt., in N. Kent, <i>H. W. Andrews;</i> Black ab. of <i>Colias croceus</i> , <i>Hy. J. T.</i>	23
CURRENT NOTES	26
SOCIETIES	28

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LEPIDOPTERA OF A BAGDAD ORCHARD.

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

13,820



It has already been remarked (1) that the fauna of Iraq can be subdivided into that of several distinct areas:—

1. The Sea-Coast and mud flats.
2. The Syrian-Arabian desert's high ground (this area merges into area No. 9 in Upper Iraq).
3. Marsh-land.
4. Date and fruit gardens.
5. Corn lands.
6. Rivers.
7. Unirrigated alluvial mud desert.
8. Towns and buildings.
9. Upland desert and foothills.

There are, of course, many species of insects common to two or more of these divisions, and a few common to all, but in general it can be safely said that each is characterised by its own peculiar inhabitants. In places there is an overlapping or lack of distinction between two divisions: for instance, area No. 4 may fuse with area No. 8, and area No. 3 with No. 7, especially in the south of Iraq, but there is an overlapping, more or less, between all faunistic zones or divisions that the mind of man may care to make, just as there are often transitional forms between the subspecies which entomologists have described with such pains in recent years. This confusion, therefore, does not invalidate the distinction made.

The previously published lepidopterous fauna of Iraq (2) fails, in the main, to observe these distinctions for the simple reason that the authors (Rothschild and Prout) were unacquainted with the country and were only able to study a collection of tersely-labelled moths. An exception must be made of the Section on Butterflies, by Peile, whose energetic and observant field-work gives a special value to his contribution (3), in which he pays careful attention to the kind of ground on which he observed the various butterflies. For this reason the present paper, which deals with the fourth division in the above list of areas, omits all mention of Rhopalocera, and also for the reason, noted by Peile, of the extreme paucity of butterflies in the district under consideration.

Two years' residence in Iraq has enabled me to add many species to the Bombay list and, in bringing them to the notice of the public, I shall endeavour at the same time to indicate to which of the above divisions each is attached. I choose to do this by treating each division separately, except where two may be too closely related to permit such treatment. In preparation are two papers, one dealing with divisions

1P. A. Buxton and R. E. Cheesman, "Birds of Mesopotamia" (Claude Ticehurst), *Journ. Bombay N.H.S.*, December 30, 1920.
 2" Moths of Mesopotamia and N.W. Persia," by various authors, *Journ. Bombay N.H.S.*, December 30, 1921.
 3" Butterflies of Mesopotamia," by H. D. Peile, F.E.S. (*Journ. Bombay N.H.S.*, December 30, 1921, and March 25, 1922).

Nos. 7 and 9, and concentrating on the *Agrotidae* (*sensu lato*), entitled "The Saharan and other Affinities of the Mesopotamian Desert Fauna," and the other, concerned with No. 6, entitled "A Biological Study of a Tigris Island." Both of these are bigger, and take longer to prepare, than the present study, which, therefore, appears first.

In considering the whole fauna of the Kingdom of Iraq, a tenth faunal area must be added to the above list:—

10. The Kurdish mountains (including the northern section of the Zagros range).

This division forms the subject of my papers on the Rowanduz district (4).

The Bagdad orchard which I studied is probably the same as that described by Hingston, whose fascinating book (5), in the manner of Fabre, deals with certain of its Hymenoptera and Arachnida. It lies to the south of the city, near Karradah, and is known to Britishers as "Devonshire," on account of the prettiness of the almond, apricot, and apple blossom in the spring. Other crops are dates, wheat, mulberry, fig and beans. Among the old fruit trees the low vegetation is allowed to run wild. One even sees hawthorn bushes and gets caught in bramble and briar as one pushes into the shady greenery. There is less vegetation under the palms, but even here grass and many low plants grow, protected by the shade of the palms and drinking their water. Often orange-trees are planted. Wheat and beans grow in the more open spaces between the denser palm-groves. All of these crops and vegetation are entirely dependent on water raised from the Tigris by oil-driven pumps. Some of the insects to be found in the luxuriant depths of these orchards can also be found in less shady places and some are even also residents of the unrelieved desert. But others (class A, below) are not found outside this limited breeding-ground: either in the irrigated cornfields that in places grow on treeless parts of the plain, or among the jungle of the river's banks and islands, and of course, not in the absolute desert. These latter insects are like the inhabitants of an island; they are cut off from their original centre of distribution, and if they wander afield they cannot propagate their kind. In the immediate vicinity of Bagdad there is a fairly continuous series of similar orchards, either on one side of the Tigris or the other, but this fertile strip or "oasis" is by no means continuous all along the river's length. Between the hills of Kurdistan and Bagdad are vast expanses of unrelieved desert where no such wealth of humid vegetation grows and below Bagdad are similar stretches, where unirrigated land or treeless cornfields would prevent these species from now extending their range to similar gardens further south, or reinforcing brother-colonies already established there. Yet, in origin, the majority of these species hail from the North. It is unbelievable that they should have arrived at these gardens by flying over the inhospitable desert where they cannot live. Trans-desert insect-migrations in Iraq are, in my experience and opinion, invariably northwards or westwards and seem to provide a safety-valve to prolific species which find themselves

4 "Autumnal Lepidoptera in Kurdistan," *Ent. Rec.*, 31.VIII.37 and 21.IX.37, and "More Notes on Kurdish Lepidoptera" (ined.).

5 "Nature at the Desert's Edge," by R. W. G. Hingston, Witherby (London), 1925.

overcrowded in early summer on a progressively hotter and drier breeding-ground. But these species would have to have flown south-eastwards, with no such biological urge, to arrive here. One is driven to the conclusion, therefore, that they are the isolated survivors of a fauna which, in the days of Mesopotamia's greatest extent of irrigation (Assyrian-Babylonian-Seleucian-Sasanian-Islamic until the Mongol invasion), had drifted southwards from the mountains of Turkey, Armenia and Persia along uninterrupted strips of favourable ground on either side of the main rivers of the country.

Only, if it should be proved that Mesopotamian irrigation goes back to the last Ice Age, could we suppose that these species are the descendants of colonists who arrived here without human aid; for with the retreat of the Ice Cap from Europe began the desiccation of these regions, and any of these species that may have established themselves here during the Pluvial Period, which here corresponded to Europe's Ice Age, must have been exterminated by an interval between that period and the first appearance of irrigated gardens in Mesopotamia.* If such an interval occurred, as seems probable, the species peculiar to the "Devonshire" orchards are mere cultivation-followers in Iraq, with the possible exception of *C. polygrammata*, which may perhaps have survived this interval in the marshes. And their position is precarious, for should this cultivation ever become organised in a modern, scientific fashion, i.e., if the orchards were thoroughly tidied up and weeded and cleaned, most of them would be again exterminated. Their existence in Iraq depends on human culture, but it must be rural, primitive culture.

Those species below whose names are followed by (N) are here recorded for the first time from the plains of Iraq. (I include the upland plains around Mosul in the expression "plains of Iraq.")

A. PURELY ORCHARD SPECIES.

The following are the species which I have found nowhere else in the plains of Iraq than in the shadiest orchards (Division 4):—

Euxoa temera, Hbn. (N); *Rhyacia xanthographa*, Schiff. (N); *Polia oleracea*, L. (N); *Cirphis congrua*, Hbn. (N); *Sideridis ? putrescens*, Hbn.-G. (N); *Cidaria polygrammata*, Bkh. (N); *Nychiodes ? divergaria*, Stgr. (N); *Sterrha textaria*, Led. (N); *Ethmia pusiella*, Roemer. (N); *Trichophaga abruptella*, Walk. (N); *Oegoconia quadripuncta*, Haw. (N); *Actenia brunnealis*, Tr. (N).

B. GENERALLY DISTRIBUTED SPECIES.

The following inhabit both the "Devonshire" orchards and the unrelieved desert:—*Agrotis ypsilon*, Rott., *Agrotis segetis*, Hbn., *Powellinia lasserrei*, Ob., *Triphaena pronuba*, L., *Scotogramma trifolii*, Rott., *Prodenia litura*, F., *Sideridis loreyi*, Dup., *Laphygma exigua*, Hbn., *Elaphria clavipalpis*, Scop., *Plusia gamma*, L., *Plusia ni*, Hbn., *Syngrapha circumflexa*, L., *Rhynchodontodes revolutalis*, Zell. (= *syria-*

*To the possible objection: "Why should they not have survived in the shade of the Euphrates poplar?" My reply is that this tree only grows naturally on islands and banks of the Euphrates and Tigris subject to annual flooding and that my observations of this sort of ground indicate that these particular species cannot survive such conditions.

calis, Stdgr. et auctorum),† *Macaria syriacaria*, Stgr., *Cornifrons ulceratilis*, Led., *Nomophila noctuella*, Schiff., *Plutella maculipennis*, Curt.

These species, whose adaptability is shown by their occurrence in the two extreme environments of the Mesopotamian plain (humid and arid) (not to mention the fact that many of them also occur in much colder climates), are naturally also to be found in such intermediate environments as 5 and 8.

C. SPECIES GENERALLY DISTRIBUTED EXCEPT IN THE DESERT.

This class is a very large one and the following list of names makes no attempt to be exhaustive. I omit those species specially attached to Euphrates poplar and tamarisk, for these two trees are typical of the river, and their fauna will be studied in "A Biological Study of a Tigris Island," and also because, though doubtless planted along the canals of similar gardens, the "Devonshire" orchards, where worked by me, contained none.

Species occurring in 4, 5, 6, and 8:—*Celama* sp., near *squalida*, Stgr., *Oenerogyia amanda*, Stgr., *Agrotis spinifera*, Hbn., **Haemassia vas-silini*, A. B.-H. (N), *Earias insulana*, Bsd., **Earias chlorophyllana*, Stgr. (N), *Acontia graellsii*, Fest., *Rivula sericealis*, Scop., **Thermesia arefacta*, Swinh., *Acantholipes regularis*, Hbn., *Sterrhia ochroleucata*, H.S., **Tephрина perviaria*, Led. (N), *Pachyzaneta (Psara) licarsisalis*, Walk., *Ercta ornatalis*, Dup., *Hyphenodes balneorum*, Alph. (N).

D. DOUBTFUL.

Ophiuche masurialis, Guen. (N).

MORE DETAILED NOTES ON SOME OF THE ABOVE SPECIES.

O. amanda. I include this destructive insect in class C and not in class A because fig-trees are to be seen in several different types of environment in Iraq.

Rhyacia xanthographa. The genus *Rhyacia*'s Bagdad representation is still, unfortunately, rather a mystery to me, and I print the following note in the hope that the next entomologist to reside in that city in winter will clear it up. In February 1937 I found the larvae of two different species of *Rhyacia* feeding at night on grass below the palms and fruit-trees of "Devonshire." One of these I firmly expected to prove to be *Rhyacia rafidain*, Brsn., of which I took the unique holotype (♀) at the lights of the Alwiya Club, Bagdad, on 16.XI.35. The larvae, when mature, burrowed down deep into the earth of the tin in which I grew their foodplant (some four or five inches' depth), but there, perhaps because of the lack of a drainage hole at the tin's bottom, they all failed to pupate. The only imago representative of the genus that I came across in October and November 1937 on their breeding-ground was *xanthographa*. Both larvae were quite different from *xanthographa* larva as I know it in England, but M. Boursin has confirmed the iden-

†I am indebted to Herr O. Bang-Haas for the loan of the type enabling me to publish the synonymy.—E. P. W.

*These species were not taken in the "Devonshire" orchards, but in the Ramadi Road orchards, a drier, less shady locality, but they quite possibly inhabit "Devonshire."

tity of the imagines caught. The red form predominates, there being about two grey in every ten caught. It remains to be seen if there is a third species of this genus, as well as *rafidain*, awaiting discovery.

P. oleracea. Bred on 20.IV.38 from larvae found at night on 24.XI.37. A spring and an autumn brood.

Cirphis congrua (det. Boursin). Bred from a larva found with the *Rhyacia* larvae mentioned above; imago hatched 4.IV.37.

Sideridis ? *putrescens*. Hatched unnoticed during summer 1937 from a larva found with the preceding species; so spoilt itself that certain identification was impossible.

Haemassia vassilini. Also at Ahwaz, 25.IX.38.

Acontia graellsii is regarded by the Iraqi Ministry of Agriculture as a cotton-pest.

Earias chlorophyllana. One specimen taken on the Ramadi Road, Bagdad, shows that this species' range overlaps with that of *irakana*. Its early stages not being known, one cannot yet be sure to which division of Iraq fauna it pertains, but it is probably only found where there is a certain amount of irrigation.

Thermesia arefacta. The larva feeds at night on *Prosopis stephani-ana*. I think that this is the shrub to which Peile refers as *Acacia campbelli* (loc. cit.). It is the foodplant of quite a number of Iraqi Lepidoptera. The imago of *arefacta* is a day-flier from late August till October, and also is attracted to light sometimes. I have found it commonly among the rough dry herbage of the Ramadi Road orchards and also in the riverside scrub of the Kerkkeh River, Khuzistan, S.W. Iran. It is of southern (Sindian) origin.

A. regularis. I have taken this species in Ahwaz, in the Kurdish or Persian hills (Rowanduz and Hamadan districts) and the "Devonshire" orchard (one, 22.II.36), but not in unrelieved desert.

H. balneorum. I have also taken this little moth, previously known from Turkestan, at Khanikin and Ahwaz.

O. (Hypena) masuralis. One specimen of this moth was taken at the lights of the Alwiya Club, 15.IV.36. Its ancestors may have reached Bagdad by following up the course of the Tigris northwards or perhaps by crossing Arabia during the Pluvial age.

Nychiodes ? *divergaria*. Small larvae of this genus were found in XI.37 in numbers at night on apricot trees. Unfortunately I was obliged to take them with me to Tabriz in December, where the winter was longer and severer than Bagdad's. None hibernated successfully, so I cannot be sure of the species' identity, but expect that it will prove to be *divergaria* which I have found not uncommonly in Kurdistan.

M. syriacaria. Food plant: *Prosopis stephani-ana*. Many broods.

Ethmia pusiella. Food plant: *Asperugo procumbens*, in February and March. The imago flies in October and November. I also have an example from Ser Amadia (6000 ft.), a mountain in Iraqi Kurdistan not far from the Turkish frontier.

OBITUARY.—We regret to record the death of Comm. J. J. Walker, R.N., M.A., F.R.E.S., F.L.S., on 12th January. He was 87.

We also regret to record the death of Dr C. J. Gahan, M.A., late Keeper of the Department of Entomology at the British Museum, at the age of 77.

NAMES OF MICROLEPIDOPTERA.

By T. BAINBRIGGE FLETCHER, R.N., F.L.S., F.R.E.S., F.Z.S.

(Continued from Vol. L, p. 78.)

6. *CHRYSOCLISTA LATHAMELLA*, Fletcher 1936.

- Chrysoclista lathamella*, Fletcher, Festschrift Prof. Embrik Strand, I, 504-505 (x, 1936).
Tinea bimaculella, Hw., Lep. Brit. [iv], pp. 574-575, No. 50 (1828).
 [nec *Tinea bimaculella*, Thunberg. Ins. Suec. (7), p. 89 (1794); nec
Tinea bimaculella, Schrank, Fauna Boica, II, ii, 116 (1802).]
Chrysoclista bimaculella, Meyr., Rev. Handb., p. 655, No. 6 (1928).

7. *SPULERIA FLAVICAPUT*, Haworth 1828.

- Porrectaria flavicaput*, Hw., Lep. Brit. [iv], p. 536, No. 13 (1828).
Tinea aurifrontella, Geyer in Hübner's Samml. Eur. Schmett., Tin., t. 70, f. 469 (1832).
Roslertammia [!] *aurocapitella*, Bruand, Mém. Soc. Emul. Doubs, III (5 and 6), p. 44 (1850: ? 1849); *id.*, Cat. Syst. Microlép. Doubs, p. 78, No. 1352 (1850).
Spuleria aurifrontella, Rebel, Cat. Pal. Lep., II, 187, No. 3597 (1901).
Chrysoclista aurifrontella, Meyr., Rev. Handb., pp. 654-655, No. 4 (1928).

Haworth's name has four years' precedence over that published by Geyer after Hübner's death (but ascribed to Hübner by most authors).

The genus *Chrysoclista* of the Handbook seems to be heterogeneous and the British genera of Cosmopterygidae may be separated thus:—

- | | |
|--|-----------------------------|
| 1. Fw. unicolorous blue-black with erect tufts of hairs (plical and discal stigmata) above middle of dorsum ... | <i>Spuleria</i> , Hofmann. |
| Both the above characters not present at the same time | 2 |
| 2. Antenna black, pure white for about 1/5 of length; Fw. only 4 veins from cell to termen | <i>Chrysoclista</i> , Stt. |
| Antenna at most narrowly white-ringed at tip; or, if antenna is broadly white at tip, there are 5 veins from cell to termen Fw. | 3 |
| 3. Fw. with 3 or 4 veins from cell to termen | 4 |
| Fw. with 5 veins from cell to termen | 7 |
| 4. Fw. with 5 veins (excl. 12) to costa | 5 |
| Fw. with 4 veins (excl. 12) to costa | 6 |
| 5. Fw. 2 and 3 separate; antennal segments with outer edges angularly projecting, scape with single bristle ... | <i>Walshia</i> , Clemens. |
| Fw. 2 and 3 connate from lower angle; antennal segments with outer edges not projecting, scape with well-developed pecten | <i>Blastodacna</i> , Wocke. |
| 6. Fw. not more than 4 times as long as broad, 2 and 3 separate | <i>Anybia</i> , Stt. |
| Fw. more than 5 times as long as broad, 2 and 3 coincident or connate | <i>Batrachedra</i> , H.S. |
| 7. Fw. vein 6 from cell | 8 |
| Fw. vein 6 out of 7 | <i>Cosmopterix</i> , Hb. |
| 8. Fw. 11 from well before 1/2 of cell | <i>Limnaecia</i> , Stt. |
| Fw. 11 from about 1/2 of cell | <i>Mompha</i> , Hb. |

The species included in these genera are: *Cosmopterix*, as in Handbook; *Walshia*, *rhamniiella*, Zeller; *Blastodacna*, *hellerella*, Dup. = *atra*, Meyr. nec Hw., and *atra*, Hw. = *vinolentella*, Meyr. nec H.S.;

Spuleria, flavicaput, Hw.; *Chrysoclista, linneella*, Cl., and *lathamella*, Fletcher = *bimaculella*, Hw. nec Thunbg.; *Batrachedra*, as in Handbook, but *pinicolella* was described by Zeller; *Mompha*, as in Handbook, but *locupletella*, Schiff. = *schrunkella*, Hb. nec Villers; *Anybia, epilobiella*, Roemer; *Limnaecia, phragmitella*, Stt.

8. *PERONEA LATIFASCIANA*, Haworth 1811.

- Tortrix latifasciana*, Hw., Lep. Brit. [iii], p. 414, No. 65 (1811).
Tortrix comparana, Hb., Samml. Eur. Schmett., Tort., t. 46, f. 284 (1823).
Tortrix labeculana, Freyer, Neu. Beitr., I (3), p. 33, t. 18, f. 3 (1831).
Peronea perplexana, Barrett, E.M.M., XVII, 265 (1881).
Peronea schalleriana [nec Linn.], Meyr., Rev. Handb., pp. 523-524, No. 11 (1928).
Peronea latifasciana, Sheldon, Entom., LXIV, 30-33 (1931) [synon. and refs.].

9. *ARGYROPLOCE AUROFASCIANA*, Haworth 1811.

- Tortrix aurofasciana*, Hw., Lep. Brit. [iii], p. 468, No. 234 (1811).
Tortrix latifasciana [nec Hw. 1811], Hw., Trans. Ent. Soc. Lond., I, 337 (1812).
Tortrix venustana, Geyer, Hübner's Samml. Eur. Schmett., Tort., t. 51, f. 326 (1830).
Grapholitha dormoyana, Dup., Lep. Fr., IX, 297-298, t. 250, f. 10 (1835).
Sericoris latifasciana, Steph., List Brit. Anim. B.M., X, p. 74, No. 9 (1852).
Exartema latifasciana, Rebel, Cat. Pal. Lep., II, 109, No. 1965 (1901).
Exartema latifasciana ab. *vineana*, Banks, E.M.M., XLIII, 104-105 (1907) [notes that *latifasciana*, Hw., T.E.S., is identical with *aurofasciana*, Hw., Lep. Brit., but reverses dates of these descriptions].
Argyroploce latifasciana, Meyr., Rev. Handb., p. 577, No. 33 (1928).

10. *GELECHIA BETULEA*, Haworth 1828.

- Recurvaria betulea*, Hw., Lep. Brit. [iv], p. 549 (1828).
Tinea ericetella, Geyer, Hübner's Samml. Eur. Schmett., Tin., t. 70, f. 470 (1832).
Lita gallinella, Treits., Schmett. Eur., IX, ii, 79 (1833).
Anacamptis lanceolella, Steph., Ill. Brit. Ent., Haust., IV, 211, (1834); Wood, Index Ent., p. 176, t. 39, f. 1210 (1837).
Anacamptis betulea, Wood, Index Ent., p. 173, t. 39, f. 1192 (1837).
Acompsia fuscella [nec Eversmann], Dup., Lep. Fr. Suppl., IV, 510, t. 89, f. 4 (1844).
Acompsia subatrella, Dup., Cat. méth. Léop. Eur., p. 341 (1845).
Gelechia ericetella, Rebel, Cat. Pal. Lep., II, 144, No. 2579 (1901); Meyr., Rev. Handb., p. 625, No. 15 (1928); Gaede, Lep. Cat., Pt. 79, pp. 169-171 (1937).

Herr Gaede quotes Hübner's f. 470 as 1827 and Haworth as 1829, which is ingenious but not in accordance with the facts; he has also blindly copied Rebel's misquotation of Wood's fig. 1192.

NOTE ON SUMERIA DIPOTAMICA, Tams.*With a Description of the Female.*

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

NOTE ON SUMERIA DIPOTAMICA, Tams, with a Description of the Female.

Until the life-history of this recently described Notodontid is known, one cannot say to which of the above divisions of the Mesopotamian fauna it pertains, though, to judge from its facies and the situations in which I have taken it, it may well prove to be a reed-feeder. It seems to be most frequent in the delta of the Euphrates and Tigris, but it also occurs up to some height in the Zagros range. In 1938 I captured a female at Basra (25.V.) and a male at Khorramshahr (Mohammerah) (2.X), both to light near the river. I also believe it occurs at Bagdad. Since no description of the female was published by Mr Tams, I append one hereto:

Sumeria dipotamica, Tams (*Proc. R. Ent. Soc. Lond.* (B) 1938).

♀ Neallotype; Basra, 25.V.1938, in coll. m.

Antenna: Much more lightly bipectinated than ♂.

Expanse: 54 mm., i.e., considerably larger than ♂.

In other respects, similar to the ♂.

N.B.—The autumnal brood ♂ taken by me at Khorramshahr was only 40 mm. in expanse.

WEESEN AND PONTRESINA.

By H. G. HARRIS, M.D., and E. SCOTT, D.M.

(With Plate).

Many papers have been contributed to the *Entomologist's Record* in the past, dealing with the Engadine, so this is only a short account concerning this district for a period of three weeks in July 1938.

Amongst the papers consulted is a lengthy account by Mr B. C. S. Warren, "Six Weeks among the Butterflies of Switzerland," *Ent. Rec.*, Vol. XXXV, and one by Mr P. Haig Thomas, "The More Local Butterflies of Switzerland," *Ent. Rec.*, Vol. XXXIX; and we must not omit Mr H. J. Turner's long paper on St Moritz with numerous references to Pontresina, *Ent. Rec.*, Vols. XXVII and XXVIII.

Our party consisted of Dr and Mrs E. Scott and myself, and when we reached Pontresina we found Mr and Mrs B. C. S. Warren already installed at the Hotel Collina, together with their youthful daughter, whose knowledge of entomological terms was wonderful. We were much indebted to Mr Warren for his previous experience of the best localities and for help in many ways.

Leaving London on July 1st, we stopped for three nights at Weesen on Lake Walensee to obtain specimens of *Lycaena euphemus* and *L. arcas*. The first two days were hopeless for collecting owing to continuous rain, but on our last morning the sun shone brilliantly and we were able to obtain a satisfactory number of *L. euphemus* on the marsh sur-



Entomologist's Record.

Photo. E. Scott, M.D.

ROSEG VALLEY. Locality for *B. thore* and *B. matura*.

SCHAFFBERG. Locality for *E. flavofasciata*.

rounding the Lake wherever the food plant *Sanguisorba* grew. *L. arcas* was also taken but not so common as *L. euphemus*. Dr Scott found an aberration of *Melanargia (Satyrus) galathea* with the white ocelli on the posterior side of the lower wings devoid of the usual black points.

Aphantopus (Hipparchia) hyperantus was just emerging but very little else. A colony of *Vanessa io* was found feeding on wild hop. A few were taken, which later pupated, and emerged in August. We did not find the railway banks as productive for *L. euphemus* as the marsh itself.

On 4th July we left for Pontresina and stayed there till 22nd July. We had excellent weather on the whole, but the temperature was quite moderate till the last few days.

PONTRESINA (5910 feet) differs from most Alpine resorts in being open on all sides for walks. The following districts were explored for collecting purposes:—

1. THE ROSEG VALLEY.—This was frequently visited, as here were to be found *Melitaea maturna*, var. *wolfensbergeri*, and also *Brenthis thore*, both of which were secured in fair numbers, but a suitable locality had to be searched for in each case.

B. thore was especially fond of settling on the flowers of wild geranium, which grew near streams. Dr Scott tried to find evidence of its food plant but was unsuccessful. Wheeler's "Butterflies of Switzerland" states that the food plant is unknown. Seitz states that it can be reared on violet. [See *Ent. Record*, XV, 301; XVI, 236; XVII, 78; XVIII, 69.—HY. J. T.]

I was here lucky in finding a nice male specimen of *Brenthis pales* with both upper wings marked heavily with black.

Pieris napi, f. *bryoniae*, was just going over and females were difficult to obtain in good condition.

The Roseg Valley leads to the Tschierva glacier, where Mr Warren in 1922 discovered *Erebia flavofasciata*. I was unable to make the excursion personally, as it is an arduous climb, but he kindly brought me back some specimens of this interesting butterfly. They were flying on ground above the glacier in good numbers.

2. THE SCHAFBERG (8965 feet). Ascended by zigzag paths or else by cable railway from Punt Muraigl, a detour resulting in an hour's walk. This is a well known locality for *Erebia flavofasciata* and we had hoped to obtain a good series, but our united efforts only succeeded in obtaining two specimens after the several excursions we made here for this purpose. I was, however, told by a French collector that it was useless looking for it, as in 1937 a number of Italians had practically wiped them all out.

Erebia epiphron was not uncommon and so also *Coenonympha satyrion*, with the white band on the underside of the lower wings reminding one of the similar band in *E. flavofasciata*, and one could not help wondering whether in by-gone ages a hybrid had resulted from these two insects.

As regards the almost complete absence of *E. flavofasciata*, this year some observers consider that it is only common in alternate years as *E. arete* is supposed to be.

3. MUOTTAS MURAIGL (8058 feet). Reached, as already stated, from Punt Muraigl by cable railway. Here a few *Pontia callidice* were seen flying on the summits, whence there was a wonderful view of Pontresina, Moritz, and Sameden, and five lakes glistening in the sun; and here on a steep bank Mrs Scott took several male *Melitaea cynthia*; they however eluded my net, but later I picked up a female on the path.

Erebia gorge typical and form *triopes* were just emerging on the same spot, together with *E. lappona*.

4. MORTERATSCH GLACIER. The ascent starts from the station on the Bernina Railway. On the only occasion on which we visited this locality the weather was cloudy and unpropitious for collecting but Dr Scott found a single *Lycaena alcon* and also one *Pararge hiera* and a few *E. gorge*.

5. BERNINA HOUSES (6720 feet) and BERNINA HOSPICE (7400 feet), stations on the Bernina Railway. Near the former Mrs Scott took a *Hesperia andromedae* from a flower head, the only one seen, and here also were *Parnassius delius* flying swiftly and *Colias phicomone* in numbers. *Melitaea varia* also was in fair quantity. A new path has been constructed from the Hospice leading round to Bernina Houses. It is very rough and fatiguing and was not attempted by the writer, but those who followed it were rewarded with some excellent large specimens of *Erebia glacialis*, and these will probably be described later.

6. PUNT MURAIGL (5708 feet). Here we were lucky in finding *Polyommatus amanda* in good numbers on a railway bank in a very restricted area. I believe this is the first occasion on which it has been recorded for Pontresina. *L. alcon*, *L. arion* and *Heodes dorilis* were flying with it. *Erebia melampus* was common in the adjoining meadows with a few *Erebia medusa* still in good condition. I also netted a fresh specimen of *Melitaea cinxia* on July 20th, a late date for this insect. Walking across the Bernina Railway in the direction of St Moritz an excellent locality for *Colias palaeno* was found; this *Colias* was fairly common and as the marsh on which it was flying was fairly flat there was not much difficulty in securing it. Females ab. *herrichi* and also white ones were caught. As we obtained *Polyommatus optilete* elsewhere, it was surprising that we found none on this marsh where the food plant (*Vaccinium uliginosum*), common to both insects, was growing.

C. phicomone males showed some variation. Some of the males had very few striations on the borders of the wings, and one had the lower wings very similar in pattern to a female with the colour a primrose yellow in place of the usual greenish tint.

I append a list of the remaining species captured or observed (86 in all); very few were in their usual large numbers, but the season was a late one and quantity was made up for by the quality. The nomenclature in the list is from Wheeler's "Butterflies of Switzerland," and the photographs were taken by Dr Scott.

No list of butterflies captured at Weesen is given as practically only one morning was spent there collecting, and our objective in stopping there to obtain *euphemus* and *arcas* was successful.

Hesperia alveus, Hb., *H. carthami*, Hb., *H. serratulae*, Rmbr., *H. cacaliae*, Rmbr., *H. malvoides*, Elwes., *P. sylvanus*, Esp., *T. lineola*, Ochs., *C. virgaureae*, L., *H. (C.) hippothoë*, L., *C. minima*, Fssl., *N. semiargus*, Rott., *P. eumedon*, Esp., *P. coridon*, Poda, *P. bellargus*, Rott., *P. icarus*, Rott., *P. eros*, Ochs., *P. orbitulus*, Prunner, *P. astrarche*, Brgstr., *P. pheretes*, Hb., *P. argus*, L., *P. argyrognomon*, Brgstr., *P. machaon*, L., *P. apollo*, L., *A. crataegi*, L., *P. brassicae*, L., *P. rapae*, L., *L. sinapis*, L., *C. croceus*, Fourc. (one only), *A. aglaia*, L., *A. cydippe*, L., *A. niobe*, L., and var. *eris*, Meigen, *B. euphrosyne*, L., *B. selene*, Schiff., *B. thore*, Hb., *B. ino*, Rott., *B. amathusia*, Esp., *I. lathonia*, L., *M. aurinia*, var. *merope*, Prunner, *M. didyma*, Ochs., var. *alpina*, Stgr. (E.S.), *M. athalia*, Rott., var. *helvetica*, *M. dictynna*, Esp., *Ag. urticae*, L., *V. cardui*, L., *M. (E.) tithonus*, L., *P. hiera*, Fab., *C. arcania*, var. *darwiniana*, Stgr., *C. pamphilus*, L., *E. pharte*, Hb., var. *phartina*, Stgr. (E.S.), *E. mnestra*, Hb., *E. euryale*, Esp., *E. goante*, Esp., *E. tyndarus*, Esp.

COLLECTING NOTES.

NOTES ON THE LARVAE OF BRITISH MOTHS. (Continued from p. 69, vol. L).—

Cerura bicuspis. This species must occur at Camberley, where birches abound, though I have taken only a single example of the larva. This was beaten from a birch tree in a much frequented street in the town. Further search was prevented by the issue from the house of an irate occupier, who, not unnaturally, objected to my interference with his tree. Unfortunately, the larva had been disturbed during the process of changing its skin, from which it never recovered. However, I had been able to establish the occurrence of the species. I have never found larvae on alder, though these trees occur in the neighbourhood.

Cerura bifida. Larvae of the "Poplar Kitten" occur, commonly, on the wild Aspen, throughout Camberley. Young larvae have been observed from the middle of June till early in September. Though they habitually rest on the upper surface of the foliage, the eggs (of both *bifida* and *furcula*) appear to be deposited more commonly on the undersurface of the leaves. Moths have emerged in the last week of May and early in June.

Cerura furcula. I have found that larvae of the "Sallow Kitten" are equally common, chiefly on narrow-leaved willow. On one occasion only I reared this species from Aspen. Very young larvae have been taken in the middle of June and others as late as September. I suspect that both this species and *bifida* also may, at least partially, be double-brooded, though I have no actual proof of this. Fertile ova have been obtained as late as 20th August and pupae as early as 9th August. Ova of *furcula* are considerably smaller than those of *bifida*. I reared two moths on the 21st of March, but others did not appear until early in May. The latest emergence was on 23rd June.

Dicranura vinula. I have taken the larvae on several species of *Populus*, on willow and on various kinds of willow. Young larvae are

noticeable in early June. They feed up rapidly and have commenced to spin up by the first week in August. Moths were emerging in the following May and June.

Stauropus fagi. I have taken full-fed larvae of "the Lobster" from Oak and Beech, at Camberley, in September, and have received several batches of ova from Reading, all of which have been successfully reared. The species must be rather common in the woods about Camberley, for I have repeatedly had the males in my moth-trap. They have turned up from 25th May to 5th July.

Drymonia chaonia. The "Lunar Marbled Brown" is not abundant in this neighbourhood, but I have beaten out the larvae, occasionally, from Oaks. I have found it, more commonly, in the New Forest. The resulting moths appeared in mid-April.

Drymonia trimacula. I have never found this species in Camberley. My only acquaintance with it was in the days of my youth, in Kent, when I used to dig up the pupae under isolated Oak-trees in grassland.

Pheosia tremula. I find the larvae of this species chiefly on small Aspens, but occasionally on *Populus alba*. These caterpillars always have the appearance of having been coated with oil or varnish. I have taken young and full-fed larvae on the same day (20th September). I have had moths emerging in May and again in the middle of July.

Pheosia dictaeoides. Though the moths are frequent visitors to my moth trap (which is placed in an upper window of this house), I have seldom taken the larvae in Camberley. But, on one occasion, beating some stunted birch bushes in a hollow below the Chobham Ridges, there fell into my tray a surprising number and variety of caterpillars, including several of this species.

It will be convenient here to mention the catch on this particular day (25th September, 1927):—Bunches of *bucephala*, 5 *leporina*, 3 *dromedarius*, 3 *dictaeoides*, 3 *contigua*, 5 *falcataria*, innumerable *lacertinaria*, many young *papilionaria*, several *betularia*, and a host of undetermined Noctuids and Geometers. I suspect that a prevailing wind had blown the moths down the slope to take refuge among the group of stunted birches, where they had forthwith lightened themselves of their ova.

Notodonta ziczac. Larvae of the "Pebble Prominent" are abundant around Camberley, on Sallow, Willow, and Aspen. I have found full-fed caterpillars in June and again in September. I once found a larva, on Aspen, which differed from typical *ziczac* in being nearly cylindrical in form, with the usual dorsal humps almost completely suppressed and the terminal hump greatly reduced. In its general form this abnormal larva resembled Buckler's figure (II, pl. XXXV, fig. 4) of *Lophopteryx cucullina*, but differed in colour, being of a uniform dull olivaceous brown, slightly purplish on the dorsum in front. However, the moth emerged (on 12th April) as a typical example of *ziczac*.

Notodonta dromedarius. Many larvae of *dromedarius* have been found in various stages of growth. Very young larvae have been observed on 15th August and again a month later. Full-fed larvae have been taken in June and up to the middle of October. I know of few

caterpillars that are so perfectly adapted, both in form and colour, for concealment when feeding on the edge of a birch leaf. Though the larvae are so frequent here, the moths are seldom seen at light, but I have bred them out from May to July.—E. E. GREEN.

A NEW GENONYM, *LOPHOSETIA*, IN TINEIDAE.—In *Trans. R. Ent. Soc. London*, LXXXVII, 527 (xii, 1938) Mr Meyrick described a new Tineid genus from New Guinea under the name of *Syncopacma*, evidently having overlooked his own use of this name for a Gelechiad genus from the Transvaal (*Wytsm. Gen. Ins.*, fasc. 184, p. 72). I therefore re-name *Syncopacma*, Meyr. 1938 (nec Meyr. 1926) as **Lophosetia**.—T. BAINBRIGGE FLETCHER, Rodborough, 15th January 1939.

CATABOMBA PYRASTRIS, L., VAR. *UNICOLOR*, CURT., IN N. KENT.—On 6th August 1938 I took a specimen of this melanic ♀ form of *C. pyrastris* in the Thames Marshes at Stone, near Dartford. I have only once taken it before, viz., on 16th July 1920, when I took another single specimen on the chalky uplands near Shoreham (Kent). Verrall in Vol. 8 of *British Flies* suggests that this form is seasonable, and gives as dates:—One in 1867: in considerable numbers in various parts of England in 1869; and then one again in 1905: Audcent in "British Insect Fauna" gives records from Gloucestershire in July 1930, and Somerset in August 1923. I am not aware of any other recent records.—H. W. ANDREWS.

BLACK AB. OF *COLIAS CROCEUS*.—In *The Entomologist's Record* for 1892 (vol. iii, p. 8) a description is given, under the above heading, of a specimen caught in Croatia. As some of your readers may not have this volume handy for reference, perhaps you will allow me to quote the complete description:—

"The specimen on the upper surface is black, instead of the orange colour of the normal form, with the exception of a small oval yellow spot near the base on the upper margin of hind wings. The colour of the latter is shot with blue. The broad band, which is black in the normal form, is in this brownish, which, as seen on the upper wings through a lens, shows rather long yellow scales sprinkled over it. All the nervures are black. The middle area of the forewings on the underside is blackish blue, from the base towards the outer margin runs a broad grey blotch. The colour of the wings on the costa towards the tip is olive green. The black spot normally present is in this specimen only perceptible on both sides by a deeper black. The underside of the hind wings is olive green, otherwise spotted with the characteristic metallic markings of the *Colias* genus. The body, antennae, palpi, and fringes like the ordinary form, only instead of yellow, black is more predominant. Size 25 mm. (one forewing ♂). The above variety was caught on September 25th, in a meadow enclosed by a wood, near Agram, where other *Colias* species occur. It appears to have freshly emerged, and is perfectly developed.—AUGUST ONSSEN, Bakacgasse No. 4, Agram, Croatia."

Can any of your readers acquainted with Continental literature and collections tell me: (a) Whether this specimen is still in existence; if so, where; (b) has an illustration of it ever been published; (c) has any other specimen of this aberration been taken; if so, where, when, and

by whom? The usual English text books are silent about it, and make no mention of melanism in this species.—P. B. M. ALLAN, No. 4 Windhill, Bishop's Stortford, Herts.

[I can find no reference to this aberration in Dr Verity's publications, nor in Seitz works, and Herr Lempke (Holland), who has recently been making a summary of the recorded variation in *C. croceus*, informs me that he has no knowledge of the form. Perhaps some of our Continental workers can give us some further recent information about this specimen.—HY. J. T.]

CURRENT NOTES.

Having now completed three of the four *Supplementary Volumes* to *Seitz Palaearctic Macro-lepidoptera*, quicker progress is being made on the 4th volume, that of the Geometers. We have just received 8 sheets and 1 plate of varieties, some 50 figures. The text deals with additions to the following British species. *Cidaria* (conclusion), *furcata*, 20 new forms; *badiata*, 1; *Pelurga comitata*, 2; *Venusia cambrica*, 3; *Discoloxia blomeri*, 2; *Eupithecia haworthiata*, 2; *E. plumbeolata*, 7; *E. linariata*, 2; *E. pulchellata*, 2; *Gymnoscelis pumilata*, 5; *Chloroclystis coronata*; *C. rectangulata*, 5; *C. debiliata*, 2; *Coenocalpe lapidata*, 1; *Horisme vitalbata*, 5; *H. tersata*, 6. So much research has been carried on among European *Geometridae* during the period this Supplement has been in hand, that it has been decided to give an interim Addendum to the species hitherto considered and in the present issue nearly 120 new forms are dealt with and the knowledge of each species brought up to date. Not only has the author, Mr Prout, been working on this Supplement, but sections of the Indo-Malay and American Main Volumes of the *Geometridae* have recently come from his pen.

In part II of the *Stett. Ent. Zeitg.*, vol. 99, just issued, are several interesting articles. 1. The conclusion of a long paper on the Acrydiinae (Orth.) with 139 figs. No doubt our colleague Dr Burr will take note of it. 2. Herr Warnecke of Kiel contributes another of his useful articles, this time on *Laelia coenosa* in Germany, illustrating his remarks with a map of Europe, showing the distribution of the species. 3. A comprehensive article on *Hesperia carthami*, its distribution, especially in Germany, and its various forms, with a capital plate of 24 figures by Dr B. Alberti. (4) and (5) Aristide Caradja continues his work on the fauna of China, dealing mainly with the *Pyralidae*. Other contributions are of other orders.

Messrs Gustave Fellar are publishing in parts a work on Listing the Literature of Coleoptera. It is proposed to have four volumes: Europe, Indo-Malay, Aethiopia, and America.

The Wanderings of the Y-moth, *Plusia gamma*, observed by Mrs K. Grant (now Mrs Fisher) has been published as a separate from the *Jr. of Animal Ecology*. It is well illustrated by maps and diagrams.

The last part of the *Mitt. Münch. Ent. Gesell.* for 1938 contains a discussion on the Systematics of the Polyommataini section of the *Lycaenidae*. It is illustrated by several plates and text figures. The writer, Dr Walter Forster, begins by mentioning that English authors "in the first line" (Chapman, Tutt and Bethune-Baker) had noted the fact that Staudinger had united in the genus *Lycaena* a heterogeneous collection of species. Other articles deal with (1) Notes on Persian *Lycaenidae*. (2) The Butterflies of the Southern Tyrolean Inntals. (3) Some new species of E. Asian Geometers. (4) A very useful Study of the three *Everes* species, *argiades*, *alcetas*, and *decolorata*, with a plate and text figures. (5) Observations on the Genus *Procris*, etc.

Another annotated Catalogue must be added to those issued of late. Our kind correspondent, Herr B. J. Lempke, of Amsterdam, has sent us part III of his "*Catalogue of Netherland Macro-lepidoptera.*" His notes on the distribution and variation of the various species dealt with are just those upon which future workers can base their field work and observations. Although the name *pyritoides* (1766) is absolutely correct for *derasa* (1767) it has never been used except in an obscure list since. It seems too extreme a case of priority to push. We are also of opinion that all very modern corrections or re-arrangements, re-classifications, should be linked up with the more recent usages which all text books in common use present. In this Catalogue we have *Amatidae* and *Amata*, which in the interest of the readers should be *Amatidae* (*Syntomidae*) and *Amata* (*Syntomis*): the educative method, not the dictatorial.

In the *Zeitschrift* of the *Deutsches entomologische Gesellschaft*, Heft II, 1938, is published an important and valuable contribution on the ecological material which has been collected in South China. Herr R. Mell deals at great length with the Family *Papilionidae* (150 pages), illustrating his remarks with 8 plates, 2 of which are coloured. The character of the area is well depicted in the 10 views of localities on the plates. The 2 coloured plates are devoted to figuring the larvae and pupae, chiefly *in situ*, on their food plants. This is probably one of the most important contributions to the Macro-lepidopterous Fauna of China which has yet appeared.

The *Zeits. Oestr. Entom.-Ver.* for the past few months has had a number of very well illustrated short articles, attractive and useful to both the Macro- and Micro-lepidopterist. Nos. 8 and 9 contain descriptions and coloured figs. of several new species of *Micros*. No. 10. New races of *Acronicta* species, with a plate of 18 figures and a new Coleophorid. In No. 11 two new Coleophorids are described, and there is a plate of forms of *Lythria plumularia*, and in No. 12 where continued are 16 more figures. This periodical, with *Lambillionea* and *L'Amateur de Papillons* (now *Revue Française de Lepidopterologie*) form a splendid trio of entomological news and modern advance.

Dr F. Heydemann, of Kiel, has sent us a number of separates of articles he has written recently to various magazines, including a very useful, interesting, and well-illustrated discussion on the Lepidoptera

more or less confined to the shores of the North and Baltic Seas, in fact any portion of the area of a saline character. The author divides the species so listed into three classes: I. Species living under either brackish or sweet water conditions. II. Species living on salt water plants only. III. Species occurring at places along the shore more or less salt, but also as xerophytic species in sandy and steppe areas. The article was written for an imposing work, *Die Tierwelt der Nord und Ostsee*.

In the *Ent. Rundts.* for January there is a figure and description of a Coleopteron *Carabus glabratus* with only 4 tarsal segments in place of the usual 5 to each leg.

For several months' issue of the *Ent. Rundts.* W. Brandt has contributed a series of *Notes on the Lepidoptera of Iran (Persia)*. New genera, species, and forms of Macro-lepidoptera with about 50 coloured figures on two plates, and many other figures, especially of Geometers.

SOCIETIES.

A meeting of the Entomological Club was held at the Junior Carlton Club on Friday, 25th November, Mr H. Willoughby-Ellis in the chair. *Members present* in addition to the Chairman—Mr H. St J. K. Donisthorpe, Dr Harry Eltringham, Mr W. Rait-Smith, Dr Sheffield Neave, Dr Richard Armstrong. *Visitors present*—Mr H. E. Andrewes, Dr K. G. Blair, Mr J. C. F. Fryer, Dr A. D. Imms, Dr Karl Jordan, Sir Guy A. K. Marshall, Capt. N. D. Riley, Mr W. H. T. Tams, Dr C. B. Williams. The meeting was called for seven o'clock, and the members and visitors were received by the Chairman in the ante-room, where refreshments were available. This hour, preceding dinner, provided an opportunity for general conversation, which was much enjoyed. Dinner was served at eight o'clock in the Parliamentary Library on the historic round table. After the toast of the King, Dr Jordan showed the imago, chrysalis and cocoon of a West African moth, *Eligma hypsoides*, Walk., 1869, and explained the interesting stridulating apparatus of the chrysalis. Unlike the usual type of stridulation, the rattling sound made by the pupa in the cocoon is not produced by the friction of two parts of the body against each other, but by the disturbed chrysalis rapidly playing a densely ribbed subapical transverse bar over sharp longitudinal regular ridges constructed in fan-shape on the inner surface of the cocoon; an approach to a primitive string instrument, except that the ridges are firmly attached to the surface of the cocoon.* Provision without prevision on the part of the caterpillar? A lively discussion on the possible origin of this instrument and the bearing of natural selection on its perfection ensued and made an enjoyable meeting also scientifically profitable.—H. WILLOUGHBY-ELLIS, Hon. Secretary.

*[A similar arrangement is found in the Indian *Eligma narcissus*, Cramer, and was described and figured in *Pusa Bulletin*, No. 89, p. 64, fig. 38 a-d (1919).—T. B. F.]

f. *deprivata*, Bng.-Haas, *Iris*, XXVI, 139 (1912).

ORIG. DESCRIP.—“From the neighbourhood of Yarkand we have a number of specimens which differ from typical *c-nigrum* by the conspicuous dark costa of the central area and the thereby prominent reniform. The colour of the forewing is a dull black, a little vivid but somewhat of a coppery tint. The hindwings in both sexes as in typical *c-nigrum*.”

ab. *nigrescens*, Buresch., *Trans. Soc. Bulg. Sci. Nat.*, VII, 100 (1915).

ORIG. DESCRIP.—“A melanic form with perfectly black forewings. Of the usual brown ground colour there is only a spot lying between the black but ill-expressed C mark. Also the hindwings along the margin strongly black. Taken at light in Sofia among typical examples.”

ab. *maerens*, Dahn., *Ent. Zts.*, XXXIX, 123 (1925).

ORIG. DESCRIP.—“Extreme examples show a perfectly smooth unicolorous tone; only the markings towards the costa appear bright, and towards the outer margin (inner-half of the reniform) they show somewhat bright; a small black spot at the base of each wing and the small costal spots are visible.”

Dr Cockayne records a form from Gorleston (*in lit.*): “Thorax and forewings pale grey; usual black markings a slightly darker brownish grey; hindwings and abdomen nearly white.” This grey form has not so far been recorded. It might be called ab. **grisea**, n. ab.

Noctua, L. (Ochs. & Treit, 1816-25) H.-S., Gn., Barrett. [*Agrotis*, Ochs. & Tr. (1816-25) Stdgr., Meyr., Hamps., Spuler, and Culot: *Rhyacia*, Hb. (1821) Warr., Stz.: *Graphiphora*, Ochs. & Tr. (1816-25) Steph., Meyr.] *ditrapezium*, Bork. (1792).

Tutt, *Brit. Noct.*, II, 111 (1892): Barr., *Lep. Brit. Is.*, IV, 56, pl. 143 (1897): Stdgr., *Cat.*, III ed., 139 (1901): Hamp., *Lep. Phal.*, IV, 400 (1901): Splr., *Schm. Eur.*, I, 149, pl. 33, 5 (1905): South, *M.B.I.*, I, 222, pl. 110, 9 (1907): Warr.-Stz., *Pal. Noct.*, III, 44, pl. 9i (1909): Culot, *N. et G.*, I (1), 41, pl. 6, f. 12 (1910).

Gn. gives the distinction from *triangulum*, which it so closely resembles, as “Forewings narrower, of a dark violet-brown; subterminal line obsolescent, reniform with a grey C in the centre, lower wings ochreous, with dark lunule and outer border.”

Ernst & Engr., *Pap. d'Eur.*, VII, 29, fig. 425 (1790), give 2 figs. of *ditrapezium*, fairly good.

Borkhausen described the red form, the male, *ditrapezium* (1792). Treitschke described the red-brown female, *tristigma* (1825). Godart described the ♀ as *sigma* (1824) and considered *ditrapezium*, Bork. as the ♂ of his *sigma*.

Hübner, *Samml.*, 113 (1800-3) and 472 (1808-18) gives two figures. 472 has more black marking than 113, which is of much more uniform red ground colour. The red of the former is of a much less intensity.

113 has uniformly black hindwings (deterioration ?). 472 has grey hindwings, the inner basal half somewhat lighter.

Godt., *Hist. Nat.*, V, 174, pl. 61, 3 (1824), gives a very dark good figure, but not smaller than that of *triangulum*.

Treit, *Schm.*, V (1), 243 (1825), says of *tristigma*, smaller than *triangulum*. He gives *ditrapezium* of Bork. and of Hb. as synonyms of *tristigma*.

Freyer, *Beitr.*, III, 15, pl. 99 (1830), gives an excellent figure of the dark *tristigma*.

H.-S., *Bearb.*, II, 357 (1849), says of Hüb.'s fig. 113: "From the dark, similarly coloured hindwing this figure might well be taken for a female of *triangulum*; also the breadth of the forewings is emphasized, these are also much too lac-red for *tristigma*." Of 472: "The forewing is too wide behind, the waved line too straight. This figure was of a large female not worn, and shows that all the distinctions from *triangulum* given by Treitschke are insufficient."

Newman, *Brit. Moths*, 346 (1868), gives a bad figure of this species.

Barrett, *Lep. Br. Is.*, pl. 143, gives 2 very good figures.

Brown, *Dobr. Eur. Noct.*, 58 (1905), records an Amur example "purplish black."

Splr., *Schm. Eur.*, I, 149, pl. 33, 5 (1905), gives an excellent figure of *ditrapezium* showing the distinction very clearly.

South, *M.B.Is.*, I, pl. 110, fig. 9 (1907), gives a good figure typical for marking.

Warr.-Stz., *Pal. Noct.*, III, 44 (1909), treat *tristigma*, Treit. and *sigma*, var. Godt. as type synonyms, and on pl. 9i give a very fair figure. No variation is recorded.

Culot, *N. et G.*, I (1), pl. 6, 12 (1910), gives an excellent figure delicately contrasting with the figure of *triangulum*.

Barrett says of the Variation:—

"Rather variable in the ground colour from bright rosy-brown to dark purple-brown, but otherwise very constant."

Barrett, *l.c.*, reports 2 specimens in which "the surface of the forewings is not so glossy as usual, there is a broad darker purplish-brown transverse stripe at the base, and another beyond the central space, which is itself rather pale, but has the stigmata and spots very conspicuous."

The Names and Forms to be considered are:—

ditrapezium, Bork., ♂ (1792), *Naturg.*, IV, 515.

sigma, Godt., ♀ (1824), *Hist. Nat.*, V, 174, pl. 61.

tristigma, Treit., ♀ (1825), *Schm. Eur.*, V (1), 243.

r. *orientalis*, Hamp. (1903), Strand. (1915), *Lep. Phal.*, IV, 400:

Strand., *Arch. Nat.*, LXXXI, A.11, 145.

ab. *pallida*, Hoffm. (1914), *Schm. Stiermark*, 349.

Tutt dealt with: (1) *ditrapezium*, the red male; (2) *tristigma*, the red-grey female; (3) the *sigma* ♀ of Godart.

Race *orientalis*, Hamp., Strand., *Cat. Lep. Ph.*, IV, 401 (1903), *Arch. Nat.*, LXXXI, A.11, 145 (1915).

ORIG. DESCIP.—"Head, thorax, and forewing darker and more purplish; hindwing without ochreous tinge except on cilia" (1903).

ab. *pallida*, Hoffm., *Schm. Stiern.*, 349 (1914).

ORIG. DESCRIP.—“ I possess a light example like the ab. *rosea*, Tutt, of *C. nigrum*. This form has a great similarity with *Agrotis triangulum*; I have long thought that they were both the same species, but have found an infallible distinction; in *triangulum* the inner transverse line runs to the costa at right angles to it, while in *ditrapezium* it is bent above the orbicular and here runs almost horizontally inwards towards the base.”

Noctua, L. (1758), Ochs. & Tr. (1816-25) Frr., H.-S., Barr., Sth. [*Agrotis*, Ochs. & Tr. (1816-25) Stdgr., Splr., Meyr., Hamp., Culot: *Graphiphora*, Ochs. & Tr. (1816-25) Steph., Meyr.: *Rhyacia*, Hb. (1821) Warr.] *stigmatica*, Hb. (1808-13).

Tutt, *Brit. Noct.*, II, 112 (1892): Barr., *Lep. Br. Is.*, IV, 60, pl. 143, 2 (1897): Stdgr., *Cat.*, IIIed., 140 (1901): Splr., *Schm. Eur.*, I, 149, pl. 33, 7 (1903): Hamps., *Lep. Phal.*, IV, 411 (1903): South, *M.B.I.*, I, 223, pl. 113, 2 (1907): Culot, *N. et G.*, I (1), 45, pl. 7, 5 (1910).

Ernst & Engram, *Pap. d'Eur.*, VII, 29, fig. 425 (1790), give 2 figures, which have been supposed to represent this species. The figures are well executed, but only 425b may represent it, but is too clearly marked and also has the pre-costal black spot, which is not present in *stigmatica*.

Esper, *Abbild.*, IV, pl. 149 (1790 ?), is an unrecognizable figure as *rhomboidea* and certainly cannot be taken as the typical figure.

Hübner, *Samml.* (1808-13), gives 2 good figures: 470 with one very dark quadrate spot between the stigmata, the other with another very dark quadrate spot before the orbicular. The latter, 471, is more variegated than the former, which is of a bright red-brown colour. *stigmatica*.

Godt., *Hist. Nat.*, V, 193, pl. 62, 5 (1824), gives a figure, *rhomboidea*, with markings far too emphasised and much too definite.

Treit., *Schm.*, V (1), 231 (1825), describes it under the name *rhomboidea* and gives *stigmatica*, Hb., as a synonym. He took the *rhomboidea* of Esper as *stigmatica*, but this is probably *triangulum*.

Steph., *Ill.*, II, 132 (1829), considered *rhomboidea*, Tr., as a separate species, as did

Humphrey and Westwood, *Br. M.*, I, 129 (1845 ?), while

Bdv., *Ind. Meth.*, 105, considered them as one species.

Frr., *New. Beitr.*, IV, 33, pl. 309 (1842), gives a very fair figure of this difficult species to portray distinctively. He makes a special note of its distinction in wanting the pre-apical black spot, which is present in all the closely allied and very similarly marked species of the genus. He calls it *rhomboidea* with *stigmatica*, Hb. as a synonym.

H.-S., *Sys. Bearb.*, II, 359 (1850), uses the name *rhomboidea* and the genus name *Noctua*.

Werneburg, *Beitr.*, discussed the *rhomboidea*, Esp., at length and considers it to represent *triangulum*, Hufn.

Gn., *Hist. Nat.*, V (1852), throws much doubt on the *rhomboidea*, Esp. (1790), which he considers may be a *triangulum* form. He treats *stigmatica* as a synonym of *rhomboidea*, Tr., and also of Stephens' *tristigma*.

Barr., *Lep. Brit. Is.*, IV, 58, pl. 143, 2 (1897), used the name *rhomboidea*, Esp. He gave two figures, of which 2a is a dark ♀, uniform in coloration, obscure marking except the post-discal transverse line, which is conspicuously white, a feature not referred to in the text.

Hamp., *Lep. Phal.*, IV, 411 (1903), called it *rhomboidea* with *stigmatica*, Hb. and *tristigma*, Steph. as synonyms. He used *Agrotis* as the generic name.

South, *M.B.I.*, I, 223, pl. 113, 2 (1907), gives a very good figure showing extremely well the indefinite appearance of the diffuse markings, but little deeper in tint than the dark ground.

Warr.-Stz., *Pal. Noct.*, III, 45, pl. 10b (1909), use the name *rhomboidea*, Esp., as the prior, and refer to *stigmatica*, Hb. and *tristigma*, Steph. as pure synonyms. The figure is not sufficiently distinctive.

Culot, *N. et G.*, I (1), 45, pl. 7, 5 (1910), gives an excellent figure ♂. He says very like *ditrapezium* from which it differs by the absence of the black pre-apical spot.

Of the Variation Barrett says:—

“Rather variable in the ground colour from dark smoky-brown, almost smoky-black, to rather light reddish-brown, the darkest specimens often showing the pale colour along the second line; otherwise very constant.”

The Names and Forms to be considered are:—

stigmatica, Hb. (1809-13), *Samml. Noct.*, 470-1.

tristigma, Steph. (nec Tr.), 1829, *Ill.*, II, 132.

rhomboidea, Tr. (1825), *Schm.*, V (1), 231.

ab. *stigmatula*, Hrtg. (1924), *Ent. Rund.*, XLI, 45.

ab. *lalle*, Schultz (1934), *Int. Ent. Zt.*, XXVIII, 419.

ab. **pallida**, n. ab.

Tutt dealt with: (1) *stigmatica*, the red-brown form; (2) *tristigma*, Steph., dark purple-brown form; (3) *rhomboidea*, the alternative name for the typical form.

ab. *stigmatula*, Hrtg., *Ent. Rund.*, XLI, 45 (1924).

ORIG. DESCRIP.—“A small form of *stigmatica*, Hb., corresponding to the *bajula* of *baja*, in which the dark area between the orbicular and reniform stigmata is absent. For further recognition of this distinct form I will bestow the name *stigmatula* upon it.” 2 ♂♂ at Terlan, S. Tyrol, 32 and 38 mm.

ab. *lalle*, Schultz, *Int. Ent. Zt.*, XXVIII, 419 (1934).

ORIG. DESCRIP.—“Ground colour of forewings violet-brown without reddish tinge, but the hindwings are darker, giving the insect, compared with the typical form, a very much more obscure appearance.” Constance.

Dr E. A. Cockayne reports (*in lit.*) a form with “Ground paler than normal; square spot between the stigmata obsolete; other markings present but pale; thorax and abdomen paler than usual.” Reading. This may be called ab. **pallida**, n. ab.

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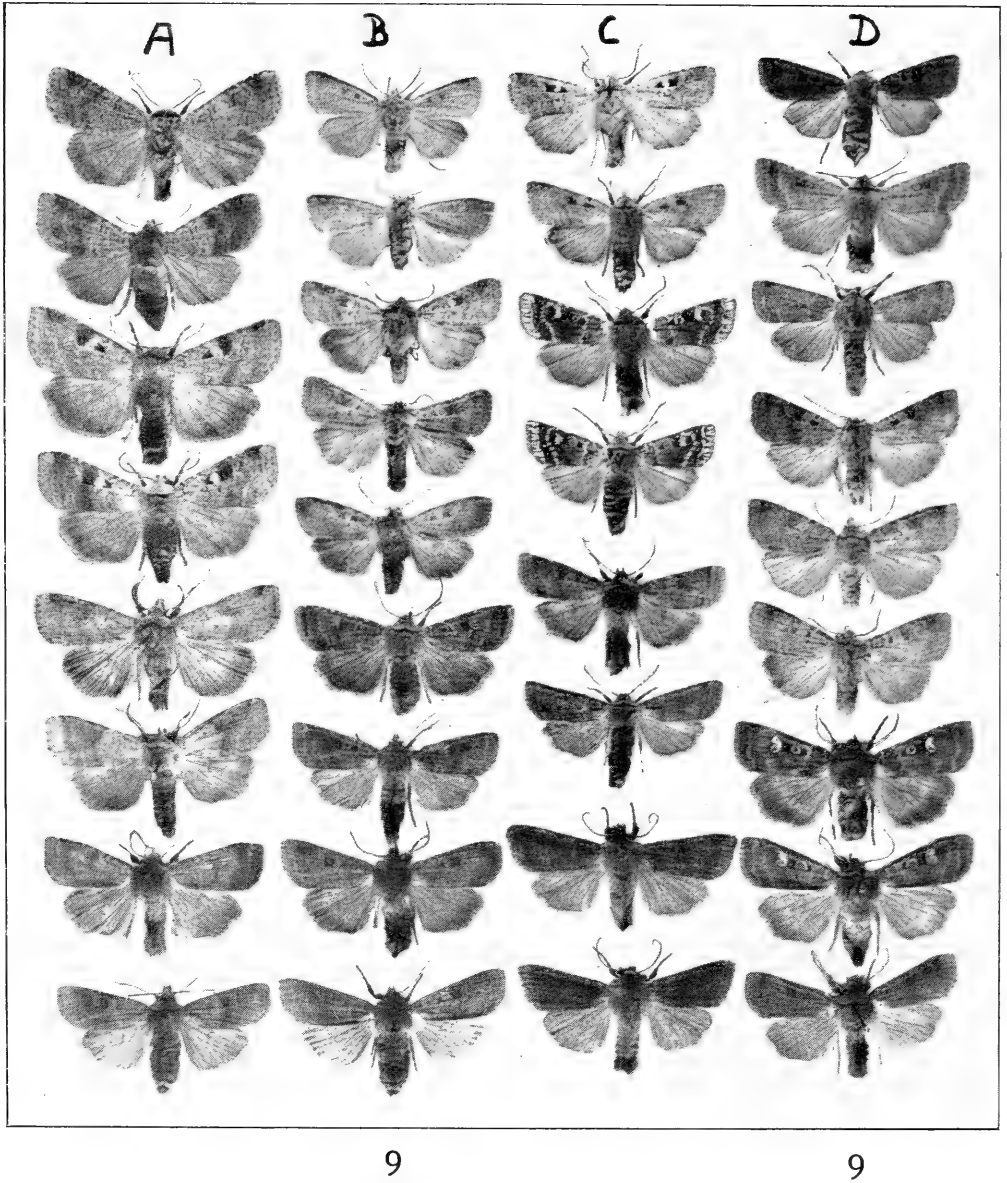
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RHYACIA FESTIVA, Schiff.

ON RHYACIA FESTIVA, SCHIFF., SSP. CONFLUA, TR., AND SSP. THULEI, STGR.

By HANS BYTINSKI-SALZ, Ph.D., F.R.E.S. (Jerusalem).

Plate III.

I have always been much interested in what name should be applied to the Shetland specimens of *Rhyacia festiva*, Schiff., but not until recently have I been able to gather enough material from the Shetland Islands, Iceland, Scandinavia, and Great Britain to try to clear up this problem. I have now before me some 450 specimens of *Rh. festiva*, and I think I saw some thousands more in the larger collections of England and the Continent. Through the courtesy of Dr A. Schmidt, from Budapest, I had the opportunity to examine the original specimens of "*Apamea*" *conflua* from the Treitschke Collection, and during a visit at Dresden I saw also the series of original specimens on which Staudinger made his description of var. *thulei*.

Tutt (*British Noctuids*, Vol. II, p. 118-123, 1892) already gave a detailed description of the various forms of this species, adding a number of new names to the different variations in colour and design. As he also gave translations of the original description I may refer to them without citing them again.

There is still considerable doubt about the aspect of the type form of *Rhyacia festiva*, Schiff. Guenée (*Noctuelles*, Vol. V, p. 331) thinks that Hübner's figure (*Sammlung europäischer Schmetterlinge*, fig. 114) has perhaps been drawn after the actual specimens of Schiffermüller in the collection of the Theresianum Gymnasium at Vienna. Anyhow, as Hübner's figure is the first one which has been published after the very summary description of Schiffermüller, it can conveniently be used to determine the type form of *R. festiva*. Unfortunately, this dark reddish brown form with grey base is extremely rare in the collections, as Tutt already stated. Tutt only got one specimen from Perth which comes near to the type figure. I never saw any specimen which completely agrees with the type form. The nearest specimens I got are one ♂ from the Isle of Lewis, one ♂ from Lettonia, and a ♂ and ♀ from Vienna, but they are all much lighter red and with very little greyish shade at the base, the pair from Vienna almost none at all.

I am thinking, therefore, that Hübner's figure is not too good, and the colours are too strongly in contrast, the outer area being too bright red brown and the inner area too grey. This opinion is also confirmed by the figure of Hübner's var. *congener* (fig. 617), which also is coloured too deeply and too bright red. This brownish form without the black quadrate spots is very common on the Continent, but not so common in Great Britain, and is generally classified as *festiva*, Hbn. The darkest forms I got came from Lettonia and the moors of Southern Bavaria. My British specimens came from Aberdeen and Braemar.

Var. *subrufa*, Haw. seems to be a rather rare form. I have only 3 ♂♂, one ♂ from the environment of Berlin, one very beautiful ♂ with dark slate greyish base from Deep, Pomerania, and one ♂ from Aberdeen. Tutt mentions this form also from Pitcaple, Perth, and Warrington.

f. **pseudoconflua**, By.-S. (nom. nov. pro *conflua*, H. Sch., nec *conflua*, Tr.). The name of var. *conflua*, H. Sch. has to be altered as this form has nothing whatever to do with the form named by Treitschke. This is a very common form in the British Isles but is not so common on the Continent and is found in Continental collections generally under the name of *conflua*, Tr. which, however, is a mistake. Tutt compares this form with bright specimens of *R. rubi*, which is right if we compare it with English *rubi*, which in general are lighter than Continental ones. My European specimens came from Vienna and Berlin; the British from Moneymore, Perth, Pitcaple, Braemar, and Aberdeen. Tutt adds Chattenden and Rannoch.

Var. *rufo-virgata*, Tutt. This form is almost identical with the former one, but has the base of the forewing pale. It is common on the Continent and in Great Britain and is mostly included under the name *conflua*, Tr. or H. Sch. My Continental specimens came from Berlin; Amata, Lettonia; Dievenow and Deep, Pomerania, and Amsee, Bavaria; my British from Newton Abbot, Abbot's Wood, Epping Forest, Hampstead, Perthshire, and Inveran. Tutt adds Liverpool and Chattenden.

Var. *mendica*, Fabr. Very common. My Continental specimens are from Berlin, Chemnitz, Deep, Pomerania, the British from Moneymore, Newton Abbot, Isle of Lewis, Perth, Braemar, and Aberdeen. Tutt mentions also Hampstead, Farnboro, Chattenden, Shooter's Hill Wood, Carlisle, and Pitcaple.

The light yellow-ochreous forms without dark spots are almost entirely British, while the form with black quadrate spot (var. *primulae*, Esp.) seems to be prevalent on the Continent.

Var. *ignicola*, H. Sch. I have Continental specimens from Berlin, Oderberg, and Dievenow, and English ones from London, Epping Forest, Abbot's Wood, Folkestone. Tutt adds Hampstead, Chattenden, and Aberdeen.

Var. *ochrea-virgata*, Tutt. I have only specimens from Great Britain: London, Eppingham, Abbot's Wood, and New Forest. Tutt adds Farnboro, Chattenden, Hampstead, and Shooter's Hill.

Var. *primulae*, Esp. is primarily a Continental form, where it is very common. My specimens are from Berlin; Stettin; Deep and Dievenow, Pomerania; Vienna, and the Ortler Mountains. British specimens are from Newton Abbot, Folkestone, Aberdeen, Braemar, and, according to Tutt, Chattenden, Carlisle, Perth, and Moray.

The grey and bluish grey forms described by Tutt from Aberdeen must be very rare on the Continent. Closs and Hannemann mention this form from Berlin, but I never saw a typical specimen from there. It is also mentioned for Poland by Romanistyn (*Fauna Lep. Poloniae*, 1930).

Of the var. *grisea*, Tutt, I have only a transitory specimen from Berlin, and of the var. *coerulea*, Tutt none. A few specimens with slate-grey suffusion and dark quadrate marks, but still of a rather yellowish colour, may however be classified as *trans. ad var. quadrata*, Tutt. Tutt quotes these greyish forms from Aberdeenshire, but all my Aberdeen specimens are decidedly reddish or yellowish forms, which seem there to be the prevalent colours.

Variations of the wing pattern are not very common. Only one aberration has been named:—

f. *fasciata*, Hannemann (*Int. Ent. Z.*, 11, p. 105) is a very rare form, described from Lake Werbellin near Berlin, with a sharply defined light postdiscal band. Some British specimens from Abbot's Wood, Money-more, and especially the ♂ type of var. *orkneyensis* (Pl. row D, fig. 7) show traces of a light band, but I never came across a specimen which showed this band sufficiently clear to be called *fasciata*, Hannem.

I think two more forms of *festiva* are worth naming:—

ab. **transversa**, ab. nov. Ground colour reddish or whitish ochreous; no dark quadrate marks present. Two very large transversal shades across the forewing. One middle shade between orbicular and reniform and another outside of the postmedial line. Hindwings normal.

Types: ♂ Cogne, Grajish Alps, VI, 1902; ♀ Abbot's Wood, England, 1899.

ab. **conjuncta**, ab. nov. Orbicular and reniform broadly conjoined at the base. This form seems to be very rare. I have only one specimen which otherwise belongs to the var. *ochrea-virgata*, Tutt.

Type: 1 ♀ Aberdeen, 1896.

In the Orkney Islands occurs a peculiar form which, without any doubt, belongs also to the ssp. *festiva*. My five specimens are very constant in coloration and only one shows variation in designs. The red ground colour, even redder than in *Rh. brunnea*, F., and the very distinct ochreous reniform, give to them an aspect very different from all other *festiva* forms. Unlike specimens from the Scottish Mainland, which in the average are somewhat smaller than English and Continental specimens, the Orkney specimens belong to the largest forms of *festiva*. I, therefore, think that the Orkney *festiva* is a good local variety which I am calling:—

Var. **orkneyensis**, var. nov. Span ♂♂ 37 mm., ♀♀ 34-36 mm. Ground colour a very rich "prussian red" to "cameo brown." The transverse lines slightly lighter, the submarginal line rather strongly contrasted ochreous. Reniform very distinct light ochraceous buff, also the orbicular circled with the same colour. Darker spots before and behind the orbicular. A small black dot at the end of the claviform. Hindwings as in *festiva*, sometimes a rather distinct light postmedial line (trans. ad f. *fasciata*, Hannem., plate, row D, fig. 7) present. Tip of the abdomen in the ♂♂ "rufous."

Cotypes: 2 ♂♂, 2 ♀♀ Orkney Islands, July 1895, ex coll. Dadd.

Var. *orkneyensis*, By.-S., ab. **depicta**, ab. nov.: as *orkneyensis*, but transverse lines obsolete, maculae of the ground colour, quadrate spots absent.

Type: ♂ Orkney Islands, July 1895, ex coll. Dadd.

Var. *conflua*, Treitschke. I examined the two type specimens from the Treitschke Collection in the Budapest Museum. They bear the numbers 1561 (♂) and 1562 (♀). Treitschke's description (*Die Schmetterlinge von Europa*, Vol. VI, pt. 1, p. 405) is very good. The ♂ spans 26 mm., the ♀ 28.5 mm. The term "forewing liver-coloured" should be applied to the colour of cooked liver and not to raw. After Ridgeway's the colour would be a pale dull "clay color," like some specimens of English f. *pseudoconflua*. In the ♂ the markings are not very indistinct, the marks before and behind the orbicular some-

what darker. The ♀ type is rather worn and this makes the markings even less distinct. The name "*conflua*" should not be interpreted as if there would be any confluency of markings!

Conflua, Tr. is a very peculiar form, and I never saw any European specimens which completely agree with it. Especially its small size is striking. Ordinary *festiva* span from 35-40 mm., while my smallest Scotch specimens still span 30 mm. (♂♂). The specimens nearest to *conflua* I saw are from Iceland, which agree well in the general coloration but are somewhat larger (29-30 mm., ♂♂). Warren's figure in *Seitz*, Pl. 8 K, is rather good though a little too greyish and probably drawn also after an Iceland specimen. I think Staudinger (*Iris*, IV, p. 266) is undoubtedly right in applying the name *conflua*, Tr. to the Iceland specimens.

Tutt already gave a comprehensive compilation of what is known of the occurrence of *conflua*, Tr. in the Silesian Mountains, but the question what kind of a form *conflua* really is remains still unsettled. H. Marschner, who undoubtedly has the largest knowledge of the Lepidoptera of the Riesengebirge of our times, writes in "*Die Grossschmetterlinge des Riesengebirges*" (*Ent. Rundschau*, Vol. 50, p. 38, 1933):— "*primulae*, Esp. belongs to the rarities of the district," and mentions neither *conflua* nor other *festiva* forms at all. According to Rössler and Standfuss this form does not breed true but always gives *festiva*-like offspring. Perhaps the series which Treitschke received were from collected larva and are a second generation raised under unfavourable conditions.

Ssp. borealis, Zett. is the Scandinavian race which comes nearest to var. *conflua*, Tr. It occurs only in northern Sweden, Norway, and Finland, while in the south still typical *festiva* forms occur. *Ssp. borealis*, Zett. is somewhat larger than *conflua*. My specimens came from Northern Norway, Lapponia, and Finlandia, and span from 32-34 mm.; they are darker than *conflua* and suffused with grey. The typical form *borealis*, Zett., with the black marks before and behind the orbicular, seems to be rarer than the f. *diducta*, Zett. I have of this form only one ♂ from Bossekopp, Norway, while the form without the marks = f. *diducta*, Zett. is represented in large series from Norway, Swedish Lappland, and Finland. Corti and Draudt (*Seitz Suppl.*, Vol. II, p. 76) describe another form—f. *disparata*, from Lappland which is dark violet with bright reddish-yellow tip to the abdomen. It is unknown to me. The var. *obsoleta*, Tutt (p. 123) belongs to *ssp. thulei*, Stgr.

Ssp. thulei, Stgr. The first one who started the confusion was Weir in 1884 (*Entomologist*, 17, p. 2), who called the *festiva* from the Shetlands var. *conflua*, Tr. But Staudinger put things right already in 1891 (*Iris*, IV, p. 266), calling the Shetland form of *festiva* a distinct local variety under the name of var. *thulei*, Stgr. and separating it from *conflua*, Tr. English authors, such as Newman and Tutt, keep the name *conflua* for the Shetland specimens. Hampson (*Cat. Phal.*, Vol. IV, 491) cites *thulei* as a separate form, but Warren (*Seitz*, Vol. II, p. 40) attributing to *conflua*, Tr. the value of a subspecies, and giving the following range of distribution:—Iceland, Shetlands, and Lappland, puts var. *thulei*, Stgr. again into synonymy. Culot (*Noctuelles*, Vol. I, p. 49) again separates *thulei* from *conflua*, Tr. but gives the entirely wrong distribution: "Boreal" England and Iceland. His

specimen, pictured on plate 7, fig. 18, undoubtedly came from the Shetlands.

Tutt (*l.c.*, p. 115) already points out that the var. *thulei*, Stgr. (his *conflua*, Tr.) occurs in Great Britain only in the Shetland Islands and not in England, Ireland, Scotland, or the surrounding Islands as, for example, the Orkneys. All specimens from Scotland, though sometimes as small as Shetland specimens, are undoubtedly true *festiva* forms.

I do not need here to go into a detailed description of the differences between *thulei* and *festiva* as this has already been done by Staudinger (1891) and Tutt (1892). Ssp. *thulei* is always much smaller—my specimens span from 29-35 mm. In general it is somewhat larger than var. *conflua*, Tr. and never reaches the size of large *festiva* specimens (40 mm.). The shape of the forewing is decidedly narrower than in all other *festiva* forms, with the apex more pointed.

Ssp. *thulei*, Stgr. varies as much as *festiva*, Schiff., but in an entirely different way. While in *festiva* the lighter red and ochreous forms prevail, these are almost absent in *thulei*. On the other hand, *thulei* is chiefly represented in dark red-brown, dull brown, or even blackish forms which are entirely absent in *festiva*. For comparative reasons it will be necessary to classify the colour forms of *thulei* in the same manner as Tutt did for *festiva*. We will consider the following forms which all came from the Shetland Islands (Mainland or Unst) and which were collected by McArthur 1907, Newman 1912, and Reid 1895.

- A. Ground colour ochreous-yellow.
 1. Without dark quadrate spots: not represented in my material.
 2. With dark quadrate spots: f. *primuloides*.
- B. Ground colour bright chestnut-red.
 1. Without dark quadrate spots: f. *rufobsoleta*.
 2. With dark quadrate spots: f. *hethlandica*.
- C. Ground colour dull liver-brown.
 1. Without dark quadrate spots: var. *obsoleta*, Tutt.
 2. With dark quadrate spots but without lighter reniform and transverse lines: ssp. *thulei*, Stgr.
 3. As 2, but with light reniform: f. *maculata*.
 4. As 2, but with light reniform and light transverse lines: f. *glabrina*.
- D. Ground colour purplish-black.
 1. Without black quadrate spots: not represented in my material.
 2. With black quadrate spots: f. *rufonigra*.
- E. Ground colour dull blackish-brown.
 1. Without black quadrate spots: f. *unicolor*.
 2. With black quadrate spots: f. *nigra*.

f. **primuloides**, f. nov. Ground colour yellow-ochreous, but with a duller shade as in *primulae*. Designs less conspicuous and not so reddish. Spots before and behind the orbicular black. This form may be considered a very light f. *thulei*, Stgr.

Cotypes: 5 ♂, 1 ♀ from Unst.

f. **rufobsoleta**, f. nov. Ground colour bright red chestnut-brown; base middle shade and marginal area sometimes darker. In most specimens lighter transverse lines present; reniform of the same colour as the ground, rarely somewhat lighter. No black marks present.

Cotypes: 14 ♂, 5 ♀ "Shetlands" (Newman).

f. **hethlandica**, f. nov. This is the same form but with dark marks before and behind the orbicular. The reniform and sometimes also the orbicular are often lighter than the ground colour.

Cotypes: 29 ♂, 11 ♀ "Shetlands," Mainland and Unst.

f. *obsoleta*, Tutt. Ground colour a dull liver-brown, the transverse lines and rarely the reniform somewhat lighter. I have 17 ♂, 6 ♀ from "Shetlands" and Unst.

f. *thulei*, Stgr. As above but with the black markings before and behind the orbicular. This is the form described by Staudinger (*Iris*, IV, p. 266) and is also very well represented in the original series of Staudinger in Dresden. The transverse lines are in general obliterated or only present in the marginal area. This is the most common form in my material: 35 ♂, 17 ♀ from "Shetlands," Mainland and Unst.

f. *maculata*, f. nov. As f. *thulei* Stgr., but the orbicular surrounded with light ochraceous and the reniform entirely ochreous. Submarginal line in the ♂ obsolete, in the ♀ rather distinct.

Types: ♂, ♀ "Shetlands."

f. *glabrina*, f. nov. The most beautiful form of all. Ground colour as in *thulei*. Basal line, ante- and postmedial lines light ochreous, very distinct. Submarginal line and marginal area ochreous with dark longitudinal streaks along the veins. Fringes dark. Reniform and orbicular light ochreous, the latter with darker centre. End of the claviform distinct black. Resembles somewhat *Conistra vaccinii*, f. *glabroides*, Fuchs.

Cotypes: 8 ♂, 5 ♀ "Shetlands."

f. *rufonigra*, f. nov. Ground colour a very dark "chocolate;" surroundings of the orbicular, reniform and marginal area slightly lighter. Black marks before and behind the orbicular. This is the darkest f. *hethlandica* in which the forewing is entirely suffused with black.

Type: 1 ♀ Mainland (Shetlands).

f. *unicolor*, f. nov. Ground colour a very dark "sepia." All lines slightly lighter. Maculae obsolete. Black spots absent.

Cotypes: 2 ♂ Unst.

f. *nigra*, f. nov. Ground colour an almost black "sepia." Maculae very slightly lighter. Spots before and behind the orbicular and end of the claviform black, but not very contrasty.

Type: 1 ♀ "Shetlands."

f. *unicolor* and f. *nigra* are the extreme dark forms of f. *obsoleta*, Tutt, and f. *thulei*, Stgr., in which the brown colour is entirely suffused with black.

Variations of the wing pattern are rather rare. Occasionally the ab. *conjuncta*, By.-S., with the orbicular and reniform conjoined at the base, is found. Another striking aberration is:—

ab. *nigrostriata*, ab. nov. Colour and markings as f. *hethlandica* but with black streaks on the veins. Vein 1 black almost to the base, veins 2-4 black to the cell, veins 5-9 only to the submarginal line.

Type: 1 ♀ "Shetlands."

In the following part I will try to give a statistical account of the occurrence of the different forms of *Rh. festiva* in Great Britain, on the Continent, and in the Shetlands. I am leaving out the var. *conflua* from Iceland and ssp. *borealis*, as these show a too small range of variation to be treated statistically. Of course I am aware that the division of *festiva*-forms in British and Continental specimens is rather unsatisfactory, as neither Great Britain nor the Continent represent uniform populations. It is well known to British collectors how much

different are the populations of the London District and Aberdeenshire in their range of variation and general aspect, though, as Reid (*Tutt*, p. 115) states, all Scotch forms may also occasionally occur in Kent. The same is also the case on the Continent, if we compare, for example, the populations of Pomerania with those of Berlin or the Alps. But, as my material is still too small to give a statistical survey of the different populations of one country, I have to confine myself to this rather crude division which, however, gives already some interesting results.

Another point which has to be considered in studying the following table is that the material tabulated has not been collected at random but consists of selected series taken by various collectors. But this means only that, while not too much stress should be laid on the actual percentage values, the rarer forms are represented in larger numbers than correspond to their actual frequency. But the range of variation of the different forms will remain the same in even much larger series collected at random.

General Coloration.	Named Form.	Great Britain.	Continent.	Shetland Islands.
Brownish or reddish-black.	f. <i>nitra</i> , By.-S.	—	—	1
	f. <i>rufonigra</i> , By.-S.	—	—	1
	f. <i>unicolor</i> , By.-S.	—	—	2
Dull liver-brown.	f. <i>obsoleta</i> , Tutt.	—	—	23
	f. <i>thulei</i> , Stgr.	—	—	52
	f. <i>maculata</i> , By.-S.	—	—	2
Bright chestnut-brown.	f. <i>glabrina</i> , By.-S.	—	—	13
	f. <i>hethlandica</i> , By.-S.	—	—	40
	f. <i>rufobsoleta</i> , By.-S.	—	—	20
Bright prussian-red.	var. <i>orkneyensis</i> , By.-S.	4	—	—
	ab. <i>depicta</i> , By.-S.	1	—	—
Dull ochraceous reddish-brown	f. <i>festiva</i> , Schiff.	(1)	(3)	—
	f. <i>congener</i> , Hübn.	2	31	—
	f. <i>subrufa</i> , Haw.	1	2	—
Reddish-ochraceous.	f. <i>rufo-virgata</i> , Tutt.	30	23	—
	f. <i>pseudoconfluens</i> , By.-S.	17	5	—
	f. <i>mendica</i> , Fabr.	16	21	—
Pale yellow-ochraceous.	f. <i>ochrea-virgata</i> , Tutt.	31	—	—
	f. <i>ignicola</i> , H. Sch.	34	4	—
	f. <i>primulae</i> , Esp.	7	23	—
	f. <i>primuloides</i> , By.-S.	—	—	6
Greyish and bluish.	f. <i>grisea</i> , Tutt.	+	(1)+	—
	f. <i>coerulea</i> , Tutt.	+	+	—
	f. <i>quadrata</i> , Tutt.	+	(5)	—

Numbers in brackets indicate transitory specimens; += known from the country but not represented in my collection.

It will be noticed that I applied somewhat different terms for the general coloration, as did Tutt. In fact, the colours given by Tutt are seen more with the eye of an impressionistic painter than with that of a critical scientist. I am sure that "dark purplish or reddish-brown" specimens of *festiva* do not exist, though they may have sometimes a faint hue towards these colours. But a hue is not yet the actual colour observed with our eyes. I would call the colour of *festiva*, *congener* and *subrufa* a dull ochraceous reddish-brown, or after Ridgeway: tawny to mikado-brown.

From the tabulation above, the following points may be seen. Taking the general coloration, the middle shades are the more frequent ones, the light and dark shades the rarer ones. In *festiva*, the most common forms are reddish or yellowish-ochraceous, in ssp. *thulei*, those which are liver or chestnut-brown.

Ssp. *thulei* is without any doubt a distinct subspecies, as is also shown by its range of variation. Only the lightest form: *primuloides* agrees in colour somewhat with the *festiva* form, *primulae*, but has decidedly a duller shade. All other colour-forms are not represented in ssp. *festiva*.

Between the populations of Great Britain and the Continent (chiefly Germany incl. Austria) there seem to be some remarkable differences in the distribution of the different forms, though I do not think that one form is lacking entirely either here or there. The prevalent forms in Britain are: *rufo-virgata*, *pseudoconflua*, *mendica*, *ochrea-virgata* and *ignicola*. On the Continent they are: *congener*, *rufo-virgata*, *mendica* and *primulae*. f. *pseudoconflua*, *ochrea-virgata* and *ignicola* are much more common in Britain than on the Continent, while *congener* and *primulae*, which are common on the Continent, are decidedly rare in the British Islands. The greyish and bluish forms seem to be very rare both on the Continent and in Great Britain.

EXPLANATION OF THE PLATE.

Though great care was taken to represent the different shades of colour right, the photograph did not come out too well. For subjective observation the light forms with reddish tinge are pictured too dark. There also seems to be almost no difference between the bright chestnut-red forms and the almost black forms. The specimens A. 2-7, B. 8-9, C. 1-2, 5-6, and D. 7-9 should be somewhat lighter.

Rhyacia festiva, Schiff.

- A. 1. Near f. *festiva*, Schiff. ♂. Isle of Lewis.
 2. Near f. *festiva*, Schiff. ♀. St Amata, Lettonia.
 3. f. *primulae*, Esp. ♂. Berlin.
 4. f. *primulae*, Esp. ♀. Berlin.
 5. f. *ignicola*, Tutt. ♂. Aberdeen.
 6. f. *ignicola*, Tutt. ♀. Epping Forest.
 7. f. *pseudoconflua*, By.-S. ♂. Aberdeen.
 8. f. *pseudoconflua*, By.-S. ♀. Vienna.
- B. 1. v. *conflua*, Tr. ♂ Type. Riesengebirge, Germany.
 2. v. *conflua*, Tr. ♀ Type. Riesengebirge, Germany.
 3. v. *conflua*, Tr. ♂. Iceland.
 4. v. *conflua*, Tr. ♂. Iceland.
 5. v. *conflua*, Tr. ♂. Iceland.
 6. ssp. *thulei*, Stgr. ♂. Shetland Islands.
 7. ssp. *thulei*, Stgr. ♀. Shetland Islands.
 8. ssp. *thulei*, Stgr., f. *hethlandica*, By.-S. ♂ Cotype, Shetland Islands.
 9. ssp. *thulei*, Stgr., f. *hethlandica*, By.-S. ♀ Cotype, Shetland Islands.
- C. 1. ssp. *thulei*, Stgr., f. *primuloides*, By.-S. ♂ Cotype. Shetland Islands.
 2. ssp. *thulei*, Stgr., f. *primuloides*, By.-S. ♀ Cotype. Shetland Islands.
 3. ssp. *thulei*, Stgr., f. *glabroides*, By.-S. ♂ Cotype. Shetland Islands.
 4. ssp. *thulei*, Stgr., f. *glabroides*, By.-S. ♀ Cotype. Shetland Islands.
 5. ssp. *thulei*, Stgr., f. *rufobsoleta*, By.-S. ♂ Cotype. Shetland Islands.
 6. ssp. *thulei*, Stgr., f. *rufobsoleta*, By.-S. ♀ Cotype. Shetland Islands.
 7. ssp. *thulei*, Stgr., f. *unicolor*, By.-S. ♂ Cotype. Shetland Islands.
 8. ssp. *thulei*, Stgr., f. *unicolor*, By.-S. ♀ Cotype. Shetland Islands.

- D. 1. ssp. *thulei*, f. *rufonigra*, By.-S. ♀ Type. Shetland Islands.
2. ssp. *thulei*, f. *obsoleta*, Tutt. ♂. Shetland Islands.
3. ssp. *thulei*, f. *obsoleta*, Tutt. ♀. Shetland Islands.
4. ssp. *borealis*, Zett. ♂. Bossekopp, Norway.
5. ssp. *borealis*, Zett., f. *diducta*. ♂. Lampela, Lapponia.
6. ssp. *borealis*, Zett., f. *diducta*. ♀. Lampela, Lapponia.
7. var. *orkneyensis*, By.-S. ♂ Cotype. Orkney Islands.
8. var. *orkneyensis*, By.-S. ♀ Cotype. Orkney Islands.
9. var. *orkneyensis*, By.-S., f. *depicta*, By.-S. ♂ Type. Orkney Islands.

MICRAMBE AUBROOKI SP. N. (CRYPTOPHAGIDAE, COL.).

A BEETLE NEW TO SCIENCE.

By HORACE DONISTHORPE, F.Z.S., F.R.E.S., Etc.

Reddish brown, antennae and legs yellow, shining, clothed with rather long semi-decumbent light yellow hairs which are more numerous on the elytra. *Head* rather strongly and deeply but not closely punctured. *Thorax* transverse, considerably narrower than elytra, the callosities at anterior angles are shorter, and flatter, than in *vini* or *villosa*, and are not toothed; puncturation consisting of round, fairly deep, but not close, punctures. *Elytra* with similar puncturation to thorax, but the punctures are not quite so large. *Long.*—1.6 mm. It is a smaller species, more shining, not nearly so closely but more strongly punctured than either *vini* or *villosa*. It is also darker in colour and its hairs are a little longer, but more sparse, and the thorax is less transverse. It appears to be a very distinct little species; it is certainly not a known palaeartic one, and I have been unable to find a description to fit it.

Mr E. W. Aubrook, of the Hope Department, University Museum, Oxford, sent it to me to name. It was taken by Mr C. Jones at a Chrysanthemum Show at Manchester in November 1934. The type has been placed by Mr Aubrook in the National Collection at S. Kensington.

Entomological Department, British Museum
(Nat. Hist.), February 1939.

ZELLER'S VERSUCH: MARCH 1839.

By T. BAINBRIGGE FLETCHER.

Just one hundred years ago, in March 1839, there appeared in Oken's *Isis* (Vol. XXXII, Heft 3, pp. 167-220) Zeller's "Versuch einer naturgemässen Eintheilung der Schaben" (an attempt at a natural arrangement of the Tineae), which laid the foundations of our present-day classification. Previous efforts, by Fabricius, Latreille, Hübner, Haworth, Treitschke, Stephens and others, to split up the old Linnaean concept of "Tinea" into smaller groups, had all been founded, more or less, on colour-characters, and Zeller's new arrangement represented a great advance as being founded more on structure. Unfortunately, Zeller's paper, published in a rather out-of-the-way medium, was little known to entomologists of the time and this volume of the *Isis* has now become so scarce as to be found in very few entomological libraries.

In his Schaben (Tineae) Zeller included some Pyralidina (Crambidae, Pyraustidae, Phycitidae and Galleriadae), but his 478 species of Tineaceen (Tineina) were disposed in 42 genera, of which some were divided into subgenera. Two of the genera, 1. *Coryptilum* and 25. *Stenoma*, were founded on exotic species but the others were all European and were:—2. *Exapate*, Hb.; 3. *Chimabacche*, Hb.; 4. *Semioscopis*, Hb.; 5. *Talaeporia*, Hb.; 6. *Tinea*, Linn., divided into 4 sections, A. *Lampronia*, Steph., B. *Incurvaria*, Hw., C. *Tinea*, D. *Swammerdamia*, Hb.; 7. *Ochsenheimeria*, Hb.; 8. *Micropteryx*, Hb.; 9. *Nematopogon*, Zell.; 10. *Adela*, Latr., divided into 3 sections, A. *Cauchas*, Zell., B. *Eutyphia*, Hb., C. *Adela*, Latr.; 11. *Nemotois*, Hb., divided into two unnamed sections; 12. *Euplocamus*, Latr., divided into two sections, A. *Euplocamus*, Latr., B. *Scardia*, Tr.; 13. *Plutella*, Schr., divided into 3 sections, A. *Plutella*, B. *Harpipteryx*, Tr., C. *Theristis*, Hb.; 14. *Ateliotum*, Zell.; 15. *Ypsolophus*, Fb., divided into 3 sections, A. *Sophronia*, Hb., B. *Ypsolophus*, C. *Megacraspedus*, Zell.; 16. *Holoscolia*, Zell.; 17. *Anarsia*, Zell.; 18. *Anchinia*, Hb., divided into 3 sections, A. *Pleurota*, Hb., B. *Topeutis*, Hb., C. *Anchinia*; 19. *Harpella*, Schr.; 20. *Hypercallia*, Steph.; 21. *Oecophora*, Latr., divided into 3 sections, A. *Dasycera*, Steph., B. subdivided into a. *Oecophora* and b. *Endrosis*, Hb., C. also subdivided into a. *Scythris*, Hb., and b. *Prays*, Hb.; 22. *Yponomeuta*, Latr.; 23. *Psecadia*, Hb., divided into A. *Psecadia*, B. *Ethmia*, Hb.; 24. *Haemylis*, Tr.; 26. *Depressaria*, Hw., divided into A. *Depressaria*, B. *Volucra*, Zeller; 27. *Carcina*, Hb.; 28. *Gelechia*, Hb., divided into 5 sections, Aaa. *Nothris*, Hb., Aab. *Gelechia*, Hb., Ab. *Brachmia*, Hb., Ba. *Chelaria*, Hw., Bb. *Metzneria*, Zell.; 29. *Roeslerstammia*, Zell., divided into 2 sections, A. [*Roeslerstammia*], B. *Chrysitella*, Zell.; 30. *Glyphipteryx*, Hb.; 31. *Aechmia*, Tr., divided into A. [*Aechmia*], B. *Tinagma*, Zell.; 32. *Argyresthia*, Hb., divided into A. *Argyresthia*, B. *Cedestis*, Zell.; 33. *Coleophora*, Hb., divided into 4 sections, A. *Haploptilia*, Hb., B. *Eupista*, Hb., C. *Apista*, Hb., D. *Coleophora*; 34. *Gracilaria*, Hw.; 35. *Coriscium*, Zell.; 36. *Ornix*, Tr.; 37. *Cosmopteryx*, Hb.; 38. *Elachista*, Tr., divided into 5 sections of which only 3 are named, A. *Chauliodus*, Tr., Ba. (unnamed), Bb. *Schreckensteinia*, Hb., C. *Elachista* with 2 unnamed subsections; 39. *Opostega*, Zell.; 40. *Lyonetia*, Hb., divided into 2 sections, A. *Bucculatrix*, Zell., B. *Lyonetia*; 41. *Lithocolletis*, Hb.; 42. *Tischeria*, Zell. (described on p. 214). [In this abstract, Zeller's misspellings of certain names are reproduced.]

His 42 genera were therefore expanded into 73 named groups (besides several unnamed). Some of them contained very diverse elements (e.g., his *Oecophora*, which included *Esperia*, Hb. (*Dasycera*, Steph.), *Scythris* and *Prays*, and his *Elachista*, which included *Epermenia*, Hb. (*Chauliodus*) and some *Cosmopterygids*) and the order of the group is, of course, very different from our ideas; but for its time it was a good attempt to classify the Tineina and it is interesting to look back at this paper, then the latest contribution to the subject one hundred years ago.

Besides the generic diagnoses, this paper also included descriptions of numerous new species, with notes on those previously described and references to Hübner's figures. It is unfortunate that it has become so scarce that few modern microlepidopterists appear even to have seen it.

CONTINUOUS BREEDING. III.**ORRHODIA RUBIGINEA, FAB.**

By H. B. D. KETTLEWELL, M.A., M.B., B.Chir.

CORRECTIONS.—P. 7, line 25 from top, for “ pale ” read “ unshaded ; line 34, for “ not ” read “ now.” P. 8, line 4 from top, for “ any ” read “ airy.”

The breeding of this species is an example of the minimum of work producing the maximum result. The original parent is taken at sallow in the spring, when it may be safely assumed that the species will have paired and be fertile. Eggs are laid freely on muslin, broken twigs, or the sides of wooden boxes.

The female is therefore introduced into a large box, taking care that there are no cracks through which young larvae could escape, and having the edges planed down so as to ensure an even surface on top. There are six inches of coconut fibre at the bottom and a number of broken apple twigs fixed across the box. On the sides I pin up pieces of torn muslin. The top is covered with butter muslin and partly secured with string and drawing pins.

This is placed out in the open, sheltered from direct rain by glass, but at the same time taking care that it does not dry up.

A month or so later, as soon as apple leaves are fully out, collect a sack of these and pour into the box to depth of four or five inches. The box is still left out of doors in the shade but now exposed to rain and weather. These leaves will wither and turn brown by the time the ova hatch. The larvae of *rubiginea* thrive on this diet of rotten leaves more than any other food plant, and refuse all green food in preference for it.

A further supply of leaves should be added a month later (in June). In July the larvae can be found in groups wallowing in the sodden mass and perfectly healthy.

After June the box need not be opened till early October when the moths will be found hatching in numbers. The larvae will have pupated in the remains of the dead leaves and fibre.

These moths can either be transferred to an ordinary meat safe (wooden with perforated zinc) or left in the same box. More dead leaves should be added for them to hibernate in and sugar should be sprinkled occasionally throughout October on the sides of the box or cage. They hibernate in groups in curled-up leaves. The box is left out of doors partly sheltered now from direct rain.

No further attention need be paid till March or April (according to the season). They should then have their occasional meal of sugar or birch sap given.

At this time of the year there occurs a perfect orgy of nuptial relations, night after night they pair and repair. It is undoubtedly this habit of the species which accounts for the peculiar genetic figures bred from a given female, for each may have paired with an unknown number of males, each fertilising an unknown number of ova.

At this time of the season (March) you pin up your muslin strips for ovipositing and return those specimens which have been kept in meat safes to the wooden box. The males die in May but the females may drag on till early June.

By this means it will be seen one gets an unknown number of mixed pairings between offspring from the original female. In practice I have so far found it unsatisfactory to keep one male and one female shut up together. Secondly, it must be noted that in the F_2 generation, due to each female having paired with more than one male, one stands a greater chance of hitting off a certain number of pairings in which both sexes were heterozygous to a given variety. In terms of genetics let us assume that one of the original parents was heterozygous to a variety. In the F_1 generation 50% will be heterozygous and 50% pure strain. The chance of two heterozygotes pairing is therefore increased if each female pairs with more than one male. In a state of nature when the ratio of heterozygotes to pure strain is smaller this chance must be considerably more.

In the F_2 generation any resulting homozygote should be segregated and hibernated separately in the autumn. There are at least four distinct varieties of this species occurring in areas over the range of the species in this country; none, so far as I know, have been worked out.

COLLECTING NOTES.

NOTES ON THE LARVAE OF BRITISH MOTHS. (Continued from p. 25.)

Notodonta trepida. I took a single male in Camberley, at light, in May, but have never found any larvae here. My only experience of this fine caterpillar is from captures in the New Forest (half grown, 25th June), at Reading (very young, 11th June), and near Chichester (three-quarter grown, 15th July). A pair of moths found on a tree trunk at Arundel (22nd May) produced ova which were successfully reared. The moths emerged in April and May.

Lophopteryx camelina. Larvae of the "Cockscomb Prominent" are abundant in Camberley. I find them chiefly on the foliage of Birch; less frequently on Oak and Sallow, and—once only—on *Crataegus*. They have occurred from August (quarter to half grown), in September (very young to full-fed), and October (some still quite small). Moths have appeared in my cages in the following May and June.

Odontosia carmelita. I have—on several occasions—taken the moth at light, in Camberley, early in April, but have never met with the larva.

Ptilophora plumigera. I took two larvae that I recognised as of this species, at Horsley, on Sycamore, on 5th June; but both of them proved to be ichneumonid.

Pterostoma palpina. Full-fed larvae of this species were taken at Camberley about the middle of August. A male came to light on 25th May. But the species is not common in this neighbourhood.

Phalera bucephala. Caterpillars of the "Buff Tip" are everywhere such common objects that records in my journal are very few. I have only noticed its occurrence throughout August and September when it strips whole branches of various trees. But it is the moth, in its resting position, that excites wonder and admiration by its marvellous cryptic resemblance to a decayed piece of Birch branch. If it were not so plentiful, the beauty of the moth itself, with its delicate buff and

silvery tints, would make it a treasured object in any cabinet. Moths have appeared in my breeding-cages as early as the 4th of April. Others have emerged in June and early July.

Pygaera curtula. Larvae of this species are found—not uncommonly—around Camberley on various species of *Populus* (Aspen, White and Balsam Poplar). Small larvae (of ? the second brood) occurred in the middle of August and full-fed larvae were found in the first week of October. Until late in life the caterpillars are concealed within spun-up leaves of the plants. The resulting moths emerged in April and May. I have not met with larvae of the early summer brood.

Pygaera pigra. Larvae of the “Small Chocolate-tip” are very abundant amongst the foliage of the dwarf *Salix repens* and other narrow-leaved Sallows about Camberley, also on small Aspens, from mid-June till mid-September. Moths have emerged on 5th May, others appeared on 21st July (from larvae collected on the 1st of the same month).

Orygia gonostigma. On several occasions I have received apterous females of the “Scarce Vapourer” from the Reading district, where this species appears to be fairly plentiful. I have raised many larvae from ova produced by these females. Of the resulting moths the males are much more variegated than are those of the commoner species. They emerged during late July and early September.

Orygia antiqua. I will not waste time in saying anything about the habits of this so familiar species.

Dasychira fascelina. I have found well-grown caterpillars of the “Dark Tussock” in May, June and July and again in October. It would appear, therefore, that there may be occasionally two broods, though South states that “it hibernates when still quite small.” The larvae were feeding on *Cytisus*, Sallow, Birch and *Lotus corniculatus*. The moths have always emerged in mid-July.

Dasychira pudibunda. The very pretty larva of the so-called “Hop Dog” may be found commonly in September on various trees, and I have taken it on Hawthorn and Rose also. The moths emerge in May and June.

Nygma phaeorrhæa. I have received many larvae of the “Brown-tail” moth from the Kentish coast where they were feeding on “Sea Buckthorn” (*Hippophae rhamnoides*). The species is said to have a fairly wide range of food-plants; but these larvae would not touch any of the plants (*Prunus*, *Rosa*, *Crataegus*, etc.) that I offered them. I subsequently found mature larvae at Eastbourne (11th June) feeding on bramble. The moths were emerging during July and August.

Leucoma chrysoorrhæa. Again, I can have nothing new to say about this species.

Stilpnotia salicis. I have only once seen this larva in Camberley. It was a single individual, feeding on Poplar, in front of the Camberley station. The moth came out on 7th August. In former days I used to find the caterpillars quite commonly near Maidstone, feeding on Willows.

Lymantria monacha. I have beaten out these fine larvae from Oaks in the neighbourhood of Wellington College, and also in the Swinley Woods, near Bagshot. The resulting moths have emerged in the latter half of July.—E. E. GREEN.

NOTES ON A HOLIDAY IN NORWAY.—My nephew collected some butterflies for me in August 1936, when he was in Norway (Tellemarken area). They were sent me in one of Newman's relaxing tins and subsequently, after being set, were submitted to Rev. G. Wheeler.

Mr Wheeler writes: "I have been through the Erebias with Warren's Monograph. The Scandinavian is the typical form of *E. ligea*, or rather the typical form is Scandinavian; four specimens are of this form, the other is the form *dovrensis*, and is exactly represented in Warren's illustration. The pale *Heodes phlaeas* is the true ab. *schmidtii* (the white *phlaeas* is not). The "blues" are *Polyommatus icarus* and *Plebeius aegon*, but their condition is not such as to show minute peculiarities. The *Brenthis selene* is not the f. *hela*, nor are the *B. euphrosyne*, f. *finjal* [later these "*euphrosyne*" turned out to be *B. arsilache*, a form just like those from other parts of S. Norway, but larger and lighter than those from S. Finland]. *Satyrus semele*, as far as one can tell, is ab. *pullida*; quite unlike Finnish specimens. The *Urbicola comma* are quite typical, but I believe f. *catena* is generally commoner in Scandinavia. *Aglais urticae* though rather dark are not ssp. *polaris*. There is one *Argynnis adippe* (*cydippe*) and *A. niobe*. The *Polygonia c-album* are very handsome. The *Vanessa antiopa*, mostly in splendid condition, are the typical form."—G. S. ROBERTSON, M.D.

NOTES FROM STORRINGTON.—Two flies (Dip.), *Dryomyza flaveola*, 1'ab. came to light in December 1938. The winter form is darker than the spring and has the varietal name of *zavadskii*, Schm. Mr H. W. Andrews kindly identified them and tells me he has no specimens so dark as these. *Hygrochroa* (*Pericallia*) *syringaria* appears to have been double-brooded in 1938, as a specimen was taken at light on 25th September. [The season was so erratic that a single specimen might be only a late emergence.—T.B.F.] On 22nd January 1939 a male specimen of *Gymnoscelis* (*Eupithecia*) *pumilata* came to light. It is small and in good condition; perhaps doubtful whether hibernated, or emerged during recent mild weather. South, *Moths of British Isles*, Series II, page 250, states that the spring specimens are usually larger, and that the species may be found any time between April and November. My dates, extending over periods since 1910, confirm this, but I have never found one during the other months.—GEO. S. ROBERTSON, M.D., Storrington, West Sussex.

A REVISED LIST OF DIPTERA CAPTURED AT BOSTON MANOR, NEAR EALING, LONDON, DURING THE LAST TWO OR THREE YEARS. BY A. M. LOW.

Asilidae.—*Dioctria rufipes*, common.

Tabanidae.—*Theriopteles bisignatus*, Fin., rare; *Haematopota* (*Chrysozona*) *pluvialis*, L., rare; *H. (C.) crassicornis*, Whlb., rare.

Dolichopodidae.—*Argyra argyria*, Mg., common; *A. leucocephala*, Mg., fairly common; *A. argentina*, Mg., rare; *A. diaphana*, Fab., common; *Leucostola vestita*, Wd., rare.

Stratiomyidae.—*Pachygaster leachii*, Curt., uncommon; *Stratiomys potamida*, Mg., rare; *S. furcata*, Fab., rare; *Odontomyia* (*Hoplodonta*) *tigrina*, Fab., common in 1937; *O. viridula*, Fab., common, seen for first time last year.

Syrphidae.—*Xanthogramma ornatum*, Mg., rare; *Volucella bombylans*, L., uncommon, not seen for the last year or two; *Eristalis sepulchralis*, Fab., common; *E. intricarius*, var. *fulvus*, uncommon; *Helophilus trivittatus*, Fab., rare; *H. hybridus*, Loew., common; *H. frutescentum*, Fab., uncommon; *H. versicolor*, Fab., common in 1933, otherwise scarce; *H. lineatus*, Fab., abundant; *H. lunulatus*, Mg., uncommon; *H. transfugus*, L., common; *Chrysochlamys cuprea*, Scop., rare; *Chrysotoxum festivum*, L., uncommon.

This interesting little locality consists of a very small patch of ground by the side of the Grand Union Canal between the Great West Road and Boston Manor tube station. As this locality is not likely to remain intact for very much longer, I propose to publish a complete list of the Diptera captured here but, owing to new material continually turning up, I do not intend to do this for another two seasons unless the locality becomes built over next year.

It is interesting to note (having worked this locality since 1931) the disappearance and return of several of the species mentioned in the list; also the appearance of species hitherto absent from the spot. In 1937, for instance, *Odontomyia tigrina* turned up for the first time in large numbers; last season it was as far as I could see entirely absent, but *Odontomyia viridula* made its appearance for the first time and was fairly common.

I can heartily recommend collectors, who are staying in London, to visit this spot, which has already given me a fly not previously recorded as British, and I would be pleased to show the spot to collectors who are really interested.

In conclusion, I would like to thank Mr H. Oldroyd and Mr R. L. Coe for so kindly naming some of the specimens for me.

6 Manor Gardens, Gunnersbury Park, London, W.3.

CURRENT NOTES.

NORTH-EAST KENT. A REQUEST.—Some friends and myself are engaged in the production of a list of Macro-lepidoptera for N.E. Kent; more precisely, for the district which is bounded on the south by the main road from Faversham to Canterbury and from Canterbury to Sandwich; east of Sandwich town, our southern boundary is the Stour. The list is intended to complete the survey of East Kent begun by Mr A. M. Morley for Folkestone, and continued by Dr E. Scott for Ashford and by Mr B. Embry (shortly to be published) for Dover. We have already a great deal of material; but it is hard to keep in touch with all those who visit the district, perhaps only for a month's holiday in the summer, and we should be very grateful for any records of Lepidoptera taken in the district during the last twenty years. Records should be as full, and localities as precise, as possible. Perhaps it should be mentioned that the sand-hill area of Sandwich, where so many collectors go, is outside our district, being south of the mouth of the Stour.—A. J. L. BOWES, 15 Queen's Gardens, Herne Bay, Kent.

The firm Dr O. Staudinger and A. Bang-Haas of Dresden-Blasewitz has just published part 8 of their *Catalogus Lepidopterorum regionis*

palaearticae. This Catalogue gives a complete list of species and forms of Macro-lepidoptera based upon Seitz works and any more recent systematic publications. The present part begins with *Charaeas*=*Cerapteryx* and goes to *Hydroecia*=*Apamea*. It also answers as a price list for the firm.

In the current part of the *Mitt. Münch. ent. Gesell.*, XXVIII, pt. 3, Dr Alberti discusses the question, "What is *Procris cognata*, Luc.?" A few Asiatic species of *Zygaena* are considered and illustrated by two plates. H. Bollow continues his Monograph of the *Dryopidae* (Col.) and C. Kosh writes concerning a few Palaeartic *Paederinae* (Col.).

Opuscula Entomologica, the publication of the *Soc. ent. Lund* (Sweden), Vol. III, pts. 3-4, contains an article on the *Coleophoridae* of Sweden, where 43 species have been recorded as occurring. There are also several articles dealing with species of the Geometridae.

The *Annales Ent. Fennici*, pt. IV, 1938, discusses the occurrence of a second generation in a few species of Lepidoptera: *Brenthis selene*, *Plusia chrysitis*, *Abraaxas sylvata*, and *Boarmia roboraria*, being the most interesting.

In the current issue of the *Mem. Soc. ent. Ital.*, F. Hartig describes the area around Campiglio as a locality for Macro-lepidoptera and gives notes on all the species which he and others have recorded from the district. There are four plates.

The monthly plate in *Lamb.* for January depicts two examples of the duplication of wings in Lepidoptera. (1) *Polyommatus icarus* with 5 wings, the R. forewing being reproduced. (2) The Saturniid, *Perisomena caecigena*, with 5 wings, the extra R. hindwing being a fused double one. There are diagrams of the venation of both additional wings.

Dr H. G. Amsel, of the Bremen Museum, has sent us a number of separates, on Lepidoptera mostly, concerning Micro-lepidoptera. One separate deals with the Micros of Sardinia and a plate of 39 figures. A somewhat larger pamphlet gives notes on the Macro- and Micro-Lepidoptera of Palestine. Still another pamphlet describes a large number of new species from Palestine, with 10 plates. Most of the figures are of Micro-lepidoptera.

In the *Journal of the Federated Malay States Museums*, XVIII, part II, pp. 299-318, 1938, W. D. Hincks has a preliminary list of the Earwigs of Oceania. Thirty-eight species are included, which is manifestly too incomplete to offer any basis for theorising. It is to be noted that our common *F. auricularia*, L., seems to have followed the rabbit and the sparrow to Australia and also to New Zealand. Cheesman is quoted as reporting *Hamaxas nigrorufus*, Burr, flying in numbers. The list includes no less than six species of that queer equatorial sub-family the *Brachylabinae*, that are so archaic in appearance and seem to have a predilection for islands. There are many species with very restricted distribution, and it is earnestly to be hoped that collectors in the archipelagoes will pay more attention to the earwigs and send home something more than the usual cosmopolitan species.—M. B.

Noctua, L. (1758), Ochs. & Tr. (1816-25), Gn., Barr., Sth., most authors. [*Agrotis*, Ochs. & Tr. (1816-25), Stdgr., Hamp., Splr., Meyr., Culot: *Rhyacia*, Ochs. & Tr. (1816-25), Warr.-Stz., Corti-Drdt.-Stz.: *Graphiphora*, Ochs. & Tr. (1816-25), H.-S., Meyr.] *dahlia*, Hb. (1809-13). [*punicea*, Hb. (1802)]?

Tutt, *Br. Noct.*, II, 113 (1892): Meyr., *Handbk.*, 103 (1895): Barr., *Lep. Br. I.*, IV, 64, pl. 144, 1 (1897); Stdgr., *Cat.*, IIIed., 140 (1901): Hamp., *Lep. Phal.*, IV, 423 (1903): Splr., *Schm. Eur.*, I, 150, pl. 33, 13 (1905): South, *M.B.I.*, I, 225, pl. 114, 1-2 (1907): Warr.-Stz., *Pal. Noct.*, III, 46, pl. 10e (1909): Culot, *N. et G.*, I (1), 47, pl. 7, f. 9-11 (1909): Meyr., *Rev. Hand.*, 108 (1928): Corti-Drdt.-Stz., *Pal. Noct. Supp.*, III, 74, pl. 11e (1933).

Ernst & Engram., *Pap. d'Eur.*, VII, 32, fig. 428 (1790), give two good figures, a very pale straw-coloured form and a dark dove-coloured form with darker markings.

Some authors have considered the species described under the name *silene* by Bork., *Naturg.*, IV, 741 (1792), is *dahlia* and not the *silene* of Schiff., View., Fab. (*Mant.*) as Bork. says. This, Wern. says, *Beitr.*, II, 182, is *erythrocephala*, of Bork., p. 533.

Hb., *Samml. Noct.*, 465-6 (1809-10), gives very good figures of two forms, ♂ and ♀, the former like the Scotch form, the latter darker. Tr., *Schm. Eur.*, V (1), 224 (1825), suggests that fig. 115, Hb. (1802) *punicea* is this species. If so, which seems very probable from comparison of the figures, the name *punicea* should replace *dahlia*.

Haw., *Lep. Brit.*, 227 (1809), described the mottled typical form under the name *erythrocephala* (not to be confused with the Continental *erythrocephala*).

Godt., *Hist. Nat.*, V, 189, pl. LXII, 1-2 (1825). The ground colour of these two very good figures is too rich in brilliance of colour. Fig. 2 is a striking aberration in which much of the marking is suppressed, so that the outer marginal area is fully marked more on the L. than on the R. wing, while the basal and costal areas are almost markingless and the discal area on the R. wing is very clear of marking.

Treit., *Schmet.*, V (1), 222 (1825), notes that a yellow tinge is the differentiating character between *dahlia* and *brunnea*.

Wood, *Index*, p. 38, pl. 9, fig. 160 (1833), figures the *candelisequa*, Steph. There is but little differentiation between the depth of colour of the ground and of the marking.

Gn., *Hist. Nat. Noct.*, V, 332 (1852), says that *erythrocephala*, Haw., is this species (and of Stephens). He refers to a pale form with partly obliterated markings as var. A.

The American *rubifera*, Walk., and *phyllophora*, Smith, have been cited as forms of *dahlia*. But Smith showed, *Contrib. Revis. of Gen. Agrotis*, p. 85 (1890), that structurally they were not *dahlia*.

In *Moths. of Ind.*, II, 184 (1894), Hamp. gave a description of the Indian *descripta*, which he referred to Brem. (*Lep. Öst. Siber.*), but in his *Lep. Phal.*, IV, 423 (1903), he referred to this description and labelled it "nec Brem." Bremer himself says that his species is related to both *dahlia* and *festiva*.

Of the Indian forms of *descripta*, Hampson says, *M. of Ind.*, II, 185, "*descripta* = *subdolens*, Btlr. = *canescens*, Btlr. are reddish forms." f. *basistriga*, Moore, is yellowish chestnut with distinct markings; f. *rubicilia*, Mre., golden brown with the markings indistinct; f. *efflorescens* and f. *erubescens* from the Nilgiris are vinous grey-brown with very indistinct markings, the latter with the claviform black.

Barrett, *l.c.*, plt. 144, gives three figures, 1b is a rich dark brown form with a light submarginal line and still lighter reniform. W. Scotland form.

Leech, *Tr. Ent. Soc.* (1900), 40, treats *descripta*, Hamp., as being covered by *descripta*, Brem., and also that *dahlii*, Hb., covers *descripta*, Hamp.

Stdgr., *Cat.*, IIIed., 136 and 140 (1901), identifies *pachnobides* with *descripta*, Brem. (1901).

Splr., *Schm. Eur.*, I, 150, plt. 33, 13 (1905). The figure too brown.

South, *M.Br.I.*, I, 225, plt. 114, 1, 2 (1907). Fig. 2 is a dark ♀; fig. 1 is ♂ lighter in colour. An Irish form, dark sepia, is called *perfusca*, Kane. The whole plate is poor with all the figures very similar in ground colour and with indistinguishable markings.

Warr-Stz, *Pal. Noct.*, III, 46, plt. 10e (1909), treat *descripta*, Auct. (nec Brem.), *erythrocephala*, Haw., *candelisequa*, Steph., and *rufa*, Tutt, as synonyms. A good figure. Genus *Rhyacia*.

Warr-Seitz, *Pal. Noct.*, III, 45, 46, place *subdolens*, Btlr., as a synonym of both *brunnea* and of *dahlii* (=ab. *canescens*, Btlr.): treat *descripta*, Brem., as a distinct species far removed from *dahlii*, and put *pachnobides* as a synonym to *dahlii*.

Culot, *N. et G.*, I (1), 47, plt. VII, 9, 10 (1910), gives two good figures, a light and a darker (one from a Doubleday specimen). Fig. 11 is ab. *bicolor*, Obthr., with so much yellowish coloration as to be difficult to distinguish from *N. festiva* = *primulae*, by a written description.

Corti-Drdt.-Seitz, *Supp. Pal. Noct.*, III, 74 (1933), say that *canescens* is by no means identical with *subdolens*, which they place with *dahlii*.

Corti-Seitz, *Pal. Noct. Supp.*, III, 74, plt. 11e, submarginal band complete, the discal and basal not complete, all diffuse, the latter also imperfect in lower half.

Corti-Drdt., *Pal. Noct. Supp.*, III, 74, plt. 11e (1933), add four forms and give good figures of 3.

Drdt.-Seitz, *l.c.*, 76, refuse to give a decision, whether *pachnobides* is a true species or a form of *descripta*, Brem., which they consider a separate species.

Barrett describes the Variation as follows:—

"The male is variable in the depth of brown colouring, and still more so in shading of umbreous or bistre-brown, and also in some instances takes a tinge of the purple-brown of the female; its markings are sometimes distinct, at others altogether obscured. In the female the principal variation is in the shade of purple-brown or purple-red. But in Ireland these colours are intensified, the female more particularly being of a very deep dark purple-red, sometimes even purple-black, the male following in the same direction and both being of rather large size. Similar variations, though hardly so extreme, are found in Scotland, some with the yellow stigma conspicuous others in which it is

obscure, while pale ochreous and pale brown forms, some of them with all the markings distinct, are obtained in that country."

The Names and Forms to be considered are:—

punicea, Hb. (1802), *Samml.*, 115.

dahlia, Hb. (1809-13), *l.c.*, 465-6.

erythrocephala, Haw. (1809), *Lep. Brit.*, 227.

f. *candelisequa*, Steph. (1829), *Illus.*, II, 132: *Syn. Cat.*, II, 69 (1829). [*descripta*, Brem. (1864), *Lep. Öst. Sib.*, 51, pl. IV, 11 (1864)], a species.

ab. *canescens*, Btlr. (1878), *Ill. Het. B. M.*, II, 28, pl. 30, 1.

ab. *subdolens*, Btlr. (1881), *Tr. Ent. Soc. Lond.*, 181, ♂.

ssp. *pachnobides*, Stdgr. (1888), *Stett. e. Zeitg.*, 246.

f. *nana*, Stdgr. (1888), *Iris*, V, 355.

ab. *efflorescens*, Hamps. (1891), *Lep. Ill. Het. B. M.*, VIII, 78.

ab. *erubescens*, Hamps. (1891), *l.c.*

ab. *rufa*, Tutt (1892), *Brit. Noct.*, II, 113.

ssp. *descripta*, Hamp. (1894, 1903), *Moths Brit. Ind.*, II, 184: *Lep. Phal.*, IV, 423.

f. *perfusca*, Kane (1895), *Ent.*, XXVIII, 217.

ab. *bicolor*, Culot-Obthr. (1909), *N. et G.*, I (1), 48.

ab. *fusca*, Lenz. (1927), *Osth. Schm. Sud.-Bay.*, II (2), 239.

f. *provincialis*, Corti-Drdt.-Stz. (1933), *Pal. Noct. Supp.*, III, 74.

ab. *stagnata*, Strnd. (1937), *Festschr.*, III, 5634.

ab. *accentifera*, Strnd. (1937), *l.c.*

ab. *griseopulverata*, Strnd. (1937), *l.c.*

ab. *nyx*, Strnd. (1937), *l.c.*

Tutt dealt with (1) the typical form, chestnut coloured mottled *dahlia* (= *erythrocephala*, Haw.); (2) *rufa*, the distinctly reddish-brown with distinct stigmata; (3) *candelisequa*, red-brown irrorated with glaucous: a dusky dot behind the anterior stigma; (4) refers to var. A of Guenée from America.

punicea, Hb., *Samml.*, 115 (1802).

DESCRIPTION.—Ground colour a pale "dead" sandy brown. Outer marginal band lighter with row of brown dots down the middle, separated from the richer brown fringe by a fine black line, and preceded by an irregular richer brown narrow band. Inside the last is a narrow somewhat slatey narrow band, defined on the inner side by the dark outer transverse line of the wing. The reniform, defined by a darker line, is of a lighter shade and united to the orbicular by a wide black band. The orbicular is light like the reniform, but is defined by a double line, which fails somewhat above and below. From the bottom of the reniform there runs a curved diffused dark brown line to the inner margin and expanded to a blob about the middle. The inner line is complete as a pale band, finely defined by a black line on the inside and, on the outside, by a diffuse thick brown line. An extension of the light clouding, which surrounds the orbicular, extends basal and cuts across the inner line. The basal transverse line is incomplete, but double with a lighter middle, and scarcely traceable. The hindwings with a rich brown fringe. There is a dark marginal shade and a similar shade across the disc of the wings; thus the h.w. is quite distinctive (by Hy. J. T.).

ab. *canescens*, Btlr., *Ann. and Mag. N.H.*, Ser. 5, Vol. I, p. 165 (1878), *Ill. Het. B. M.*, II, 28.

FIG.—*l.c.*, plt. XXX, 1 (1878).

ORIG. DESCRIP.—Primaries above greyish brown; disc browner externally; ordinary lines black, with white borders; discoidal spots whitish; a black interno-median spot below the orbicular; three white costal dots near apex; secondaries sordid white, with broad dusky outer border; a marginal white line near anal angle; fringe greyish towards apex; body grey. Wings below shining sordid white, costal and external areas black speckled; a well defined brown discal stripe; a blackish discocellular stripe on each wing. Exp. 1 in. 10 lines." Yokohama.

Noctua, race *subdolens*, Btlr., *Trans. Ent. Soc.*, 181 (1881), ♂.

FIG.—Corti-Stz., *Pal. Noct. Supp.*, III, 74, plt. 11e (three dark diffuse bands, basal complete, discal, submarginal).

ORIG. DESCRIP.—“Nearly allied to *C. erythrocephala*, but larger, less sericeous varying in the colour of the primaries and thorax from laky brown to pale sandy flesh tint, whereas the European species varies from shining chocolate brown and grey to reddish clay-coloured; the reniform spot larger and paler, sometimes almost entirely yellowish white; there is also invariably a small submedian black dot below the orbicular spot; the secondaries are slightly darker along the external border, and have a decidedly narrower fringe; on the under surface the external pale border is diffused and decidedly wider at apex, the dark discal line is indistinct, the costal border is noticeably redder; the secondaries are considerably whiter, with redder costal border; the discal line is placed much farther from the outer margin, and the spot at the end of the cell is much smaller; the body below is darker and redder; expanse of wings, 1 in. 7½-9 lines.” Tokei, Japan.

ab. *nana*, Stdgr., *Iris*, V, 355 (1888).

DESCRIP.—“fere dimidio minor.”

ab. *nana*, Hamp., *Cat. Lep. Ph.*, IV, 423 (1903).

“Hardly more than half the size of typical form.”—Dauria, S.E. Siberia, Kentei.

ssp. *pachnobides*, Stdgr., *Stett. e. Ztg.* (1888), 246.

ORIG. DESCRIP.—“It stands near *punicea*, Hb., so near, that I only noted the distinction that it was a somewhat smaller species probably on account of its expanse. The forewings appear to be somewhat broader; the antennae are distinctly thicker in *pachnobides*, in the ♂ strongly dentate (almost comblike), but in the ♀ only very slightly toothed and with short cilia. The palpi are distinctly longer. The forewings are gayly variegated mostly with blue-grey spots and such-like more or less distinct transverse bands. Between the two stigmata and generally also before the first lies a prominent darker brown-black spot. All is almost the same otherwise, but since I have undoubted *punicea* from Askold and Suifun, I have little doubt that *pachnobides* is a different species from it.” Vladivostock, Askold, Baranowsky, Suifun and Ussuri.

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CONTENTS.

NOTES ON EUXOA CINEREA, SCHIFF., A. J. Wightman, F.R.E.S.,	45
A FEW ORTHOPTERA NEAR WORTHING, Malcolm Burr, D.Sc., F.R.E.S.,	48
GADFLIES IN THE SAVOY ALPS, P. A. H. Muschamp (Plate),	49
COLLECTING NOTES, JANUARY—MID-JUNE, 1938, A. J. L. Bowes,	55
CONTINUOUS BREEDING: IV., H. B. D. Kettlewell, M.A., M.B., B.Chtr., ...	58
COLLECTING NOTES,	59
CURRENT NOTES,	62
SOCIETIES,	63
REVIEWS,	64
SUPPLEMENT:—The British Noctuae and Their Varieties, Hy. J. Turner, F.R.E.S., F.R.H.S.,	(173)-(176)

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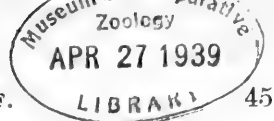
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NOTES ON EUXOA CINEREA, SCHIFF.



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NOTES ON EUXOA CINEREA, SCHIFF.

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

It is often assumed that all British *cinerea* are correctly classed as belonging to race *tephrina*, Staudinger. *Cat. Lep. Pal.*, III, 148, 1901. "Minor. al. ant. angustioribus distinctius signatis, al. post. in ♂ albidioribus."

Mr H. J. Turner, *Brit. Noct. and Vars. Supp.*, Vol. II, page 92, accepts that British *cinerea* are in fact a distinct race, on the ground of colour and markings, and suggests that the race name is *tephrina*, Stdgr.

But one of the main characters of this race (*tephrina*) is small size, and while there certainly are British localities in which the species is normally very small, there are many others in which the average size of the specimens is quite equal to that of typical *cinerea* on the Continent. Which seems to rule out the name *tephrina* as the name of the British race and restrict it to examples of small size from areas where small size is normal.

The variation in *cinerea* is so great both in colour and markings and individual forms of striking appearance are so numerous that I feel that the giving of names to even the more extreme forms can serve little purpose and so refrain from naming any of those which are described in these notes. But I have no objection to their being named if anyone wishes to do so.

The material, from which the insects described are taken, has been collected during the last twenty years in the counties of Kent, Sussex, and Hants.

The higher downs seem to be the favourite breeding grounds, but they also occur in shingle beach areas. A flat hill top or shallow valley high on the downs is better than a hillside. The males come freely to light and less freely to sugar; the females are seldom taken except by searching, although they do come to both light and sugar upon occasion.

This species, unlike most Noctuae, can be taken in really bred condition at light. This is due to several facts. The light is taken to the breeding ground, the locale is free from high vegetation among which the species can get damaged upon its short flight to the lamp. It comes to light often on its first flight when wings are hardly dry, and can be boxed without being netted (which last is fatal).

I have found that a sheet placed flat, or as flatly as possible, on the turf with the light in the centre is better than a rigged-up perpendicular sheet. It should be weighted with lead shot at the edges to prevent it flopping about in the ever-present cold stiff breeze one encounters in the higher downlands at night.

The flight of the males is from dusk to near dawn, but usually within certain definite periods. Some nights they come early, and then after an interval again appear about 11.20 p.m., and yet again just before 1 a.m.; Summer Time.

After a wet day early comers are mostly wrecks, while just before midnight fine specimens appear, from which I surmise that early comers are last and previous nights' emergences, while those coming later on are fresh emergences.

The females emerge the hour before midnight and I think the males, at light just before midnight, are on the mating flight, but have failed to find mates. Those coming just before 1 p.m. have paired. There is no hard and fast rule, of course, and the weather conditions are very important—fog is hopeless, moonlight nearly as bad, temperatures below 48° F. nearly hopeless, but rain in slight showers after a dry day is not at all bad. The ideal conditions are a dark and sultry night, following a reasonably dry day, no moon, and thunder desired if without a downpour.

When the flight is on, the moths appear from the dark and drop straight on the sheet (6 feet square), rest a second, with wings vibrating, and then run towards the light.

These first moments are the chance for boxing, for once the moth reaches the shadow of the lamp it will climb on it or fly about it and make boxing difficult and quickly suffer damage. Once they come, they come often, several at a time, and quick boxing is important.

It is wise to at once sort moths into two piles of boxes—wanted and not wanted—so that those rejected can be released quickly should the weather compel a sudden start for home, for if thrown out at once they come again and again to be boxed.

I doubt these moths coming far to the light, having noted that when several lights are worked and placed 200-300 yards apart, all being visible at once from the high ground, it is the same lamp, night after night, which makes the largest capture. This presumably is because it is nearest to the spot in which emergences are taking place.

Cinerea is very plentiful indeed in its haunts, and although definitely local to special pieces of ground, there are endless spots for it. It emerges from mid May to mid June and from first to last the nightly emergence in a normal locality must be several dozens, and when emergence is at peak well over 100 may come to a well-placed lamp, mostly quite fresh, but only if the weather is "right."

The ground colour of insects for any given locality is usually wide in range. But, nevertheless, there are brownish areas, silver grey areas, and reddish areas, by which it is not meant that all specimens from such an area are of that colour group, but that the bulk are. The ground colour varies from almost white, greyish-white, silver grey, dove grey, blue grey, lavender grey, purplish grey, pale slate grey, deep smoky grey to black, which I call the grey group; and from pinkish grey, palest cafe-au-lait, palest yellow brown, pale red brown, rusty brown, deep brown, to brown so deep as to appear black in most lights. This I call the brown group. Some of these ground colour shades are scarce.

The usual form has uniform ground colour with distinct markings in deeper shade of same basic colour.

These markings consist of basal line, inner line, central shade, outer line, sub-marginal line, and a row of dots along the outer margin; the reniform is present and sharply defined.

There are endless minor differences between examples, apart from ground colour.

Markings in general may be little darker than ground colour or very much darker. The sub-marginal in some examples is very dark and

thick, like a wavy band; while in others it is line-like and sharply toothed; the reniform may be just a dot or a large spot.

The orbicular is present in a fair percentage of specimens, while there may be a dark line along the inner margin or outer margin.

The central shade in some cases is lineal and in others wide and much suffused. It may be reddish on a grey ground colour, and I have examples in which it is confined to the lower half of wing.

Another point, which is worth recording, is the occasional presence of lanceolate marks from the sub-marginal to the outer margin.

All the foregoing points, while small in themselves, create a very large number of forms which appear rather different one from another.

The more striking forms are usually produced by one or more areas of the wing being darker than the rest of the wing. These banded forms occur from the palest ground colours to the brown and slate grey shades. In these darker shades the contrast is not great.

- (a) Dark band occupies area sub-marginal to outer margin.
- (b) Dark band occupies area outer line to sub-marginal.
- (c) Dark band occupies central shade to outer line.
- (d) Dark band occupies inner line to central shade.
- (e) Dark band occupies central shade to outer margin.
- (f) Dark band occupies whole outer area.
- (g) Dark band occupies whole central area.

The above have a single, if in some, extensive darkened area. The following have two such areas separated by pale ground colour:—

- (h) Dark basal and outer line to sub-marginal areas.
- (i) Dark basal and central shade to outer marginal areas.
- (j) Dark basal and outer areas.

I have never taken one with dark basal area only, but such must occur.

All these banded forms have many minor varieties apart from ground colour.

The dark areas may be little deeper in colour than the rest of wing or may be in very strong contrast to it.

The dark area may be solid looking and smooth in appearance or reticulated and peppered with a rough appearance.

In the deep ground colour examples deep brown, black brown, slate and black, these banded insects do occur but the bands can only be seen in certain lights when the insect is viewed obliquely and are not apparent in the cabinet. Unicolorous forms occur in these deep shades, in which no markings are to be seen, but more often the central shade is to be traced (except in the black ones), and in many examples the transverse lines have a pale edging, so that the insect appears to be lined in pale whitish grey or silver grey and the outer half of basal area is also sometimes suffused with whitish grey.

With all the differences in marking which occur and the multiplication of these forms by the wide colour variation, this species must be able to run any other British *Noctua* close for the title of most variable.

Tutt was not well supplied with material for his notes. He says (*Brit. Noc. and Vars.*, II, 76) British examples lack the orbicular which Hübner mentions as present in his description, but, as I have said, this

is often present. He also says "Central shade is 'always' reddish." It is, in fact, "often" so.

Turner (*Brit. Noc. and Vars. Supplement*, Vol. II, page 91) says "I have not seen an *obscura* male." But this dark black or black-brown nearly unicolorous form occurs in very small numbers in all localities I have worked at all well.

I have pairs, ♂ and ♀, of a great many forms, both light and dark, and feel quite certain that, while males are usually much paler in shade than females, both sexes occur in all forms and shades, pale-grey ♀♀ being about as scarce as black-brown ♂♂.

A FEW ORTHOPTERA NEAR WORTHING.

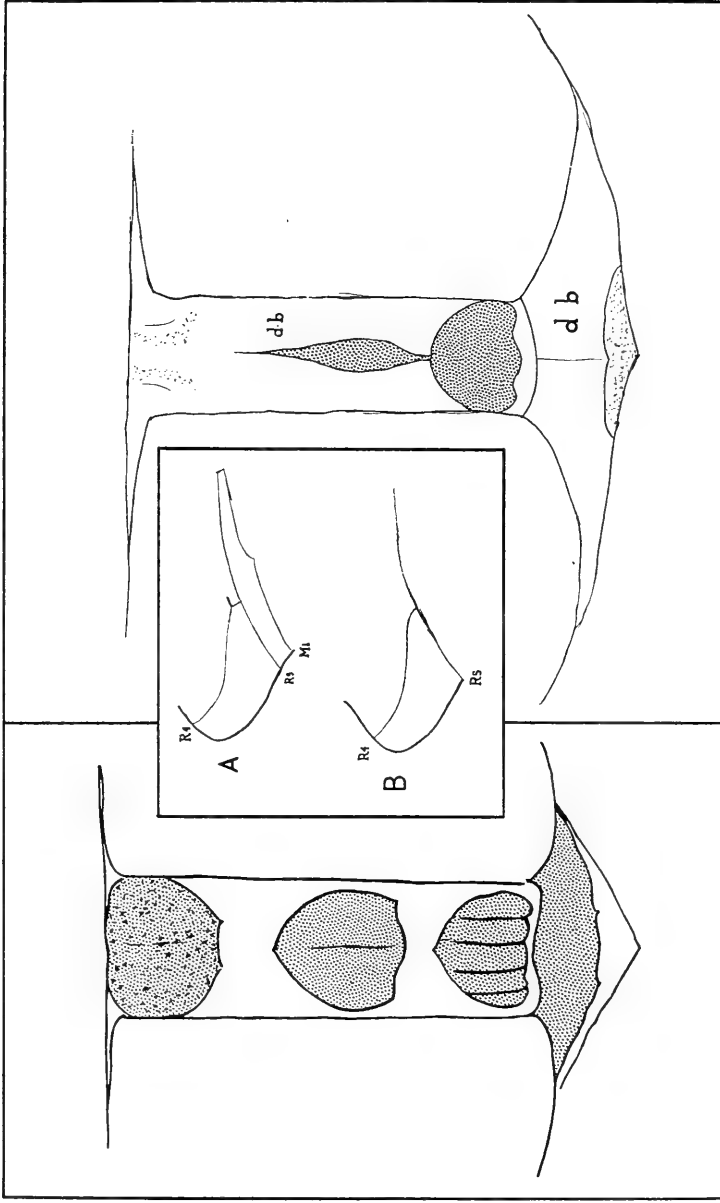
By MALCOLM BURR, D.Sc., F.R.E.S.

Worthing enjoys such a reputation for sunshine, to which it lived up this year, that I hoped to find a good representative set of Orthoptera in the district on the few occasions that I have had a chance of getting into the field. But probably because I was not able to give the time to the work, I was rather disappointed.

I had expected to find *Chorthippus albomarginatus* all along the coast, where there is still a little grass left between the houses, but actually came across it only in the flats at the mouth of the Adur at Shoreham. These are usually under water, I believe, in winter, or at least apt to be flooded. Another species that I expected to find was *Platyceles grisea*, which can survive in a built-up area, such as now exists all along the coast, almost without a break from Littlehampton to Seaford, as I used to see plenty of it on the cliff of the Leas at Folkestone. Neither did I happen to find the little coast cockroach, *Ectobius panzeri*.

On the Downs the usual grasshoppers were in evidence fairly early. *Omocestus viridulus* and *Chorthippus bicolor* were adult at High Salvington on 16th July, and on Cissbury Ring, a few days later. *Stenobothrus lineatus* was tolerably plentiful, with *Ch. parallelus* and the two mentioned. But grasshoppers were not really abundant anywhere. On the short turf inside the camp at Cissbury there is a small colony of *Myrmeleotettix maculatus* and another further towards the north-east, near Stubb's Bottom. It was very dark on some burnt ground. The other grasshoppers mentioned are generally distributed on the Downs. On 21st August, a bright sunny day with a strong sou'-west wind blowing, *S. lineatus* was taking short flights. Specimens disturbed by my feet would leap into the air and open their wings, always facing up wind, but they could not fly against it, and were always carried away down wind. That evening, in a sheltered corner, I came across *Asilus crabroniformis*. I watched it for a few minutes and left it apparently settled for the night under a big leaf.

On 24th August I snatched half-an-hour in the river flats by the estuary of the Adur, near Shoreham. There were plenty of *Ch. bicolor* in the rough grass and, on the football ground, *Ch. albomarginatus*, but most of the specimens were freshly emerged and still soft. Alongside



Entomologist's Record.

Atylotus cherbottiae, Musch. (Female).

Straba bromius, L. (A) with (B) without recurrent veinlet.

del. P. Muschamp.

Atylotus (Theriotplectes) lowei, Musch. (Female) or *Sziladyinus rufipum*, var. *lowei*, Musch.

db (dull black). Foot of frontal triangle dusted with yellow.

the river there is a field with a dense crop of couch grass, and in this too was *C. albomarginatus*, rather to my surprise, as I have not before come across it in long thick grass. With it was *Conocephalus dorsalis* in fair numbers on the couch. I was rather surprised to find *C. dorsalis* on couch grass, as I have always considered it dependant upon rushes. It requires rushes, as it needs a stem with pith in which to oviposit, which grass does not provide. There was a sluggish brook running through the field with muddy banks. Here were sea aster, sea blite and rushes, but on these, which grow only in the mud near the water's edge, I saw no *C. dorsalis*. Perhaps there were some on the rushes, but I did not see them. No sign of *Acrydium*, nor was *Ch. parallelus* there. I wonder if *Ch. parallelus* and *Ch. albomarginatus* are mutually exclusive. There was no reason visible to my eye why the former should not have mixed with its congener on the football ground.

A few days later I swept in the nettle beds in the avenue of ilex at Goring Point. Here there were plenty of the Common Earwig, and one or two *Leptophyes punctatissima* and, in the fields around, *Ch. parallelus*, but not *Ch. albomarginatus*. There is one small bed of rough grass, with nettles, burdock, bitter sweet, couch grass and knotgrass, covering only a few square yards, between the footpath and the beach, just above highwater mark. Sweeping in here was difficult, owing to the old bricks, logs, chunks of concrete and pieces of wire, but it was worth the effort as I found a colony of *Forficula lesnei*. It was curiously restricted, for the moment I left that little patch I found only *F. auricularia*. By comparison, *F. lesnei* is an anaemic, undersized creature, and I should think it is being pushed out of existence by the stronger species. I noticed, rather to my surprise, that the numerous still immature specimens were narrower and darker than those of the common earwig. It would, I should think, have been a record to have caught a rabbit in a sweep-net, and I do not know which was the more startled, the bunny or I. But for the central stick, he would have been in the net.

GADFLIES IN THE SAVOY ALPS, 1938.

Plate IV.

By P. A. H. MUSCHAMP.

The year 1938 has been a superlatively good one from the point of view of the student of *Tabanidae*, and a superlatively bad one from the point of view of the cow, the horse, and the mere tourist. To meet with several members of the genus *Sziladymus* so early as May and so late as 15th September is almost incredible. Cattle tenders declare that all gadflies are completely destroyed by the first storm after 10th August and, till this year, I have found this to be true. Alpine flora was late and Alpine insects were early. I think this may be explained by the phenomenally early spring followed by a cold spell which destroyed the early buds and retarded the plants, but did not damage the larval life of insects that had been forced on as in a hot-house. Curiously enough, although the ♀ gadfly was so very abundant, ♂♂ were harder to capture than last year, and I found none on the flowers that they generally haunt. I am not going to transcribe my notes on

all the *Tabanidae* taken this year. I shall confine myself to notes on variations in the sub-family *Tabaninae* and a description of several new forms. To assist me in comparing my Alpine flies with others, I have consulted the very clear descriptions of E. Rivenhall Goffe so far as the British list goes. Surcouf has given us a useful monograph, but many changes have taken place since 1924. To get nearer to the source I have made considerable use of Schiner (1862), Meigen (1804), Meigen and others (1820, etc.). I consulted also, but with small profit, my Linnaeus (1758 and 1761) and terminated by a prayer to the gods to send us a worthy successor of Verrall, who is a well of information, but, like other wells, does not cover much ground. Séguy's work on Diptera is up to date, but his *Tabanidae* section does not pretend to be more than a table. I follow Séguy's order and nomenclature, i.e., Enderlein's genera, even when I quite disagree with them.

The chalet where I spend the summer months is about an hour from Arâche, about 4500 feet above sea level. Hard by runs a torrent, a favourite haunt of *Hilara*. Mountains all around me, among others the wonderful Platté and its desert. The district is not very rich in Lepidoptera, though certain slopes haunted by *P. delius* often provide beautiful dark forms that are really well worth while. Almost all other orders are well represented, especially the sawflies.

Following Séguy, *Dasyrhamphis atra*, Rossi comes first and is a fly which rarely shows itself in my happy hunting ground. Those which I captured this year only vary in the coloration of the eye, which, instead of being blackish green, is sometimes brown and in one case blue.

The next genus, *Glaucops*, has not yet been taken in the Savoy. Its one species has only been taken at St Moritz, Switzerland, it would seem; however, I captured a fly, *Sz. harriettae* (see below), which should possibly be placed here, antenna III being ovate.

Straba is a genus which contains all the British Tabanini except *T. bovinus*, Loew. It is characterised by the upper corneules or facets of the ♂ eye being separated sharply from the lower and much smaller corneules.

Straba sudetica, Zeller is, as in England, rather more frequently met with than *Tabanus bovinus*. In 1937 the ♂♂ were easily captured on the flowers of a tall Umbellifer together with ♂♂ of *T. apricus*. In 1938 these flowers seem to have lost their attraction. The Alps have given me no interesting form of *sudetica*, but in Leicester, where the fly appears to be very rare, I have taken two flies that are minus the central triangles on the abdomen. This is perhaps worth noting, as I find no mention of a tendency in this direction. The venter is dark and there is scarcely a trace of the pale margins on tergites or sternites.

S. glaucopsis, Meigen did not arrive till the last days of July and was still fairly plentiful on 15th September. It varies considerably and I regret that I did not bring home a long series. The following forms are worth mentioning:—

- (a) 17 ♂♂ with 2 recurrent veinlets; abdominal flecks normal
- (b) 13 " " 1 " " " " "
- (c) 3 " " 2 " " " " " " " " " " "
- (d) 6 " " 2 " " " " " " " " " " "
- (e) 8 " without " " " " " " " " " " "

- (f) 15 flies with coal black abdomen and red spots on segments II and III, sometimes a third on IV. Central triangles reduced to a few tawny red hairs on segment II only. Antennae all red. Palpi reddish. Venter uniformly covered with gold pubescence. A fine fly, rather larger than *glaucoptis*=ab. **rubra** new ab.
- (g) One of the *rubra* has, in addition to the recurrent veinlets, an extra median vein, i.e., 4 veins spring from the discoidal.
- (h) One fly with uniform brown eyes.

There is also considerable variation in the frontal calli. (d) is the var. *cognata*, Loew; (a), (b), (c) and (e) are unnamed; the side spots of *rubra* are isolated as in *cognata*, but smaller. *Cognata* flies everywhere with *glaucoptis* but is less common. I was greatly surprised to find a *Phalangus* running off with a lady *glaucoptis* held under it and still alive. The gadfly was quite as large as the Daddy-long-legs, which, nevertheless, was moving rapidly when I bottled the two together, most unkindly.

Straba bromius, L. is a notoriously variable fly and I think I may say that all the named forms are found in these Alps. The British gadfly authority, Goffe, mentions a *bromius* captured in Somersetshire with a recurrent veinlet on one wing and another from Devonshire with a recurrent veinlet on both wings. At my alpine home this year I took 47 with recurrent veinlets and this means about 5% of those I examined. Whenever the vein R4 meets the vein R5, forming a right angle (see illustration), we may safely expect a recurrent vein or at least a little blob of black vein. The phenomenon may be thaumatological, but to me it seems more likely that it is a case of alpine atavism. This veinlet is regularly found in the genus *Dasystipia* and is mentioned by authors as the chief characteristic of the genus. Frequently the base of R4 looks like a cross vein between R5 and a foreshortened R4. When a genus is characterised by a phenomenon that occurs occasionally in other genera, it seems to me that some unnecessary splitting has taken place. I think it was a mistake not to have adopted Szilady's sub-genus *Ochrops*, which included *Dasystipia* and other yellow-eyed flies.

The eyes of the high-flying *bromius* are occasionally covered with fine short hairs. The var. *nigricans*, Szilady is not rare in my neighbourhood and is often of a more extreme form and more worthy of the name than the described form from Hungary.

Bromius is described by all authors as possessing a single and regular purple band on the eye, and this is what we always look for first when we examine a fly that looks like *bromius*. Last year I captured near my chalet 33 male *bromius* and of these 22 had no sign of an eye band. Females of this aberration seem to be rare, for in several years I have only captured two entirely without a band and three with a slight trace of one. These flies with uniform eyes bear a very close resemblance to the ♀ fly described as *S. regularis* (I can find no description of the ♂). I don't want to suggest that this African fly is a var. of *bromius*, but I wish to call attention to the fact that the straight purple bar on the eye is not a safe characteristic of the alpine *bromius* ♂. As 66% of the males, together with a few of the females that I examined, were of this form, I think I am justified in giving it a name, ab. **simplex**, new ab.

To continue: 4 *bromius* have green eyes. As many as 23 have raised apical calli on the frontal stripe, either single or double. Possibly an atavic form. One female, on the other hand, has no sign of a middle callus. Another has a small detached callus instead of the attached linear one. One has femora II yellow.

S. exclusa, Pandellé. Two or three that I have taken differ slightly from those described originally by Pandellé and those taken recently by Pierre.

The next genus, *Tabanus*, includes those of the hairless eyed Tabanini, whose males have eyes in which the corneules present no sharp contrast in size, but become progressively smaller. First in the list comes *T. apricus*, Meigen, a handsome fly which in July and August is all too common. This year it made its appearance exceptionally early—on the 10th of July. Its wonderful golden-green eyes flash so brightly that one can recognise them as far as they are visible. The males are bolder and tamer than those of any other European gadfly and only once, in Canada, have I come across a male Tabanid so easy to capture. It shows little variation. A few have less brilliant eyes:—I have taken (out of thousands) 4 ♀♀ with bright blue eyes, 1 ♂ and 1 ♀ reddish brown; 3 ♂♂ greenish red; 1 ♂ blue green; 1 ♂ dull brown. The abdominal triangles, always wanting in the males, are absent in about 10% of the females. The black abdominal central band of the male varies in breadth and is sometimes reduced to a couple of flecks. In size, I have a small ♂ 13 mm. and an outsize ♀ 20 mm. Although the difference between the eye facets is gradual it is marked by a very distinct line. A few of these northern (alpine) flies conform with the description of *T. graecus*, Fabricius. *T. bovinus* ♀♀ are just as easy as the ♂♂ to distinguish from *S. sudetica*, if you examine them ventrally. It is useless to take the form of the abdominal triangles into consideration as they vary almost as much in *bovinus* as in *sudetica*. *Bovinus* attacks horses in preference to cows. I do not think that either of them ever have much chance of tasting human blood as they are slow and settle down so heavily that they are immediately noticed. French authors give nearly the same figures for the dimensions of the two sexes. I know not what they are elsewhere but in the Alps there is a difference of from 2 to 4 mm.

The genus *Sziladynus*, Enderlein, is characterised by hairy eyes together with an ocelligerous callus on the vertex of the frontal stripe. This genus is well represented in my locality. The females of *Sz. aterrimus*, Meigen, *Sz. auripilus*, Mg. and *Sz. lugubris*, Zetterstedt, are all common, though it is quite impossible to say where one begins and the other ends. I have never seen and am inclined to disbelieve in the existence of a ♂ *auripilus* at any altitude, high or low. In my Alps the male is always the blackest of black *lugubris* and this I have taken in conjungo with *auripilus* and *aterrimus* (so far as I can distinguish these females). I am convinced that the thick yellow pubescence is restricted to the female. The hypothetical distinction of the frontal stripe is . . . hypothetical. One occasionally finds flies with the yellow pubescence replaced by grey or white. Occasionally also they show the recurrent veinlets, but infrequently (I took 8 this year).

Sz. harriettae, Muschamp. Here I must place what is either a new species or a very strange aberration. I cannot attach it to any

other fly, unless it be *Sz. micans*, Meigen. Thorax, abdomen, face, frontal stripe and antennae are all black. The eyes have no coloured bands. They are covered with whitish hairs of medium length. The frontal stripe is $4\frac{1}{2}$ times as long as broad at base and widens slightly at the vertex; the stripe is dusted over with white, which is easily lost; the basal and median calli are joined; the ocelligerous callus is rather small. Palpi yellowish brown with a brown stripe beneath, rather thinly covered with black hair. The third antennal joint is ovate and resembles that of *Glaucoptis hirsutus*, Villers (= *Theriopectes haematopoides*, Jaenicke). It is rather smaller than *aterrimus* or *micans*—13 mm. Its legs are not black but a uniform dark brown. Around the mouth parts are tawny silky hairs and there is a forest of long brown hairs on the meta- and pteropleurae. My reason for placing this fly here, as a possible form of *aterrimus lugubris*, is because of its general resemblance. The "hump" of the antenna of *lugubris* is very small and pointed and it would not be very surprising to find a specimen in which the little point was lost, but when this trait is combined with brown legs, a unicoloured eye and a slight difference in the palpi I cannot confidently pass it by as an aberration of *lugubris* or *micans*.

Sz. micans, Meigen, is found everywhere. In the mountains a particularly black form with but little of the tufts of white hair on the abdomen and with black, rather than brown palpi is the form generally met with. About one in a thousand has yellow palpi and about the same proportion is without the ocelligerous callus. I have only taken one *Sz. rupium*, Brauer.

Sz. montanus, Meigen, and *Sz. fulvicornis*, Meigen. The great authority, Séguy, considers that these are two separate species and one can generally follow Séguy blindly, but . . . The structural difference given is that the hump of the antennae is much more pronounced in *fulvicornis*. Moreover, *montanus* has all black and *fulvicornis* more or less red antennae. In favour of Séguy's decision I may add that *fulvicornis* appears a full month earlier than *montanus* in my neighbourhood. Both were flying together in the second half of July and the first few days of August. Then *montanus* alone remained. This looks quite convincing but unfortunately there are many intermediate flies both in the form and colour of the antennae. They are at all events very closely allied, if one be not a var. of the other. The same thing may be said of *solstitialis*, Schiner, *distinguendus*, Verrall and *muhlfeldi*, Brauer. I took 8 *montanus* with recurrent veins.

Sz. montanus var. **alpicola** (new var.) differs from *montanus* in appearance more than either the Danish *muhlfeldi* or the Manchurian *morgani*. It lives on a solitary plateau of about 5800 feet altitude, where there are no quadrupeds other than marmots or mayhap a chamois. I have taken only 25 females and no males, but live in hope of increasing my series. It is much smaller than *montanus*, 12 to 14mm., with a single giant of 16mm. (the said giant being much nearer *montanus* in colour as well as size). Eyes covered with short white hairs and having 3 purple bands, persistent after death. Frontal band $4\frac{1}{2}$ -5 times as long as broad at base and nearly parallel, dark grey (one is black), covered with black hairs; callus I (basal) rectangular, II spindle shaped and united both to I and III, III is indistinctly triangular with the "ocelli" transparency at apex. Antennae black,

stained throughout with red (as though the depth of the red showed black; 3 out of the 25 are quite black. Palpi yellow; 2nd article a long ovoid with blunt extremity. Thorax blackish, with 5 grey stripes; ante-alar callus reddish. Abdomen resembles the *bromius* group rather than the *montanus*; lateral patches on segments II and III are greyish-yellow and the row of tubercles is present on these flecks (I have examined about a thousand *montanus* and not one had these tubercles). Venter uniform dark grey (the intermediate larger fly has fulvous-red patches on I and II). Legs as in *montanus*. None have recurrent veinlet.

Sz. tropicus, Panzer, I have found only in the var. *bisignatus*, Jaennicke.

The genus *Atylotus* differs from *Sziladynus* in that the ocelligerous callus is absent, being replaced by a single or double callosity, which indeed may sometimes be wanting.

A. quatuornotatus, Meigen. I brought home a very short series of these flies, though I believe they were fairly plentiful.

A. quatuornotatus, var. **cherbottae** (new var.). Here is the probable cause of my neglect of the last mentioned. Not before I reached home did I notice what an interesting little group of 18 flies had been captured. A verbal description is not nearly so convincing as a drawing, so, fearing that I myself might exaggerate, I persuaded Miss Nichols of Leicester Museum to draw the frontal stripe of this fly to scale. The top callus is raised, shining black; studded with tubercles and rudimentary bristles, the sectional (?) lines on the two lower calli are slightly exaggerated. The hairs on the eyes are very long and thick. Other points of difference are very slight. There is no silver indumentum at the base of antennae, and the antennae are blacker than those of my *4-notatus*. The tarsi are black (not brown) above and red underneath.

Atylotus lowei or (*Sziladynus rupium*, var. *lowei*), Muschamp (Dr E. E. Lowe of Leicester Museum). According to the dichotomical tables of Surcouf, this fly should belong to the *Atylotus erberi* group, but these all have red abdomens. My private opinion is that it is a form of *Sz. rupium*, Brauer, minus the ocelligerous callosity that characterises the genus. The drawing shows you the extreme form, having no trace of the upper callus, a very fine pubescence marking the double *Atylotus* normal callus. In some specimens there is a low bifid callus. A short description of these flies will show you that, save for the upper callus and the entire absence of any ocellar transparency, they might pass for the Swiss *rupium*, especially as Surcouf says that the upper callus of the latter is on the way to regression. Eyes hairy, either with no purple band or with a short, weakly marked one. Legs bicoloured; femora black; tibiae I $\frac{1}{2}$ brown, II and III brown, tarsi black and red. Thorax and abdomen as in *rupium*. Antennae black, hump near base and rather accentuated. Palpi plump at base, elbowed, white with brown hair. Face black, with white pubescence around mouth parts and black hairs on eye margins. Occiput black with white indumentum. Frontal stripe and calli as illustrated. Against my *rupium* hypothesis comes the fact that *rupium* has not been taken in France and that careful examination with the microscope has not revealed a trace of an ocelligerous callus in any of my *lowei*. It would be revolutionary to place the variety in a separate genus from the

species, especially as I have only 10 specimens (all taken this year). Until a long series give confirmation in one direction or the other *lowii* stays with the *Atylotus*. The more one studies gadflies the more clearly one sees that they are in a state of evolution (and regression!). I am sorry that the old genus *Tabanus* should have been split up before the early stages of the larvae have been worked through. There will, I think, be much to correct.

Theriopectes albipes, Fab. (*Atylotus gigas*) is rare in the Alps.

Dasystipia fulva, Meigen, though common in the Arve valley, near our railway station, Cluses, rarely ever ventures up the mountain slopes. It takes nearly 3 hours to get down into the valley and a great deal longer to return, so *fulva* has been neglected. This brings me to the end of the list of the *Tabaninae* that I have captured in 1938. I am always surprised that no mention is ever made by authors of the black tubercles found on the abdomens of such a large percentage of gadflies. The microscope has taught me to believe that they are of chaetotaxical value.

Last August I took near my chalet a *Coenomyia feruginea*, Scopoli, a new fly for me. Last year, 1937, I took more than my share of interesting flies, including *Hexodonta dubia*, Zetterstedt, of which, so Séguy informed me, only one other has been taken in France. Perhaps I was too busy in other ways this year to do full justice to the flies. To terminate, let me express a hope that some more skilful entomologist may be tempted to come and join me next summer. There is much interesting work to be done, especially with the *Empididae*.

COLLECTING NOTES, 1938.

I: JANUARY—MID-JUNE.

By A. J. L. BOWES.

The following notes are a record of collecting done during 1938 in the intervals of schoolmastering. It is hoped that they may be of interest to those whose holidays fall at similar times of the year, and at the end I shall make some remarks about the methods of breeding employed for various species which I have had through my hands.

I did little collecting in the first three months of the year, but of the early species, *Theria* (*Hybernia*) *rupicapraria* was first noted in Surrey on 25th January, *Theria* (*H.*) *marginaria* on 31st January, *Alsophila* (*Anisopteryx*) *aescularia* on 6th February, *Phigalia pedaria* on 11th February, and *Erannis* (*H.*) *leucophaearia* on 19th February. During February and March I cut a good many willow twigs near Ripley, which I hoped contained larvae of *Synanthedon* (*Sesia*) *flaviventris*, but though I am convinced that I had several larvae, no moths emerged.

My first real excursion was on 27th March, when I went with Mr J. O. T. Howard to be introduced to *Bapta distinctata* (*Aleucis pictaria*), not far from East Horsley. We arrived on the ground at 7.30, and soon found the insect sitting about on the low bushes of sloe. All were beautifully fresh, and few were found on the larger bushes. Males and females seemed to be equally well out, and we continued to find them

steadily up till ten o'clock, when we left. On the coarse grasses we picked up a few worn *Calostigia (Malenydris) multistrigaria*, and on the bushes *Earophila (Anticlea) badiata* in crowds, with hosts of assorted larvae. I heard later that *pictaria* was worn on 1st April, and as 1938 was rather an early year, the best time for the species in a normal season should be the very last days of March and the first few of April. Two other notes which I find in my diary as being on the early side are a *Lampropteryx suffumata* at Ripley on 5th April, and a male *Euchloë cardamines* at Ockham on 3rd April.

The night of the 10th was cold and clear in the woods at Ashford, but insects were quite frequent on the willows and on sloe blossom, chiefly *Taeniocampa populeti*. This species has become very common in these woods in the last few years, and it is easy to find both sexes newly emerged on aspen stems; while later in the night most of the females will be found with accompanying batches of ova. *Brephos notha*, which is usually out at the same time and can be found, leisurely, in the same way, was absent. A month of hot sun may well have brought out the species earlier than in other years. *T. miniosa* is a well-known feature of these woods, but only one example was seen.

In spite of a severe hailstorm, larvae were feeding freely at the base of the cliffs near Dover on the night of the 11th. *Triphaena comes* was abundant, with *Noctua xanthographa* and a good many *Epunda lichenea*. The only moth was a single *Phlogophora meticulosa*, sitting forlorn on the chalk face. My larvae of *lichenea* fed up well on a mixture of valerian and savoys, and produced outsize imagines. A chance larva, unfamiliar, but retained in case it might come in useful, turned out to be *Leucania albipuncta*; if it fed at all after being put in a cage, it must have eaten cabbage.

Mr Howard and I started for Scotland by car on the 15th, and were on parade at Struan the next afternoon. The fence along the railway on which *Nyssia lapponaria* sits had been worked over by successive waves of entomologists, but after a mile or two we found a row of derelict posts running up over the moor, and here we found a few females; the males were virtually over, although a few had been taken by early birds during the morning. *Nothopteryx (Lobophora) carpinata*, the fine bright Scottish race, were common on the railway fence, and we excavated some cocoons of *Dicranura vinula*. Night work along the railway with Mr Edgar Hare and his son produced a few larvae of *Eurois occulta*, three specimens of the pink form of *Taeniocampa gracilis* (of which more later), and *Lycia hirtaria*.

The next morning we went on to Aviemore, where we lodged with Miss Fraser at Alt-na-Craig. Her house is very convenient for the famous birch slopes at the back of the golf course, and Miss Fraser did us very well. Mr and Mrs A. G. Peyton were already installed and had taken a few fine *Endromis versicolora*, which was the insect we most wished to see. We were soon out on the hill and during a bitterly cold afternoon picked up about a dozen sitting quite conspicuously on the smaller birches. Dr C. G. M. de Worms and Mr A. G. B. Russell had already been over the ground, as well as our friends the Peytons, and we thought ourselves lucky. In the evening we each picked up one or two more by lamp light, and found larvae of *Aplecta tinctoria* swarming on the birch twigs, but it was too cold for anything to come to light.

It was not until the 20th that the wind moved from NW to SW; immediately there was a remarkable emergence of *versicolora*, and while we had found an odd individual here and there before, they now popped out all over the place, and we could watch the uncanny speed with which the males would find a newly emerged female. Females are apt to be lively if shut in a box, but they would sit quite happily on our coats, and we each walked home with three or four pairs festooned about our persons. Two crippled females which we kept for eggs laid 275 between them on the first night. There was a good deal of minor variation in both sexes, and I was pleased to find both a male and female with the three white spots on the apex of the fore-wings forming one streak. Apart from watching the antics of this splendid insect, there was plenty of work to be done in the daytime in trunk-hunting; *Lycia hirtaria* was not uncommon, but needed a great deal of looking for, and *Odontosia carmelita* was just beginning to appear. On the 18th we found one female, which laid eggs, on the 20th five males, and on the 21st one male. Men said that we were too late for *Bruchionycha nubeculosa*, and we found only one, a female, stone dead but quite soft and fresh, at the bottom of a large birch; this was on the 21st, a very late date for the species.

Night work was on the whole a failure. On our first few evenings there was little flying beyond an occasional *Iampropteryx suffumata*; but about midnight on the 21st it clouded over and a light rain made things move. Both sexes of *E. versicolora* came freely to the sheet, and very lovely they looked, while some two dozen males of *L. hirtaria* arrived between midnight and 2 a.m. Other visitors were *Pachnobia rubricosa*, *Taenioecampa gothica* (very worn), *T. incerta*, *T. stabilis*, *N. (L.) carpinata*, *E. (A.) badiata*, and *Ectropis crepuscularia*.

On the evening of the 19th, Howard and I drove over to Forres, our object being larvae of *Triphaena comes*. We had been told that at Forres they fed mainly on heather, but we found few on this plant and those with difficulty. We then tried broom, on which they were so plentiful that it was merely a matter of decanting them at will into tins. From about a hundred larvae which we brought away a fine varied series was bred with ease. It was noticeable that the few we found on heather were small, while the broom feeders were on their last lap and pupated within a few days. Visitors to our wandering lights were *Pachnobia rubricosa* and *Chesias rufata*.

We left Aviemore on the 22nd, and spent another night at Struan on our way home. We were lucky enough to have a mild night with a light westerly breeze, and, after putting on some sugar, we struck out over the moor to look for newly emerged *Taenioecampa gracilis*, which were sitting commonly on grass stems and bog-myrtle. The Struan brand of *gracilis* is very variable, ranging from a deep salmon pink to pure white. Howard was lucky enough to find one of the latter, the only other two known examples of which are in the Rothschild series. Another excitement was the appearance of a few *Boarmia cinctaria*, which were flying near the belt of trees which runs along the south side of Struan station. Our five specimens were seen by Dr Cockayne and appear to be almost new to Scotland. On the bog-myrtle we found occasional small colonies of *Eurois occulta* larvae, and the birches were full of *Aplecta tineta*, some nearly full fed. Visitors to light were *T.*

gracilis, *T. gothica*, *Chesias rufata*, and *Apocheima (Boarmia) hispidaria*, but there was nothing at sugar beyond a few *Calocampa vetusta*. Sallow blossom was nearly done and produced nothing of note, beyond a tired *Polyploca flavicornis*, of which there was just enough left to show what a fine insect the Scottish race is.

Once home from Scotland I was busy until 14th May, when I paid a call on *Leptidea sinapis* in the Chiddingfold woods. In spite of persistent collecting, this insect continues to make a brave show there, although houses are being built and roads driven across its home; indeed, the existence of houses and therefore of restrictions on collecting may save the insect from extinction in this spot. One hopes, piously but probably vainly, that those who want this species will content themselves with one female; with care, it is not a particularly hard species to breed.

During the last weeks of May, Mr J. K. Rideout and I made two journeys to the Test valley, near Winchester, to look for larvae of *Plusia chryson* on hemp-agrimony. They were not uncommon, but needed a deal of finding. I found that a good method was to look for the little piles of frass which collect between the leaves and the stem and that once these were found there was always a larva underneath the leaf immediately above. They never sit on the top of a leaf. They are simple to cater for. If hemp-agrimony is not handy, garden mint will do; but when full grown they should be segregated, for they are very apt to pupate on top of each other, with disastrous results to the underdog.

In early June, *Hydriomena coeruleata (impluviata)* was common, but very hard to catch, in a boggy alder clump in the Wey valley near Godalming. It was a place quite impossible to work at night, and all one could do was to jar the trees and hope that one would fly low enough to be reached. In the same clump *Euchoeca nebulata (obliterata)* was swarming, and *Mysticoptera (Lobophora) sexalata* turned up now and again.

I note that my earliest larva of *Plusia chryson* spun up on 7th June and produced a moth on 4th July; the last spun on 3rd July, and emerged on 1st August.

(To be continued).

CONTINUOUS BREEDING: IV.

COSCINIA CRIBRUM.

By H. B. D. KETTLEWELL, M.A., M.B., B.CHIR.

(Continued from p. 40).

About ten years ago I obtained a small batch of ova of this species. The young larvae fed up well in glass-topped tins on a mixed diet of heather, lettuce and dandelion. They were hibernated in a small zinc breeding cage on growing heather, and in the spring half the brood was sent to P. Milman of Paignton and half kept by me. In both cases larvae continued to feed slowly throughout the summer, and to our surprise proceeded to hibernate a second winter and hatched the following June after a two years life cycle. Whether this is a usual procedure in nature I am unable to say.

In 1930 I obtained some more ova of this species, this time a very much greater number. The larvae fed up well in glass-topped tins as before. In October, when they were $\frac{1}{4}$ -inch to $\frac{1}{2}$ -inch in length, they were transferred to special quarters. This consisted of a box, three feet by two, with glass on three sides—the fourth was covered with fine perforated zinc for ventilation. The whole box was planted out with short heather. It was left on a flat roof out of doors, facing south, in the middle of London. In due course the 150 larvae disappeared in hibernation, and on cold days none were seen. About March the larvae reappeared, feeding for short periods only when the sun was out. At this time I had an eighty watt electric light bulb extension run out to the case. The light was turned on for a couple of hours each evening. The bulb was supported on top of the glass covering over the case and shining through it. The result was immediate. A few minutes after the light was turned on each night the larvae appeared in their scores and ate ravenously the heather nearest the light. By this means I could control the area eaten. At the end of the two hours most of the 150 larvae were up basking and feeding around the light. In May they pupated and the moths hatched in June, the mortality rate being practically nil. Not one departed from the one year life cycle. The moths paired freely in confinement and eggs were laid all over the box and the heather. No selected pairing was attempted on this occasion.

The variation in a single brood like this is very considerable, grading from those with very dark markings to those with markings greatly reduced. One knows that practically all-black and all-white forms exist. These are most probably " multifactorial " in origin, and could be produced by carefully selected pairings in these two directions.

(To be continued.)

COLLECTING NOTES.

GRASSHOPPERS.—While on outings in this area of North-east Cumberland during the past few seasons I have come across four short-horn (Acridiodes) and one long-horn (Locustodes). They were as follows:—*Stenobothrus (Stauroderus) bicolor*, Charp., which seems to be fairly common in our drier fields. *Stenobothrus viridulus*, L., also common, but less so than the last. I got one spotted *Myrmeleotettix maculatus*, Thunb., on a piece of sandy ground, in August 1936. *Acrydium vittatus*, Zett., was fairly common among shrubs in a clearing in a mixed wood near Mallsburn, where the wood cutters were at work. This cleared piece of woodland promises to be a profitable collecting ground later. In August 1936 I went for a car ride, stopping to collect whenever we arrived at a suitable looking locality. Shortly after crossing the river at Penton I tried one inviting spot at the edge of a wood. Here I came across a long-horn, which was named for me afterwards as *Metrioptera brachyptera*, L. I overlooked the fact that I had crossed the Border and that my find was outside of any area, and in Scotland. On consulting the list of my late friend, Mr G. B. Routledge, in the Carlisle Natural History Transactions, Vol. IV, p. 106, I find he gives this

insect as common in Cumberland, but unrecorded for Scotland. At this rate my record must be the first for Scotland, though any self-respecting grasshopper could pass from England to Scotland in three hops, where I found it.—T. FRED. MARRINER. [Congratulatory on this find.—M.B.]

SOME OBSERVATIONS CONCERNING THE ODOUR OF ACANTHOMYOPS (*DENDROLASIUS*) *FULIGINOSUS*, LATR.—It is fairly certain that the seat of the peculiar odour of the "Jet Ants" is the head, as suggested by Forel, for when the head is crushed this odour becomes most strong, though how this odour is produced is not exactly certain. Presumably, however, these ants possess some glands* which perform this function. It was, then, with great astonishment, that I noticed the same smell become more strong, almost as strong as in the case of *fuliginosus* itself, when I crushed a wounded *mixtus* ♂, taken from my mixed *fuliginosus-mixtus* colony. Thinking that this was in all probability an isolated case, or else an olfactory mistake on my part, I crushed other *mixtus* ♂♂. The result was the same. It is known, of course, that *fuliginosus* nests become pervaded with their peculiar odour, but it seems surprising that this odour is transferable to ants of another species. I also noticed that if *fuliginosus* ♂♂ be placed in a jar, that jar becomes saturated with the odour, and it was this that made me try the following rather simple, but intriguing experiment. I took some *fuliginosus* ♂♂ and placed them in a jam jar where I left them for about a quarter to the half of an hour. I then took them from the jar, and placed some ♂♂ of *Acanthomyops* (*Donisthorpea*) *niger*, L., in the jar, leaving them there for a good half hour, in order to attempt to transfer the *fuliginosus* odour to them through the medium of the jar. When the ants, about 10 ♂♂, were placed in the observation nest containing about 30 *fuliginosus* ♂♂ and 25 *mixtus* ♂♂, they started to rush around, exciting and apparently angering the ♂♂ of the other species, causing several of their number to be killed. About six *niger* ♂♂ remained, apparently unharmed, and though during the next day or so two more were killed, the rest remained uninjured in the nest for just about a week, one remaining much longer. The cause of the death of the *niger* seemed to be their habit of going up to the *mixtus* (the *fuliginosus* disregarded them practically entirely), and jerking their body backwards and forwards,† thus exciting the *mixtus*, who then attacked them.

A similar experiment was tried with *Myrmica ruginodis*, Nyl., four ♂♂ being introduced, but in this case the strangers tried to hide, and eventually died or were killed, the last one being taken out on the death of the others.

I have also observed solitary ♂♂ of *Formica fusca*, L., walking on the tracks of the mixed *fuliginosus-mixtus* nest in the garden.

I think that these observations seem to suggest that the odour of *Acanthomyops* (*Dendrolasius*) *fuliginosus*, Latr., is transferable to other ants though no really definite conclusions can be arrived at from the above data, excepting possibly in the case of *Acanthomyops* (*Chthonolasius*) *mixtus*, Nyl.—B. D. W. MORLEY, Bournemouth.

*Mr Donisthorpe suggests that the odour arises from a yellow secretion contained in the reservoir of the mandibular glands.

†"Saluting." See Donisthorpe, *Br. Ants* (1927), p. 208.

OBSERVATIONS EARLY IN THE SEASON.—Our colleague, Mr T. Bainbrigge Fletcher, writes me a list of species of Lepidoptera which he and Mr Richardson noted on the evening of 15th February in the Forest of Dean. “*Orrhodia vaccinii* (of course!), *Monima pulverulenta* (very early), *Biston strataria* (also early, but it was out the week before), *Phigalis pedaria* (plenty), *Apocheima hispidaria* (a few), *Erannis marginaria* and *E. leucophaearia* (both abundant), and *Oxypteron tortricella* (common). An early *Aglais (Vanessa) urticae* was also on the wing on 15.II.”—HY. J. T.

AN IRREGULAR PAIRING.—On the night of 17th February, at 7.45 p.m., I was interested to find *Erannis marginaria* ♂ in cōp. with *Phigalia pedaria* ♀. I understand from my friend, Mr T. Bainbrigge Fletcher, that the former species ♂ insect is rather given that way, there being previous records of its pairing with *Monima pulverulenta* ♀ (*Ent.*, xxii, 166, 1896): with *Selenia bilunaria* ♀ (*Ent. Rec.*, xli, 167, 1929): *Apocheima hispidaria* ♀ (*l.c.*, iv, 156, 1892). I am keeping the ♀, but fear that any ova which may result are unlikely to be fertile.—AUSTIN RICHARDSON, Beaudesert Park, Minchinhampton, Glos. [Of course, if the ♀ had paired naturally previously, fertile ova may accrue from that. But that brings up another question for discussion.—HY. J. T.]

A BLACK COLIAS CROCEUS.—For many years I have spent my holiday at Hastings during the fortnight of the Annual Bowling Tournament, which last year was from 22nd August to 3rd September. As I had not been very well I spent most of my time at the White Rock watching the various games. Most of the fortnight was bright, warm and sunny, and it was a great delight to me to watch the numbers of *Colias croceus* flying across the greens daily. On 25th August in the morning I had the surprise of my life, for a most wonderful var. came to within a few feet of where I was sitting. It was nearly black. There was just a suspicion of yellow to make identification certain; as it flew further away it looked all black. Though I must have seen a few score of *C. croceus*, I did not observe one ab. *helice* during my stay. One of the features of the White Rock is the rock garden which extends in a straight line for over 150 yards with a sloping bank. The flowers were very numerous in kind and colour. I noticed that the butterflies were attracted in numbers especially to the flowers of the purple *Statice* clumps. On 2nd September at about 11 a.m. I counted the following on a small clump:—1 *Pieris brassicae*, 1 *P. rapae*, 2 *C. croceus*, 2 *Aglais urticae*, 3 *Vanessa cardui*, and 1 *V. atalanta*.—A. H. HAMM. [It is most interesting to get a record such as this from a well-known life-long observer.—ED.]

In the *Times* of 18th February we note that Mr Eric Parker, an erstwhile Editor of *The Field*, records a “red admiral” which appeared in his garden in the morning of 15th February, which he and his daughter watched for some time on the flowers of *Viburnum tinus* at Hambleton, near Godalming. He records a specimen in 1935 in his garden on 23rd March. Surely these had hibernated in this country. [Other records in the *Times*:—Lyndhurst, 18th and 20th February; Epping Forest, 16th February.]

CURRENT NOTES,

PROPOSED NEW PUBLICATION.—It has been proposed that Mr H. St J. Donisthorpe's "Preliminary List of the Coleoptera of Windsor Forest," appearing in the *Entomologist's Monthly Magazine* from September 1936 to December 1938, should be published in book form. Before proceeding, it is necessary to have an approximate idea of the number of subscribers who would be interested in the publication, owing to the expense of production. Therefore, will those intending to subscribe send a card to the publishers.

In Staudinger's *Catalog*, III ed., p. 410 (1901), under *Hepialus humuli* (No. 1726) occurs an erroneous reference: "v. (et ab.) *thuleus*, Crotch, *Entom.*, II, p. 176 (1865)." Unfortunately this is being copied again and again. I have looked up this on behalf of our contributor, Sigr. Bytinski-Salz, late of Padova. (1) Crotch did *not* describe this form but only referred to the description of Newman in the previous month's issue, where (2) Newman described the variation and suggested the name *thulensis* and *not thuleus*. (3) This was on p. 162. I may add that Crotch used the name *thulensis* in his reference on p. 176. Hence the reference should stand corrected thus:—"v. (et ab.) *thulensis*, Newman, *Entom.*, II, p. 162 (1865)." Why in Seitz, *Pal. Bombyces*, II, 434, does *hethlandica*, Stdgr. (1871) stand instead of *thulensis* (1865) which has 6 years' priority?—HY. J. T.

We have received from Dr Wm. Junk, the great Continental publisher of scientific works, a *Catalogue of Publications*. This is really a catalogue de luxe in large quarto of works mostly published by his firm, works devoted to Biology and Natural History, Biology, Catalogues, Facsimile Editions, Vertebrata, Insecta, Evertibrata, Botany, Cryptogams, etc. In many cases there is a summary of the contents of the volume, or short reviews of it and much interesting detail. Facsimiles of Linné, *Systema Naturae*, and Poda, *Insecta Musei Graecensis*, two extremely rare and important works, are in the Catalogue, as well as Loew, *Die Europaischen Bohr-fliegen* (Trypetidae).

Our colleague, Dr Malcolm Burr, has been elected a Corresponding Member of the American Entomological Society.

When we were very young in the hobby of collecting, we should have welcomed an elementary periodical giving elementary matter, simple practical hints on collecting and breeding; instructions for making simple apparatus for both setting and storing; the adaptation of various containers for the rearing of larvae, and the making of more permanent cages for hibernation and pupation; the treatment of ova before hatching of the larvae, and of hibernating ova; how to care for the young larvae on hatching; hints on what to look for and how to do it, and all such. The above is the aim of the bi-monthly *Amateur Entomologist*, which has come to our table. Recently we have met with "followers of the net and pin" who have worked alone not caring to join associations of collectors who have passed their tyro stage and many of whom are more or less eminent in the study. This periodical opens its pages for queries on simple matters which, as a rule, only personal inter-

course can answer, and no doubt from its subscribers the future of both our local societies and our more advanced magazines will be assured. All honour to the ardent workers who are responsible for this enterprise.

We have to congratulate Dr F. W. Edwards, F.R.E.S., and Dr V. B. Wigglesworth, F.R.E.S., who have both recently been elected to the Fellowship of the Royal Society, an honour which is well deserved but hard to get.

SOCIETIES.

Long ago it was found impossible to print the monthly reports of the meetings of Societies owing to want of space, for which more valuable and interesting papers and notes were always awaiting. However, we hope during the present year to have extra pages occasionally and to be able to give short notices and extracts from reports of Societies, which may come to hand, but we cannot publish them in full. •

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. 15th November 1938. Mr G. de C. Frazer, President, in the chair. There were numerous interesting exhibits, including:—Mr S. Gordon Smith—A fine series of *Eumenis semele*, L., from Gloucestershire, Dorset, and Prestatyn district. The undersides of the Gloucestershire series were much lighter in colour than those taken in the Prestatyn district. *Argynnis aglaia*, L., with heavily marked black spots; *Satyrus galathea*, L., with black markings of large size; *Maniola jurtina*, L., a whitish form; *Cupido minimus*, Fuessl., with a black streak on underside of right upperwing. All these from Gloucestershire. A pale form of *Smerinthus ocellatus*, L., bred from Chester larva. Mr R. C. R. Crewdson—A series of *Spilosoma lubricipeda (menthastri)*, Esp., L., from Ballachulish, Argyll, and Rannoch, Perth, with the ground colour of forewings dark cream; three specimens of *Crymodes exulis*, Lef., var. *assimilis*, Doubl., taken in the Rannoch district; *Boarmia repandata*, L., ab. *conversaria*, Hübn., with ground colour nearly white, taken in Ross-shire in 1937, and black examples at Rannoch in 1938. Mr Wm. Mansbridge—A specimen of *Epischnia boisduvaliella*, Guen. (*farrella*, Curt.) taken at Formby, with a short series from the East Coast for comparison. This is an addition to the Lancashire and Cheshire fauna. A series of *Argyroproce profundana*, Fabr., from Arnside, showing a long range of variation.

A meeting of The Entomological Club was held at Florence House, Heston, on 14th December 1938, Mr H. Donisthorpe in the Chair. The following were present:—*Members*—Mr H. Donisthorpe, Mr H. Willoughby Ellis, Mr James E. Collin, Dr Harry Eltringham, Mr R. W. Lloyd, Mr W. Rait-Smith. *Visitors*—Dr K. G. Blair, Dr Malcolm Burr, Dr Karl Jordan, Mr W. H. T. Tams. The meeting was called for 7 o'clock, and supper was served at 7.30. After supper, the Chairman showed a living female of *Formica fusca*, L., which was sent with ten of her workers by air from the Orkneys in September last. The workers had died but the Queen was alive when the consignment arrived. This is the first record of this ant from the Orkneys. These islands, including the Shetlands, had been worked before for ants, the

only record being *Myrmica ruginodis*, Nyl. The late Rev. F. D. Morice had specially worked the Shetlands and Orkneys; the late J. Waterson the Shetlands; and Mr J. R. le B. Tomlin the Orkneys without success. Before the above records the most northerly range for *F. fusca* in the British Isles was Sutherland. The Chairman also exhibited a living larva of *Otesias serra*, F. (Col.); it was taken in Windsor Forest in oak bark on 26th June 1936, since which time it has been kept alive. It was in good condition and had been well fed, but had shown no inclination to pupate up to the date of the exhibit. Mr J. E. Collin exhibited specimens of the two Blow-flies, *Calliphora germanorum*, Villen, and *C. uralensis*, Villen, which are found in this country only in the North of Scotland, the former not uncommon north of the Grampians, and the latter known only from the Island of St Kilda and the neighbourhood of Tongue (Sutherland). Both are very little known on the Continent, though possibly overlooked owing to their close general resemblance to the other two very common species. *C. germanorum* was described from specimens found in Prussia, and *C. uralensis* from Zlatonšt (E. Russia) and Lapland, but the latter has since been found to be the common Blow-fly of W. Greenland and to occur on the Murmansk Coast of N. Russia and in Iceland, while the specimens exhibited were captured by the exhibitor at Loch Hope near Tongue in July of last year. A very pleasant evening was spent and the meeting broke up about 11 o'clock, the members and guests wending their way home with difficulty in the thickest fog of the year.—H. WILLOUGHBY ELLIS, Hon. Secretary.

REVIEWS.

PIERIS BRYONIAE, OCHS. UND *P. NAPI*, L., by the late Dr L. Müller and Hans Kautz, xvi + 190 pp., 16 colour plts., 3 text figures. Wien, 1938.—This is another outstanding work, an intensive, thorough and interesting investigation of a species about which there has been much ink spilled during recent years. A foreword is given by the famous and learned Dr Rebel, who, in his remarks, calls attention to the new term introduced by Dr Müller, viz., "Modification," as being of no genetic significance, nor of any systematic category, but only to record a slight variation within the significance of a well-recognised and named form of the species. The contents pages give a valuable analysis of the whole work, which is divided into eight main chapters, besides the Introduction by Herr Kautz. The whole of the literature has been examined and all possible evidence reviewed. Material from S. Siberia, the Amur, N. China, Japan, Alaska, Canada, N. America, N. Africa, West and Central Asia was studied and the results of Temperature experiment, were all examined, with the contributions of Harrison, Main, Merrifield, Standfuss, even as recent as Hale Carpenter and Hobby's "yellow *napi* forms." The genitalic investigation supports the view that there are two subspecies in very close relationship, that is, we have two species in the making, in an embryonic form, so to say. The plates, which have 242 excellent coloured figures, are a most valuable addition to a very brilliant contribution affording a real scientific knowledge of this interesting common species.—Hy. J. T.

ab. *efflorescens*, Hamps., *Ill. Het. B. M.*, VIII, 78 (1891).

FIG.—*l.c.*, pl. 145, 7.

ORIG. DESCRIP.—“♂ forewings purplish grey suffused with pink; numerous very indistinct transverse wavy lines; the most distinct of which form a band beyond the cell, and another submarginal one; reniform chestnut with an indistinct dark spot below it; an indistinct dark patch on costa near the apex. Hindwing dusky nacreous. Cilia of both wings pinkish brown. Underside pale; costa of both wings pink; a dark striga from costa three-fourths from base; hindwing with lunule at end of cell and postmedial band. Head and collar reddish grey; palpi black at sides; thorax and abdomen purple-grey.” Nilgiris.

Hamp., *Cat. Lep. Ph.*, IV, 423 (1903). “Head, thorax, and forewing much greyer; palpi blackish except at tips.”

ab. *erubescens*, Hamps., *Ill. Het. B. M.*, VIII, 78 (1891).

FIG.—*l.c.*, pl. 145, f. 14.

ORIG. DESCRIP.—“♂ forewing grey uniformly suffused with pink; orbicular grey, outlined with black; a large black spot below it in the median interspace; reniform grey, outlined with chestnut. Hindwing pale nacreous. Underside whitish, hindwing with distinct lunule at end of cell and post-medial band. Head and abdomen ochreous grey; thorax rosy grey; palpi black at sides.” Nilgiris.

race *descripta*, Hamp., *Moths. Br. Ind.*, II, 184 (1894).

ORIG. DESCRIP.—“Fuscous or purplish grey-brown, pale or dark red-brown, or bright red or golden-brown. Palpi black at sides, or pink in the golden specimens. Forewings with the sub-basal, ante- and post-medial wavy lines indistinct, the last much curved; the submarginal line pale and angled below the costa; the orbicular and reniform indistinct, the latter often with the upper part ochreous or reddish, the lower part fuscous; the claviform small and obsolescent, sometimes filled in with black. Hindwings pale or dark fuscous; cilia of both wings reddish. Underside with a post-medial line doubly curved on hindwing, which has a cell spot.” Japan: N.W. Himalayas: Sikkim: Nilgiris.

f. *perfusca*, Kane, *Ent.*, XXVIII, 217 (1895).

ORIG. DESCRIP.—“A rarer form also occurs of a ‘unicolorous dark sepia brown, the only markings being a very clear whitish reniform stigma, preceded by a darker blotch representing a vestige of the median band, and in some instances a pale dotted ante-marginal wavy line.’ Some examples of this melanic variety (*rufa*, Tutt) are wholly unicolorous, while others show only a trace of the pale reniform, and others only with its outline represented.” Tyrone, Sligo, Roscommon, Clonbrook, Ireland.

ab. *bicolor* (Obthr.) Culot, *N. et G.*, I (1), p. 48 (1910).

FIG.—*l.c.*, pl. 7, f. 11.

ORIG. DESCRIP.—“Certain examples of *dahlia* from England in the Oberthur collection, particularly those of yellowish coloration, are so near to *A. primulae* (*festiva*) that it is almost impossible to indicate the fixed characteristics, allowing of their differentiation; since the general aspect can alone serve as guide, I am induced to figure a series of the very variable *A. primulae*. It was the only means of recognition,

for it is in my opinion impossible to arrive at a satisfactory result by descriptions of markings, which would only succeed in confusing the differences the more, so great is the general similarity."

ab. ♀ *fusca*, Lenz., *Ostheld. Schm. Sud-bay*, II (2), 239 (1927).

ORIG. DESCRIP.—"The deep dark-brown form of the ♀ with obsolescent stigmata."

f. *provincialis*, Corti-Stz., *Pal. Noct. Supp.*, III, 74 (1933).

FIG.—*l.c.*, pl. 11e.

ORIG. DESCRIP.—"This is a robustly built rich brown form, well marked with bold dark bands in discal and subterminal areas. Especially the latter contrasts strongly with the paler marginal areas."
Cogne.

ab. *nyx*, Strand., *Festschrift*, III, 563-4 (1937).

ORIG. DESCRIP.—"The forewings have almost completely lost their marking. But the hindwings are darker than in normal specimens. ♀." Brandenburg.

ab. *signata*, Strand., *Festsch.*, III, 563-4 (1937).

ORIG. DESCRIP.—"This ♂ example has yellow-brown ground colour of forewings. The inner margin is somewhat darkened, as much as it is in the typical form; thus the yellow-brown ground is here somewhat more striking. The character of the new form is the outer third of the wing between the outer transverse line and the margin. To the outer transverse line there follows next a narrow band of the ground colour. This is finished off by a soft waved blackish streak of about 1½ mm. wide. This goes to the inner margin, but is abruptly cut off before the costa. In this streak lie the pale nervures. The area up to the waved line is again yellow-brown. The waved line itself is again outwardly very strongly dark shaded so that a deep contrast in marking arises." Brandenburg.

ab. *accentifer*, Strand., *Festschrift*, III, 563-4 (1937).

ORIG. DESCRIP.—"Only observed in the ♀. From the spot-like sagittate stigma arises a yellowish streak about 2 mm. long, which reaches up to the inner transverse line. It has the same colour as that which often forms the filling of the reniform. While in my similar bred transitional forms, in which this character was more or less developed, I obtained only one example possessing this character strongly." Brandenburg.

ab. *griseopulverata*, Strand., *Festschrift*, III, 563-4 (1937).

ORIG. DESCRIP.—"Only observed in the ♀. It is characterised by the very grey general suffusion, which occurs on the whole inner half of the forewings. Placed against the dark central shade, the deep brown colour stands out strongly. Behind the outer transverse line there is a narrow band of very gray tone, like the area between the waved line and the margin. Here in this form there is developed a strong contrast of colour."

Noctua, L. (1758) Ochs. & Tr. (1816-25) Gn., South, Barr. [*Agrotis*, Ochs. & Tr. (1816-25) Stdgr., Hamp., Splr., Meyr., Culot: *Rhyacia*, Ochs. & Tr. (1816-25) Warr.-Stz., Corti-Drdt.-Stz.: *Graphiphora*, Ochs. & Tr. (1816-25) H.-S., Meyr.] *brunnea*, Fb. (1788) [*lucifera*, Esp., 1786] ?

Tutt, *Br. Noct.*, II, 112 (1892): Meyr., *Handb.*, 101 (1896): Barr., *Lep. Br. I.*, IV, 56, plt. 143 (1897): Stdgr., *Cat.*, IIIed., 140 (1901): Hamps., *Lep. Phal.*, IV, 413 (1903): Splr., *Schm. Eur.*, I, 150, plt. XXXIII, 14 (1905): South, *Moths Br. Is.*, I, 224, plt. XXV (1907): Warr.-Stz., *Pal. Noct.*, III, 45, plt. 10b (1909): Culot, *N. et G.*, I (1), 48, plt. 7, 12 (1910): Meyr., *Rev. Hand.*, 107 (1828): Corti-Drdt.-Stz., *Supp. Pal. Noct.*, III, 76 (1933).

Schiff., *Verz.*, 83 (1775), gives the name *brunnea* to a *Noctua*, "Alis anticis rufo-brunneis, the Stockerbsen-Eule."

Illiger & Haf., *Neu. Ausg. Verz.*, I, 277 (1801), identify the *Bombyx flammea*, Esp., with this, after reference to the collection in Vienna.

Esp., *Abbild.*, IV (2), 1, 453, plt. 142, 6, *lucifera* (1786), is a crude figure considered by the older authors to be a form of *brunnea*, called by Tutt a "beautiful purple variety."

Bork., *Naturges*, IV, 462, says "I have no hesitation in considering the *Phalena* figured here by Esper for the *Noctua brunnea* of the *Wien Verz.*" But the *flammea*, Esp., *Abbild.*, III, 269, plt. LIII, 3, is a good recognisable figure of quite another species. Hence *brunnea*, Schiff., is not the prior authority, and *flammea*, Esper, should be called *brunnea*, Schiff. And! *brunnea*, Fab., requires a new name!!! In the description by Fabricius is the phrase "macula media transversa flava;" this seems to apply to what we are calling *brunnea* at the present time.

I place little reliance on the opinion of Borkhausen. He gives as references for *brunnea*: (1) Rosel., *Ins. Belust.*, III, plt. 68, fig. 6; (2) Kleeman, I, plt. 17, fig. B, both of which figures are undoubtedly *nictitans*. Hufnagel's *brunnea*, *Berlin Mag.* is said by Rottemberg, *Naturf.*, IX, 131, to be Kleeman's fig. of *nictitans*. There is no similarity between *nictitans* and *brunnea*.

Since it is practically certain from the reference in the "Anhang" on p. 364 of Esper's *Abbild.*, vol. iv, that the plates at least up to plt. 159 were issued (published long before the text) in or before 1786, the date of the title page of vol. iv, it would seem that the priority name may be *lucifera*, Esp., the purple form, and for the brown form hitherto taken as the typical, the name *fragariae*, View., a brown form like that hitherto called *brunnea*, Fab., must be substituted.

Gdt., *Hist. Nat.*, V, 183, plt. LXI, 4 (1825), gives a good figure of a brown (not red-brown) form. He says that fig. 428, Ernst & Engram., is of this species.

Hb., *Samml. Noct.*, 121 (1800-1803), gives a good figure of one of the forms.

H.-S., *Sys. Bearb.*, II, 350 (1851), puts Hb., fig. 121, as "very poor, much too pale coloured, especially the hindwing."

Esp., *Abbild.*, IV (2), plt. 142, 6 (1786). This figure is very crude and hard, but carefully looked into there show all the chief features of a *brunnea* scheme of marking.

Frr., *Beitr.*, II, 30, plt. 58 (1829), gave a figure rather richly brown with a smooth slate coloured wide band. *Neu. Beitr.*, VI, plt. 531, 4

(1848), gave a figure with an unusual sub-apical complicated blotch, a large yellow square with a dark + and two yellow dots below.

Gn., *Hist. Nat. Noc.*, V, 330 (1852), treats *lucifera* and *fragariae* as synonyms.

Barrett, *l.c.*, plt. 143, 4 figs. 3 and 3a, ♂ and ♀ very good figures; 3b, light ochreous brown with well marked spots, lines and bands; 3c, dark black brown somewhat small, marking not conspicuous.

Splr., *Schm. Eur.*, I, 150, plt. 33, 14, gives a good general figure but hardly red enough for the usual form.

South, *M. Br. I.*, I, 224, plt. 113, 3-4 (1907), gives 2 very fair figures. Fig. 3 is a purple brown; 4 is a pale reddish.

Warr.-Stz., *Pal. Noct.*, III, 45, plt. 10b (1909), treated *lucifera*, Esp., *arvensis*, Gmel., *fragariae*, Bork., *carnea*, Thnbg., and *subdolens*, Btlr., as synonyms and recognised no variations. In the genus *Rhyacia*, a good figure.

Culot, *N. et G.*, I (1), 48 (1910), evidently doubts the name *brunnea* as he places *lucifera* in brackets as alternative to *brunnea*. He gives a good figure, plt. VII, f. 12.

Corti-Drdt., *Pal. Noct. Supp.*, III, 76, add two forms from Norway, *norvigicola*, Strnd., and *suffusa*, Strnd.

Barrett says of the Variation:—"Variable in the tone of the ground colour of the forewings, from dark purple-brown to light purple-red or brownish red; and in the colour of the reniform stigma, which is sometimes obscured and almost hidden by dark scales. The greyish suffusion is also somewhat tinged with violet. All the shades of colour in this species are so fully connected by every shade of intermediate that no distinguishing line of variation can be drawn. Specimens from Ireland are often very rich in dark purple or purple-red colouring, and noticeable from the rich yellow of the reniform stigma, or its extreme obscuration."

Barrett, *l.c.*, plt. 143, gives four good figures including a light purplish red form (2b) and a very dark purple-brown almost black (2c).

The Forms and Names to be considered are:—

brunnea, Schiff. (1775), *Verz.*, 83, is *flammea*, Esp.

lucifera, Esp. (1786), *Schm. Abbild.*, IV (2), 453, plt. 142, 6 (doubt as to date of publication).

brunnea, Fb. (1787), *Mant.*, II, 168.

arvensis, Gmel. (1790), *Sys. Nat. Linn.*, I (5), 2569.

fragariae, View. (1790), *Tab. Verz.*, II, 56, plt. II, 4-5.

f. *carnea*, Thnbg. (1792), *Diss.*, IV, 55.

race *subdolens*, Btlr. (1881), *Tr. Ent. S.*, 181.

ab. *nigricans*, Homeyer-Lampe (1888), *Ent. Tid.*

ab. *rufa*, Tutt (1892), *Brit. Noct.*, II, 112.

ssp. *norvigicola*, Strnd., *Arch. f. Naturg.* (1915), Vol. 81, A, Hft. 12, p. 143 [*Hamp.*, *Lep. Phal.*, IV, 413 (1903)].

ab. *suffusa*, Strnd. (1903), *Arch. math. og. Nat.*, XXV.

Tutt dealt with (1) the brown form, (2) the purple variety "generally distributed" in Britain, *lucifera*, Esp., (3) our purely purplish black *nigricans*, Homeyer, (4) the var. *rufa* suffused with red generally.

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CONTENTS OF VOL. II.

MELANISM AND MELANOCHROISM—Bibliography—Notes on Collecting—Articles on VARIATION (many)—How to breed *Agrotis luntgera*, *Sesta spheniformis*, *Taenioctenoptima*—Collecting on the Norfolk Broads—Wing development—Hybridising *Amphidasys prodromaria* and *A. betularia*—Melanism and Temperature—Differentiation of *Dianthoectas*—Disuse of wings—Fauna of Dulwich, Sidmouth, S. London—Generic nomenclature and the *Acronyctidae*—A fortnight at Ranoch—Heredity in Lepidoptera—Notes on Genus *Zygaena* (*Anthrocera*)—Hybrids—Hymenoptera—Life-history of *Gonophora derasa*, etc., etc., 312 pp.

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

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CONTENTS.

PUPA-DIGGING, AND SOME MORALISING, <i>An Old Moth Hunter</i> ,	65
JAMES JOHN WALKER, <i>H. Donisthorpe</i> (Plate),	67
NOTES ON FOOD-PLANTS OF THE LARVAE OF BRITISH TRYPETIDAE, <i>M. Niblett</i> ,	69
OVIPOSITION OF OCHRIA OCHRACEA, HUB. SYN. FLAVAGO, SCHF., <i>P. B.</i> <i>M. Allan, M.A., F.S.A.</i> ,	73
COLLECTING NOTES:—A Few Records of Orthoptera, <i>E. S. Brown</i> ; Micro- lepidoptera New to Gloucestershire in 1938, <i>T. Bainbrigge Fletcher</i> ; Plume Larvae in May-June, <i>Id.</i> ,	76
CURRENT NOTES,	77
SOCIETIES,	79
REVIEWS,	80
SUPPLEMENT:—The British Noctuae and Their Varieties, <i>Hy. J.</i> <i>Turner, F.R.E.S., F.R.H.S.</i> ,	(177)-(180)

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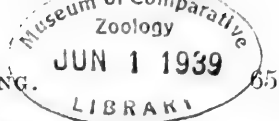
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PUPA-DIGGING, AND SOME MORALISING.



PUPA-DIGGING, AND SOME MORALISING.

By AN OLD MOTH HUNTER.

If you ask a number of people to name a play by Shakespeare probably a majority will say "Hamlet." And if you discuss pupa digging it is odds on that someone will mention Parson Greene. For the Reverend Joseph Greene was undoubtedly the greatest pupa-digger of all time. His little book of instruction, *The Insect Hunter's Companion*, has been reprinted several times; indeed it is unlikely that it will ever be superseded; for it contains the experience of a lifetime—a lifetime of practising one particular method of obtaining and observing Lepidoptera. No one has ever surpassed Greene's skill and his knowledge of pupa-digging. That he occasionally allowed enthusiasm to urge on his pen when writing of his favourite pursuit in no way detracts from his greatness: he was a first-rate entomologist, and a successful one to boot. The reason for his success is the usual one: he studied his subject carefully and he practised it assiduously. He had the time and the opportunity, and he made the most of both.

Pupa-digging was practised by entomologists, however, long before the vicar of Brandeston came on the scene. Benjamin Wilkes, whose book, *The English Moths and Butterflies*, was published between 1747 and 1760, recommends us to use "such a trowel as bricklayers use" and to dig "about the roots of such trees as oaks, elms, limes, poplars, willows, etc., and also by the sides of walls and pales." And he goes on to tell us that "the usual time" to dig is from September to March, which indicates that it was an established method of obtaining pupae in his day. Doubtless Albin and the first members of the old Aurelian Society pooled their experiences in the coffee-house and dug at the trees which grew in the meadows at Vauxhall, Chelsea, and Marylebone.

Many entomologists, I know, do not practise pupa-digging. They regard it as the perquisite of the collector, and indeed, if one may judge by a small book on the methods of obtaining Lepidoptera published a few years ago, pupa-digging is chiefly to be recommended because of the facility with which it enables the collector to fill his cabinet. In the words of this writer, it provides the collector with "absolutely perfect specimens with the minimum of trouble"—just as previously the same writer had advocated the use of the lamp trap for providing "a steady enrichment of the collection with the minimum of personal effort." One gains the impression from these words that the collector's ideal would be to recline in a deck-chair while an attendant drew pupae from the earth in abundance with an adapted vacuum-cleaner!

But the abuse of a practice is no reason why that practice should be abandoned by thoughtful men, and one has only to read Greene's book to see how considerably he advanced our knowledge of one stage of the Lepidopteron's life cycle. Though he certainly was a collector he did not turn up the soil solely to obtain specimens: he was interested in discovering the pupating site of every insect in his cabinets. He examined, slowly and carefully, with a keenly observant eye, every nook and cranny which might contain a cocoon, noting the cocooning site, the structure and texture of the cocoon, its substance and colour, its size and shape. "To find this pupa is a work of both time and pain," he writes; and

again "great caution is necessary. It is a good plan to put your hand in and gently feel the trunk for any cocoons which may adhere to it." . . . "The pupa is black and stout, enclosed in an extremely delicate open network of a rusty brown colour: it is very difficult to find: it spins on the surface of spreading moss, or barely beneath it, sometimes between two leaves . . ." But I need quote no more: doubtless most entomologists possess the book and many of them will have found it as valuable as I have.

Pupa-digging, then, should not be despised by the entomologist. By breeding Lepidoptera from the egg we can determine every external characteristic of the pupa and most things about its cocoon. But unless we search for pupae out of doors we shall have to rely on the books for our knowledge of pupating sites and of the materials woven about the cocoon as camouflage in a state of nature. And book-information is a poor thing compared with actual experience and personal observation in the field.

Greene recommends that we dig all the year round—a course that has its disadvantages. My personal experience, which, as the Irish M.P. remarked, "is a mere flea-bite in the ocean" compared with Parson Greene's, is that old oaks are the most productive trees to dig, though oaks are but third in Greene's list. And if you live in an open wooded country, as I do, practically every oak that you prospect with a trowel in August will yield a few (sometimes a lot of) *C. aprilina*. You cannot put these pupae back among the roots of the tree and cover them with soil, because a pupa without a cocoon in such a situation has no chance at all of resulting in a moth. Moulds of all kinds, fungi of various species, birds, mice, voles and moles will see to that. All you can do is to take them home with you, place them in the puparium, and release the moths when they emerge. Provided your home is in the above-mentioned open wooded country no harm is done: the moths will find both oaks and mates. But if you live in a town you are in a different case: your *aprilina* will, ten to one, get no further afield than the nearest street lamp, and you will have done harm to your local fauna.

So in this matter of sempiternal digging I do not see eye to eye with the great Greene. He does not tell us what he did with his *aprilina*, and that the species was as common with him as it is with me is shown by his remark that it occurs "in the utmost profusion: I have taken as many as twenty at one tree." But that he took them all home is certain; for in another passage he informs us that he "once had a thousand pupae of *instabilis* . . . some curious and beautiful varieties may be obtained."

In my district *aprilina* usually appears at sugar in the first week of October. But in 1937 bred pupae began to hatch on 2nd September. So I prefer to start my digging about 7th October. *Trepida* and the other two oak-feeding Prominents should have pupated by then—though in 1936, that year when *furcula*, *palpina* and *ziezac* were still in the larval stage in mid-October—I dug up a *trepida* unpupated on 24th October.

Dr Guard Knaggs was not, it seems, a pupa-digger. He mentions digging as "a method which has been strenuously advocated in this country" and goes on to quote Greene, giving no hint as to whether he himself had ever put trowel to earth. Richard South could not "say much for the practice" as his own efforts "have not been very highly



Ent. Rec. and Jr. of Varn.

Photo. H. Donisthorpe.

COMM. J. J. WALKER, R.N., M.A., F.L.S., F.R.E.S.

rewarded," and he observes that "Not a single species was ever obtained by digging that I could not have secured more easily in some other way."

"More easily"

Dear, dear! I am sadly out of tune with the times. I ought to have gone to earth myself years ago; for I thrive on mental and bodily exertion, and both are anathema to the world to-day. Everything must be done as easily and with as little "trouble" as possible if you would be abreast of the times. The energies of mankind must be directed towards the discovery of "labour saving" devices. Work is so irksome, life is such a trouble, everything is such a bother. "Work is a man's reward and his strength and his glory and his pleasure" wrote George Sand; but who reads George Sand nowadays? No wonder, say my young friends, a person who expressed such outrageous sentiments should be as dead as mutton. And as for Carlyle, who asserted that "work is the mission of man on this planet," what did the old mugwump know about the movies and talkies and film stars and soccer and *Daily Mail* labour saving Exhibitions, and all the things that count to-day? Why, the old idiot never saw a picture theatre in his life. A pity he cannot come back and see how we have progressed since we discarded that ancient fetish, that outworn shibboleth, that hypocrisy called "work"

But pupa-digging—

No. On second thoughts I do not recommend it. It is too much trouble.

JAMES JOHN WALKER.

(With photo.)

With the death on 12th January 1939 of our old friend, Commander Walker, the last of the "Old Guard" of British Coleopterists has passed away. Walker was born at Sheerness on 16th May 1851, his father being James Samuel Walker of the Royal Naval Dockyard there. He was apprenticed, at the age of 14, as a student of engineering at the Royal Naval Dockyard at Sheerness, where he had a successful career. He became a Chief Engineer in April 1888, Staff Engineer in April 1892, and Fleet Engineer in April 1896. He was married in July 1885 to Angelina Kerry, who died in 1887, and he leaves one daughter, to whom our deepest sympathy is tendered. He has left his manuscript diaries to the Royal Entomological Society of London, and his collections, books, etc., to Oxford University Museum. He went to Oxford to settle down in May 1904, and the University conferred on him the degree of M.A., *honoris causa*, on 10th August 1905. He became a Fellow of the Royal Entomological Society of London in 1878; of which he was President in 1919-20 and Secretary in 1899, and 1905-18. He joined the South London Natural History Society in 1880; The Linnean Society in 1889; The Linnean Society of New South Wales in 1900; The Ashmolean Natural History Society of Oxford in 1904, became President 1913-14; and The Society of British Entomologists in 1933. He had been Chief Literary Editor of the *Entomologist's Monthly Magazine* for many years until the time of his death. It must have been round about the year 1891 when I first met Walker, but the first time I appear to have definitely been out collecting with him was on 25th October 1893, in the Isle of

Sheppey. I remember we took the beautiful beetle, *Ilelops coeruleus*, L., in old posts, and a nice series of the rare species, *Telmatophilus brevicollis*, Aub., at the roots of rushes, which we cut through with a knife he called "Jack-the-Ripper." The last time I was actually out collecting with him was on 21st July 1935, when we captured the recently discovered, but widely spread in England, *Philonthus rectangulus*, Sharp, in a manure-heap near his house in Oxford. The last day's collecting we had together, however, was in the New Forest, on 24th June 1930, when he and his daughter, the late Miss Kirk, and I, took a carriage and drove to Mark Ash. Although he was 79 then, he managed the long walk back to Brockenhurst quite comfortably. Walker was an all round naturalist, and a first rate botanist, etc., and his memory, to the last, for the names of species, whether in Britain, or elsewhere in the world, was phenomenal.

He had collected much in Australia (where I believe he was known as "bug Walker") and New Zealand, and many other places; China, Gibraltar, etc., etc.; but our memory is chiefly of him as a British Coleopterist. The many rare and new beetles he took, or discovered, are too numerous to record here, but one may mention a few of them:—*Baris scolopacea*, Germ., was first taken in Britain by Walker, and his, then to be brother-in-law, G. C. Champion, at Sheerness in June 1871, by sweeping Sea Purslane (*Atriplex portulacoides*). This beetle has never been found elsewhere in Britain, except at Bosham, where it was discovered by the writer on the same plant on 17th August 1920. [*Ent. Mo. Mag.*, 57, 153 (1921): *Ent. Record*, 44, 148 (1932).] In 1873 he captured three specimens of *Anisotoma pallens*, Strm. [= *Liodes rotundata*, Er., *Ent. Mo. Mag.*, 69, 53 (1933)], then new to Britain, by evening sweeping on the Deal sand-hills. In 1906 he discovered the very interesting myrmecophilous beetle, *Claviger longicornis*, Müller, in nests of the ant, *A. (D.) niger*, at Bletchington, near Oxford. He was the last Coleopterist in Britain to take the beautiful little *Acupalpus elegans*, Dej., at Queenborough in 1875. As pointed out by him: "The large village known as 'West Minster' now occupies the locality of this and many other choice beetles." He visited the New Forest every year for many years and took many rare species; some only found there by him. He took more specimens of the rare *Colydium elongatum*, F., than any other coleopterist, past or present. One may here quote a few couplets of "The New Forest National Anthem" by Walker, of which we possess a copy in our New Forest note-book. The air is that of "Our Tight Little Island":—

"Oh *Aedes detritus*, you beggar you bite us,
Ri-toodle de-oodle de i-do!"

"Oh curse you oh 'Clegg,' you're biting my leg,
Ri-toodle, etc."

"Oh Gad-fly, oh Gad-fly, you'll drive us all mad fly,
Ri-toodle, etc."

"Oh 'Stout,' oh 'Stout' you beggar, get out,
Ri-toodle, etc."

"Oh *Chrysops caecutiens* here's (whack!) where our duty ends,
Ri-toodle, etc."

"Oh ants, oh ants, you bite through our pants,
Ri-toodle, etc."

There are a number of other verses. It was a joy to hear him humming this song in the Forest, and it illustrates in a small way his cheerful and happy disposition, and his contented outlook on life in general. I for one, always felt happier when I had been in Walker's company—he made many friends, and, I am sure, had no enemies at all. Of his very numerous notes and papers on Entomology there is no space to deal with here. One may mention that he published a number of very useful and interesting local lists:—"The Coleoptera of the Rochester District" (1899); "The Coleoptera of the Oxford District" (1819-1929), and especially his last on "An Annotated List of the Coleoptera of the Isle of Sheppey" (1932).—H. DONISTHORPE.

We are much indebted to Miss Walker for kindly lending us this snapshot. It was taken by us on 13th September 1907 outside his house, "Aorangi," Summertown, Oxford.—H. D.

NOTES ON FOOD-PLANTS OF THE LARVAE OF BRITISH TRYPETIDAE.

By M. NIBLETT.

The following notes on food-plants of British *Trypetidae* are compiled partly from personal observations, and partly from published records mostly of Continental origin.

The first section deals with insects recorded at some time or other as occurring in Britain; the second of species not so recorded, but having food-plants indigenous to this country, which provides a possibility of their occurring here. I have not included all the recorded food-plants as some are to my mind very doubtful, or the plants are not found in Britain.

It may be well to note that many of those occurring in flower-heads hibernate as larvae, and pupate about May there; gall-causing and stem-feeding species have similar habits, none of these leaving their food-plants except as an imago, and that all species, whose larvae are leaf-miners, pupate in the earth, as also do those infesting fruits. Certain species complete their transformations by the end of the summer, the flies emerging and hibernating as adults, while a few species are double-brooded.

SECTION I.

- Furibia (Urophora) aprica*, Fall. Food-plant unknown.
- E. cardui*, L. The larvae are to be found in galls upon the stems of *Cnicus arvensis*, L., from midsummer until early spring.
- E. cuspidata*, Mg. In galls in the flower-heads of *Centaurea scabiosa*, L.
- E. jaceana*, Her. In galls in flower-heads of *Centaurea nigra*, L. Note that this species has been recorded in error as *Urophora solstitialis*, L., for many years.
- E. macrura*, Lw. Recorded by Wingate is I think very doubtful, as larvae are recorded abroad only from the flower-heads of *Onopordon illyricum*, L., a thistle confined to the Mediterranean regions of South Europe, North Africa, and Asia Minor.
- E. quadrifasciata*, Mg. The larvae may be found in the flower-heads of *Centaurea nigra*, L., enclosed or partly enclosed in the seeds, from July to the following April.

- E. solstitialis*, L. The larvae inhabit galls in the flower-heads of *Carduus nutans*, L. and *Cnicus lanceolatus*, Scop.
- E. spoliata*, Hal. Lives in the flower-heads of *Serratula tinctoria*, L., from July to the following May.
- E. stylata*, Fab. In galls in the flower-heads of *C. lanceolatus*, *C. nutans*, and less frequently in those of *C. arvensis*, from mid-summer to late spring.
- Myopites blotii*, Bréb. In a hard gall in flower-heads of *Pulicaria dysenterica*, L. and *Inula crithmoides*, L., from August to July.
- M. longirostris*, Lw. (*frauenfeldi*, Sch.). In a hard gall in flower-heads of *Inula crithmoides* and *P. dysenterica*, from July onwards.
- Platyparea* (*Poeciloptera*) *poeciloptera*, Schrank. In stems of *Asparagus officinalis*, L., from May to September.
- Platyparella* (*Platyparea*) *discoidea*, Fab. In stems of *Campanula latifolia*, L.
- Vidalia cornuta*, Scop. (*Spilographa abrotani*, Mg.). Larvae are to be found in mines in leaves of *Eupatorium cannabinum*, L., during the summer.
- Rhagoletis* (*Spilographa*) *alternata*, Fab. The larvae inhabit the fruits of various species of Roses, both cultivated and wild, and are best searched for at the end of the summer.
- R. cerasi*, L. Recorded from fruits of *Prunus avium*, L., *P. cerasus*, L., *Lonicera xylosteum*, L. and *Berberis vulgaris*, L. British occurrence requires confirmation.
- R. meigeni*, Lw. Recorded from fruits of *Berberis vulgaris*, L.
- Trypeta* (*Spilographa*) *artemisiae*, Lw. Recorded from *Artemisia vulgaris*, L., *A. absinthium*, L., *E. cannabinum*, L., *Senecio vulgaris*, L., and *Tanacetum vulgare*, L.; lives in leaf-mines in summer.
- T. hamifera*, Lw. Food-plant unknown.
- T. zoë*, Mg. Recorded as mining the leaves of *Senecio vulgaris*, L., *S. Jacobaea*, L., *S. erucifolius*, L., *Chrysanthemum leucanthemum*, L., *C. maximum*, *C. indicum*, *Artemisia vulgaris*, L., and *E. cannabinum*; the larvae have usually left the mines by the end of June.
- Gonioglossum wiedemanni*, Lw. Larvae in the berries of *Bryonia dioica*, Jacq. during July and August.
- Phagocarpus permundus*, Har. (*Anomoea antica*, Weid.). Occurs in fruits of *Crataegus monogyna*, Jacq., *C. oxyacantha*, L., and *Berberis* spp. in September and October.
- Acidia cognata*, Wied. Larvae in mines in the leaves of *Tussilago farfara*, L., and *Petasites ovatus*, Hill. I have never found these larvae before the beginning of October.
- Philophylla* (*Acidia*) *heraclei*, L. Another leaf-miner, the larvae may be found in the leaves of *Apium graveolens*, L. (Celery), *Heracleum sphondylium*, L., *Sium latifolium*, L., *Angelica sylvestris*, L., and *Peucedanum sativum*, Benth. & Hook. (Parsnip), in the summer.
- Myiolia caesio*, Har. (*Acidia lychnidis*, Fab.). The larvae occur in mines in the leaves of *Lychnis diurna*, Sibth.
- Cryptaciura* (*Aciura*) *rotundiventris*, Fal. In "Typical Flies," E. K. Pearce, 1921, there is a note to the effect that this species was bred from Burdock by Mr F. C. Adams and Mr King.

- Ceriocera ceratocera*, Hend. (*Trypeta cornuta*, Fab.). In the flower-heads of *Centaurea scabiosa*, L., from July to the following May.
- C. microceras*, Her. In stems of *C. scabiosa* from August to June.
- Chaetorellia* (*Trypeta*) *jaceae*, R. D. In flower-heads of *C. scabiosa* and *C. nigra* from August to May.
- Chaetostomella* (*Trypeta*) *onotrophes*, Lw. The larva of this species seems to occur in the flower-heads of a number of plants from July to May. It is recorded from *Arctium majus*, L., *A. minus*, Bernh., *Carduus crispus*, L., *C. nutans*, L., *Centaurea cyanus*, L., *C. nigra*, L., *C. scabiosa*, L., *Cnicus eriophorus*, Roth, *C. lanceolatus*, Scop., *C. palustris*, L., and *Serratula tinctoria*, L.
- Terellia longicauda*, Mg. (*Trypeta acuticornis*, Lw.). Occurs in the flower-heads of *Cnicus eriophorus*, Roth from August to May.
- T. serratulae*, L. May be found in flower-heads of *C. crispus*, *C. nutans*, and *C. lanceolatus* from August to May.
- Orellia* (*Trypeta*) *colon*, Mg. The larvae may be found in flower-heads of *C. scabiosa* every month of the year except perhaps June.
- O. falcata*, Scop. The larvae of this species live in the root-stock of *Tragopogon pratense*, L. from July to May.
- O. lappae*, Ced. British records still considered doubtful. The larvae are recorded from flower-heads of *Onopordon acanthium*, L. and *C. crispus*.
- O. ruficauda*, Fab. (*florescentiae*, L.). In flower-heads of *C. arvensis*, *C. palustris*, and *C. pratensis* from July to May.
- O. tussilaginis*, Fab. Larvae in the seeds of *Arctium majus* and *A. minus* from July to May. Continental records from the *Centaureas* I consider more than doubtful.
- O. winthemi*, Mg. In the flower-heads of *Carduus crispus* from July to May. Continental records give *C. eriophorus* and *C. palustris* as additional host plants.
- O. vectensis*, Col. In the flower-heads of *Serratula tinctoria* from August to June.
- Acinia* (*Tephritis*) *corniculata*, Zett. Food-plant unknown.
- Xyphosia* (*Tephritis*) *miliaria*, Schr. In flower-heads of *C. arvensis*, *C. eriophorus*, *C. palustris* and *A. majus* from July to May.
- Ictericia westermanni*, Mg. Larvae in flower-heads of *Senecio erucifolius*, L. and *Jacobaea*, L. from August to May.
- Campiglossa grandinata*, Rond. Larvae live in a gall on the stems of *Solidago virgaurea*, L., which should be searched for during the autumn or early winter.
- Paroxyna* (*Tephritis*) *absinthii*, Fab. Larvae recorded from flower-heads of *Bidens cernua*, L., *B. tripartita*, L. and *Filago gallica*, L.
- P. argyrocephala* Lw. Food-plant unknown.
- P. loewiana*, Hend. Larvae in flower-heads of *Solidago virgaurea*.
- P. parvula*, Lw. Food-plant unknown.
- P. plantaginis*, Hal. In flower-heads of *Aster tripolium*, L. from August to May.
- P. tessellata*, Lw. In flower-heads of *Sonchus arvensis*, *Hypochaeris radicata*, *Crepis capillaris*, *Taraxacum officinale*, *Leontodon autumnale* and *L. hispidum*.
- Oxya* (*Tephritis*) *flavipennis*, Lw. The larvae in fleshy galls on the roots of *Achillea millefolium*, L., autumn and winter.

- O. nebulosa*, Wied. (*proboscidea*, Lw.). Larvae in a gall upon the root-stock of *Chrysanthemum leucanthemum*, L.
- O. parietina*, L. Larvae in galls upon stems of *Artemisia vulgaris*, L. and *A. absinthium*, L.
- Sphenella marginata*, Fal. In swollen flower-heads of *Senecio aquaticus*, Hill, *Jacobaea*, L., *silvaticus*, L., *viscosus*, L., *vulgaris*, L. and *erucifolius*, L. in July and August.
- Ensina sonchi*, L. In flower-heads of *Hypochaeris radicata*, L., *Sonchus arvensis*, L., *S. oleraceus*, L., *Picris hieracioides*, L., *Leontodon hispidum*, L., and *Tragopogon pratense*, L. during July and August. Also recorded from *Aster tripolium*, L., *Carduus nutans*, L., *Crepis biennis*, L., *Leontodon autumnale*, L., *Senecio jacobaea*, L. and *S. vulgaris*, L.
- Euaresta guttata*, Fal. Recorded from flower-heads of *Anthemis arvensis*, L., *C. palustris*, *Hieracium* spp. and *C. leucanthemum*.
- Tephritis bardanae*, Schr. In flower-heads of *Arctium majus* and *A. minus* during July and August.
- T. (Urellia) cometa*, Lw. Recorded from flower-heads of *Cnicus arvensis*, L.
- T. (Euaresta) conjuncta*, Lw. Food-plant unknown.
- T. conura*, Lw. Recorded from *Cnicus heterophyllus*, Willd., *C. lanceolatus* and *C. palustris*, the larvae inhabiting a hard gall in the flower-head.
- T. dioscurea*, Lw. In flower-heads of *Achillea millefolium*, L.
- T. formosa*, Lw. In slightly swollen flower-heads of *S. oleraceus*, *H. radicata* and *Crepis capillaris*, Wallr.
- T. hyoscyami*, L. In flower-heads of *Carduus crispus* and *C. nutans* in July and August.
- T. leontodontis*, De Geer. In flower-heads of *Leontodon autumnale*, L. *hispidum* and *C. leucanthemum* June and July.
- T. praecox*, Lw. The larvae live in flower-heads of *Filago gallica*, L., a plant that is extremely rare in Britain.
- T. vespertina*, Lw. In the flower-heads of *Hypochaeris radicata*, L. in June and July.
- Trypanea (Urellia) amoena*, Frfld. Recorded from flower-heads of *Lactuca virosa*, L., *L. serriola*, L., *L. saligna*, L., *Picris hieracioides*, L. and *Sonchus oleraceus*, L. during summer.
- T. stellata*, Fues. In flower-heads of *Anthemis cotula*, L., *A. arvensis*, L., *Artemisia absinthium*, L., *Aster tripolium*, L., *Centaurea* spp., *Crepis paludosa*, Moench, *Hieracium* spp., *Matricaria chamomilla*, L., *M. inodora*, L., *Senecio jacobaea*, L., *S. vulgaris*, L., *Serratula tinctoria*, L. during summer.
- Acanthiophilus helianthi*, Rossi (*Urellia eluta*, Mg.). Recorded as occurring in flower-heads of *C. nigra* and *C. lanceolatus* in summer.
- Noëta (Carphotricha) pupillata*, Fal. Larvae in flower-heads (which are considerably swollen), of *Hieracium* spp., from July to the following April. It is not uncommon to find larvae and pupae in the same heads.
- Ditricha (Carphotricha) guttularis*, Mg. Larvae in a gall at the stem-base of *Achillea millefolium*, L. during autumn and winter. I have given no localities; but suggest that students of this family

examine the plants in whatever localities they may be at suitable times. There are few or unsatisfactory records of many of the species mentioned.

SECTION II.

The following species at present unrecorded for Britain are found in plants indigenous to this country and there is a possibility of some at least being found if diligently searched for.

Euribia erirolepidis, Lw. In flower-heads of *Cnicus eriophorus*, Roth, *C. nutans*, *C. scabiosa* and *C. cyanus* inhabiting a hard gall.

E. stigma, Lw. Larvae in a hard gall in flower-heads of *A. millefolium*, *Anthemis arvensis*, *A. cotula* and *C. leucanthemum*.

Myopites exima, Seguy. Larvae in galls in flower-heads of *Inula crithmoides*, L.

Myiolia lucida, Fall. In fruits of *Lonicera xylosteum*, L.

Orellia punctata, Schr. In flower-heads of *Tragopogon pratense*, L.

O. wenigeri, Mg. In flower-heads of *C. scabiosa* from July.

Xyphosia laticauda, Mg. In flower-heads of *C. nigra*.

Campiglossa irrorata, Fal. In flower-heads of *Artemisia campestris* L., a rare plant here.

Tephritis angustipennis, Lw. In flower-heads of *Achillea ptarmica*, L.

T. crepidis, Hend. In flower-heads of *Crepis biennis*, L.

T. dilacerata, Lw. In swollen flower-heads of *Sonchus arvensis*, L.

T. heiseri, Frfld. In flower-heads of *Carduus nutans* and *C. crispus*.

T. nesii, Wied. In flower-heads of *Leontodon autumnale* and *Picris hieracioides*.

T. nigricauda, Lw. In flower-heads of *Achillea millefolium*, *A. Ptarmica* and *Matricaria inodora*.

T. postica, Lw. In flower-heads of *Onopordon acanthium*, L.

T. ptarmicae, Her. In flower-heads of *A. ptarmica*.

T. ruralis, Lw. Larvae in swollen flower-heads of *Hieracium pilosella*, L.

Noëta crepidis, Her. In flower-heads of *Crepis biennis*, L.

OVIPOSITION OF OCHRIA OCHRACEA, HUB. SYN. FLAVAGO, SCHF.

By P. B. M. ALLAN, M.A., F.S.A.

If any reader of *The Entomologist's Record* has actually found the ova of this insect in a state of nature on Marsh Thistle (*Carduus palustris*, L.) he will be conferring a benefit on at least one entomologist if he will describe exactly where he found them, for the books either copy or contradict each other and a diligent search of this plant by the writer of this note has been in vain.

In *The Entomologist* for June 1874 (No. 130, Vol. VII, p. 121) Edwin Birchall, in a paper headed "*Gortyna flavago* and its Householding," states: "We look for knowledge, but what we mostly find is our own ignorance. Every collector is familiar with the larva of *Gortyna flavago*; in many parts of England it is difficult to cut open a thistle-stem in July or August without finding its traces. The moth emerges from the pupa in September, quickly deposits its eggs, and dies; and there, until lately, my knowledge ended. None of the published histories of the

insect that I have seen carry the matter further or state in what condition, or where, the insect exists from September to June.

“ The egg is said to be laid on the stems of burdock, thistle, etc. (*British Moths*, Newman, p. 280); but as the old thistle-stem dies down in the autumn, and a new one does not appear for many months, there is an evident want of continuity in the chain of circumstances, and it is left open to conjecture whether the female moth hibernates, or if the egg is deposited in the autumn, when the larva hatches, and what becomes of it, till thistles and June come round again. I have been able this spring to fill the gap in the history of the insect; but a kind friend having given me a copy of the works of Christian Sepp, and finding that he knew all about it one hundred years ago, I prefer that he should tell the story in his own quaint way, and hope that your readers will find pleasure in perusing the account of a ‘ Morning’s Collecting in the Last Century ’.”

He then gives a translation of Sepp’s account (1762) of this insect’s life-history, the part germane to the purpose of the present note being as follows. I must first state that Sepp bred, from collected larvae, a male and a female moth which paired “ in a box.”

“ The female laid on the 20th of the month (September) one hundred and twenty-one little eggs; further, other thirty: they were set here and there by heaps, and fastened with a shining humour or glue. . . . At the elapse of eight days they changed colour and became somewhat darker . . . they remained thus all the winter.”

These ova hatched on 18th April. “ I gave them at first burr-leaves, for there were no burr-stalks grown yet, but they let the leaves lie untouched; on the contrary they made holes in the stems of them, and thus made a ready way to the inside.” And there they remained until the observer could provide them with stalks.

Now, it will be noticed that although Birchall says he has been able to fill a “ gap in the history of the insect,” and infers that Sepp also has solved the problem, Sepp in fact makes no suggestion as to *where* the eggs are laid in a state of nature, and this is really the crux of the whole matter. Apparently Birchall accepted Newman’s assertion (*loc. cit.*) that “ the egg is laid on the stems of burdock (*Arctium Lappa*), thistles (*Carduus*) . . . ” etc. But there is a certain passage in Newman’s account which suggests that if he did not actually base his own account on Sepp’s observations, at least he had Sepp’s observations in mind when writing his book:—“ The young caterpillar enters the stems through an excessively small opening, no trace of which can be discovered a few days after it has achieved the passage.” Sepp’s words are:—“ It does not follow that you can always see the holes in the burr-stalk through which the insect has entered, as the grub may have entered quite young, and consequently through an almost imperceptible hole.”

Tutt, quoting Merrin, states (*Practical Hints for the Field Lepidopterist*, Part I, page 8) “ The eggs of *Gortyna ochracea*, laid in heaps, are to be found on marsh-thistles, burdock, etc.” Later in the same book (Part II, p. 15), quoting V. E. Shaw, he says: “ In January cut open the old dead stems of *Arctium lappa*. Inside, the eggs of this moth are laid, in batches of about 50, in the old burrows made by the larvae. They are laid about half an inch down from the opening in that side of the

stem from which a moth has previously made his exit. The young larva presumably feeds on the old pith, and later descends to the new growth of the plant."

But there is no "new growth" of the marsh thistle or burdock from which a moth has emerged. Tutt's quotations and Birchall's "the old thistle-stem dies down in the autumn, and a new one does not appear for many months" indicate that Tutt, his authorities, and Birchall all thought marsh thistle and burdock were perennials. Of course marsh thistle and burdock are not: they are *biennials*. The plant from which a moth has emerged dies, stem, leaf and root, in the autumn, and that is the end of it. So it would hardly profit a moth to lay its eggs either on or inside an old stem which, in a few months, will fall and become a sodden pulp.

The recorded food-plants of *O. ochracea* are both biennials and perennials. It is my experience that *Carduus palustris*, L. is far and away the commonest food-plant of this insect. In my district burdocks are common, but I have not yet found one showing traces of *O. ochracea*, though plants of the marsh thistle close to them often have larvae within. In other localities *O. ochracea* may pass by the marsh thistle and prefer one or other of the alternative food-plants listed by Newman and Barrett. I do not know. At least Newman (*loc. cit.*, p. 280) bears me out to a point by his assertion: "I have found these caterpillars full-fed during the first week in July in the stems of the tall marsh thistles, which often abound . . . at Birch Wood Corner: scarcely one of these stately plants escapes . . ." But whatever the foodplant may be it does not affect my argument. The authorities I have quoted, Newman, Birchall, Merrin, Shaw and Tutt, all specify biennial plants, and I want to know where the egg is laid on these biennial plants.

In September in my district the first year plants of *Carduus palustris*, L. are showing only as rosettes of foliage, having no stems at all. They lie, in fact, "pancaked" on the earth, and in this state they remain till spring.

Where, then, does *O. ochracea* deposit its eggs?

Sepp's experience of a female moth in a box is, it would seem, the *fons et origo* of the accounts of this moth's oviposition given by the authorities I have listed—save Shaw. I have been unable to trace the source of the very circumstantial statement which Tutt attributes to that "authority," who, for the first time, asserts that the ova are laid *inside* a stem. Making every allowance for the unexpected, which one so frequently encounters in studying lepidoptera, it seems frankly incredible that a moth should insert not only its ovipositor but half its abdomen into a hole in an "old dead stem" of burdock in order to deposit ova in a situation which would ensure the starvation of the hatching larvae. There must be a mistake somewhere. We have all of us found ova in impossible places—on a tennis-net, a garden roller, a verandah-post; but these were abnormalities, not the regular customary procedure.

So I believe all these accounts to be wrong. I do not even believe that the ova are laid, in a state of nature, in batches of "about 50." The behaviour of a moth in a box is no criterion of its behaviour in the wild. I have never found more than two larvae of this moth inhabiting one thistle-stem, and I doubt if anybody has ever found a colony of them

in the same plant. So, until I am traversed by indisputable fact, namely the production of a batch of ova deposited in a state of nature inside or on the stem of a decaying plant, I shall assume that this moth deposits its ova in the way one would naturally expect. That is to say, the female moth flies over the herbage, settling now and again on the rosette of a first-year plant to deposit one, two, or at most three ova on or in the crown of it. When the ova hatch in spring the plant has already begun to make such growth that the nibblings of the young larva, eating its way into the rapidly growing stem, have no effect on the plant's well-being. Indeed, the hole by which the larva enters may well be, in Sepp's words, "almost imperceptible."

COLLECTING NOTES.

A FEW RECORDS OF ORTHOPTERA.—The following records extend the range of the species of Orthoptera concerned, as given in Dr Malcolm Burr's "British Grasshoppers and Their Allies." *Acrydium subulatum*, L. taken in Oxfordshire, at Woodeaton in 1934, and at Somerton in 1935. *Acrydium vittatum*, Zett. taken in Hertfordshire, at Haileybury College, in 1935, 1937, and 1938; at times found abundantly. *Chorthippus bicolor*, Charp. taken in Somerset, on Haddon Hill, in 1934. *Chorthippus albomarginatus*, De G. taken on Muswell Hill, on the border between Oxfordshire and Buckinghamshire, in 1935 (one specimen). *Omocestus viridulus*, L. taken in Hertfordshire, at Haileybury College, in 1938. *Metrioptera brachyptera*, L. taken in North Hampshire, near Aldershot, in 1936.—E. S. BROWN, Hailey Lodge, Hertford Heath, Hertford.

MICROLEPIDOPTERA NEW TO GLOUCESTERSHIRE IN 1938.—*Acentropus niveus*, Oliv. was found at Woodchester on 22.vii, when a few males came to a light placed about 60 feet above a large pond formed by an embankment across a valley: it was interesting to note that one male was carrying a female, as this may throw some light on the upstream distribution of the semiapterous females. A few examples of *Argyroploce decrepitana*, H.-S. 1851 (*bifasciana*, Hw. 1811, nec Hb. 1787), occurred in my garden in July, beaten from *Pinus* and attracted to light: this was only known previously from Durdham Down, Glos., but has not been recorded. *Cedestis gysseleniella*, Zeller, was also beaten from *Pinus* in my garden on 5 and 16.vii. *Argyresthia atmoriella*, Bankes was taken at light at May Hill on 23.vi.—T. BAINBRIGGE FLETCHER, Rodborough, 8.iv.1939.

PLUME LARVAE IN MAY-JUNE.—This is the best time of the year for collection of Plume larvae. *Trichoptilus paludum*, on Sundew, but not everywhere and difficult to see on the plants; full-fed about end of May. *Oxyptilus pilosellae* and *O. parvidactylus*, in heart of *Hieracium pilosella*: I do not know the former and the latter is difficult to find, its presence revealed by a slight withering of the central bud; full-fed from middle or end of April. *O. britanniodactylus*, on *Teucrium scorodonia*, its presence indicated by its habit of biting through the midrib of a shoot so that this hangs down. *Platyptilia rhododactyla*, on rose flower-buds and shoots; can be beaten but apparently very local and scarce

nowadays. *P. punctidactyla* and *acanthodactyla*, mostly on *Stachys sylvatica* top-shoots. *P. calodactyla*, in young shoots of Golden-rod, but very local. *P. gonodactyla*, in flower-stems of *Tussilago*, has pupated by second half of May but pupae may be found inside the fluffy seed-head, which is spun up so that the seeds do not drop. *P. isodactyla*, in stems of *Senecio aquaticus* about mid-May; larva of this brood sometimes emerges to pupate in a rolled leaf of the food-plant. *P. ochrodactyla*, in stems of Tansy and *P. pallidactyla* in shoots of Milfoil. *Stenoptilia bipunctidactyla*, in shoots and flowers of Scabious, but I do not know it at first hand. *S. pterodactyla*, on top-shoots of Speedwell; full-fed about end of May or early June. *Marasmarcha lunaedactyla*, on Rest-harrow in June. *Oidaematophorus lienigianus*, usually on *Artemisia*. *O. carphodactylus*, inside young shoots of *Inula*, in chalky places. *O. osteodactylus*, on seeds of Golden-rod, is full-fed in the autumn and hibernates amongst the seeds, pupating about end of May, and is better collected in the autumn but old seed-heads, if available, might produce it. *O. tephrodactylus* has apparently the same habits but I have never found its larva. *O. lithodactylus* is especially to be collected as a larva, as the moth is rarely seen; larva on *Inula* to end of May or a little later, the younger larvae often hidden inside the unexpanded leaves at the top of a shoot. *O. monodactylus*, larva on *Convolvulus*, but very scattered and not easy to find in any number. *Adaina microdactyla*, larva in stems of *Eupatorium cannabinum*, usually in damp places, but local. *Pselnophorus brachydactylus*, larva on *Lactuca muralis*, full-fed about end of May, its presence indicated by eaten leaves and its habit, when nearly full-fed, of biting through the midrib so that the tip of the leaf hangs down. *Alucita tridactyla* (*tetradactyla*), larva on *Thymus*, but I have never been able to find it or to breed it from moths confined over potted plants. *A. baliodactyla*, on Marjoram, but local. *A. pentadactyla*, on *Convolvulus*, but scattered and not easy to find when wanted; however, in this case the moth is common enough. *A. galactodactyla*, on Burdock leaves in rather shady places, the presence of the larva made conspicuous by the large holes bitten in the leaves and the larvae (often several on one plant) always found on the underside of the youngest leaves; pupae also under the leaves, alongside a rib, easily overlooked; requires to be bred, as the moth is very sluggish and rarely seen. *A. spilodactyla*, on *Marrubium* in the Isle of Wight, but local; feeds on upperside of leaves but very difficult to see.—T. BAINBRIGGE FLETCHER, Rodborough, Glos., 10.iv.1939.

CURRENT NOTES.

Dr Burr informs us that his little work on Orthoptera can only be obtained now from Messrs R. B. Janson & Sons, 44 Gt. Russell Street, London.

The *Mitteilungen der schweiz. entom. Ges.*, Vol. XVII, Heft 9 (iii. 1939), contains (pp. 419-442, 8 figs.) a very interesting paper by Herr J. Seiler on the reproductive-biology of some *Solenobia* species, *S. pineti*, Zeller, *S. lichenella*, L., and *S. triquetrella*, F.R., about all of which

considerable information is given regarding the bisexual and agamogenetic (female only) races. The illustrations are excellent.

With much regret we hear of the death, which occurred on 23rd September 1938, of Count Emilio Turati. He was born in 1858 and published much good work on the Lepidoptera of Italy and the Mediterranean Region, especially on the Lepidoptera of Cyrenaica.

The Heft I of Vol. XXIX *Mitt. Münch. Entom. Gesell.* contains (1) a "3rd Contribution to the Knowledge of the Early Stages of Oriental Lepidoptera," of which the first two contributions occurred in our own magazine in 1935 and 1936 by E. P. Wiltshire, F.R.E.S. There is a plate of 10 figures of larvae. (2) Herr Daniel commences a discussion on the genus *Lithosia*, its Variation and Distribution. (3) The *Zygaena* of South-eastern Europe are dealt with by Herr Holik. (4) Dr E. Wehrli describes a few new Geometers from Iran and Irak. (5) A very interesting addition to the Lepidopterous Fauna of Marasch in N. Syria with a plate of 28 species, is a joint contribution of Herrn, Osthelder, Pfeiffer, Corti, Daniel, Draudt and Wehrli.

"And still they come." A new subspecies of *Parnassius apollo* is announced with a plate of 4 figures in the *Rev. Franc. Lep. (Am. de Pap.)* of March. It appears to be well established in the Monts du Forez, Central France.

Volume XLIX of the *Ann. Naturhist. Mus. in Wien* has recently been published. There is contained an extremely valuable contribution to our knowledge of fossil insects by the late Anton Handlirsch. This is the second and concluding part of which the first portion was published in Vol. XLVIII (1937). The present section consists of 240 pages with 16 plates of wing venation depicting over 300 species of all Orders. In this article material from the whole world has been incorporated and in particular the results of the study of the venation of insects by Tilliard have been extensively used. The volume also contains an obituary of Dr Handlirsch with portrait. It is fortunate for science that the author was able to conclude such a valuable contribution to science before his decease. In the same volume Dr Rebel adds to the seven previous a further contribution on the Lepidopterous Fauna of the Canary Isles.

Capt. K. J. Hayward sends us three further contributions on the *Hesperiidae* of the Neotropical Region, including VII and VIII of the Argentine Fauna with descriptions of some new Brazilian species, and also descriptions of a few abnormalities of insect structure.

The Society for British Entomology has just published part 9 of its Journal. It contains over 30 small contributions on many details of insect economy, with 2 plates (VIII and IX). There are short accounts of the 2nd (Cambridge), 3rd (Reading), and 4th (Bournemouth) Congresses and a leaflet gives details of the coming 5th Congress to be held at Manchester, 15th to 17th July, under the Presidency of Prof. W. A. F. Balfour-Browne, M.A., F.R.E.S., etc.

We have had a nice little brochure on "Giant Moths of the Jungle," how to obtain them and rear them in England. There are several illustrations, details of various species and instructions on breeding, etc.

Herr Max Cretschmar of Celle sends us his notes on a new hybrid between *Dicranura erminea* ♂ × *D. vinula* ♀. It may be remembered that Tutt in Vol. V, *Nat. Hist. Brit. Lep.*, recorded the previous and reverse hybrid, *D. vinula* ♂ × *D. erminea* ♀. Six figures are given. It is interesting to know that this has now been accomplished. The previous crossing was made over 80 years ago.

Parts 81, 82, 83 of the *Supplement* to Seitz *Palaeartic Macrolepidoptera* have just come to hand. It consists of two sheets of text (16 pp.) and seven plates on which over 300 figures of new species or newly recognized forms of older species are portrayed. The text, for which Mr L. B. Prout is responsible, deals with Geometers. New forms are described: of *virgata* 1, *griseata* 5, *plagiata* 1, *efformata* 1, *brumata* (2 biological races), *alternata* 1, *prunata* 1, *testata* 1, *variata* 2, *truncata* 2, *munitata* 1, *fluctuata* 1, *ferrugata* 2, *designata* 1, *obstipata* 1, *didymata* 1. The author calls attention to the large amount of investigation of new material by numerous Continental workers which has compelled him to go back on what he has already done, and add an Appendix while the earlier genera are still on his mind, although such action will interrupt the continuity and sequence of the work for a while.

Of the main volumes of the Seitz work 5 parts of the *Geometridae* of the Indo-Australian Region have just reached us, consisting of twelve sheets and three plates, all by Mr Prout. Since but little attention has been given to this family by collectors because the species on the whole are not so attractive and but little breeding has been carried on, with absence of literature, study in this section is very difficult. Whatever is now done must be subject to considerable modification until extensive general field work has been carried out. At any rate Mr Prout's work will, we are assured, furnish a solid basis for further work. The text of these parts deals with the genera around *Scopula* and *Sterrhia* going on to the *Larentiinae* of which *Xanthorhoë* and *Larentia* are among the more well-known genera.

SOCIETIES.

The *Verrall Supper Meeting* took place at the Holborn Restaurant on 17th January 1939. The meeting was as usual called for the early hour of 6.30 p.m. to enable the members and their friends to enjoy the *conversazione* in the large room specially reserved for this purpose. The attendance at the *conversazione* was 170 and 168 sat down to supper which was served at 7.30, Mr Jas. E. Collin occupying the chair. In the absence of his Chaplain, the Bishop of Edmundsbury and Ipswich said grace. After the toast of "The King" and the silent toast of "Mr Verrall," the Chairman gave a short account of the aims and objects of the Association, reminding the company of some of the difficulties, finan-

cial and otherwise, which as Hon. Secretary of the Verrall Supper Association he had to contend. He also emphasized the necessity for the co-operation of everyone if the success attained by the Association was to be continued and he reminded the younger generation of their obligation to make a study of the spirit in which the Founder intended the Association should be organized as it was obvious that some day it would devolve upon them to carry on the traditions. The high spirits of the meeting were well maintained and everybody appeared to be having a very happy and pleasant evening. Mr Collin is to be congratulated in again providing a most successful function.—H. WILLOUGHBY ELLIS, Hon. Secretary.

THE AMATEUR ENTOMOLOGISTS' SOCIETY.—An exhibition of apparatus and specimens was held at the Buckingham Gate Central School, London, S.W., on the afternoon of Saturday, 3rd April. It was the first exhibition arranged by the Society and was an unqualified success, about 100 members and visitors being present. The exhibits were of a very varied nature, embracing the study of many orders of insects, although Lepidoptera predominated, the latter including living specimens in all stages. Numerous types of apparatus for collecting and preserving were also on view, together with books dealing with many branches of Entomology. Specimens of Coleoptera, Diptera and aquatic insects were included in the exhibits. The demonstrations of the use of the microscope, the making of microscope slides and the setting of insects proved very attractive.—D. H. STIRLING, Hon. Secretary.

REVIEWS.

SOME BENEFICIAL INSECTS, by W. R. Thompson, Ph.D., D.Sc., F.R.S., 26 pp., 2 plts., Bull. 20, Ministry of Agriculture, &c., H.M. Stationery Office, 9d net. Tendency for ill-informed and amateur pestologists is to destroy ruthlessly all insects found around or on their crops or plants. The present pamphlet calls attention to "beneficial insects." This is a new edition of a pamphlet issued seventeen years ago, but now rewritten and with coloured plates of the chief insects to which reference is made. After an interesting Introductory section, the working of Natural Control is described, succeeded by general remarks on the Chief Types of Beneficial Insects, which are treated in two groups, Predators and Parasites. Among the former are Ladybirds (*Coccinella*), Ground Beetles (*Carabidae*), Flies (*Syrphidae*), Lace-wings (*Neuroptera*), &c. Among the Parasites are certain families of the Hymenoptera (Bees, &c.), Chalcids, Braconids, and Ichneumons, with notes on their life-history and methods of action. Then the Dipterous parasites, closely resembling House-flies, Green-bottles, and Blue-bottles, (the *Tachinidae*) come under consideration. Then comes a short history of the Utilization of Beneficial Insects and the method of attack. This is an admirable pamphlet, most attractive to read and no doubt of inestimable use to those whose experience forces them to control measures. It gives the scientific knowledge underlying all these measures of control, and of which a knowledge is necessary for their effective use.—HY. J. TURNER.

arvensis, Gmelin, *Linn. Sys. Nat.*, I (5), 2569 (1790).

ORIG. DESCRIP.—“*Alis fuscis: macula media transversa flava, margine brunneo.*”

Noctua brunnea, Fab., *Mant.*, II, 168.

This refers to the *brunnea* of Fab. and of Schiff., *Verz.*, 83, but this latter is not *brunnea*, Fab., but *flammea*. See Esper and Illiger.

fragariae, View., *Tab. Verz.*, II, 56 (1790).

FIG.—Plt. II, f. 4, 5. The imago is a good figure, but somewhat too large.

ORIG. DESCRIP.—“The thorax and the fore-wings are dark red-brown. Beyond the middle of the fore-wings toward the costa there stands a pale golden yellow reniform stigma, which is joined to a spot of colour darker than the ground of the wing. Then follows also a darker but not very visible crossband, the space between the reniform stigma and this crossband has also a slight golden yellow streak-edge. Outside these markings one also notices two quite small black pale marginal dots, of which one is just in the middle of the fore-wing, the other oblique beyond it. The hind-wings are grey with red-brown fringes. The apex of the grey abdomen has a similar colour.” This is a re-description of the species we know as *brunnea*.

carnea, Thunbg., *Diss.*, IV, 55 (1792).

ORIG. DESCRIP.—“*Anticis carneis; stigmatate flavicante; posticis arcu punctoque fusco; tota fusco rubra.*

Rufescentes, ferrugineo fasciatae. Stigma anterius cinereum, posterius flavescens; fascia cinerea intra marginem. Posticae pallidiores supra immacolatae. Subtus puncto arcuque fusco.”

race *subdolens*, Btlr., *Trans. Ent. Soc.*, 181 (1881)♀.

ORIG. DESCRIP.—“Nearly allied to *C. erythrocephala*, but larger, less sericeous, varying in the colour of the primaries and thorax from brown to pale sandy flesh-tint, whereas the European species varies from shining chocolate-brown and grey to reddish clay-coloured, the reniform spot larger and paler, sometimes almost entirely yellowish white; there is also invariably a small submedian black dot below the orbicular spot; the secondaries are slightly darker along the external border, and have a decidedly narrower fringe; on the under surface the external pale border is diffused and decidedly wider at apex, the dark discal line is indistinct, and the costal border is noticeably redder; the secondaries are considerably whiter, with redder costal border; the discal line is placed much farther from the outer margin, and the spot at the end of the cell is much smaller; the body below is darker and redder.”—Tokei, Japan.

ab. *suffusca*, Strand., *Arch. Math. og Nat.*, XXV, 10 (1903).

ORIG. DESCRIP.—“The forewings are a paler grey-brown and the fringes a less brownish colour; the violet suffusion so distinct in typical specimens is here only slightly expressed on the costa and on the basal half. The stigmata are less emphasised; the stigmata are obsolescent, one sees only a slight black ring in their place. The hindwing rather pale.” A rare aberration.

ssp. *norvigicola*, Strnd., *Arch. f. Naturg.* (1915), 81, A, Heft 12, p. 143. [Hamps., *Cat. Lep. Ph.*, IV, 413 (1903).]

ORIG. DESCRIP.—“Head, thorax, and forewing fuscous grey tinged with olive, and without the rufous and purple tints.” Scandinavia, Söndmore.

Noctua, L. (1758), Ochs. & Tr. (1816-25), Barr., South, and most authors. [*Agrotis*, Ochs. & Tr. (1816-25), Stdgr., Splr., Meyr., Hamp., Culot: *Graphiphora*, Ochs. & Tr. (1816-25), Steph., Meyr.: *Rhyacia*, Hb. (1821), Warr.-Stz., Corti-Drdt.-Stz.] *rubi*, View. (1790).

Tutt, *Brit. Noct.*, II, 123 (1892): Barrett, *Lep. Br. Is.*, IV, 89, plt. 147, 2 (1897): Stdgr., *Cat. Lep.* IIIed., 140 (1901): Hamp., *Lep. Phal.*, IV, 419 (1903): Splr., *Schm. Eur.*, I, 150, plt. 33, 11 (1905): South, *Moths Br. I.*, I, 226, plt. 114, 3-4 (1907): Warr.-Stz., *Pal. Noct.*, III, 45, plt. 10c (1909): Culot, *N. et G.*, I (1), 47, plt. 7, 8 (1909): Corti-Drdt.-Stz., *Pal. Noct. Supp.*, III, 78 (1933).

Bork., *Naturg.*, IV, 605 (1792), describes this species under the name *bella* and this name was used by various subsequent authors. This was two years after Vieweg described it as *rubi*.

Esper, *Abbild. Schm.*, IV (2), 497, plt. 151, 4 (1796?), gives a figure named *radica*, which has been attributed to *bella* = *rubi* (View.) by H.-S. but, as Wernb., *Beitr.*, II, 46, points out, the stigmata in this figure are much too light and there is a row of submarginal dots not present in *rubi*. Nor does the figure agree with the text.

Hb., *Samml. Noct.*, 115 (1800-3), is of a rather large specimen, under the name *punicea*. It is a good figure and shows the character of the submarginal band of what we call *rubi*. Figure 477, *l.c.* (1809-13), *quadratum*, has the size of our *rubi* but the colour is much too dark mahogany brown for our British form. The square spot is very plain.

Haw., *Lep. Brit.*, 228 (1809), describes “the small square spot,” the *punicea* of Hb.

Tr., *Schm.*, V (2), 121 (1825), describes this species under the name *bella*, Bork., and give *rubi*, View. and *quadratum*, Hb. as synonyms.

Godt., *Hist. Nat.*, V, 199, plt. LXIII, 2 (1825), under the name *bella*, Bork., gave a good figure of what we call *rubi*, with, perhaps, rather too great emphasis on the surround of the stigmata, but he gives the *rubi*, View. (prior name) as a synonym.

Frr., *Neu. Beitr.*, II, 7, plt. 100 (1836), gives a good figure with rather too much emphasis on the submarginal lighter band, as *bella*, and gives Hb.'s figure and Tr. as synonyms.

Under the name *punicea* in his *Beitr.*, I, 46, plt. XV (1828), Frr. had given a poor, badly coloured figure, and endeavoured in the text to distinguish it from *bella*, Tr. and *quadratum*, Hb.

H.-S., *Sys. Bearb.*, II, 359 (1851), describes this species under the name of *bella*, Bork., although he gives the prior *rubi*, View. as a synonym.

H.-S., *Sys. Bearb.*, II, 359 (1851), under *bella*, says Frr. fig. 100—f.w. much too pointed, colour too thick, the dots too heavy. Of *quadratum*, Hb. he says, forewings too short, especially the h.w.; markings poor, colour too reddish, the stigmata too yellow. *rubi*, View., a synonym.

His own figure *bella* = *rubi*, 81 (1845), is a large ♀ somewhat too suspicious of ochreous ground (purple-reddish brown in text).

Gn., *Hist. Nat.*, I, 334 (1852), names it *bella*, Bork., and he treats the prior *rubi*, View. as a synonym. As to variation he says there is no fixity in its variations to justify the names which have been given it.

Barrett, *l.c.* (1897), gives three good figures on plate 147, including a figure in which the stigmata and other markings tend to become obsolete, the general colour being considerably darkened, with, perhaps, the sub-marginal light line being the most prominent feature.

Splr., *Schm. Eur.*, I, 150, pl. 33, 11, 12 (*florida*) (1905). A very fair figure. 12 is v. *florida*.

Splr., *Schm. Eur.*, I, 150, pl. 33, 11 (1905), figures typical *rubi* and the form *florida*, a larger, broader winged insect with somewhat lighter ground which throws out the marks plainer.

South, *M. Br. I.*, I, 226, pl. 114, 3-4 (1907). Fig. 3 is 1st gen., fig. 4 is 2nd gen. The figures are not good.

Warr.-Stz., *Pal. Noct.*, III, 45, pl. 10c (1909), treats *radica*, Esp., *bella*, Bork., *quadratum*, Hb. and *posticata*, Walk. as synonyms and recognises only one variation, ab. *florida*, Schmidt. The figure is a very fair one. Genus *Rhyacia*.

Culot, *N. et G.*, I (1), 47, pl. 7, 8, gives an excellent figure of the normal Continental somewhat darker form. In the text he discusses the *florida*, Schmidt, and determines it as a form of *rubi*.

Corti & Drdt., *Pal. Noct. Supp.*, III, 78 (1933), add 2 new forms, *quadratum*, Hb. and *floridoidea*, Dhn. l.

Of the Variation Barrett says:—

“Variation very slight, and mainly in the depth of the ground colour; but there is a slight dimorphism, the earlier brood being of a brighter purple-brown, the later smaller in size and usually darker in colour. There is also a tendency toward darker colouring in the northern and western portions of its range, and the spot between the stigmata becomes sometimes black.”

The yellow form was first mentioned by Sam. Walker of York in the *Ent. Rec.*, II, 184 (1890), and has been known as ab. *ochracea*, but I fail to find the original bestower of this name. This insect is now in the collection of Dr E. A. Cockayne.

The Names and Forms to be dealt with are as follows:—

rubi, View. (1790), *Tab. Verz.*, II, 57, pl. III, 5.

bella, Bork. (1792), *Naturg.*, IV, 605.

radica, Esp. (1796?), *Abbild.*, IV (2), 497, pl. 151, 4.

punicea, Hb. (1800-3), *Samml. Noct.*, 115.

ab. *quadratum*, Hb. (1809-13), *l.c.*, 477.

race *posticata*, Walk. (1858), *Cat. Lep. Het. B. M.*, XV, 1695.

ab. *florida*, Schmidt (1859), *Stett. e. Ztg.*, 46.

ab. *floridoidea*, Dhn. (1925-6), *Ent. Zts.*, XXXIX, 123.

ab. *borealis*, Ling. (1936), *Lamb.*, XXXVI, 239.

ab. *ochracea*, Sam. Walk. (1902), *Ent. Rec.*, XIV, 172.

ab. *flava*, Sam. Walk., *l.c.*, 171.

Tutt dealt with (1) the *rubi*, View., (2) the (*ochracea*), Sam. Walker, without naming it, and (3) the bright red form *quadratum*, Hb.

race *posticata*, Walk., *Cat. Lep. B. M.*, XV, 1695 (1858).

ORIG. DESCRIP.—“♂ pale fawn colour, very pilose, whitish beneath. Antennae stout, crenulate. Pectus cinereous in front. Abdomen whitish; apical tuft very large. Forewings testaceous, slightly and irregularly tinged with pale fawn colour about the borders, and with some bands of the same hue, of which the exterior and submarginal are straight and parallel to each other, and more distinct than the others; orbicular mark nearly round, with a brown border; reniform with a whitish border, excavated on the outer side; marginal lunules brown. Hindwings a little paler than the forewings, with a pale brown discal mark and pale brown marginal lunules. Length of body, 6 lines; of the wings, 12 lines.”

ab. *florida*, Schmidt, *Stett. e. Zeitg.*, 46 (1859).

ORIG. DESCRIP.—“Head, neck and thorax brown, abdomen above more dull coloured, below towards the sides the hairing and the anal tuft in the male rose-reddish, feet white ringed, antennae brownish, in the male of a pink tinge.

“The ground colour of the forewing of a uniform bright yellow-brown, all the markings on it distinct. The half transverse line and the second line on the outer side, the first line on the inner side more strongly dark margined than on their respective inner side. The area from the less varied curved transverse line to the rosy red fringes as well as the costa for one-third darker (reddish) brown, in which the veins are visible as fine blackish streaks. The central shade very feeble, the usual stigmata paler than the ground, the reniform shining brown, an indent on the outer side, the orbicular darker on the lower part. The area between these two stigmata dark-brown, the apex of the third stigmata coloured blackish like the others. The hindwings in both sexes pale earth-brown, darker in the marginal area with blackish discal spots and rosy reddish fringes.”

Hamps., *Cat. Lep. Ph.*, IV, 419 (1903). Deeper and brighter rufous, the markings of forewing more prominent.

ab. *flava*, S. Walker, *Ent. Record*, XIV, 171 (1902).

ORIG. DESCRIP.—“Anterior wings rich chrome-yellow; some specimens with an orange tint on the costa; the stigma and transverse lines rather indistinct; the quadrate spot pale rosy, fringes yellow. Thorax and body yellow. Posterior wings greyish-yellow.”

ab. *ochracea*, S. Walker, *l.c.*, 172 (1902).

ORIG. DESCRIP.—“Anterior wings dull buff, with stigma clearly outlined; transverse lines distinct; the quadrate spot reddish brown. Posterior wings greyish-yellow; fringes paler.

ab. *floridoides*, Dnhl., *Ent. Zeit.*, XXXIX, 123 (1925-6).

ORIG. DESCRIP.—“Among the very richly varied specimens are found numerous but large light variegated ones such as pass as ab. *florida*, Schmidt. Whether those examples flying especially in the Elsch-moor by Terlan are to be considered as a true good species *florida* or whether it is to be dealt with as a regularly appearing common form of *rubi*, especially of the spring generation, is not possible for me up to now to clear up. The former not being the case, the *rubi*-race or -variety referred to above requires another name.” S. Tyrol.

Communications have been received from or have been promised by T. Bainbridge Fletcher, A. J. Wightman, T. Greer, W. P. Curtis, Dr M. Burr, H. Willoughby-Ellis, Wm. Fassnidge, E. Ernest Green, Rev. T. G. Edwards, P. Siviter-Smith (plates), Dr Bytinski-Salz (4 plates), P. B. M. Allan, H. B. D. Kettlewell, Austin Richardson, A. J. L. Bowes, E. P. Wiltshire and T. F. Marriner (plate).

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CONTENTS.

NEW AND LITTLE KNOWN FORMS OF HEPIALUS MOSTLY FROM GREAT BRITAIN, <i>Hans Bytinski-Salz, Ph.D., F.R.E.S.</i> (Plate)	81
COCCINELLID NOTES. TWO NEW ABERRATIONS, <i>T. F. Marriner</i> (Plate)	85
NOTES ON ORTHOPTERA IN GLOUCESTERSHIRE, <i>T. Bainbrigge Fletcher</i>	87
CONTINUOUS BREEDING: V., <i>H. B. D. Kettlewell, M.A., M.B., B.Chir.</i>	89
COLLECTING NOTES, 1938. II: MID-JUNE—AUGUST, <i>A. J. L. Bowes</i>	89
COLLECTING NOTES: Orthoptera from the Isle of Purbeck, <i>W. D. Hincks;</i> <i>Labidura riparia, Pall., M. B.</i>	94
CURRENT NOTES	95
REVIEWS	96
SUPPLEMENT:—The British Noctuae and their Varieties, <i>Hy. J. Turner, F.R.E.S., F.R.H.S.</i>	(181)-(184)

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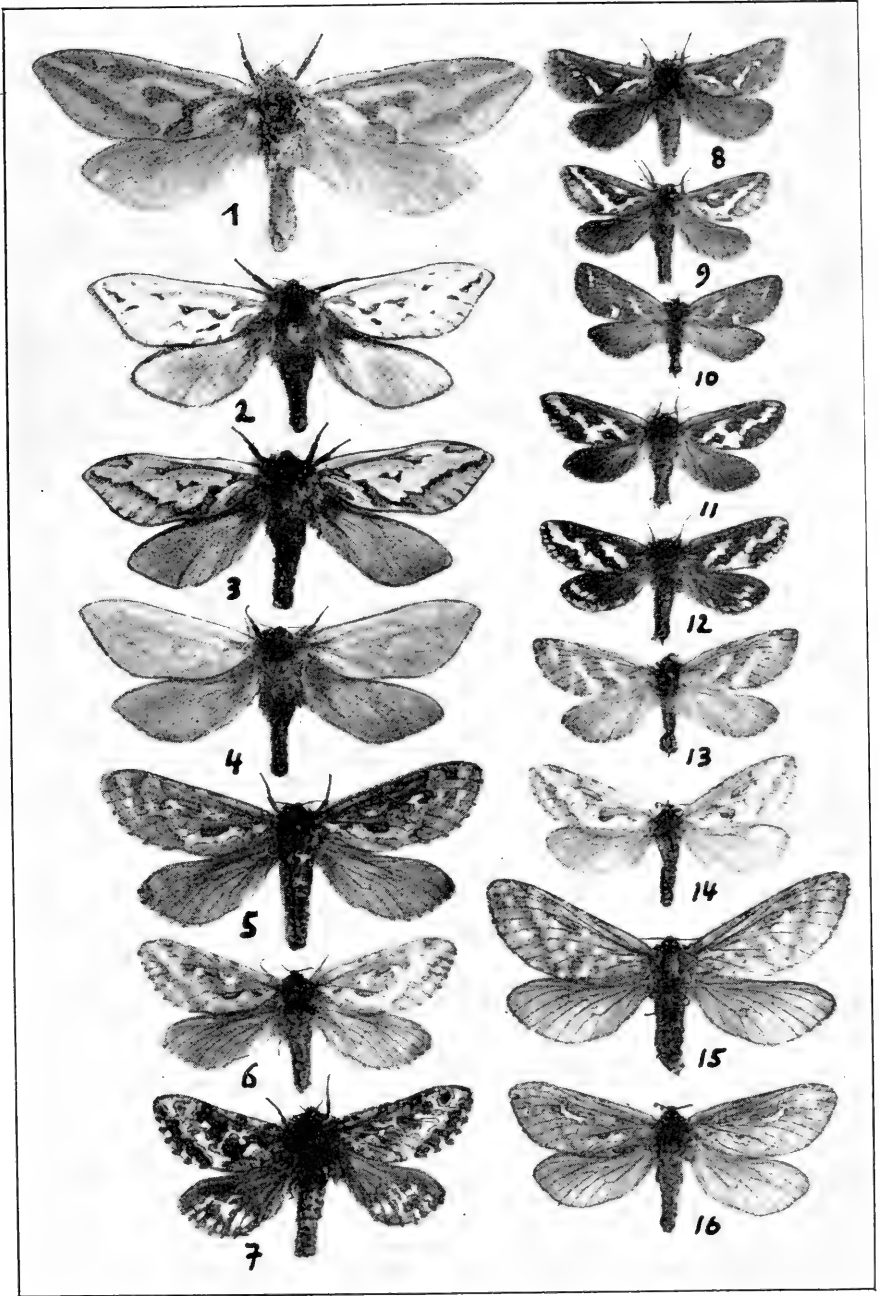
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FORMS OF HEPIALUS.

NEW AND LITTLE KNOWN FORMS OF HEPIALUS MOSTLY FROM GREAT BRITAIN.

By HANS BYTINSKI-SALZ, Ph.D., F.R.E.S., Jerusalem.

13,620

(With Plt. VII.)



In presenting here the description of a number of new and interesting forms of *Hepialus*, I wish to express my sincerest thanks to our editor, Mr Hy. J. Turner, who very kindly and untiringly furnished me with extracts of some of the original descriptions mentioned below. In clearing up the different questions in connection with the Shetland forms of *Hepialus humuli*, it is also his merit to have discovered the right author of *H. thulensis*. (See also "Ent. Record," LI, p. 62 (1939).)

Hepialus humuli, L., ab. **roseornata**, ab. nov. (Fig. 1).

All pink markings very distinct, much enlarged and confluent. A continuous band along the subcosta reaching the costa just above the apex. The three patches at the base, below the cell and on the inner margin confluent. Oblique post-medial band to the apex also large and broad.

Holotype: ♀, Tavistock, July 1914, leg. A. T. Stiff.

Pfützner mentions in *Seitz*, Vol. II, p. 434, a similar form to which he erroneously attributes the authorship to Caradja as he writes: "Caradja describes a very beautiful (form) from Azuga in Roumania (54c)." As I could not find the original description of this form, I wrote to Prince Aristide Caradja, who very kindly replied to me, that he actually described this form in *Iris*, Vol. 8, p. 83-84, 1895, but did not name it. He wrote there: "I received gigantic specimens from Azuga where this species flies from 12th to 16th June; the largest ♂ measures 65 mm., the ♀♀ span even up to 73 mm. The latter ones have intense brick-red fascia The hindwings are rather dark in all of them."

Count of Caradja sent one of these females to Prof. Seitz who figured it on plate 54 and who intended to name this form after Caradja, but this seems to have been omitted during publication. From the description of Caradja, as cited above, it is clear that this form from Azuga (near Sinaia, 1100 m. elevation) is at least a distinct local variety; apparently Pfützner did not intend to name this form as is clearly indicated by his text and by the omission of the original citation, but as the name *azuga* is printed in heavy letters and also reprinted on the margin as it is always done with names of taxonomic value, and furthermore, the name *azuga* appears also below the figure on plate 54c, I think that the name *azuga*, therefore, has taxonomical value. Similar cases, where a form had to receive a name of taxonomical value which the author himself did not intend to apply, have been known before. I remember only the mut. *domestica*, Klimesch of *Sterrhia eburnata*, Wke. Here a dark mutation arose in captivity, which the author called for convenience in his genetical studies "mutatio domestica," and this name has been regarded, later on, as valid by several authors, i.e. Prout and Müller. The name *Hepialus humuli* var. *azuga*, Pfützner has therefore to be used for this fine Roumanian local race.

H. humuli ab. *roseornata* differs from var. *azuga* in being an individual aberration of the English population and no local variety. It is much smaller, measuring only 63 mm. The type of confluency of the

markings is entirely different from that of *azuga* as can readily be seen by comparing the figures 1 on the plate attached, and *Seitz*, Vol. II, pl. 54c. The hindwings are as greyish as in normal *humuli* ♀♀ and not darker as in *azuga*.

Hepialus humuli, L. ssp. *thulensis*, Newman, f. **uniformis** f. nov. and f. **albida** f. nov.

Considerable confusion has arisen in regard to the question, what name should be applied to the geographical race of *H. humuli*, L., which occurs in the Shetland Islands. Generally these specimens went under the name of *thuleus*, Crotch or *hethlandica*, Stgr. as quoted by Staudinger in the Staudinger-Rebel Catalogue, 1901. As these names were also quoted by Pfitzner in *Seitz*, Vol. II, p. 433, they came in general use though entirely wrong.

To clear up this matter I am giving here the original description by Edward Newman, published in *The Entomologist*, Vol. II, p. 162, February 1865:

"Abnormal series of *Hepialus humuli* taken in the Shetland Isles.

I have been led to doubt the accuracy of the conclusion at which Entomologists have arrived, that all specimens of *Hepialus humuli* with white wings are males, and all those with fulvous wings females. In some specimens the forewings are tinted with yellow, while the hindwings are pure white; in others the forewings are pure white, the hindwings dark fuscous. In those specimens supposed, from their general appearance, to be females, the tint is paler than in our southern specimens and more approaches a dull lemon-yellow than fulvous; the body is uniformly dark fuscous and the hindwings when tinted at all, are of the same dark colour."

"I would propose for them the name of *Hepialus thulensis* as a species."

In the next number of *The Entomologist*, Vol. II, March 1865, p. 136, Crotch only states that this is not a species, but gives no further description, and quotes the name in full as "*Hepialus humuli* var. *thulensis*."

From these quotations three points are evident:

1. That Newman and not Crotch is the specific author of var. *thulensis*.
2. That the correct name is var. *thulensis* and not "*thuleus*," which is a misprint by later authors, e.g. Staudinger and Pfitzner, and
3. That as the type form of var. *thulensis*, Newm. male specimens with a dull lemon-yellow colour must be chosen.

As the original description of Newman does not mention whether dark markings on the forewing are present or not, it was still impossible to determine the right form to which Newman applied his name, until Mr Turner kindly traced the original series in the British Museum Collection, from which Newman's description was made. Mr Turner kindly informs me that there is a male specimen labelled "*thulensis*, Crotch," with yellowish forewings and heavy brown markings as in fig. 3 of the plate. I am therefore choosing this specimen in the British Museum Collection as the type of ssp. *thulensis*, Newman.

Staudinger's diagnosis of the var. *hethlandica* in the Staudinger-Wocke Cat., 1871, and the Staudinger-Rebel Catalogue, 1901, p. 410: "♂ sim. in ♀ al. ant. flavidibus fulvo striatis" describes clearly the same form and is therefore a synonym to ssp. *thulensis*, Newman.

Ssp. *thulensis* varies considerably in respect to coloration and designs of the forewing. Three principal forms of ♂♂ may be distinguished by the following key:

1. Forewing yellow, heavily marked with dark designs :
 ssp. *thulensis* f. *thulensis*, Newm. (syn. *hethlandica*, Stgr.)
2. Forewing yellow, without dark designs : ssp. *thulensis* f. *uniformis*
3. Forewing white, heavily marked with dark designs :
 ssp. *thulensis* f. *albida*
- (4. Forewing white, without dark designs : ssp. *humuli*, L.)

Spuler (*Schmetterlinge Europas*, Vol. II, 485) also mentions three different ♂ forms from the Shetlands without naming them :

- a. Forewings greyish ochreous white with distinct sepia-grey brown markings.
- b. Forewings yellowish white grey with dark ochreous yellow brown edged markings.
- c. Forewing ochreous brownish white with very few remnants of the brownish design.

Of these three forms, forms a and b probably correspond both to the f. *thulensis*, while form c is a transitus ad f. *uniformis*.

The descriptions of the two new forms mentioned above are as follows : *Hepialus humuli*, L. ssp. *thulensis*, Newm. f. **uniformis** f. nov. (Fig. 4).

Ground colour of the forewing ochreous yellow as in f. *thulensis*, Newm. but entirely without dark designs. Hindwing very dark grey.

Cotypes : 2 ♂♂, Shetland Isl., leg. 1909.

Hepialus humuli, L. ssp. *thulensis*, Newm. f. **albida** f. nov. (Fig. 2).

Ground colour of the forewing silky-white as in *humuli*, L. with distinct brown markings as in f. *thulensis*. The hindwings vary much from white to dark grey with a radial white suffusion from the base.

Cotypes : 7 ♂♂, Unst, leg. A. J. Hodges, July 1899, and Shetlands, 1909.

The distribution of the Shetland specimens of ssp. *thulensis* in regard to these three different forms in my collection is as follows : f. *thulensis*, 16 ♂♂ ; f. *albida*, 7 ♂♂ ; f. *uniformis*, 2 ♂♂ ; but as these series were not collected at random, f. *uniformis* may be considered as a still rarer form.

Hepialus fusconebulosus, de Geer ab. **latefasciatus** ab. nov. (Fig. 6).

One female has all the white markings confluent and enlarged. A broad white band from the base along the inner margin towards the apex, confluent with the spot on the end of the upper cell. A complete row of large and confluent subterminal and terminal spots. Hindwing uniform pale brown.

Holotype : ♀, Pitcaple, Scotland.

Hepialus fusconebulosus, de Geer ab. **ornatus** ab. nov. (Fig. 7).

One male has all the white markings also much enlarged and almost as confluent as in ab. *latefasciatus*, but has in addition on the hindwing two rows of post-medial and marginal white spots between the veins, which may be confluent and form radial streaks.

Holotype : ♂, Sligo, Ireland, leg. A. J. Hodges.

Hepialus fusconebulosus, de Geer, ssp. *vallei*, Grönblom. (fig. 16).

K. J. Valle described in the *Memoranda Societatis pro Fauna et Flora Fennica*, vol. 7, pp. 286-287, Helsingfors, 1931-1932, a new *Hepialus fusconebulosus* ssp. *hyperboreus*, of which he gives the following description :—

"The specimens of this species from the environment of Pummanki on the Fisher Peninsula (Petsamo district, Finland) differ markedly from more southern specimens. In the male the white markings on the forewing disappear more or less, the discal marking, especially the light discal spot, may remain. The female even more deviates from southern specimens, as there all designs become very inconspicuous and only traces of the cellular macula may be present. The colour of the upper side of the forewing is also somewhat different and more or less greyish rust red. . . . I propose for this arctic form the name *hyperboreus*."

As the name *hyperboreus* Valle is preoccupied by *Hepialus hyperboreus*, Möschler, Grönblom (*Act. Soc. Fn. u. Fl. fenn.*, LVIII, 1936, p. 43) changed this name into ssp. *vallei*, Grönblom, nom. nov. pro. ssp. *hyperboreus*, Valle.

Of this interesting arctic *fusconebulosus* race I received a ♀ from the Rybatchi Peninsula, Murman Coast, 70° lat., 150 m., 1-15, VII, leg. Kotzsch, which agrees well with the description of Valle. The forewings are of an uniform dull greyish brown colour. Of the markings only an elongated white spot at the end of the upper cell present. On the first aspect this form resembles much more *H. carna*, Esp. (fig. 15) than *fusconebulosus*, but the shape of the wing and the type of designs clearly indicate its relationship to *H. fusconebulosus*.

Hepialus lupulinus, L. ab. **latemarginatus** ab. nov. (fig. 9).

Pfützner already mentions in *Seitz*, Vol. II, p. 436, that many of the English specimens of *lupulinus* tend to an enlargement of the white markings on the forewing. The extreme form with the whole forewing white he called ab. *senex*. I think that also an intermediate form is worth naming. It has a continuous band from the base along the inner margin and is confluent with the oblique postmedial band. This band is not separated in spots as in normal *lupulinus* and is at least twice as large as normally. The silvery spot in the cell is also much enlarged. In the terminal area a whitish subterminal band and a row of 6 white terminal spots.

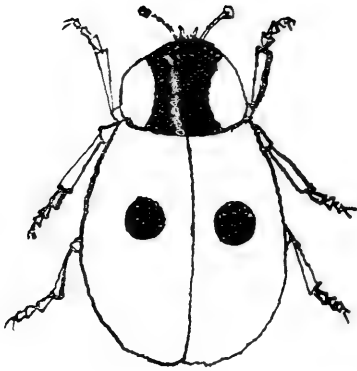
Cotypes: 2 ♂♂, London District and Wicken, leg. A. J. Hodges.

Hepialus hecta, L. ab. **confluens** ab. nov. (fig. 11).

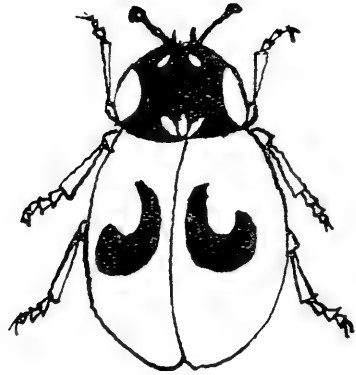
Of *H. hecta*, L. I have an interesting series of 11 ♂♂, 2 ♀♀ from Thundersley, Essex, which differ remarkably from specimens from the Continent and other English places. All ♂♂ have the silvery spots on the margin present in the following proportions:—3 specimens with 3 spots; 3 with 4; 4 with 5; and 1 with 6. One specimen is very dull brown and belongs to the ab. *flina*, H.-Sch.; 4 specimens have the marginal spots radially elongated and therefore belong to the ab. *decolorata*, Krul. In one specimen the series of postmedial spots forms a continuous band up to the apex.

Another specimen has the ante-medial and post-medial bands complete and conjoined by a transversal streak = ab. *confluens*.

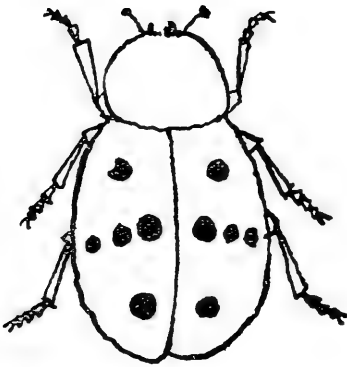
Holotype: ♂, Thundersley, 6th July 1911, leg. A. T. Stiff.



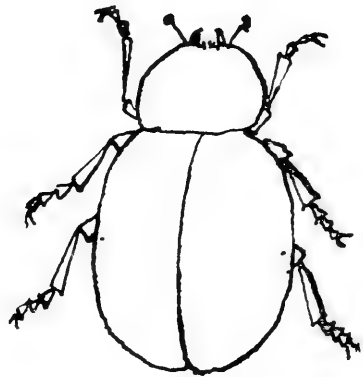
1



2



3



4

Ent. Rec. and Jr. of Variation.

det. T. F. Marriner.

ABERRATIONS OF COCCINELLIDS.

Hepialus hecta, L. ab. **ornata** ab. nov. (Fig. 12).

One male has the post-medial band well developed and 6 spots on the margin. On the hindwing there are two rows of interneural silvery spots, one post-medial row of 4, and a complete marginal row of 7 spots.

Holotype: ♂, Thundersley, 4th July 1911, leg. A. T. Stiff.

ab. *ornata* comes nearest to ab. *strigosa*, Hartig, but this form has only one row of radial intervenal spots on the hindwing; *strigosa*, Hart. can be considered as a *decorata*, Krul. with the same pattern also on the hindwing, while in ab. *ornata* there are two rows.

Hepialus hecta, L. ab. **inversa** ab. nov. (Fig. 14).

One female has all the white markings very much enlarged; the whole ground of the forewing is greyish white. Of dark markings there are present: 4 costal dots, one elongated mark in the upper cell, one large claviform mark at the base below the lower cell and a darker band outside of the post-medial line.

Holotype: ♀, St Amata, Lettonia, 16th July, 1933, leg. W. Brandt.

This form corresponds to the ab. *senex*, Pftz. of *H. lupulinus*, L.

EXPLANATION OF THE PLATE.

1. *Hepialus humuli*, L. ab. *roseornata*, By.-S. ♀, Type, Tavistock.
2. *Hepialus humuli*, L. ssp. *thulensis*, Newm. f. *albida*, By.-S. ♂, Cotype, Shetland Islands.
3. *Hepialus humuli*, L. ssp. *thulensis* Newm. ♂, Shetland Islands.
4. *Hepialus humuli*, L. ssp. *thulensis*, Newm. f. *uniformis*, By.-S. ♂, Cotype, Shetland Islands.
5. *Hepialus fusconebulosus*, De Geer. ♀, Pitcaple.
6. *Hepialus fusconebulosus*, De Geer ab. *latefasciatus*, By.-S. ♀, Pitcaple.
7. *Hepialus fusconebulosus*, De Geer ab. *ornatus*, By.-S. ♂, Sligo, Ireland.
8. *Hepialus lupulinus*, L. ♂, Berlin, Germany.
9. *Hepialus lupulinus*, L. ab. *latemarginatus*, By.-S. ♂, London District.
10. *Hepialus hecta*, L. ♂, St Amata, Lettonia.
11. *Hepialus hecta*, L. ab. *confluens*, By.-S. ♂, Type, Thundersley.
12. *Hepialus hecta*, L. ab. *ornata*, By.-S. ♂, Type, Thundersley.
13. *Hepialus hecta*, L. ♀, Berlin, Germany.
14. *Hepialus hecta*, L. ab. *inversa*, By.-S. St Amata, Lettonia.
15. *Hepialus carna*, Esp. ♀, Triglav, 1800 m., Eastern Alps.
16. *Hepialus fusconebulosus*, De Geer ssp. *vallei*, Grönl. ♀, Rybatchi Peninsula; Murmansk Coast, 70° lat.

COCCINELLID NOTES. TWO NEW ABERRATIONS.

By T. F. MARRINER.

(With Plate VI.)

Some years ago my friend, the late Mr G. B. Routledge, showed me three fine specimens of *Adalia bipunctata*, L., which he had bought in a collection in London. I spent much time and search over these as they all seemed worthy of names. Lately I submitted drawings of them again to Mr H. Donisthorpe and he tells me that two of them appear in Dr Mader's great work.* The third, however, does not appear to have been noted and I would like to name it as *Adalia bipunctata*, L., ab. **routledgei**, after my late friend. It is shown in the plate (No. 2) alongside the normal *A. bipunctata* (No. 1). It agrees with the Linnean description

*"Evidenz der paläarktischen Coccinelliden und ihren Abberationen," 1927-1935.

of *bipunctata* except as shown in the sketch, where it will be noticed that both the elytral and the thoracic spots are unusual.

According to a data label attached, when I saw it, the insect had come from the collection of a Mrs Taylor, London, and had been taken at Hanwell in 1877. Mr Routledge's collection is now in Tullie House Museum, Carlisle.

When I came to live at Easton in north-east Cumberland, almost six years ago, I came to an area which had been unexplored by the naturalist and I am spending my time in exploring its natural history. One of my chief disappointments is the fact that it appears almost devoid of my favourite family, *Coccinellidae*, but I hope to show in a later paper that even their scarcity has yielded some interest. At present I wish to call attention to one of my finds. In four seasons I never came across even such a commonly occurring species as *Coccinella 10-punctata*, L., but last August, when collecting along the Netherby Road, I stopped at a point some four miles from home to watch some men bringing timber out of the wood. I saw some ladybirds on one of the logs and managed to tube some half-dozen for the sake of the locality. They were *C. 10-punctata*, L., and when I came to set them I only found a single normal specimen among them (3) and one of them had no spots, while two others were almost clear. This no-spot variety must surely be rare, for I have been interested in the insect for over thirty years and have never either seen or heard of it. It is not an immature specimen. A very powerful lens shows an exceedingly faint, minute, black speck close to the edge of each elytron (4). The insect agrees with the normal description in every other respect. I propose the name *C. 10-punctata*, L., ab. **inornata** for this.

The spotless forms of *Coccinellidae* now discovered and named are:—

- Subcoccinella 24-punctata*, L., ab. *saponaria*, Weise has been recorded from France, Essex, and Cumberland, *Ent. Record*, XXXVI, p. 86.
Hippodamia variegata, Goeze, ab. *immaculata*, Gmel. taken only in Sweden, *l.c.*, XXXIV, p. 24.
Coccinella 11-punctata, L., ab. *pura*, Weise, France only so far, *l.c.*, XXXI, p. 122.
Coccinella 7-punctata, L., ab. *lucida*, Weise, France, Cumberland, *l.c.*, XXXVI, p. 87.
Coccinella 10-punctata, L., ab. **inornata** (n. ab.), Cumberland.

[The following other spotless forms are figured by Mader:—

- Hippodamia 13-punctata*, L., ab. *signata*, Fald.
Adonia variegata, Gr., ab. *immaculata*, Gmel.
Anisosticta 19-punctata, L., ab. *egena*, Weise (with immaculate thorax), and ab. *athesis*, Weise (*pallida*, Possi).
Adalia 10-punctata, L., ab. *pellucida*, Weise (quite immaculate without Marriner's very small spots on elytra).
Adalia bipunctata, L., ab. *concolor*, Meier.
Coccinella 5-punctata, L., ab. *minskwitzi*, Hän.
Coccinella hieroglyphica, L., ab. *brunnea*, Weise.
Synharmonia conglobata, L., ab. *vandalitiae*, Weise.—H. D.]

NOTES ON ORTHOPTERA IN GLOUCESTERSHIRE.

By T. BAINBRIGGE FLETCHER.

Labia minor, L., is noted from Gloucestershire on Dr Burr's map of this species, but the only Earwig which I have seen here is *Forficula auricularia*, L., which is abundant from August to October. It comes to sugar freely and on 21.ix.1937 a male and female were found *in cop.* alongside a sugar-patch. On 24.ix.1937 I saw a male with large forceps backing, with its forceps open, towards a female, which moved away, and this action appeared to be an attempted preliminary to copulation. Again, on 21.x a male and female were in a crack of the bark near a sugar-patch, the male below the female; when the light was turned onto them, the male had his forceps erected upwards and forwards and was apparently grasping the female by (or near) her forceps, but the male disengaged his hold as soon as the light came onto them.

Blatta orientalis, L., occurs in some of the houses about 400 yards away and 200 feet downhill from mine, which is isolated on an open Common. It does not inhabit my house but on 3.x.1936 one female was found in the house, and during the last week of September 1937 four nymphs, about three-quarters grown, also invaded the house. It looks as if this species, possibly able to live out-of-doors during the Summer, invades new territory at the beginning of the cold weather. Shaw (*E.M.M.*, XXV, 365, 1889) states that it is also found out of doors.

Acrydium vittatum, Zett., is not common here; usually found as odd specimens. I have seen adult examples at Rodborough on 17.iv.1935, 29.v.1936 and 2.viii.1937, and have specimens dated 30.v.1934 and 2.ix.1937; also from Symond's Yat on 24.vii.1937 and from Haresfield (Stroud District) on 3.ix.1937. This species is supposed to be adult or in its last nymphal stage in the Autumn, but these dates make it difficult to decide when it does become adult.

Dr Burr notes *A. subulatum*, L., from Gloucestershire on his map, but I have only come across it near Elmore.

Stenobothrus lineatus, Panzer, is abundant on the hill-tops at Rodborough, Haresfield, and Selsley, and I have one from Nailsworth on 4.ix.1937. In 1934 it was adult on 10.vii; in 1935 it occurred on 11.x, in 1936 from 29.vii to 24.x, and in 1937 from 30.vii to 27.x.

Omocestus viridulus, L., which is not noted from Gloucestershire on Dr Burr's map, is common, but by no means abundant, at Rodborough and Haresfield. Dates noted are 10.ix.34, 7-21.viii.1936, 30.vii-9.x.1937.

Omocestus ventralis, Zett., also not noted from Gloucestershire on Dr Burr's map, has been recorded previously by Shaw from Wotton [under-Edge]; it seems to be scarce in Gloucestershire and I have only come across it on two occasions, at Oddington on 25.ix.1937 and at Rodborough on 4.x.1937.

Myrmeleotettix maculatus, Thunberg, seems to be a hill-top species, found at Rodborough, where it is abundant, and at Haresfield and Selsley. In 1937 it was adult on 1.vii and occurred as late as 2.xi.

Chorthippus bicolor, Charp., which, by some oversight, is not noted from Gloucestershire on Dr Burr's map, is abundant and I have it from Rodborough, Haresfield, Nailsworth and Selsley (all in the Stroud District), from the Tortworth District and from Chastleton (near the Ox-

ford border). In 1935 it occurred to 11.x; in 1936 from 11.viii to 24.x; in 1937 from 30.vii to 21.xi.

Chorthippus parallelus, Zett., is abundant in the valleys and on the lower slopes of the hills. I have found it at Rodborough, Haresfield, Nailsworth, Selsley, and Cranham (all in the Stroud District), in the Tortworth District, at Oddington (towards the Oxford border), and at Rollright, which is just over the border in Oxon. In 1937 it occurred from 30.vii to 26.x. Dr Burr took at Rodborough a single macropterous example, which he will doubtless record in more detail, but prolonged search failed to reveal another similar specimen here, although in 1938 I took one in the Gloucester Brickfields.

Gomphocerus rufus, L., which is usually regarded as a local and uncommon species in S. England, is very abundant on Rodborough Hill and on Cranham Common, but I have been unable to find it on other similar hills in the Stroud District. In 1934 it occurred to 5.x, in 1935 to 11.x, in 1936 to 24.x; in 1937 it was adult from 5.viii and went on until 11.xi, but on 26.xi I found one nymph still living—an extraordinarily late date.

Gryllotalpa gryllotalpa has recently (*Field*, 27.v.39, p. 1244) been recorded as found near Nailsworth some thirty years ago, but is otherwise not known so far from this county.

Gryllulus domesticus, L., certainly has a regular habit of coming into the house at the beginning of the cold weather, about the end of September, but seems to breed out-of-doors in the Summer. Occasionally a young cricket comes to enjoy a feast at a sugar-patch. One male, taken in the garden on 25.vii.1933, has the HW. abbreviated. It is common at Rodborough.

Leptophyes punctatissima, Bosc., is noted from Gloucestershire on Dr Burr's map but I have only found it near Newent.

Meconema thalassinum, Fb., does not seem to be very common. I have taken single specimens at Rodborough, on 2.x.1934 at sugar, 30.ix.1935, and 12.ix.1937 at sugar: on Selsley Hill I took a few by sweeping (mostly Beech and Hazel) on 30.viii.1937 and there was one there on Ivy-bloom on 29.ix.1937. Also near Newent and at Woodchester.

Pholidoptera griseo-aptera, de Geer, 1773 (*cinerea*, Gmelin, 1789), occurs commonly in several places, on the edge of bushes: Nailsworth, 8 and 22.viii.1936, 4.ix.1937; Haresfield, 29.vii.1936 (nymph); Selsley, 9.viii.1937; Rodborough, 5.viii.1937. It is not found on the open ground on hill-tops.

Tettigonia viridissima, L., which is also not noted from Gloucestershire on Dr Burr's map, occurs fairly commonly in one small colony at Nailsworth, where I have found it on 25.vii.1935, 8 and 22.viii.1936 and 4.ix.1937, and there are also other colonies in the Stroud District.

It will be seen that our County List of Orthoptera is at present a small one but no Orthopterist seems to have collected in Gloucestershire and systematic search would doubtless add a few species.

[*Blatta orientalis* evidently tries to establish itself with us in the open, as it has been recorded away from houses at Dorney (*Ent. Rec.*, 1937, p. 115), and in the New Forest (*ibid.*, p. 136), but fortunately there is no hope that it could survive the winter in the open. I have

taken two or three *M. thalassinum* at light at Stroud in the autumn (*Ent. Rec.*, 1934, p. 110)

An addition to the list for the county is the mole cricket, *Gryllotalpa gryllotalpa*, L. A writer in a recent number of *The Field* (27th May 1939, p. 1244), Mr M. Leighton Ridgway, records a specimen taken at Nailsworth thirty years ago.—M. B.]

CONTINUOUS BREEDING: V.

DIANTHOECIA (HARMODIA) NANA. ROTT. (CONSPERSA, ESP.).

By H. B. D. KETTLEWELL, M.A., M.B., B.Chir.

(Continued from p. 59.)

Larvae of this species can be collected by the simple means of collecting the flower heads of its foodplant, species of *Silene* (Campion), in July and August wherever the species occurs.

The larvae feed at night on the dried seedpods augmented with the flowers of pinks and carnations [not local champion for fear of introducing local larvae]. They pupate in ordinary dry earth. These pupae are dug up a month later and transferred into ordinary round cardboard boxes. It is essential to keep the pupae dry. The moths emerge in May and June—some the first year, some the next, and some even the third year after pupation, according to what place they came from. The champion will grow away from its normal habitat without much difficulty. Three or four plants are planted in a shallow wooden box, 3 ft. by 2 ft., and allowed to cover the bottom. Three sides of my box have glass let in, the fourth having perforated zinc for ventilation. The top is covered over with muslin. The selected male and female *nana* (*conspersa*) are introduced into this. Though I have not yet actually observed the pairing or found the eggs the fact remains that young larvae will be found in the flower heads some weeks later. There are usually too many larvae for the amount of food, so that pinks must occasionally be added. The pupae are later scratched out from the earth.

Varieties in this species seem limited to its geographical range, with the extreme dark forms occurring along with more normal ones in the west and north [Devon and Shetlands]. Intermediates of all grades occur in these places; also black ground colour (Sussex), yellow replacing normal white (Cornwall), etc.

COLLECTING NOTES, 1938.

II: MID-JUNE—AUGUST.

By A. J. L. BOWES.

(Continued from p. 58.)

Mr Rideout and I set off from Godalming on 19th June for a week-end in the Fen and Breck country. We left Godalming by car at 4.0, and were at Warboys, where we stayed at "The Pelican," by 9.0 p.m. Mason, that excellent naturalist, met us at the gate of Wood Walton Fen, and made us feel at home. We were not fortunate in our weather, which gave us a cool and clear night, not without moon;

but we had come to see *Tapinostola extrema*, and though Mason was not too sanguine, the first one appeared at 11.30. There is in the middle of the Fen a large patch of *Calamagrostis*, which is kept free of undergrowth, and newly-emerged *extrema* can be found sitting high up on the stems. A few, very few, will come to light, and a few to sugar; and there is a big flight between 1.30 and 2.30 a.m. Of a dusk flight we saw nothing, but inferred one from early arrivals on sugar. An hour's hard work in the patch of food-plant gave us eleven immaculate specimens. On sugar there was the usual riff-raff; hosts of *Apamea unanimitis*, *A. gemina*, and so on. Now and then *Leucania obsoleta* would turn up to gladden us, or a *Chaerocampa elpenor* perform miracles of levitation on the sugar; but there was not the almost oppressive wealth of insects that turn up on a really good night in the fens. Our next two nights, the 18th and 19th, were similar; we found a few more *extrema* in the same way, since long and energetic days made us too tired to wait up for the dawn flight, and *L. obsoleta* came again in ones and twos. Light was disappointing; on the 19th insects came fairly freely in the early hours, but none of the choicer species made any sort of a show. The fen is a stimulating place, and its watcher, Mason, a most admirable guide to its birds and flowers and insects.

We spent our days in the Breck country, 30 miles off. Our main object was *Lithostegia griseata*, which had eluded us on a previous visit a few years before. This time, thanks to a kind friend's help, we were able to find it in plenty near Brandon; both sexes could be readily flushed from rough herbage, but a strong wind carried many away out of reach. In the same field *Emmelia trabealis* was swarming, three or four getting up at once, and we saw one *Heliothis dipsacea*. The afternoon of the 21st we spent in a vain attempt to remain long enough in a promising field to find *Silene otites*, the food plant of *Dianthoecia irregularis*; but the keepers were in exceptionally good form that afternoon, and after a couple of summary ejections we went off to an open field near Barton Mills where *H. dipsacea* was flying freely. Here we hoped to catch a few of this local insect, which was in fine condition, but the wind-blown grass made them almost impossible to see, and after an hour we came away without a single one.

At about this date the moths were emerging from our Struan larvae of *Eurois occulta*. These had been heavily parasitised by two flies, and only a dozen emerged successfully. They were all of the dark form, and though I sacrificed two and got a pairing, the male died in copula; an amateur operation freed the female and she laid many eggs, but all were infertile. And unhappily a union between two of our dark *Triphaena comes* from Forres was not blessed with issue.

On the night of 30th June I went down to the Lewes district, and visited a locality in which I had taken two *Nola albula* the previous year; since then, however, the ground had been burnt, and no more were found, although *Senta maritima* was common enough near by. Other insects which flew to light were *Neuria reticulata* and *Dianthoecia lepida (carpophaga)*.

I spent an evening near Havant on 2nd July. It was cold, with a mist lying over part of my round, but that did not prevent *Leucania turca* from having a meal. He was just emerging, and was as common as usual in the rides of the extensive oak-woods. Two other visits

were paid to this spot during *turca*-time, on the 9th and the 16th; on each occasion *L. turca* came well up to scratch, but no extreme varieties turned up, such as have been bred by Mr Wightman from this district. My main object on these last two nights was *Oeonestis quadra*, which is rumoured to occur in these woods; I saw none, but the weather was bad, and this species in my experience needs very muggy weather before it will come freely to light. Besides the common species, a *Moma alpium* (*orion*), still fresh, came to sugar on the 16th, with quite a crowd of *Dyschorista suspecta*.

As a second string to Havant, I explored a heath near Godalming, to be precise the expanse of open ground at Cutt Mill. An avenue of oak and birch was sugared, and a light pitched in a marshy area full of coarse grass. The sugar produced *Noctua augur*, *N. festiva*, *Aplecta nebulosa* in numbers, *Dipterygia scabriuscula*, *Leucania impudens* and *Rusina tenebrosa*. Most of all I was glad to see *D. suspecta*, which came at intervals to sugar on the birches. The marshy ground was better fun; soon after dark fresh specimens of *Cybosia mesomella* were common on the grass, and very welcome they were, for I had never before been able to find examples that really were worthy of cabinet rank; here was clearly a breeding ground, and I was able to select a good series, including some of the rather scarce yellow form of the male. It was good, too, to see *Tholomiges turfosalis* flying freely at dusk in the same area, and *Hydrelia uncula* was common on the grass stems. *Leucania impudens* swarmed on 11th July, and there was a good flight of *Acidalia subsericeata* between 9.50 and 10.15 p.m. on the 6th. *Nudaria senex*, rather a meagre race, could be found on grass, very conspicuous, and species that turned up oddly were *Acronicta leporina* and *Dyschorista fissipuncta*.

A second visit was paid to the Chiddingfold woods on 24th July, when we found the second brood of *Leptidea sinapis* not uncommon. *Hesperia malvae*, fresh as paint, was a surprise—presumably an early second brood; and we saw one male *Apatura iris*, sweeping grandly up over an oak. This species is usually to be seen here in its own time, and once I was foolish enough to run over a male in my car, as it sat on a pile of horse droppings. At the same date, *Lithosia griseola* was locally common in a marshy, sallow-lined field near Compton; f. *stramineola* was present also, apparently in a ratio to the type of about one to three. Efforts to find the black variety of *Limenitis camilla* by myself and my friends were fruitless, although the species was fairly plentiful, and some had occurred to us at Farnham two years before.

During June and July a number of moths came to the light in my room, which looked out over Godalming to Hindhead. Results were very thin until late in July, when a row of very warm nights brought reports of miraculous draughts of insects all over the south of England. On the 21st and 22nd moths swarmed into my room between 1 and 2 a.m., and I was hard put to it to excavate all those which went to ground behind books and cricket tackle and what not. At last, in despair, I shut the window tight and went to bed; and in the morning the window panes were plastered with insects which had made to escape at dawn. Most were common stuff, but the better sort included a couple of that shy insect *Xylophasia scolopacina*, *Calymnia pyralina*, and *Laspeyria flexula*,

On the 27th I drove up to the Broads for a few days. Mr Michael Chalmers-Hunt came with me, and we stopped that night at Wicken. After a look at the eggs of the Large Copper, which appeared to be very plentiful, we used the rest of the daylight in a short journey to Barton Mills, where *Emmelia trabealis* and *Acidalia rubiginata* were still about. A high wind and heavy rain after dark made Wicken an unpleasant place; a few *Gastropacha quercifolia* and *Phragmatoecia castaneae* came to the upright sheet, and we were pleased to see a yellow male of *Cosmotriche potatoaria*, but at midnight the rain won, and we splashed home.

The next morning was fine but windy, and we stopped on our way to the Broads near Brandon. After my failure in June, it was with surprise and delight that I came across a good patch of *Silene otites* at the side of the road, with several larvae of *Dianthoecia irregularis* sitting on the stems. Not wanting to take larvae with us, we left them till the return journey, and chased *Satyrus semele*, which was in good order and abundant. At this point my car became dyspeptic, but we made shift to reach Barton Turf in the early evening. Innless, bathless, yet most hospitable, this village is still fairly quiet except in regatta-time, and is an ideal and charming centre for the Broadland insects and birds. Mr C. W. V. Gane, equally expert at birds and insects and boats, is reputed to have spent some twenty-five consecutive summer holidays there without surfeit; I am not surprised. On the Broads one is utterly at the mercy of the weather, which at this time of year often produces hot days and very cold nights; when I was there in 1936 night collecting was hopeless, and for a week we saw neither *Pelosia muscerda* nor *Leucania brevilinea*. On the other hand, a hot day may be followed by a hot night, if there is just enough breeze to keep the air moving; and in 1938 we were lucky enough to meet a row of four muggy nights. On the first evening Hunt stayed at the staithe, while I drove round to a reed-field on the north side of the Broad; we found this latter place so good that we made it our base for the future evening work. At dusk in this reed-field *Celaena haworthii* was common, buzzing low down in the herbage and almost invisible; but later in the night it would fly wildly shoulder high, and was then very hard to catch. The first *Leucania brevilinea* came at 9.30, at the time of the lighting of lamps; it seemed to have a regular time of flight, from 9.30 until 10.15, and after this one could find couples on the reeds, though rarely. While the flight lasted, it was remarkable; *brevilinea* easily outnumbered other species, and it was no rare thing for us to have two or three at a time around our lamps as we walked along the edge of a newly-cut reed-field. The form *sinelinea* turned up about once in every ten, but we found it hard to get the insect in good condition, two of every three having to be turned loose. It is, I think, an insect that will not travel far to light; it may, for instance, be taken by walking with a light through its breeding grounds, or by coasting along the edges of reed-fields in a tub, with a light aboard; but Hunt at the staithe saw only one at his stationary lamp, and Mr Peyton tells me that on a good night when insects are coming freely to light at the staithe, he has never seen more than two. *Pelosia muscerda* was fairly common, with the typical and yellow forms of *Lithosia griseola*; it could be taken flying around the willow bushes—

rarely in the open reed-field—or more freely on the sheet late at night. The three other nights which we spent at this spot produced the same species, with the interesting additions of *Meliana flammea* and a tired *Senta maritima*. The night of the 31st was of the sort that comes only once or twice a year; after a commonplace start, we moved our sheet to a little wood that overlooked the reed-field, and between 1 and 2 a.m. it was covered so thickly with moths that Mr Howard, who had joined us, suggested that we should take the sheet away, shake it, and start again. In a few minutes it was as full as before. *P. muscerda* dropped on to it as fast as we could box them, and we took a fine varied series; they were still coming when we packed up at 2.30. Another good species which came in numbers was *Calamotrophus paludellus*. It is the only occasion when I remember counting more than 200 moths on a sheet at once.

By day we went on the water. Collecting pupae of *Nonagria cannae* in public is an undignified business, recalling an ostrich, but very good fun on a warm day. The moorhens had thought so too, and had ripped up most of the stems of *Scirpus* that contained a pupa. Our rate was about one in ten minutes. I suspect that this species, like *N. sparganii*, keeps up its numbers by pupating in large colonies on semi-dry land; Mr Wightman, who has found such a colony of *cannae*, tells me that the pupae were in considerable numbers, far thicker than one ever finds them out on the open water. Out of half-a-dozen pupae which I kept to complete my series, I was glad to breed a nice female of a pale but bright salmon-pink colour.

Larvae of *Papilio machaon* were abundant in one field near the village, and we saw a few of the second brood imagines hawking over the reeds. We just missed *Orgyia gonostigma*, which had pupated but was not yet flying, it seemed.

On our way home on 1st August we put in another night at Wicken. Leaving my friends at the fen, I went off at dusk to Brandon to pick up a few larvae of *Dianthoecia irregularis*; they were still very small, and could be found quite commonly crawling up the stems of the catch-fly for their evening meal. While I was doing this, *Acidalia rubiginata* and *Eupithecia subfulvata* came to my lamp. Later I met Mr P. J. Burton, of Lowestoft, collecting near Mildenhall; under his guidance I was introduced to *Tapinostola hellmanni*, which was flying in profusion in a limited area with *Lithosia complana*. Mr Burton also netted an *Acidalia muricata*, which he thought to be new to Suffolk. By 1 a.m. I was back at Wicken, to find that insects had been swarming; *Arsilonche albovenosa* and the usual fen insects had come to sugar and light in quantities, with two notable exceptions—*T. hellmanni* and *N. dissoluta*. It must be admitted that *Xylophasia monoglypha* was so abundant and self-assertive that no delicate insect had a dog's chance on the sugar, but it is odd that not one *N. dissoluta* was seen either at sugar or at light on five good nights in its home. There was further excitement on my arrival, for two *Chiasmia clathrata* ab. *nigricans* appeared at the sheet almost simultaneously. Two yellow males of *Cosmotriche potatoria* were taken, and the expedition ended in the arrival at 3 a.m. or so of a male *Laphygma exigua*; this, and both the *clathrata*, were taken not in the fen but at the village end of the main drove.

(To be concluded.)

COLLECTING NOTES.

ORTHOPTERA FROM THE ISLE OF PURBECK.—During the last few days of July 1938 I was collecting *Ichneumonidae* and Coleoptera in the Swanage district of Dorset. A little attention was also paid to the Orthoptera, which were extremely abundant almost everywhere. Dr Malcolm Burr has been kind enough to examine my material, and the following list is based on his identifications. Several searches on Ballard Down for *Calliptamus italicus* proved fruitless though these were amply repaid with material in other groups.

Ectobius panzeri, Steph. Studland, sand dunes, 5 ♂♂, 3 ♀♀, 1 juv., 25.vii. Swanage, 2 juv., 24.vii.

E. lividus, F. Corfe Castle to Blue Pool, 1 ♀, 1.viii.

Acrydium vittatum, Zett. Studland Heath, near Little Sea, south side, 5 ♂♂, 2 ♀♀, 25.vii.

Omocestus viridulus, L. Ballard Down, 1 ♂, 25.vii.

Chorthippus bicolor, Charp. Corfe Castle to Blue Pool, 2 ♂♂, 1 ♀, 1.viii. Near Corfe Castle, 2 ♂♂, 1 ♀, 31.vii. Studland Heath, near Little Sea, south side, 1 ♀, 25.vii. Swanage, 16 ♂♀, 24.vii; 4 ♂♂, 25.vii; 2 ♂♂, 2 ♀♀, 26.vii; 4 ♂♂, 13 ♀♀, 27.vii. Ballard Down, 4 ♂♂, 25.vii; 1 ♂, 3 ♀♀, 28.vii; 1 ♀, 29.vii.

C. parallelus, Zett. Ballard Down, 2 ♂♂, 1 ♀, 25.vii. Swanage, 5 ♂♂, 4 ♀♀, 24.vii; 1 ♂♀, 27.vii; 1 ♂, 29.vii.

Myrmeleotettix maculatus, Thunb. Studland Heath, near Little Sea, south side, 6 ♂♂, 9 ♀♀ 25.vii. Ballard Down, 2 ♂♂, 12 ♀♀, 28.vii.

Tettigonia viridissima, L. Swanage, 1 ♂♀, 24.vii.

Platycleis grisea, F. Swanage, 2 ♂♂, 5 ♀♀, 24.vii.

Leptophyes punctatissima, Bosc. Swanage, 1 ♀, 1 juv., 29.vii.

W. D. HINCKS.

46 Gipton Wood Ave., Leeds, 8.

The way to find *Labidura riparia*, Pall., is given in an interesting note on this species by Dr Weidner of Hamburg in a recent paper on the Orthoptera of Central Germany (*Zeit. f. Nat. Halle*, 92 Bd., 1938). He points out that the best places to look for it are sand dunes and sandy banks, with a preference for sunny spots. The presence of the earwig is shown by the mouths of their galleries, small, rather broad openings with an arched roof. Sometimes these are shown up by a little pile of the excavated sand thrown out, which is noticeable if the inner sand is different in colour from the superficial, as is often the case. These holes are said by Ramme to go as much as two metres deep, and they often have a bolt hole, effected through a sharp bend, so that the gallery forms a U.

The insects are nocturnal or crepuscular, shunning bright light. They are very active and difficult to catch. Dr Weidner often found the holes empty, but if there be a colony some are sure to be occupied. He found them in May and throughout the summer. They are easy to keep in confinement.

All sand dunes, especially along the south coast, should be searched for these interesting earwigs. They will probably be found in a good

many suitable localities. On the Continent they are by no means confined to the coast and are reported from numerous rivers.—M. B.

[In India, where *L. riparia* is abundant along sandy river-beds, it comes freely to light at night.—T. B. F.]

CURRENT NOTES,

Dr Warnecke of Kiel has sent us a separate of the paper he read last year at the Berlin Congress of Entomology. "The Taxonomic Importance of the Genital Armature of Lepidoptera." It is well illustrated with plates and text figures; in fact, exceptionally well, many of the figures being composite ones.

We have received, from Dr Skat Hoffmeyer, the well-known Danish entomologist, a separate of his notes on his recent collecting experiences in that country during 1938. In that year he announced 3 species of Macro-lepidoptera as new to the country and had established the recognition of a form of *Chloridea maritima*, viz., ssp. *septentrionalis*. In addition, he summarises the discoveries which have been made of recent years in exploring the entomological fauna of the various Danish islands in the Baltic. He deals specifically with some thirteen species all of which are wanderers from the east and south-east, except the ssp. *septentrionalis* from the south-west. There is a series of diagrams showing the north-west boundary of the area of distribution of twelve of the species. The extract is from the Belgian *Lambillionea* of January last.

We have received from Dr Heydemann of Kiel a number of separates indicating the useful and interesting work he is doing. They deal with the genus *Crino*, the *Acronicta* group of species, the fauna of N.W. Europe, etc.

The Ann. Rep. of the United States National Museum records the total number of insects received during the year 1937 as 101,854, including Chinese material, several private collections of Lepidoptera, ants, weevils, reared Coleoptera, etc.

The Phase Theory in the Biology of the Locust, *Locusta migratoria*, is dealt with in a pamphlet published by the Im. Inst. of Agric. Research, India, with especial reference to the N.W. India area. The text is illustrated by a map and series of tabulated observations accumulated from many localities.

In the *Ent. News* for March the behaviour of various species of gregarious caterpillars is described. Another article describes the mating and egg-laying of *Malacosoma americana* (*Lasiocampidae*), and comparison is made with the behaviour of the British *Lasiocampa quercus* as published by Bacot & Tutt in this country.

In the *Ztsch. Österr. Ent. Ver.* for April the very interesting notes of the leaf-mines of the German lands continues and with them are 3 diagrammatic plates illustrating the individual peculiarities, without

which the letterpress would necessarily be much less understood. Two such plates had been issued with the species discussed in the March number. We must not omit to note the very fine coloured plates of *Colias* species issued with the February part of this magazine to illustrate an article on *Colias myrmidone* and *C. balcanica* by Dr Schawerda.

The January number of the Canadian Entomologist is devoted to a special resumé of the history of the Canadian Entomological Society during the seventy-five years of its existence. It is very interesting reading, and the many illustrations included allow us to see the portraits of all the more prominent entomologists who have figured in the literature of the colonial entomology of the period.

The May number of *The Microscope and Entomological Monthly* has an article by Dr Burr on The Elytra of some Grasshoppers, with ten photographs illustrating the venation, by Dr Eltringham. They are beautiful work and bring out the details remarkably clearly.

Messrs Gustav Feller of Neubrandenburg have published a facsimile edition of the MS. of Fabricius' *Systema Glossatorum*, of which a 12 page excerpt was published in the *Magazin für Insektenkunde*, Vol. VI (1807), including short diagnoses of genera and a few of the species in each genus. The MS. has never before been published, but has remained in the Stettin Museum. The publishers have sent out a facsimile of the 4-page announcement of the proposed publication of this MS., which was made in the *Zeitg. f. Lit. u. Kunst*, Kiel, 11th September 1807. The death of the author put an end to the intended publication. This has been brought out under the editorship of Herr F. Bryk, who stated at the International Congress of Entomology in Berlin, 1938, that there existed three known examples of the original edition, 1807. We now have the original descriptions of a number of our common butterfly genera, such as *Vanessa*, *Colias*, etc., whereas authors have only had the more or less incomplete translations into German which Illiger gave in vol. vi of his *Magazin d. Ent.* in 1807. As it is, only seven "signatures," 112 pp. remain. These deal with eleven genera and their species content (*Vanessa* in part).

SOCIETIES.

A meeting of The Entomological Club was held at 5 and 6 Albany, Piccadilly, London, on February 20th, Mr R. W. Lloyd in the chair. *Members present*—Mr H. Donisthorpe, Mr H. Willoughby Ellis, Mr Jas. E. Collin, Mr R. W. Lloyd, Mr W. Rait-Smith, Dr Sheffield Neave, and Dr Richard R. Armstrong. *Visitors present*—Mr Robert B. Benson, Mr Francis Hemming, Dr B. M. Hobby, Dr Karl Jordan, and the Rev. C. E. Tottenham. The meeting was called for 7 o'clock, and dinner was served at 7.30. After dinner, the Chairman's works of art and his collections of European butterflies and British beetles were on view; both of the latter are being greatly extended and reorganised. The meeting broke up at a late hour after a most entertaining evening.—
H. WILLOUGHBY ELLIS, Hon. Secretary.

ab. *borealis*, Lingo., *Lambil.*, XXXVI, 239 (1936).

ORIG. DESCRIP.—“ They are much darker than the typical form, deep grey brown without the least shade of reddish. They are a little smaller with somewhat slighter wings and with the transverse lines very indistinct.” Lapland.

NOTE.—On p. (179), lines 15, 16 and 17 from the bottom, delete the words “ but I fail to find the reference for the original bestower of this name.” Also delete “ This insect is now . . . of Dr E. A. Cockayne.”

Noctua, L. (1758), Ochs. & Tr. (1816-25), most authors. [*Agrotis*, Ochs. & Tr. (1816-25), Meyr., Splr., Culot: *Graphiphora*, Ochs. & Tr. (1816-25), Steph., Meyr.: *Rhyacia*, Hb. (1821), Warr.-Stz., Corti-Drdt.-Stz.] *umbrosa*, Hb. (1809-13) = *sexstrigata*, Haw. (1809).

Esper, *Abbild.*, IV, 453 (1796?), pl. 143, 3 (1788?), gave a figure which he named *radicea*, var. This figure Treit., *Schm.*, V (2), 123 (1825), considered was the *umbrosa*, Hb., 456-7. The text of Esper does not help to elucidate this rather unrecognisable figure of which Werneburg, *Beitr.*, II, 45 (1864), says “ looks to him much like a var. of *xanthographa*.” Bork., *Naturges.*, IV, 572, identifies it with the *radicea*, Schiff., *Verz.*, 81 (1775). To me the only suggestion of *umbrosa* is the usually conspicuous transverse subdiscal line on the underside of all the wings, but the size is small for *umbrosa*.

Tutt, *Brit. Noct.*, II, 124 (1892): Barr., *Lep. Br. Is.*, IV, 92, pl. 147, 3 (1897): Stdgr., *Cat.*, IIIed., 140 (1901): Hamps., *Lep. Phal.*, IV, 415 (1903): Splr., *Schm. Eur.*, I, 150, pl. 33, 10 (1905): South, *M.B.I.*, I, 227, pl. 114, 6 (1907): Warr.-Stz., *Pal. Noct.*, III, 45, pl. 10b (1909): Culot, *N. et G.*, I (1), 46, pl. 7, 7 (1910).

Hb., *Samml. Noct.*, 456-7 (1809-13), gave two unusually red figures, such as I have not seen.

H.-S., *Sys. Bearb.*, II, 357 (1851), says of Hb., 456-7, forewings too broad; hindwings too yellow, but good. Also that Esp., pl. 143, 3, is useless. In H.-S. copy of Gn. (in my possession) he pencilled in the name *radicea*, Esp., as a synonym.

Godt., *Hist. Nat.*, V, 201, pl. LXIII, 3 (1825), gave an excellent figure of this species.

Gn., *Hist. Nat. Noct.*, V, 334 (1852), says that the *sexstrigata*, Haw., is this species.

Barrett, *Lep. Br. Is.*, IV, 92 (1897), on pl. 147, gave two excellent figures of this species.

Hamp., *Lep. Phal.*, IV, 415 (1903), accepted *sexstrigata*, Haw. (1809), in place of *umbrosa*, Hb. (1809-13).

Splr., *Schm. Eur.*, I, 150, pl. 33, 10 (1905), a good figure.

South, *M.Br.I.*, I, 227, pl. 114, 6 (1907). This fig. also partakes too much of the general colour of the plate, too orange brown.

Warr.-Stz., *Pal. Noct.*, III, 45, pl. 10b (1909), treat *sexstrigata*, Haw., as a synonym, and give no variation. The figure is very fair. Genus *Rhyacia*.

Barrett says of the Variation:—

“ But very slightly variable—the transverse lines are sometimes less distinct, and occasionally the central shade is obsolete.”

The Names and Forms to be considered are:—

[*radicea*, Esp. (1796?), *Abbild.*, IV, 453, pl. 143, 3 (1788?).]
umbrosa, Hb. (1809-13), *Samml. Noct.*, 456-7.
sexstrigata, Haw. (1809), *Lep. Brit.*, 228.

sexstrigata, Haw., *Lep. Brit.*, 228 (1809).

ORIG. DESCRIP.—“ *Alis griseo-roseis strigis sex fuscis.*” “ *Praecedenti valde affinis, at satis distincta; alae apice rotundiores; striga secunda magis undulata: fascia pone stigmata deest, at strigam habet fasciae formem a basi stigmati postici ad marginem tenuiorem. Color inter stigmata usque ad costam saturatior est. Striga quarta pone stigmata magis arcuata: et striga quinta longe validior, et fere fasciaeformis. Sexta striga est tenuissima in ipso margine postico. Alae posticae magis cinereae, fimbria saturatore.*”

This description is a fairly good one and seems to apply to what we know as *umbrosa*, Hb. (1809).

My colleague, Mr T. Bainbrigge Fletcher, has called my attention to the use of the name *umbrosa* for another *Noctua* species on plate 133 of Esper's *Abbild. Noct.*, IV (1788?). Thus *umbrosa*, Hb. (1809-13) is a genuine homonym and must fall as *sexstrigata*, Haw. (1809) becomes the prior name.

Noctua, L. (1758), Ochs. & Tr. (1816-25), most writers, Gn., Barr., Sth.: [*Agrotis*, Ochs. & Tr. (1816-25), Meyr. (1), Stdgr., Splr., Culot: *Graphiphora*, Ochs. & Tr. (1816-25), Steph., Meyr. (2): *Rhyacia*, Hb. (1821), Warr.-Stz., Corti-Drdt.-Stz.] *festiva*, Schiff. (1775).

Tutt took, as many authors have done, the *festiva*, Hb., 114 (1800-3), as the prior name. Even before South published his *Noctuae* volume it was considered that the *primulae*, Esp. (1788-1796?) was *festiva* and was the prior, and was adopted as the original by Corti and Draudt in Seitz (1933).

But the name *festiva* occurs in the *Verz.*, Schiff. (1775), Appendix 314, and Werneburg, *Beitr.*, II, 44 (1864), determines it as this species. The description is very meagre, viz., “ *Alis anticis, purpureis. The dark-red and purple-coloured noctua.*”

Werneburg, *l.c.*, went further and determined that *mendica*, Fab., *Syst. Ent.* (1775), was *festiva*. Thus, as the *Verz.* was until just recently considered as the last work published in 1775 because a few copies had a title-page with that date, *mendica* became the prior name.

But owing to the consideration of the *Verz.* as the *last* work published in 1775 would cause such a number of changes of name, it was found to be better to date it as the *first* work to be published in 1775. Hence *festiva* still remains as the prior name.

Tutt had taken *mendica* as being described first (by Fab.) in the *Mant.*, 1787, and treated it as a var. of *festiva*.

Tutt, *Brit. Noct.*, II, 118 (1892): Barr., *Lep. Br. Is.*, IV, 74, pl. 145 (1897): Stdgr., *Cat.*, III ed., 140 (1901): Hamps., *Lep. Phal.*, IV, 491 (1903): Splr., *Schm. Eur.*, I, 151, pl. 33, 15-16 (1905): South, *M.B.I.*, I, 224, pl. 113, 8-11 (1907): Warr.-Stz., *Pal. Noct.*, III, 39, pl. 8 h, i, k. (1909): Culot, *N. et G.*, I (1), 48, pl. 7, f. 13-18 (1909): Corti-Drdt.-Stz., *Pal. Noct. Sup.*, III, 76, pl. 11g (1933).

Ernst & Engr., *Pap. d'Eur.*, VIII, 20, fig. 541 (1792), gave very good figures of varied forms of this species.

Hübner, *Samml. Noct.*, 114, 467, 468, 469, and 617 (*turbida*) (1800-1803), (1809-13) and (1814-1817) gives a set of excellent portraits of forms of *festiva*, mostly of the richly variegated forms.

H.-S., *Sys. Bearb.*, II, 358 (1851), says that 114 Hb. is not correct, omits *turbida*, Hb., but refers to the other three figures of Hb. as good.

Treit., *Schm.*, VI (not V as Tutt quotes) (1), 405, describes his *conflua* from the Riesengebirge of Central Europe and his description agrees with specimens, small (cf. *strigilis*) dark, liver-coloured, much marbled with yellowish or reddish brown, stigmata paler but large, a quadrate black spot between the stigmata, a triangular black spot on the basal side of the orbicular. All these characters describe a darker less variegated form of *festiva*, such as we find on British moorlands, e.g. Aberdeen, Perth, Carlisle, and odd ones in suitable Southern localities.

Duponchel, *Hist. Nat.*, V, 186, pl. LXI, 5-6 (1824), gave two excellent figures of *festiva* forms. Godt., *l.c.*, VII, 140, pl. 109, 7 (1827), gave a figure of the *conflua* moorland form of *festiva*, but not of the dark northern form. It came from Hungary.

Godt., *Hist. Nat.*, V, 186, pl. LXI, 5-6 (1825), gave good figures of two of its innumerable forms.

Frr., *Beitr.*, I, 135, pl. XLI (1828), gave a very poor incorrect and unrecognisable figure.

Gn., *Hist. Nat. Noct.*, V, 331 (1852), gave *mendica*, Fab., *primulae*, Esp., and *sigma*, Donovan, as synonyms. Schiff. in the *Verz.* (1775) "placed this species with *delphinii* and *purpurina*, but the fig. of Hübner which is half purple and half pearl-grey explains the difficulty." = Hb. 114, 469.

His var. A. is *subrufa*, Haw., with no black places between and before the stigmata. This is the *dahlia* of God. = Hb. 467-8.

His var. *congener*, Hb. is Hb. 617 (not 862).

Mill. (*Icon.*) *Soc. Linn. de Lyon* (1864), I, pl. LVIII, 1, gave a fine figure of the small somewhat dark *conflua* of the moorland form.

Newman, *Brit. Moths.* 348 (1868), gives 3 nice clear figures, and says out of hundreds of specimens no two were alike. The *conflua* of Newman "is very like *festiva* in miniature," and is "abundant on heaths and mosses;" Darlington, but rare in Scotland. He states that the "two caterpillars are totally different."

Buckler, *Lar. of Br. Moths*, V, *Noct.*, 2, pl. LXXVII (1893), gives 5 figures of the larvae *festiva* and 7 of *conflua*. In the latter there seems to be a backward convergence of most of the dorsal markings on each segment such as is not shown in *festiva*, in which the black elongate marks on each segment are generally larger than in *conflua*.

Tutt's note on Hb.'s fig. 617, labelled *turbida*, is to alter that name to *congener*, Hb. fig. 618, a totally different species more like *Leucania comma*. It appears to be a bad figure of a form of *festiva* with the

transverse lines or bands apparently in wrong directions. It is "very red with almost unicolorous stigmata." A mottled form without the quadrate spots. Tutt says *turbida* is an error for *congener*. I am unable to trace the basis for this statement, and have treated *turbida* as an aberration.

Barrett gives, *l.c.*, 20 figures of this species on plates 145 and 146, including two of var. *conflua*, and seven of *borealis* (?) from Shetland, etc. (146 and 146a = *conflua*), (146b-146h = *borealis* (?)).

Splr., *Schm. Eur.*, I, 151, pl. 33, 15b, 16 (1905). 15b is a good figure. It is a *conflua* form.

South, *M.Br.I.*, I, 224, pl. 113, 8, 9, 10, 11 (1907). These figures give some of the multifarious forms, but are not good. 10 and 11 are called var. *thulei*, but there seems to be but little difference. The general colour of the plate is not appropriate for all the species figured.

Pierce, *Gent. Brit. Noct.*, 55 (1909), said that he found no difference between *festiva* and *conflua*, but, as one does not know which *conflua* was examined nor how many, this is not proven.

Warr.-Stz., *Pal. Noct.*, III, 39, pl. 8h, 8i, 8k (1909), give 17 figures of this very variable species, all quite good, and depicting 8 of the 14 forms they recognise. They say *conflua*, H.-S. (nec Tr.) is the *rufo-virgata*, Tutt; the *grisea*, Tutt is the *conflua*, Auct. nec Tr.; the *conflua*, Tr. is the *thulei*, Stdg. Genus *Rhyacia*.

Culot, *N. et G.*, I (1) (1910), 48, pl. 7, figs. 13, 14, 15 = different forms of *primulae-festivae*, 16, 17 = *conflua*, 18, *thulei*. The figures do not show the great variability referred to by the author in the text. He remarks on the impossibility of describing in words the differences between some forms of *dahlia* and *primulae (festiva)* as well as the similarity to other species. The insects must be compared "under one's eyes."

Corti-Drdt., *Pal. Noct. Supp.*, III, 76, pl. 11g (1933). Corti's notes recognise *primulae*, Esp., as the prior name. They add a Lapland form, *disparata*, Corti. The figure of it is good.

Barrett writes of the Variation:—

"Unusually variable in the colour and markings of the forewings. Often the stigmata are obscure, and this occurs more particularly when the lines and the transverse shades or stripes are distinct, or the latter are obscure or absent, and the yellowish drab wings are only faintly shaded with reddish or purplish; or the lines and stigmata are almost obliterated, and the stripes distinct; or the ground colour is wholly fulvous, or red-brown, or purple-brown, with the same range of markings; or the two large angulated spots in the discal cell are black, and the costa spotted with black; or the dark spots are obliterated, and the whole surface is unicolorous, or nearly so. Rarely the entire surface is yellowish drab, except the two chocolate, angulated spots; occasionally the basal half of the wings being normal, the outer half is abruptly and intensely purple-red; or is so from the middle to the subterminal line. Every possible intermediate variation occurs, and to enumerate all the phases of colour and markings in these southern forms is practically hopeless. In the hindwings the colour varies from white to dark grey-brown. The thorax usually follows the colour of the forewings."

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CONTENTS.

MORE NOTES ON KURDISH LEPIDOPTERA, <i>E. P. Wiltshire, F.R.E.S.</i>	97
MOVEMENTS OF COCCINELLIDAE, <i>T. F. Marriner</i> (Plate)	104
CONTINUOUS BREEDING, VI, <i>H. B. D. Kettlewell, M.A., M.B., B.Chir.</i>	106
COLLECTING NOTES, 1938, <i>A. J. L. Bowes</i>	107
NAMES OF MICROLEPIDOPTERA, <i>T. Bainbrigge Fletcher, R.N., F.L.S., F.R.E.S., F.Z.S.</i>	111
A GYNANDROMORPH OF <i>ITHYSIA (NYSSIA) ZONARIA</i> , <i>SCHIFF, E. A. Cockayne, D.M., F.R.C.P.</i>	113
COLLECTING NOTES: Note on the House Cricket, <i>T. F. Marriner</i>	113
CURRENT NOTES	114
OBITUARY	116
SUPPLEMENT:—The British Noctuae and their Varieties, <i>Hy. J. Turner, F.R.E.S., F.R.H.S.</i>	(185)-(188)

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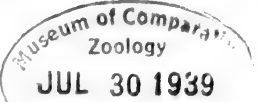
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MORE NOTES ON KURDISH LEPIDOPTERA.

With a description of a new race, and comparisons with Luristan and Alvand, Iran.

13,820

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



A previous article (1) dealt with autumnal Lepidoptera in the Rowanduz Chai valley, Iraqi Kurdistan. This article deals, in its first part, with additions and corrections to the previous article, and, in its second and main part, with the spring and summer Lepidoptera of the same region.

PART I.

ADDENDA AND CORRIGENDA TO PREVIOUS ARTICLE.

Dysauxes hyalina f. *autumnalis*, Dan. is the right designation of the *Dysauxes* recorded; the nominotypical, first brood, has also been taken, at R., 24.vi.

Ocnogyna loewi, Z. D., 8.xi.36.

Cirphis alopecuri ssp. *syriaca*, Osth. (det. Brsn.) is the right designation of the *Cirphis* mentioned.

Hyphilare lithargyria ssp. *grisea*, Haw. B.G., xi, a lightly marked race.

For *Sideridis putrescens* read *Sideridis herrichii*, H.S.

Evisa schawerdae, Reiss. ssp. n. (det. Brsn.). One of the two species recorded as doubtful *Dryobotodes* has now been identified as given.

Eumichtis muscosa, Stgr. can be confirmed.

The identity of the *Cortyta* species may have to be reconsidered, and must for the moment be queried.

Rhyacia elutior, Alph. ab. *pulverea*, Hamps. (det. Brsn.) is the correct designation of the series of grey moths recorded as “? sp. n. near *palaestinensis*.” Like *xanthographa*, a grey and a red form of this species fly in the same district, but evidently the grey is the commoner here.

Rhyacia xanthographa, Schiff. The statement that the Kurdish race is reddish should not exclude the possibility of a minority of grey forms, as at Bagdad.

Rhyacia palaestinensis, Kalchb. One specimen was taken together with the *pulverea* mentioned above, and differing in size and markings therefrom, being smaller. R.G., 7.x.

Enargia badiofasciata, Drdt. f. *basilissa*, Brdt. The previous article was published before the recognition and publication of this species, which certainly is among a series of moths assumed at first to be all *regina*. For the present the question of the occurrence here of genuine *regina* must remain open, for the four, dark-red specimens which seem to be this species are all females.

Oncocnemis sp. near *confusa-rufescens*, Stgr. (det. Brsn.). R., 14.ix.35; a damaged specimen, perhaps *erythroptis*, Brdt., 6000 ft.

Herminia crinalis, Tr. One worn specimen, B.G., 9.x.

(1) “Autumnal Lepidoptera in Kurdistan,” *Ent. Rec.*, 31.viii.1937, and 21.ix.1937.

Sterrhya palaestinensis, Stern. (det. Stern.). R.G., x. One small, pallid example, identified by its genitalia. Earlier broods from elsewhere are more distinctive.

Cidaria ? *ludificata*, Stgr. (not *salicata*). B.G., 9.x. Also at D., 16.iv.

Eupithecia brunneata, Stgr. R.G., ix and x.

Nychiodes divergaria, Stgr. Some of the examples of earlier broods are larger than suggested in the previous article. The identity of the Bagdad *Nychiodes* mentioned in "Lepidoptera of a Bagdad Orchard" can now be confirmed as this species, since I have now seen the imago in material collected in Bagdad for the Field Museum, Chicago.

I am much indebted to Dr E. Wehrli for the investigation of my *Gnophos* and *Gnopharmia* material from Iraq and Iran; thanks to him the particulars below can now be published.

Hemerophila engys, Whrli. The unique type, a male, taken at B.G., 9.x.

Gnopharmia irakensis, Whrli. R.G., 28.viii. Really a midsummer insect, that lasts into early autumn. Sh., R., R.G., and Alvand up to 7500 ft., vii (vide sub.).

Gnophos chorista, Whrli. R.G., 7.x.36. A single female constitutes the typical material of this species.

Gnophos wiltshirei, Whrli. R.G., 7 and 8.x, a small series to light. (Types.)

Gnophos wanensis, Whrli. (det. Prt.). S.A., ix; R.G., 8.x.

Gnophos stachypora, Whrli., ssp. A slightly smaller race than that at Alvand. R., 27.vii, and R.G., 8.x. (Alvand: ssp. *hamadana*, Whrli.)

Gnophos probably *variegata*, Dup. S.A., ix. A small, battered specimen.

Gnophos onustaria, H.S. (det. Prout). B.G., 9.x.

Leptarchis psologramma, Meyr. is, teste Amsel, a synonym of *Stenia intervacatalis*, Chr.

A comparison between some of the above dates and the list of visits given in the previous article will show that specimens were received from the same locality for about a month in 1936 after I was obliged to leave it. For these specimens I am indebted to the kind co-operation of Mr Consul Finch and his Assyrian chowkidar, Philippus. The material that they collected shows that most of the species taken at Diana in early October continue commonly on the wing until the end of that month, and some later.

The autumnal species taken at Ser Amadia in 1935, for most of which I am indebted to Capt. Day, will be mentioned in Part II, below.

PART II.

SPRING AND SUMMER LEPIDOPTERA.

In this part I shall not only deal with the localities described in the previous article (namely, Rowanduz Gorge, Diana, Berserini Gorge, Rayat and the pass above Rayat, which bears the name Hajji Omaran, and is 6000 ft. high) but also with the following localities which were visited on the dates given:—

Amadia (A.), 9.vi.35, morning (also v.37, the last week).

Berwar (B.), 15.viii.35, daytime.

Mazna (Ma.), 18.vi.35, morning.

Mergasur (Mr.), 18.vi.35, morning.

Rowanduz Chai valley (R.C.V.). Several villages that need not be mentioned severally are included under this general reference; they were visited on 22.v and 27.vii.35 by day.

Ser Amadia (S.A.), 9.vi, afternoon; 14.viii.35, day and night. From the same locality I now have also specimens caught by Capt. Day in v, vi and ix.35, and Dr Brodie in viii or ix.37. To these officers of His Majesty's Forces I must express my gratitude, and likewise to Mr Bellingham, for the 1937 specimens from Amadia above, and Sheikh Adi, below.

Shaqława (Sh.), 14.vi, noon; 19.vi, evening; 17.vii, evening; 1.viii.35, evening.

Sheikh Adi (Sh.A.), 12.x.36, morning (also 2.vi.37).

Sulaf (S.), 8-9.vi.35, day and night.

Suwara Tooka (S.T.), 8.vi.35, morning.

Zawita (Z.), 8.vi.35, morning.

The capital letters in brackets are the abbreviations by which these localities will be referred to hereinafter.

The spring and summer dates on which the previously mentioned localities were visited were as follows:—

Diana (D.), 20-24.v, 14-17.vi, 27-28.vi, 12.vii, 16.vii, 29 and 31.vii.35.

Rayat (R.), 16.vi, day-time; 24.vi, 13-14.vii, m; 27, 28.vii.35, day and night. If no altitude is given, it may be assumed that the specimen in question was taken at about 4500 ft. close to the village of Rayat.

Rowanduz Gorge (R.G.), 15.vi, evening; 12.vii, noon; 16.vii, evening; 30.vii.35, evening.

Of the new localities above A., B., S.A., Sh.A., S., S.T., and Z. are in a more northerly province of Iraqi Kurdistan than that described in the previous article. They lie between Mosul and the Turkish frontier. Here too there are parallel mountain ridges, but they run due east and west, not, as in the Zagros, from N.W. to S.E. Together with Turkish Kurdistan (the Diarbekr and Malatya districts) they link the Zagros faunistically with the Taurus and the Lebanon. The fauna here is doubtless very like that of the Hakkari mountains. The highlands of Armenia, however, like those of Iran, are bleaker, drier and less wooded. Since I did not collect so intensively in this province as in the Rowanduz-Rayat district, too much significance should not be attached to the record of a species from one only of the two regions, which, in fact, adjoin one another at Aqra and are separated by no more formidable boundary than the Greater Zab.

Amadia and Sulaf (4000 ft.) lie on the north side of the Supna valley, overshadowed by the limestone ridge of Ser Amadia (6000 ft.). Between this ridge and the Turkish frontier lies the almost idyllic valley of Berwar, which can only be visited on a mule or horse. South of the Supna valley, on a less elevated ridge, lies Suwara Tooka (4000 ft.). The trees of these districts are chiefly *Quercus*. Zawita is

a picturesque ford (c. 3000 ft. high) on the Mosul-Amadia road, between Dohuk and S.T. Between Z. and S.T. on this road are pine woods, and this is the only part of Kurdistan where I have seen a wild conifer growth. The fauna of these trees (*P. halepensis*) might repay investigation. Sheikh Adi lies north-east of Mosul, at a lower elevation than the foregoing. Its dense wood is due to the Yezidi tabu against cutting trees or killing animals near the shrine. The surrounding hills are quite bare, being protected by no such ban. The absence of trees from many hills in Northern Iraq, therefore, is evidently due to human deforestation.

I now come to the localities south of the Greater Zab, the true Zagros localities. Besides those described in the previous article, mention must be made of Shaqlawa, a fertile village nestling under the Safeen Dagh, and situated on the road about half way between Erbil and Rowanduz at an elevation of about 3000 ft.; and of Mazna and Mergasur, two localities lying north of Diana on the course of the Havdian river (which enters the Rowanduz Gorge close to Diana); their respective elevations are approximately 3000 and 3500 ft.

At Rayat several trips were made to heights above those mentioned in the previous article. Mt. Kawdo is the peak which stands just behind Rayat, and its slopes were worked up to a height of 8000 or 9000 ft.

The Zagros can be said to begin south and east of the Greater Zab, and to run thence south-east as far as the Gulf of Oman. The Rowanduz area, therefore, is at the northern end of this great mountain range. The hills above Urumiya (Persian Azerbaijan) are similar in fauna to those at Rayat, and constitute the most northerly finger of the Zagros, pointing at Ararat. Localities further south along the same range from which entomological records have been made are Sulaimani, Pai-Tak, Karind, Pusht-i-Kuh, my own records from Luristan (Khorramabad, Tunel, etc.) and Brandt's records from Mian Kotal, near Shiraz.

At a certain altitude, along the whole length of the Zagros is a zone of oak-forest or oak-scrub, doubtless due to precipitation from humid air-currents from the south-west.

At Rayat these oaks do not grow higher than about 5000 feet above sea-level, but in Luristan I have seen them at least a thousand feet higher. Deforestation has forced their lower limit to retreat from where it must have been before the tribal occupation of these regions, as has been mentioned above apropos of Sheikh Adi; and, further south, deforestation seems to have been far more thorough than in the Iraqi provinces here under review. All down this belt a similar fauna occurs, an outlier of the fauna of the Taurus and the Lebanon, but possessing its own distinctive species, such as *Eulocastra schah* and *Axiopaena maura*. In some cases the race inhabiting the southern part of the range differs from that inhabiting the less arid northern part; for instance, *Rhyacia semiramis*, Brsn. is mauve-grey in the R.C.V., but in Farsistan (leg. Brandt) it is rosy-tinted; these two colour-schemes accord with the prevailing hue of the earth and stones of the respective habitats.

Since collecting in Kurdistan I have spent two months (in 1938) at Hamadan, Central Iran, and there worked the Alvand range; I have

also spent a few hours of the day at a fairly high altitude in Luristan, and several nights at lower altitudes in the same province. Where, therefore, it is of interest, comparisons will be made between Kurdistan and these two regions, but no attempt will be made here to describe the fauna of the two Persian regions, except only so far as it relates to Kurdish species taken by myself. In general, it can be said that there is a broad similarity in the forms of Lepidoptera taken in all three regions; but whereas the Luristan localities were in limestone country of true Zagros type, and might justly be considered as intermediate between Kurdistan and Farsistan, the Alvand range is an independent granite formation, parallel to the Zagros but more easterly. Of my Kurdish localities, at Rayat only have we penetrated beyond the limestone and reached a mountain-backbone of earlier rock; the general appearance, indeed, of the peak of Kawdo is not unlike that of various peaks on the Alvand range. However, the following differences must be made clear. The Alvand range is drier and colder and higher; it has no forest trees, and less grass on the lower slopes; it has more snow and less rain than Kurdistan. Hamadan, at the foot of Alvand, is 6000 ft. high; the highest peak is 12,000 ft. The season therefore is shorter, and species common to Alvand and Kurdistan occur earlier or later than in Kurdistan, according to whether they are autumnal or vernal respectively.

If a record for Alvand or Luristan is given hereunder together with that of the same species from Kurdistan, it may be presumed that the forms from the different regions are identical unless the opposite is expressly stated.

I am indebted to Messrs Evans, Gabriel, and Pfeiffer, for their help in naming many of the butterflies, and to Messrs Boursin, Prout, Tams and Wehrli for assistance in determining certain moths.

The following list is not meant, with that of the previous article, to be exhaustive. But I have tried to clear up most of the doubtful identities before publishing this, the second instalment, as it were, of an account of Kurdish Lepidoptera, and to put on record all my own catches. There are certain obvious gaps; for instance I have taken such species as *Papilio machaon*, *Dicranura intermedia*, *Eusphesia pimplaeformis*, and *Pygaera pigra* ssp. *ferruginea* both at Bagdad and at Hamadan, and it is presumed that they also occur in the Zagros, which lies between these two localities, and is a suitable habitat. The Pyrales and Micros are omitted *in toto*, it being hoped that Herr Dr Amsel will publish a study of the smaller fry of Iraqi moths. A few difficult species, still undetermined, are omitted, and the final word on the *Bryophila* genus has yet to be said.

A bare name in the following list, without comment or date, implies that the species occurs but that I do not think it worth while wasting words upon its localities.

RHOPALOCERA.

Papilio podalirius, L. A.

Papilio alexanor, Esp. R., 6000 ft., 24.vi. One example.

Thais cerisyi, God. ssp. *deyrollei*, Ob. Shahr-i-zur, near Sulaimani, is the only Kurdish locality at which I have taken the imago of this species, but I have seen its larvae at D. in late v. The Kurdish form seems quite similar to the Syrian, though my series is shorter.

Doritis apollinus ssp. *apollinaris*, Stgr. Shahr-i-zur is the only Kurdish locality at which I have taken this species, not having been elsewhere in Kurdistan at the right season, but since this race was named from Turkish Kurdistan, there can be no doubt of its occurring generally. The race occurs in Persia in identical form, except that it is rather smaller there, at Kilangan, Silakhur, on the eastern edge of Luristan. My two series (8 from Shahr-i-zur, 15 from Silakhur) show that the form *ardana*, Stgr. i. l. is nothing more than the regular female of the race *apollinaris* in these two districts.

Parnassius mnemosyne, L. S.A.

Aporia crataegi, L. ssp. R.C.V., 22.v. (Also Alvand.)

Pieris brassicae, L. In Iraq a hill insect, and absent from lower altitudes.

Pieris rapae, L. ssp. *iranica*, Le Cerf. and *P. ergane*, Hbn.

Euchloë damone, Boisd. S.A., v.35.

Colias aurorina, H.S. ssp. *libanotica*, Led. S.A., v.35.

Colias croceus, F. *Gonepteryx farinosa*, Z.

Melanargia larissa, Hbn. and *M. hylata*, Men. Dr Verity in the *Ent. Rec.* recently published his view that these are the same species, while Herr Pfeiffer regards them as good distinct species. The British Museum includes *hylata* under *larissa*.

Herr Pfeiffer regards the second of the undermentioned forms as a new subspecies of *hylata*. It certainly does not agree exactly with the description of typical *hylata*. (1) Underside strongly suffused with yellow, upper side approaching f. *taurica*, Roeber at times. (2) Underside whiter, with design clearly defined in black. Two large examples of this form from S.A. approach *iranica*, Roeber, having very large white marginal dashes, but retain the black terminal line.

At R. and R.G. these two forms occur together; form 2 also occurs in Luristan, and form 1 only occurs on Alvand.

I regard them provisionally as (1) *larissa* and (2) *hylata*.

Satyrus hermione, L. ssp. *syriaca*, Stgr. S.T., 8.vi.

Satyrus briseis ssp. *hyrcana*, Stgr., or *fergana*, Stgr. A female ab. *pirata*, Esp. was taken at S.A. The species is common throughout Kurdistan, and occurs in identical form also in Luristan and the Alvand range.

Satyrus anthe, O., including ab. *hanifa*, Nordm. Identical forms from R., Syria and Alvand.

Satyrus semele, L. S.A., vi. ♂ ♀, both with the paler bands suffused with darker, but not more so than in some English examples.

Satyrus telephassa, Hbn.

Satyrus pelopea, Klug. Too many names have been wasted on forms of this species; at any rate, none of them rightly apply to the Mesopotamian, Kurdish, or Central Persian races. I have identical forms from the Lebanon, Kurdistan and Luristan, *persica* being the extreme of ♂ variation in these countries. The hindwing underside also varies considerably in every locality in which I have bothered to take more than one or two specimens.

Satyrus fatua, Frr. ssp. ? *sichaea*; Led. The Kurdish form's underside is less black than that of the Syrian *sichaea* (Amik). R.G., R.C.V., 12.vii, 16.vii.35.

Satyrus parisatis, Koll. S.A., viii.

Satyrus pimpla, Feld. (det. Gabriel). Above R., at 8000 ft., 14.vii.35.

Satyrus favonius, Stgr. (det. Gabriel). Above R., at 6-7000 ft. on steep slopes, 14 and 28.vii.

Pararge aegeria, L. Ma., 18.vi.

Pararge roxelana, Chr.

Pararge climene, Esp. ssp. R., 6-7000 ft., 28.vii, flying low among thistles on the steep sides of mountain streams. These examples were rather torn, it being probably too late in the season. Luristan, 12.vi.38; Hamadan and Alvand, 14 and 16.vi.38. At these two latter places the examples were quite fresh, and the species seemed more numerous.

Pararge megera, L.

Epinephele telmessia ssp. *marenigrans*, Verity, or *kurdistana*, Ruhl. Iraqi Kurdistan probably holds both these races, and transitional forms. They can only be distinguished from one another by the collecting of a large number of males; Verity says that his race differs from *kurdistana* by having ten to twenty per cent. of them marked with fulvous on the upper forewing. I cannot claim to have caught enough to say that *kurdistana* does not occur. A male from Rayat is quite black, while another male from Amadia is fulvous. The rest of my material from A., D., and R. are females. (But at Alvand, ssp. *palescens*, Butl.)

Epinephele lupinus ssp. *centralis*, Riley (det. Gabriel). The R. race is not quite the same as the Alvand race, the orange suffusion near the cell of the ♀ upper forewing being wider at R., but clearer, neater and smaller in the Hamadan-Alvand form, and not actually invading the cell, as is the case in some Kurdish examples; the underside hindwing coloration of the R. form is warmer, the Alvand form being a colder, more uniform grey. The Lurish form is close to the Kurdish, to judge from my few examples from Luristan.

Coenonympha saadi, Koll. R.C.V., 22.v, Z., 28.vi.35. Also Luristan and Alvand. This race is not referable to *mesopotamica*, Stgr.

Coenonympha pamphilus, L.

Thaleropsis ionia, Ev. S., 8.vi.35.

Limnitis rivularis, Scop. A., R.G., vi. and vii.

Vanessa urticae, L. R., S.A., not usually below 5000 ft.

Polygonia polychloros, L. S.A., 9.vi.35, at 5000 ft.

Polygonia c-album, L. B., 15.viii.35.

Polygonia egea, Cr. R., S.A.

Melitaea phoebe, Knoch. A., 23.v.37. Two examples of ssp. *caucasica*, Stgr. from R., 6000 ft., 16.vi., larger and blacker than the A. examples.

Melitaea didyma-casta, Koll. Z., 8.vi, S.A., R., vi and vii.

Melitaea trivialis ssp. *persea*, Koll.

Argynnis lathonia, L., *A. pandora*, Schiff., and *A. niobe*, L. ssp. *taura*, Roeb. The two latter also from Alvand.

Argynnis hecate, Denis. ssp. near *caucasica*, Stgr. R., 14.vii.

Argynnis paphia, L. A., 9.vi.

Libythea celtis, Fuessl. B., viii.

(To be concluded.)

MOVEMENTS OF COCCINELLIDAE.

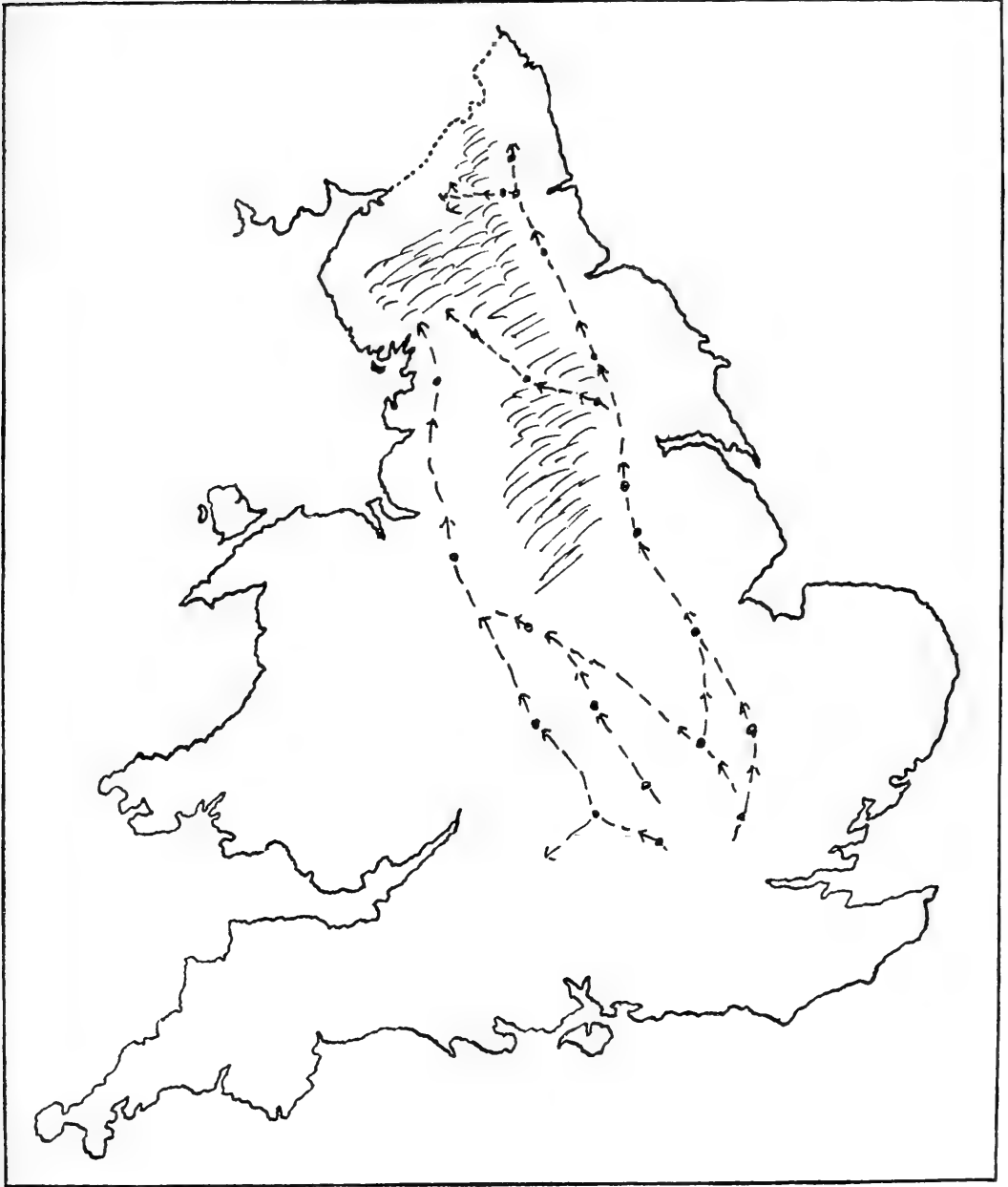
By T. F. MARRINER.

(Plate VIII.)

Inclement weather and a chill kept me indoors for the early weeks of 1939. I spent part of my time in going through some old note books and, coming across some unpublished though incomplete notes on movements of Coccinellidae, I gathered them for the purpose of this short article.

Three terms are applied to such movements: migration, swarming, and massing. These terms, I find, are sometimes but loosely made use of and in these notes I apply "migration" to movements from one country to another; "swarming" to movements from one area of a country to another area of the same country; and "massing" to the gathering of the insects in an area to some spot in that area.

Working with these meanings the only member of the British *Coccinellidae* I can discover as migrating is *Adalia bipunctata*, L. This species, as has long been known, migrates periodically from France. There is a record of such a migration in 1869, when the streets of London swarmed with the species. There is also a record of a migration when the numbers alarmed the citizens of Reading. Another migration occurred in 1872 and was noted to the west of Middlesbrough, where the crowd took a few days to pass on north. I have, myself, observed two of these migratory crowds, in each case passing east to west through the Tyne Gap in the Pennines, and it was in the case of the second of these migrations that the accompanying map was compiled. I had gone into the station at Carlisle to take train to Hexham in June 1925. When the train arrived from Newcastle I was on the platform near where the engine stopped and noticed a number of *A. bipunctata* on the engine and first coach. The train fireman noticed me looking at them and volunteered the information that they had come through crowds of them between Hexham and Carlisle. When the train drew up at Heads Nook station I saw my friend the late Mr G. B. Routledge on the platform. He came up when I put out my head and shouted, "Have you seen the two-spots, hundreds of 'em?" At Hexham I went to a market garden and found the place overrun with them and was told that there were none to be seen there the day before. On my return home I went to see Mr Routledge, and between us we wrote to some 80 people asking about ladybirds. We got some 50 replies and from these the map was compiled. It shows the route but unfortunately we were unable to add the timing from such replies as "the other day," "last week," "last Wednesday or Thursday," etc. Most of our correspondents were not scientific. From data gathered here and elsewhere I noted that *A. bipunctata* appears always to fly low, keeping not far above the ground and passing through gaps rather than rising to pass high land. This agrees with the point that many are caught by high waves when crossing the Strait of Dover or the Channel and are washed up on our south east coast. It will be noted on the map that the route avoids the Peak, and that gaps are made use of. Hereford was not touched and this is, I believe, usual, for I have an old letter from a friend who states that when he lived



Ent. Rec. and Journ. of Variation.

del. T. F. Marriner.

MIGRATION OF ADALIA BIPUNCTATA, 1925.

Dots show observation points.

there it was a custom to import boxes of the insects from France to set free in gardens and orchards there.

It would appear that an early, warm spring in France leading to quick maturing and consequent overcrowding may be responsible for the migration movement. These migrations are not of regular occurrence and if small seem to be absorbed by our south country, and this may probably account for the fact that the insect is at times not a common one in the north. As the migrating crowd comes north numbers break away and spread over suitable areas. Two points struck me as noteworthy in connection with these migrants. First of all of numbers taken from them in each of two cases over 60 per cent. were females, and second that all were type or nearly type forms. I never saw either *4-maculata* or *6-pustulata* among them. The first point I should like to deal with in a later note. The second point adds confirmation to an old theory of mine, that the dark forms are autumn bred and the migrants would be first brood.

So far as I have been able to gather no other species of our *Coccinellidae* seems to migrate. *C. septempunctata*, L. swarms, using the term as above stated. According to an old MS. in the Hancock Museum at Newcastle such a swarm appeared near Newcastle in 1750, and in 1826 Mr Albany Hancock says several hundreds were sent to him, caught a little south of Newcastle. Whence they came is unknown. I witnessed such a swarm on one occasion when on a visit to the Gullery, Ravenglass. I was standing looking across the gullery when some hundreds of the insects appeared, coming from the south and settling on the grass all around me. While *A. bipunctata* flies low down and goes through gaps in hills, *septempunctata*, a stronger flier, flies higher and when meeting high land goes straight on over the top. I noted this when one day on the top of the Pennines, a little south of Brampton, when a swarm appeared from the east and flew over the fell tops towards the west.

C. 11-punctata, L. also swarms, and this has been observed in our own country, on the Continent, and in the Sudan. Mr T. J. Bold, in the *Natural History Transactions of Northumberland and Durham*, 1873, p. 33, speaks of *C. 11-punctata* "appearing in some years near the coast in such profusion that every stone, brick, or clog of wood lying on the sandy bent will be reddened by congregated hundreds, but whence they have come and why is one of those perplexing questions which it is impossible to answer satisfactorily." G. B. Longstaff, M.A., M.D., writing in the *Proc. Ent. Soc. London*, 1909, p. xxxii, and in the *Ent. Monthly Mag.*, 1911, p. 195, describes a swarming of *C. 11-punctata*, L. near Khartum, February 16, 1909. There was a gentle breeze from the westward and the insects came from the eastward. The flight lasted over an hour.

I have noted more than one such swarming on the Cumberland coast, the most noteworthy being in August 1926, when a swarm came from the south west against a very gentle north east breeze and settled on the north east part of Burgh Marsh on the Solway. A friend holidaying there sent me word of the swarm and I went there some days later with Mrs Merritt Hawkes, M.Sc., who was staying with me at the time. We were able to work out here the life-history of the species as recorded in *Trans. Ent. Soc. London*, July 18, 1927.

It will be noted that in each case the swarming of *C. 11-punctata*, L. was against the wind (a gentle wind). In view of what was discovered on Burgh Marsh as recorded above, it seems probable that the scent of cattle and fresh dung, carried by the wind, attracted the insects and so was responsible for the swarming. Similar swarmings are also recorded from the salt marshes of Lorraine.

In the case of *C. 10-punctata*, L. the insects of an area appear to mass for the winter months, and, so far as I have been able to discover, the sexes do not mass together. I found one mass of some hundreds clustered all head inwards in a deep hollow where a big branch joined the main trunk of a lime tree, of which all I examined were females. Another mass was in a rotted hole of an old gate post, also all head inwards and apparently males. I have also found *Mysia oblongogutta*, L. massed for hibernation under leaves between exposed root branches of a pine tree.

With regard to our other species, my notes do not afford sufficient data to make any definite statement, and as I now live in an area where apparently *Coccinellidae* are but rare, I am afraid I shall have little or nothing to add and must leave further study of these movements to others.

CONTINUOUS BREEDING. VI. TAENIÖCAMPA GRACILIS, F.

By H. B. D. KETTLEWELL, M.A., M.B., B.Chir.

(Continued from p. 89.)

The original parent can be taken at sallow in April. Wild larvae are found easily when once the technique is learnt. When young they spin together three or four leaves of sweet gale edge to edge, the end being left open. These can easily be recognised and large numbers collected. In districts where sweet gale does not occur meadow sweet is a favourite foodplant. When full grown the larva is rarely seen as it descends from the plant by day. However, it was observed this year by Demuth and others that large numbers of full-grown larvae could be found sitting high up on grass stems, etc., an hour or so before dawn. Before midnight none was to be found.

Continuous breeding of this species is easy. A very large wooden box has a foot of earth placed in the bottom. Cuttings of willow and sallow are stuck into this in the autumn and the majority take root and leaf the following year. Among these in the spring are placed numbers of dead heads of knapweed flowers and dead rush. In these the ♀ *gracilis* lay their eggs.

The selected male and female are introduced into this and the box covered over with muslin.

Full-grown larvae can be collected from here in June and are handed for a few days prior to pupation in coconut fibre.

The pupae are dug up and placed on top of coconut fibre and covered with a considerable thickness of moss. The flower-pot is stood in shallow water in the open throughout the winter. During this time the moth is fully formed within the pupal shell.

Variation in this species is extreme and local, half-a-dozen different forms occurring in one locality, while in another little variation is

noticed. None of these forms have been studied beyond haphazard breeding, nor have the various local forms been crossed. An all-white form has been taken in both Scotland and Northamptonshire.

COLLECTING NOTES, 1938.

III: AUGUST-SEPTEMBER.

By A. J. L. BOWES.

(Concluded.)

To those of us who live in Kent—as in other counties on the south coast—August comes as the month in which we hope for the appearance of migrants. In 1938 the key insect was *Laphygma exigua*, and my energies were mainly taken up with the search for it; larvae could not be found, even by careful examination of all likely plants, but the moth itself appeared in varying numbers all over Kent; five or six was the usual reward for an evening's work at Dungeness, and on the 16th Mr Russell James saw as many as fifty. He saw none on the next night, and those females which he kept for eggs died one and all within a day; this, it is suggested, was an immigration, the members of which died from exhaustion soon after reaching land, and there appears no other likely theory to account for this sudden abundance and immediate extinction. Besides Dungeness, I saw *L. exigua* on street lamps in Canterbury, at Herne Bay—kicked up in a lucerne field—and more than once at Westwell near Ashford. In early August, larvae of *Heliothis peltigera* were very common on *Senecio viscosus* along the south coast of Kent; I found it profitable to shake the plants, as well as to look at them, for the larvae are often hard to see, and in this way I picked up fifty or so off plants that had been worked over by at least two other parties. As an indication of the profusion of common insects on the sugar, one post produced fifty-two insects at once; and I have a note that fifty-four species were observed on 6th August at Dungeness. *Leucania albipuncta* turned up on the 9th and the 21st, thinly.

On the 13th and 14th I collected with Dr Scott in his garden at Westwell, where we recorded forty-six species on the night of the 13th. The gems were a couple of *L. exigua* and not a few *Noctua stigmatica*. We were pleased to see one or two *Salebria obductella*, the occurrence of which at Westwell brings its range several miles west from its other known haunt near Chilham, where it has occurred every year since 1934.

No August spent in Kent would be complete without a look in at Sandwich—Tutt's Deal—and I spent an evening there on 8th August. *Lithosia pallifrons* (*lutarella*) came freely and fresh to light, with some of the choice Sandwich micros, but although there was plenty on sugar, no good things came. One expects an abundance of *Agrotis tritici* on these sandhills, and one usually gets it, but last year the species took a rest, and its place was usurped by *A. saucia*, which threw some odd forms—I took one pure black and another of a pale pinkish buff. It was surprising that no *L. exigua* were seen at Sandwich until late in September, although many parties worked there. For comparison with Dungeness and Westwell (chalk), we took forty-three species on the sandhills on the 8th of the month.

We usually hope for a few of the immigrant hawks during August, and *M. atropos* and *S. convolvuli* were brought in to me from the country round Herne Bay—the latter for three miles in a handkerchief. As far as I know, none of the *livornica* group was found in our corner of Kent.

From 27th August to 4th September I went west. The Dorset coast is a convenient half-way point between Kent and Cornwall, and I stopped for the night of the 27th near Lulworth. It was a bad night, windy and cool, and the posts had been sugarless since the previous autumn, but a few *Caradrina ambigua* were attracted, with single specimens of *Agrotis obelisca*, *A. lunigera* (brand new), and *L. albipuncta*. A lamp pitched on the sand drew many repulsive hoppers, one *Bryophila muralis*, and, oddly, a female *Stilbia anomala*.

The next day my mother and I made our way through thick fog and rain to the coast near Bude, where a full-dress gale was blowing. I might have saved my sugar, for even earwigs were blown off the posts, but one *Xylophasia monoglypha* was not to be beaten and had half-a-pound of good treacle and ale to himself. The gale was just as bad in the morning, so I went on to Mullion to try to get some shelter. At Mullion I put up with Mrs Bosustow at Belvedere; this is recommended, highly; for it is quiet, very convenient for work at the cove, and used to the habits of entomologists.

There were three insects that I wanted to make myself familiar with at Mullion, *Agrotis obelisca*, *Dianthoecia andalusica (barrettii)*, and *Polia nigrocincta*. The first and last of these will come not uncommonly to sugar plastered on the iron railing which runs over the moor to the south. The difficulty at Mullion, of course, is to find anything to sugar; there are few wooden posts and these in steep places, a tennis net or two, and one or two rocks; none of these is continuous, and the ground is rough, and I fell back on the iron railing, which after the first night took and held sugar well. I was early for *P. nigrocincta* and saw only nine males in four nights' work, all but one of these on sugar; *A. obelisca* was common on sugar and on bare posts, though I did not find it in the abundance noted by Dr Kettlewell two years before. *Lithosia caniola* was still about in quite good order, and not rare; and *Stilbia anomala* came freely to my light each evening at about 11.30 onwards. The only other insects of note were a lot of fine *Tholera cespitis*, and one *A. exclamationis*; there is something odd about the second brood of this species, for whereas it is the rule in the west of England, and Mathew speaks of it as regular in the Dovercourt district, we rarely see it in Kent. I was not lucky enough to find any of the pale variety of *Neuronina popularis* discovered at Mullion by Mr Arthur Welti.

My days I spent with the gulls on the Henscath Rock. The crest of this peninsula grows thick with rock spurrey and *Silene*. The spurrey was riddled with larvae of *D. barrettii*, which were mostly full fed, and here and there was an early pupa. There is no need to leave the place littered with uprooted plants when hunting for this larva, for the crown of a tenanted plant, which the larva kills, always comes away in one's hand at a gentle pull. *Barrettii* prefers spurrey to *Silene* when it has a choice; at Mullion I found fifteen larvae in spurrey to one in *Silene*.

The night of the 2nd of September I spent with Mr Howard near Kingsbridge, on the coast. *Leucania l-album* was scarcely out yet, but

Howard had found larvae and pupae of this species not uncommonly, and he had taken a fresh male on 31st August. We saw none on the night on which I was there, but the numbers of *Caradrina ambigua* were astonishing—six or seven on a post, and of a variable ground colour. Here too we raked out a few *D. barrettii* from the cliff.

At Bude the next day the wind greeted me again, and I saw only one *P. nigrocincta* in a spot which is reputed to swarm with them on a fair night. The *Silene* growing here was eaten by *D. barrettii*, but the slaty soil made it hard to excavate them; only too often a wee avalanche would tumble over the larva and squash it at the critical moment.

On my way home I stopped at Portland and worked there on the 4th with Rev. Guy Ford. It was a Sunday, and young Portland was out on its Sunday walk, so that my efforts to beat some larvae of *Cucullia absinthii* met with derision; I certainly must have looked rather odd. The larvae were fairly common, local, and still small, and were accompanied into my tray by hosts of *Eupithecia absinthiata*. An hour's work produced two dozen. In the evening we worked below the prison: *Heliophobus oditis* (*hispidus*) was fresh and common, but very local; it came to light freely at the top of the path, but a hundred yards down there were none. A large bush of wormwood on the cliff face provided two or three more larvae of *C. absinthii*, half-grown. Sugar was dull, except for a few *C. ambigua*; in view of Ford's *Leucania unipuncta* earlier in the year, we were all agog.

A visit to Dungeness with Mr A. M. Morley on the 11th was notable for a couple of exquisitely new *Leucania vitellina* and four *Laphygma exigua*; *Agrotis nigricans* was still fresh, and a single *Tholera cespitis* on the sugar was new to this district.

During the autumn the little collecting that I was able to do was confined to the country round Godalming. Sugar was disappointing, except for *Lithophane semibrunnea* and *Aporophyla nigra*, and a large patch of ivy at Milford, which was examined on several nights at imminent risk of death from the Portsmouth Road traffic, had little to say for itself. The only really exciting nights were those of the 23rd and 24th September; on the 23rd a *Laphygma exigua* came to light on the top of Frith Hill, and on the 24th Howard and I took two more at the same place. Capt. E. S. A. Baynes, who lives two miles away across the valley, records ten on the night of the 24th (*Entomologist*, LXXI, p. 262). I suspect that all these were from one clutch of eggs, for on all the warm nights of last autumn we saw no more. At the beginning of November I made a determined effort to find *Ptilophora plumigera*, which was found at Godalming some years ago by Dr Kettlewell; but in spite of warm nights and plenty of maple, I saw none.

To round off these notes, I shall now give a few jottings on one or two out-of-the-way species which I bred last year, which I hope will be useful to those who like myself are compelled to move from one house to another during the summer, and whose breeding arrangements have to be rather primitive.

Plusia chryson.—When hemp-agrimony is not handy, this larva will feed happily on garden mint. It is a reasonable larva and does not try

to drown itself, and can be kept safely on cut food in water. I find that when a larva really wants to drown itself (e.g. *Endromis versicolora*) it takes more than a wad of wool to stop it. *P. chryson* larvae become a whitish colour when about to pupate; they should then be segregated, for they are apt to spin on top of one another.

Dianthoecia irregularis.—The rarity of its food-plant prevents much of it being taken for breeding purposes, but a little is necessary; my larvae fed up well on *Lychnis dioica*, but often wandered off on to the *Silene otites* for a nibble of dry food. One which I fed on neat *Lychnis* soon sweated and died. Even though there is nothing but dry husks, leave the *S. otites* in the cage. It is not my experience that day-feeding larvae of this species are always parasitised, whereas those found at night will be sound; for out of ten larvae found on the stalks during the day and kept separate, four pupated well. The pupae should be kept dry.

D. andalusica (barrettii).—Larvae of this insect can be bred well in a large biscuit tin. Fill the tin half full with soil from the cliffs, lay a good thick layer of spurrey roots on it, sprinkle a handful of soil among these, and drop in the larvae. If aired every day or two, nothing further need be done to them until the pupae are decanted at leisure. Forty or fifty in a tin will do well. Keep the pupae dry.

Laphygma exigua.—From eggs laid by a Dungeness female on 14th August, the larvae hatched on the 22nd. They were fed until they were half grown in glass-topped tins, after that in large biscuit tins, on dock. After they were moved to the large tins, the dock leaves were laid flat on a few inches of earth, in which the larvae went to pupate. No artificial heat was applied until the pupae were excavated, when half were left in their cocoons, half were removed, and the whole kept on damp lint at a temperature of 75° Fahr. The naked pupae began emerging well on 8th October and produced fine and large insects, only four failing; those, however, which I had left in their (flimsy) cocoons did very badly, only two out of two dozen emerging properly. All were out within a week. This experience hardly settles finally the controversy between the dry and wet schools of thought, but it shows that good results may be obtained by a wet treatment, with none of the malformation often seen in forced examples of this insect, provided that the pupae are shelled out early in the forcing process.

Leucania l-album.—Twenty-eight eggs were received from S. Devon on 19th September. They were laid on the journey in cracks of a chip box, on the night of the 18th-19th. They began to produce larvae on the 30th, and these were fed on any soft and fresh grass that came to hand, the grass being given dry. They were kept in glass-topped tins, in the dark, and at 65° Fahr. for a week; as they grew rather slowly, I increased the temperature to 80-85° Fahr., by means of an electric light bulb burning outside the biscuit tin which contained the smaller tins with larvae, and I aired them twice a day. With this treatment, and daily feeding, they fed very fast, and all pupated by 8th November. The pupae were kept at 75° Fahr., dry, and the first moth emerged on 14th November, a period of about 56 days from moth to moth. The bred specimens were larger than wild examples, and were uniformly darker; Twenty-eight were bred, all in good order.

I must acknowledge my indebtedness to Dr Cockayne, Mr A. M. Morley, and Mr A. J. Wightman for advice on the last two species.

NAMES OF MICROLEPIDOPTERA.

By T. BAINBRIGGE FLETCHER, R.N., F.L.S., F.R.E.S., F.Z.S.

(Continued from p. 19.)

11. *SPILONOTA OCELLANA*, Schiff. 1775.*Tortrix ocellana*, Schiff., Wien. Verz., p. 130, No. E.7 (1775) [descr.].*Pyralis ocellana*, Fb., Mantissa, II, 228, No. 39 (1787) [redescr. from Schiff. Colln.: nec *Pyralis ocellana*, Fb., 1775, which is the *Depressaria*].*Pyralis luscana*, Fb., Ent. Syst., III, ii, 255, No. 52 (1794) [redescr. under new name to replace *ocellana*, Schiff., Fb. Mantissa, the combination *Pyralis ocellana* having been used by Fab. in 1775 for the *Depressaria*].*Imetocera ocellana*, Fb.: Rebel, Cat. Pal. Lep., II, 125, No. 2255 (1901).*Spilonota ocellana*, Fabr.: Meyr., Rev. Handb., pp. 528-529, No. 1 (1928).

Fabricius' Syst. Ent., published at Easter 1775, antedates Schiffermueller's Wien. Verz., but, fortunately, *Tortrix ocellana*, Schiff. 1775, is not a primary homonym of *Pyralis ocellana*, Fb. 1775, so that both names are valid, the former for the *Spilonota*, the latter for the *Depressaria*.

12. *ACROCLITA NAEVANA*, Hb. 1814-1817.*Tortrix naevana*, Hb., Samml. Eur. Schmett., Tortr., t. 41, f. 261 (13.iii.1814-31.xii.1817).*Tortrix unipunctana*, Hw., Lep. Brit. [iii], p. 454, No. 192 (1811) [nec Donovan 1805].*Lithographia geminana*, Steph., List Brit. Anim. B.M., X, p. 99 (1852).

Haworth's name was praeoccupied by *Tortrix unipunctana*, Donovan, *Epitome of Nat. Hist. of Ins. of New Holland*, t. [40] fig. *, Expl. of tab. p. [1] (1.i.1805), which is a Cryptophasid described from New South Wales and now known as *Maroga unipunctana*, Don. Donovan's name, which is wrongly entered in the *Index Animalium* as *unipunctata*, also praeoccupies *Tortrix unipunctana*, Tengstrom, *Bidrag till Finlands Fjäril-Fauna*, p. 158 (1848), which is standing in Rebel's Catalogue under his number 1578b, but which seems to have no valid name.

13. *ACROCLITA SUBSEQUANA*, H.S. 1851.

In 1847 (*Isis*, XL, 733-734, No. 296) Zeller had described a different Eucosmid species from Syracuse as *Grapholitha consequana* (Rebel, Cat. No. 2171a). In 1851 Herrich-Schäffer (*Schmett. Eur.*, IV, 247, No. 337) described this *Acroclita* from Ronda, in Spain, under the name *Semasia subsequana*, noting "*consequana*, Suppl. 423 (Zeller hat 1847 schon eine *consequana* aufgestellt)." On his Plate 59, f. 423, published in 1852, this species is called "*consequana*" only (no generic name, hence not binomial, the heading of the Plate being merely "*Torticides Europ.*"). In the *Index*, published in 1855, to Vol. IV, Herrich-Schäffer quotes this as "*subsequana* (*Semasia*) H.S. p. 247/H.S. 423 *consequana*." Herrich-Schäffer himself, therefore, not only did describe

it as *subsequana* in 1851 but intended to use the name *subsequana* (and not *consequana*, engraved on Plate 59, which was doubtless already prepared before 1851 but not issued until 1852). Yet Wocke (*Cat. Lep. Eur.*, p. 252 [ii], No. 1028: 1871) has the name as "*consequana*, H.S. 423 (non Z.); *subsequana*, H.S., IV, p. 247 (non Hw.)"; Rebel (*Cat. Pal. Lep.*, No. 1966: 1901) copied Wocke and Meyrick (*Rev. Handb.*, p. 530, No. 2: 1928) also calls it *consequana*. The name *Semasia subsequana* is not a primary homonym of *Tortrix subsequana*, Hw. 1811, nor a secondary homonym of *Eucosma subsequana*, Hw. The correct name of this species is therefore *Acroclita subsequana*, H.S. 1851 = *consequana*, H.S., f. 423 (1852).

14. ANCYLIS LAETANA, Fb. 1775.

- Pyralis laetana*, Fb., Syst. Ent., p. 649, No. 20 (1775), Ent. Syst., III, ii, p. 258, No. 63 (1794).
Pyralis lactana, Fb., Spec. Ins., II, p. 281, No. 29 (1781), Mantissa, II, p. 229, No. 47 (1787).
Ancylis laetana, Rebel, Cat. Pal. Lep., II, 127, No. 2280 (1901); Fletcher, Entom., LXIII, 187 (1930).
Ancylis lactana, Meyr., Rev. Handb., p. 537, No. 14 (1928).

15. GYPSONOMA SOCIANA, Hw. 1811.

- Tortrix sociana*, Hw., Lep. Brit. [iii], p. 434, No. 126 [*partim: forma alpha*] (1811).
Tortrix incarnana, Hw., Lep. Brit. [iii], p. 435, No. 128 (1811).
 ?*Tortrix paykulliana* [nec Fb.], Hw., Lep. Brit. [iii], p. 435, No. 129 (1811).
Tortrix dealbana, Frölich, Enum. Tortr. Württ., p. 51, No. 107 (1828).
Penthina minorana, Treits., Schmett. Eur., VIII, 43-44, No. 12 (1830), X, 53 (1835).
Anticlea sociana, Steph., Ill. Brit. Ent. Haust., IV, 115, No. 5 (30.viii.1834), p. 396 (1835) [*Philalcea*]: Wood, Index Ent., p. 144, t. 32, f. 965 (1836): Westw., Brit. Moths., II, 133, No. 5, t. 85, f. 20 (1844).
Anticlea incarnana, Steph., Haust., IV, 115, No. 6 (30.viii.1834), p. 396 (1835) [*Philalcea*]: Wood, Index Ent., p. 144, t. 32, f. 966 (1836).
Penthina dealbana, F.R., Microlep. (Heft 5), pp. 37-38, t. 22, ff. 1a-d [*minorana* on tab.] (1836).
Gypsonoma incarnana, Rebel, Cat. Pal. Lep., II, 112, No. 2010 (1901).
Gypsonoma dealbana, Meyr., Rev. Handb., pp. 538-539 (1928).

Tortrix sociana, Hw., was described under two forms: as form *Beta* was noted as "forte distincta species," the name *sociana* is only applicable to form *a*, which applies to *incarnana*, Hw. = *dealbana*, Fröl., as exemplified by Stephens' redescription in 1834 and Wood's figure 965. Stephens himself in 1852 (*List Brit. Anim. B.M.*, X, 31, No. 6) quoted *sociana*, Steph., 1834, and Wood's fig. 965 as being the same species (and form of it) as *dealbana*, Fröl., although he quoted *sociana*, form *a*, Hw., under *aceriana*, with which the description does not agree, and Stephens' 1834 description was a translation of Haworth's description of form *a*.

A GYNANDROMORPH OF *ITHYSIA* (*NYSSIA*) *ZONARIA*, SCHIFF.

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

From a batch of eggs laid by a female *Ithysia zonaria* ssp. *atlantica*, Harrison, from the Isle of Harris, sent to me by Professor J. W. H. Harrison in 1938, I bred several males, about 15 females, and the gynandromorph described below. This appears to be female except for the antennae and wings. The antennae are longer than those of a normal female: the left one has a double row of very short pectinations along the proximal two-thirds, the right one a double row of longer pectinations, about half the length of those of a male, extending almost to the tip. The forewing on the left side is about 4.5 mm. long, the hindwing about 1.5 mm., as in a normal female, the forewing on the right side is about 6 mm., and the hindwing about 5 mm. long. Both forewings are very narrow and hairy, but the right hindwing is rather broader and has a well-developed fringe along the inner margin. The abdomen was very large and round at first, but as it dried it collapsed completely and probably contained few eggs or none at all.

Gynandromorphs in this species are rare, and only two are recorded by Schultz in his lists of Palaearctic Lepidoptera which cover the period up to 1912. The first, taken by B. Cooke at New Brighton in 1838, is described and figured by W. Wing (*Trans. Ent. Soc. Lond.*, 1849, 5, 121, Pl. 14, fig. 9). It was female except that the left antenna was pectinated like that of a male. In the figure, however, the pectinations look shorter than those of a male. The second, exhibited by F. Cowham (*Proc. South Lond. Ent. and N.H. Soc.*, 1911-12, 110; *Entomologist*, 1910, 43, 229), was mainly female, but had antennae slightly pectinated and unusually large wings. The locality is not given.

I can find no other records in this species, but a similar gynandromorph of *Poecilopsis lapponaria*. Boisduv. is recorded (*Illustr. Wochenschr. f. Ent.*, 1898, 3, 309). It was mainly female with rudimentary wings, but the left antenna had a double row and the right a single row, of pectinations about half the length of those of a male. It came from Münsterberg in Silesia.

All four are very much alike, and, though I have called them gynandromorphs, they may be intersexes.

COLLECTING NOTES.

NOTE ON THE HOUSE CRICKET.—*Gryllus domesticus*, L., or, as it is now called, according to Dr Malcolm Burr's new and stimulating book, *Gryllulus domesticus*, L., used, in the old days, to be very common in the Easton area, but I have not found it easy to come across. Up to the writing of my last note on the Grasshoppers, which appeared in the *Record* for April of this year, I had not been able to find the insect. Since then, however, I have found it in plenty and also, I believe, the reasons for my former non-success. To begin with, I found that in the case of houses, where it did exist but does not now exist, the grates and fireplaces had been modernised, or built up with a mortar containing cement, and made chinkless and too hard for crickets to work

through, hence they no longer sang on the hearth at night. Even when I did find dwellings where crickets lived it was necessary, I found, to be careful. Some of the men folk took me for a "sanitary bloke," seeking to report on their dwellings, while women would not acknowledge the presence of crickets lest they were judged to keep dirty houses. Another old man I found whose habit it is to sit reading from the Scriptures in the evening, by the light of a low, ancient oil lamp, and listening to the "cheepers." He would neither permit one of them to be taken prisoner nor killed. Some of these folk are astir before dawn, and when the women "do up" the fireside they often catch up "cheepers" with the still warm ashes. The ashes are thrown on a rubbish heap, and in summer crickets survive in them, but in winter the ashes are spread on the mud of walks and hen-runs, and I am told the bodies of "cheepers," probably killed by the cold, are sometimes seen among them. But I have managed to get some local specimens.

At the request of the Secretary I have given the first Scottish taken *Metrioptera brachyptera*, L., mentioned in my note of last month, to the Royal Scottish Museum, Edinburgh. Perhaps I should have mentioned that the Cumberland record of this species was by Mr F. H. Day, of Carlisle, at Wan Fell, July 1900.—T. F. MARRINER.

CURRENT NOTES,

The *London Naturalist* for 1938 is, as usual, a summary of most interesting reports, records and notes furnished by the various sections (on Archaeology to Ramblers) of which the London Natural History Society is composed. Each section appears to have very efficient and energetic officials, but of these we can only mention our own interest, i.e. Entomology, which takes up about a quarter of the issue, some 25 pages. Plant Gall Records in 1938, H. J. Burkill; Lepidoptera of a London Garden, R. W. Robbins; Hymenoptera of S. Cornwall, K. M. Guichard; Invertebrate Fauna of Hyde Park, C. L. Collenette; Parasites of Spiders, G. H. Locket; and other notes on The House Spider, Oak Galls, Butterflies, Coleoptera, etc., make up the main section on Entomology. There is a short report of the six evening meetings and of the eight excursions arranged by the small but active Entomological Section. We might mention that the Ornithological Section issues a 50 page London Bird Report separate from the General Report.

Our Colleague, Mr H. Donisthorpe, has been compiling a *List of the Coleoptera of Windsor Forest*, with notes on each species mostly from his own intensive investigation carried on during the past fifteen years. During this period he has discovered 37 species new to Britain including 8 species new to science, the total number recorded being 1819 species. The prefacing matter contains very interesting notes on the history of the forest, its origin, its trees, its noteworthy inhabitants of other Insect Orders and an acknowledgment of the facilities which all the forest officials have afforded him. It consists of 126 pages with a portrait group. The notes to each species are so concisely full of the conditions under which each species is to be found that every coleopterist will find it a *vade mecum* to all his activities in the field. It is admirably produced.

Volume LVIII of the *Ann. Mus. Civ. Storia Nat.* of Genoa recently published contains the contributions of the period 1935-38, of which nineteen deal with various orders of insects leaving only seven non-entomological papers. Many new species, subspecies, etc., are described, in Coleoptera 23, in Hymenoptera 10, Lepidoptera 26, Neuroptera 4, Hemiptera 11. There are a considerable number of text figures, and several plates.

The *Opuscula Entomologia*, Lund, Sweden, contains in about 80 pages, the final section of an article on the "*Coleophoridae* of Sweden." It includes notes on all the 100 species of the fauna with 8 plates of structures, and a good bibliography.

The *Arbeiten über morph. u. tax. Ent.*, Berlin Dahlem, VI, No. 2, contains a full complement of useful matter largely on Coleoptera, Parasites of grain pests, Diptera, etc., well illustrated with text figures. The five excellent plates illustrate the larvae of Lycid Coleoptera described in the paper by E. C. Rosenberg, Copenhagen.

It has only recently become known that R. P. L. Navas, the eminent Spanish neuropterist, died last December.

In the Proceedings of the Zoological Society, Vol. 109, Series A, pp. 69-78, 1 fig. (May 1939), G. Fraenkel has a paper on the Function of the Halteres of Flies (Diptera): he states that the halteres are to be regarded as equilibrium-organs functioning by the gyroscopic action of the vibrating haltere on the sense-organs in the base of the haltere.—T. B.-F.

The Ministry of Agriculture has again drawn attention to the increasing danger of the Colorado Beetle reaching this country. In 1938 the situation on the Continent was serious, as this beetle now exists also in Germany, Switzerland, and Luxemburg and migrating flights from France took place over Belgium and reached Holland, so that the direct invasion of England is quite possible. All entomologists can cooperate usefully by keeping an eye open for the occurrence of this beetle.—T. B.-F.

Heer A. Diakonoff has published a useful paper on the Genera of Indo-Malayan and Papuan Tortricidae (*Zool. Meded. Rijksmus. Natuur. Hist.*, xxi, 111-240: April 1939) and another in *Tijds. Ent.*, lxxxii, 64-80, on species of the Cosmopterygid genus *Blastodacna*. In the latter he deals with our two species, *atra* and *hellerella*, and shows that *putripenella*, Zeller, is the Continental form of *atra*, Hw., and gives figures of the genitalia of the various forms. Heer Diakonoff has been appointed to a post at the Sugar Experiment Station at Pasoeroean, Java, where we hope that he will find opportunity for further work on Microlepidoptera.—T. B.-F.

Part II of Vol. II of the *Cat. Lep. de France et Belgique* has just come to hand. It completes the *Pterophoridae* and commences the Tortrices. We must congratulate the compiler, M. Leon Lhomme, on the enormous amount of information on the distribution he has amassed.

OBITUARY.

SIR GEORGE HAMILTON KENRICK, KT., F.R.E.S. (1850-1939).

It is with much regret we have to record the death, on 28th May, of George Hamilton Kenrick, Kt., at the ripe age of eighty-nine. He was a keen collector of Lepidoptera all his life, in which he was often joined by his nephew, Neville Chamberlain, our present Premier. He wrote but little, very little, the only papers I can recall were two on "New and little known Heterocera of Madagascar," 1913 and 1917, and one on "Some Undescribed Butterflies from Dutch New Guinea," 1911, published in the *Transactions of the Royal Entomological Society of London*. (All with plates, of which some were coloured.) At the beginning of the present century he joined the writer in sending out the late A. E. Pratt and his two sons to British New Guinea, and he sent him out again to collect in the Arfak Mountains of Dutch New Guinea. Both of these expeditions proved most successful, with hundreds of species new to science. He presented his entire collections to the Birmingham Natural History Museum a few years ago.

Sir George was a keen sportsman with gun and rod, a very good rifle shot when out stalking deer on his "shoot" in the far north of Scotland. He was also an energetic tennis player till late in life, and I believe bicycled up to the age of eighty. A wiry active man, he, on his eightieth birthday, took a walk of twenty miles "just to see that he could do it," as he said afterwards.

He was a son of the late Timothy Kenrick of Edgbaston, and grandson of Archibald Kenrick, the founder of the important firm of hollow-ware bearing that name. He was educated at Brighton and at the College of the London University, after which he spent two years in the engineering works of Nettlefolds, of which his brother-in-law, the late Joseph Chamberlain, was then the guiding star. Subsequently he joined his father's firm, of which he was chairman for many years.

Apart from his active business career, his life work was in the cause of elementary and higher education. At the age of thirty he became a member of the Birmingham School Board, where the writer joined him later on, and when the 1902 Act was passed, placing all schools under the Municipality, he joined the City Council and became the new Education Committee's first chairman, a post he held for eighteen years. His gifts for this cause were most munificent, to its various branches he gave in one way or another well over eighty thousand pounds, and with it all he was a man of a retiring and modest disposition.

The writer had a cheery letter from him last Christmas, but in January his strength suddenly began to fail, and in May bed became necessary and he passed peacefully away in his sleep on the twenty-eighth of that month. Sir George never married, but there is a large family circle and to them we offer our sincere condolences.

I ought perhaps to say that my friend was Lord Mayor when King Edward came to Birmingham in 1909 to open the new University Buildings, and it was then that the King knighted him.

G. T. B.-B.

with the forewings a little narrower and more blunt at the apex; usually also of more uniform colouring the tendency of the ground colour being to reddish brown or fulvous; the markings identical, though rarely distinct and having a range of variation in colour and in markings, which, though usually less pronounced, is practically the same as that already detailed, but a shading of purple-grey is much more general, while the angulated spots in the discal cell are almost always purple-brown, very rarely black. In these forms the hindwings have, in some instances, a pale shade across the middle, or a dark cloud along the hind margin, but usually are as in the larger forms. Both occur mixed together where the bases of the hills are wooded, and with them all possible intermediates.

“Another and very different form has been discovered within the last few years, accompanying these already described, in the Shetland Isles, having decidedly more pointed and narrower forewings, their costal and dorsal margins straighter, and the hind margin even slightly concave below the apex. The usual range of colour in this local race is from dark red-brown or dark chocolate to black-brown, or purple-brown, though occasional specimens are of a much paler purplish-brown, or even pale greyish-brown; the stigmata and intermediate black spots are in these often distinct, the former being usually either tinged with reddish, or clouded with grey, the latter black or extremely dark chocolate-brown; the purple-brown transverse stripe beyond the second line is usually also very distinct; but the usual double transverse lines are usually absent or indicated only by the enclosed paler narrow stripes, so that the clouded or mottled tint usual in southern specimens is here replaced by more regular deep and sombre colouring and a more uniform pattern of markings; nevertheless there is a good deal of variation in ground colours and in the presence or absence of the more restricted markings, while the aberration in form of the forewings is quite extraordinary, some of the females measuring in breadth of these wings hardly more than one-half of the width of those of a normal southern female specimen. Some of these narrow and pointed forms have the forewings chestnut-brown, the stigmata very pale and the dark markings extremely sharp; others pale purplish, pale grey, and some having the transverse lines and stigmata yellow.

“In the Orkneys specimens are found approaching the peculiar Shetland varieties, mingled with those of the smaller hill-frequenting form, ordinary southern types, and intermediates. To some extent the same tendencies seem to be observed in all the Scottish Islands. A small hill form has been taken in the New Forest, as a second generation of ordinary *N. festiva*; near Dublin the same has happened, with the remarkable addition of an example of the narrow-winged Shetland form. The higher moors and hills of Devonshire produce the small form found on the northern hills, and this mingles with the ordinary southern forms in the woods at their base; the narrow-winged form has been found in the East of Scotland.”

Barrett records a specimen “Forewings buff mottled with red in a not unusual manner, but its hindwings also are reddish buff, with two slender, dark grey, curved transverse lines, giving it an appearance approximating to that of the forewings.”

Another "of a lovely cream colour with a dark smoky-brown central shade, and the spot between the stigmata intensely black, also with sharply accentuated markings toward the hind margin."

Another "with a distinct black streak in the place of the usual dot representing the claviform stigma." Jet black streaks are recorded in other specimens in various positions.

In a further aberration the first and second lines are distinctly marked, placed near together, and so altered as to resemble those in *Cosmia trapezina*.

And one "in which the forewings are so broadened in shape that it bears a curious resemblance to *Noctua baja*."

Names and Forms to be considered:—

It has been usual to divide this species into two subspecies, *festiva* and *conflua*, but as shown above these appear to be only one species. There was also much confusion and misunderstanding of what the form *conflua*, Tr. was, owing doubtless to the general ignorance of Continental work by British authors.

festiva, Schiff. (1775), *Verz. Anh.*, 314 [now considered before Fabricius].*

mendica, Fab. (1775), *Sys. Ent.*, 611. No references given.

primulae, Esp. (1788-1796?), *Abbild.*, IV (2), 428 [after Bork., 1792]; IV (1), plt. 136, 5-6 (1788).

mendica, Fb., *Ent. Sys.*, III (2), 93 (1794).

festiva, Hb. (1800-3), *Samml. Noct.*, 114.

ab. *subrufa*, Haw. (1809), *Lep. Br.*, 227.

[ab. *turbida*, Hb.] = *congener*, Hb. (1814-17), *l.c.*, 618 "error" = *l.c.*, 617.

ab. *ignicola*, H.-S. (1850), *Sys. Bearb.*, II, 455.

f. *conflua*, Tr. (1825), *Schm.*, VI (1), 405.

f. *borealis*, Zett. (1840), *Ins. Lap.*, 941.

f. *diducta*, Zett. (1840), *l.c.*, 946.

f. *conflua*, H.-S. (1851), p. 358 = *pseudoconflua*, B.-Salz. (1939): *Ent. Rec.*, LI, 30 (1939), plt. 3, 7-8.

ab. *rufo-virgata*, Tutt (1892), *Brit. Noct.*, 121.

ab. *ochrea-virgata*, Tutt (1892), *l.c.*, 122.

ab. *grisea*, Tutt (1892), *l.c.*, 122.

ab. *caerulea*, Tutt (1892), *l.c.*, 122.

ab. *quadrata*, Tutt (1892), *l.c.*, 122.

ab. *lamentanda*, Alph. (1897), *Rom. Mem.*, IX, 330, plt. 14, 6.

ab. *fasciata*, Hannemann (1916), *Int. Ent. Zt.*, XI, 105.

ab. *havana*, Sibille (1927), *Lamb.*, XXVII, 74.

ab. *fibulata*, Dahl. (1930), *Ent. Tidskr.*, LI, 251, plt. I, 2.

ab. *disparata*, Cort.-Drdt.-Stz. (1933), *Pal. Noct. Supp.*, III, 76.

ab. *carillei*, Brndt. (1934), *Ent. Zts.*, XXXVII, 148.

ab. *transversa*, B.-Salz. (1939), *Ent. Rec.*, LI, 31.

ab. *conjuncta*, B.-Salz. (1939), *l.c.*, 31.

*This consideration is to be brought before the Entomological Commission. Otherwise many of our common generic (and specific) names will be hopelessly involved.

f. *orkneyensis*, B.-Salz. (1939), *l.c.*, 31.

ab. *depicta*, B.-Salz. (1939), *l.c.*, 31.

ssp. *thulei*, Stdgr. (1891), *Iris*, IV, 266.

ab. *obsoleta*, Tutt (1892), *l.c.*, 123.

ab. *primuloides*, B.-Salz. (1939), *Ent. Rec.*, LI, 33.

ab. *rufo-obsoleta*, B.-Salz. (1939), *l.c.*, 33.

ab. *hethlandica*, B.-Salz. (1939), *l.c.*, 33.

ab. *maculata*, B.-Salz. (1939), *l.c.*, 34.

ab. *glabrina*, B.-Salz. (1939), *l.c.*, 34.

ab. *rufonigra*, B.-Salz. (1939), *l.c.*, 34.

ab. *unicolor*, B.-Salz. (1939), *l.c.*, 34.

ab. *nigra*, B.-Salz. (1939), *l.c.*, 34.

ab. *nigrostriata*, B.-Salz. (1939), *l.c.*, 34.

Esper in his description of *primulae* in vol. IV (2) refers to Borkhausen's description (1792) and thus it could not have been published before that date. It is often put in 1796? with a query. But the plate was undoubtedly published about 1788 in vol. IV (1).

He refers to his fig. 6 as "Eine Abänderung" and fig. 5 "♂."

His short diagnosis of fig. 6 is "Wanting the very variegated markings, a specimen such as one rarely sees."

Tutt dealt with: I. Dark purplish or reddish brown (1) without quadrate spots, with pale base = *festiva*; (2) mottled, without quadrate spots = *congener* (*turbida*, Hb. in error); (3) with quadrate spots = *sub-rufa*. II. Bright reddish ochreous (1) without quadrate spots, pale base, banded = *rufo-virgata*; (2) mottled form, without quadrate spots = *conflua*, H.-S. = *pseudo-conflua*, B.-Salz.; (3) with quadrate spots = *mendica*. III. Pale yellow or whitish ochreous (1) without quadrate spots, pale base = *ochrea-virgata*; (2) without quadrate spots, mottled = *ignicola*, H.-S.; (3) with quadrate spots = *primulae*. Also (1) *grisea*, almost unicolorous dark grey with slight reddish tint; (2) *caerulea*, a clear slaty or lilac colour; (3) *quadrata*, the last with quadrate spots; (4) *borealis*, a greyish brown form of *conflua* (?), Lapland; (5) *obsoleta*, a pale *borealis*; (6) *diducta*, Lapland, comparable with *C. rubiginea*.

Tutt refers *mendica*, Fb. to the *Mantissa*, but it was first described by Fab. in the *Syst. Ent.* of 1775 as follows:—

ORIG. DESCRIP.—"Pallida incarnalis: macula media fusca: stigmatibus flavis." "Thorax fuscus, margine antico albicante. Alae anticae subincarnatae, strigis plurimis undatis, fuscis. In media alae macula magna fusca, et in hac stigmata ordinaria flavissima, anteriore orbiculata, posteriore reniformi, subtus flavescentes striga fusca." No references.

The *Mantissa* has only the first period of the above; with no references, nor does he (Fb.) give any references in the *Ent. Sys.* (1794).

var. *thulei*, Stdgr., *Iris*, IV, 266 (1891).

ORIG. DESCRIP.—"With this name I denote the striking local form of *festiva* from the Shetland Isles, which is far darker than *festiva* and also than the alpine and northern var. *conflua*. The forewings are dark chestnut-brown to black-brown, the lighter transverse markings only

becoming dull and obsolescent in the outer part; the two upper stigmata are, for the most part, somewhat lighter and sometimes separated by a deep black spot; a second, smaller spot stands before the orbicular stigma. The hindwings are also far darker grey-black than in *festiva* and *conflua*. The specimens are smaller than typical *festiva* and larger than most *conflua*, which occur in all transitions to *festiva*. The *conflua* before me, caught in large numbers from the Islands later, are all smaller and also almost all much lighter than these Shetland var. *thulei*, only single females are darker. Mr Jenner Weir in the *Entomologist*, 1884, p. 2, has noticed shortly this Shetland form and there are a few specimens of it tolerably well figured as figs. 8, 9, 10."

race *lamentanda*, Alph., *Rom. Mem.*, IX, 330 (1897).

FIG.—Plt. 14, f. 6.

ORIG. DESCRIP.—"Minor pallidior, griseus signis omnibus minus conspicuis, spatio inter maculas cellulae anticorum viso obscurato." ♂, 28-30. ♀, 26-28.

"The ground colour of the forewing is grey-brown with less sharply emphasised marking, although the latter sufficiently clearly and fully indicated the figure of the typical form. The part between the stigmata and the middle cell is no darker than the ground and only in rare cases somewhat brown. Yet at the first glance the specimens from Kamtchatka give a very different impression from that of typical examples and I thought at the time they must be considered as a variety of *A. dahlii*. However on account of the greater breadth especially of the forewings and the more pointed apex, as well as a neatness in expression of all the markings, and especially the identity of the underside markings influenced me in placing the Kamtchatka form to *festiva* and not to *dahlii*."

Hamp., *Cat. Lep. Ph.*, IV, 491 (1903), "Paler and more uniformly ochreous."—Kamtchatka.

ab. *fasciata*, Hanne., *Int. Ent. Zts.*, XI, 105 (1916).

ORIG. DESCRIP.—"The hindwing with a sharply defined light post-discal band." Werbellin Lake, near Berlin.

ab. *havana*, Sibille, *Lamb.*, XXVII, 74 (1927).

ORIG. DESCRIP.—"De couleur havana avec une bande submarginale plus foncée." Belgium.

ab. *fibulata*, Dahl., *Ent. Tidskr.*, LI, 251 (1930).

FIG.—Plt. 1, fig. 2 (a poor figure b. and w. of an insect in poor condition).

ORIG. DESCRIP.—"This separates itself from the described forms in that the dark outer border is absent. From the base of the forewing there proceeds an obscure red streak towards the lower portion of the area near the inner (anal) angle of the wing." Lima Limesforsen, Sweden.

f. *disparata*, Corti-Drdt.-Seitz, *Pal. Noct. Supp.*, III, 7b (1933).

FIG.—11g.

ORIG. DESCRIP.—"Looks almost like a *brunnea* by its dark violet brown colour with still darker patch between the stigmata and its bright yellow-red anal tuft." Lapland.

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CONTENTS.

NEW AND LITTLE KNOWN ASIATIC PHALAEANOIDEA, <i>H. Bystinski-Salz</i> , <i>Ph.D.</i> , F.R.E.S. (Plate)	117
COLEOPTERA OF EASTON, <i>T. F. Marriner</i>	121
NAMES OF MICROLEPIDOPTERA, <i>T. Bainbriggie Fletcher</i> , R.N., F.L.S., F.R.E.S., F.Z.S.	127
COLLECTING NOTES: <i>Hepialus humuli</i> , <i>B. J. Lempke</i> ; A Note from Graaff Reinet, <i>J. Sneyd Taylor</i> ; Diptera from North Kent, <i>H. W. Andrews</i> ; <i>Platychirus tarsalis</i> , Schum. [Dipt.] in Surrey, <i>L. Parmenter</i>	128
CURRENT NOTES	129
SOCIETIES	131
REVIEW	132
SUPPLEMENT: The British Noctuae and their Varieties, <i>Hy. J. Turner</i> , F.R.E.S., F.R.H.S.	(189)-(192)

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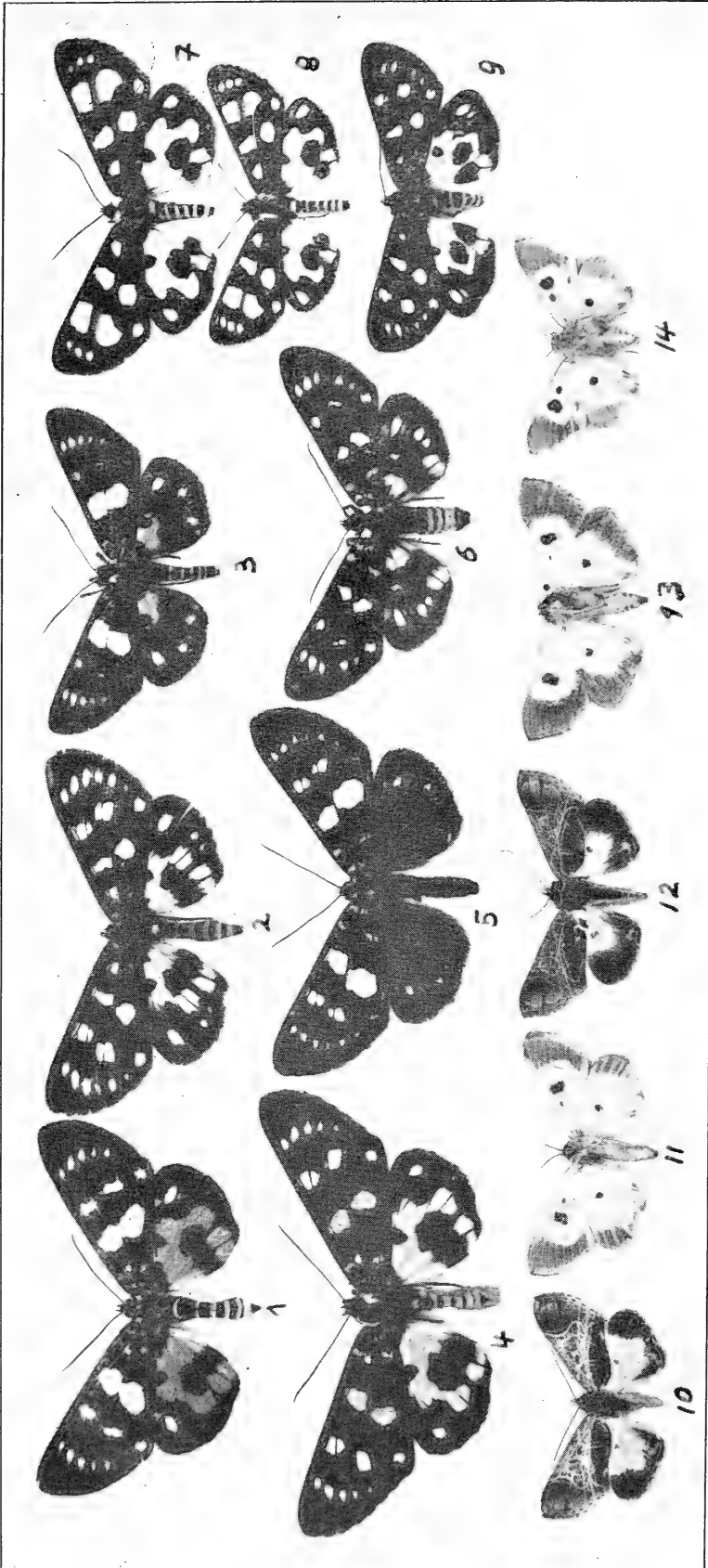
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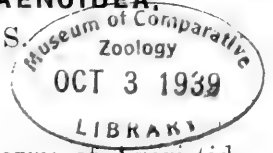
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NEW AND LITTLE KNOWN ASIATIC PHALAEENOIDEA.

By H. BYTINSKI-SALZ, Ph.D., F.R.E.S.

(Plate IX.)

13,820



I am giving here the descriptions of a number of forms of Agaristids from China, Japan, Formosa, and Hainan, which seem to be new to science, or so little known that a few additional notes seem of interest.

On the Chinese Agaristids, Mell recently published an exhaustive paper in the *Stettiner Entomologische Zeitung*, Vol. 97, 1936, which was of great help in determining the Chinese species and subspecies. As far as my material came from the same localities (chiefly from the collections of Dr Hoene) my determinations agree fully with his point of view. To determine the range of variation of several species I found it, however, desirable to describe a few extreme forms as new aberrations. The remainder of the material I received through indigenous collectors of Messrs Staudinger and Bang Haas and Mr G. L. Gressitt, who collected during several summers in Formosa, Hainan, and S. China.

I am very much indebted to Mr W. H. T. Tams, from the British Museum, who kindly copied for me the original description of *Chelonomorpha formosana*, Miyake and let me have an extract of the unpublished manuscript list of the Wileman Collection of Formosan Lepidoptera now in the British Museum.

Eusemia nipalensis, Btl. ab. **semiclara**, ab. nov.

Forewing yellow, basal spot present. Spots of the discal row yellow, well separated. Spots of the postmedial band also well separated, white, the lower one small, occupying only the interspace between vein 4 and 5. Submarginal row of spots white. Hindwings yellow and black as in *nipalensis*, Btlr.

Holotype. 1 ♂, expanse 80 mm. Naga Hills, Assam.

Differs from typical *nipalensis*, Btlr., in having the spots of the postmedial band white instead of yellow. Whereas specimens of the f. *westwoodi*, Kirby, with all spots of the forewing white (=ab. *clara*, Jord.) are fairly common among examples from Assam, I have not yet seen a specimen with yellow hindwings and the spots of the forewing completely white, which form seems to be very rare.

Eusemia nipalensis, f. **hainani**, f. (ssp.?) nov.

Forewing yellow, basal spot present. Spots of the discal row yellow, very large, connected at the lower border of the cell. Postmedial spots yellow, smaller than in f. *westwoodi*, Kirby. Submarginal spots white and rather small. Hindwing more intensive red than in f. *westwoodi*, the anal margin only with a faint ridge of orange. No orange border on the costal part. Black spot at the upper angle of the cell elliptical, not triangular as in f. *westwoodi*. Other black and white spots as in f. *westwoodi*.

Holotype: 1 ♀, expanse 65 mm. Ta Hian, Hainan, 14.VI.35, leg. Gressitt.

E. f. hainani belongs to the "*westwoodi*-group" of *nipalensis*, but differs from this form as stated above. It differs also from ssp. *expensa*,

Jord. in having the spots of the postmedial row much smaller than those of the discal row and not larger as in this form from Tonkin. Its size with 65 mm. is much smaller than any *nipalensis* ♂ ♀, which vary from 78-83 mm. As I have only this one specimen, I am treating *hainani* as a form, but I think it is a valid subspecies, as its general aspect differs very much from f. *westwoodi*.

Eusemia distincta, Btlr., ssp. **tatsienlouica**, ssp. nov.

Shape of the forewing very narrow, with sharp anal angle, outer margin less rounded. The median spots of the forewing very large, forming a complete yellow band across the wing. Postmedial spots much reduced, forming only two little specks; the lowest near the anal angle absent. Submarginal row also much reduced, spot 6 absent, 7 obsolete. Hindwing red orange, much darker than in *distincta*, base broad black. The medial row of spots and the submarginal black band completely fused, forming a broad black band over the outer two-thirds of the wing, in which are present: a large white costal spot followed by 2 tiny specks and 2 small spots; also two separate orange spots at the anal angle. Black discal spot connected by a bar with the outer black area and the black costa.

Cotypes: 2 ♂♂, expanse 59 and 63 mm. Tatsienlou, VIII, 1930.

Differs from *distincta*, Btlr. by the larger median spots and the reduced postmedial spots, which are yellow and not white. Further by the lack of the marginal streaks and the large extension of the black on the hindwing. Very similar to ssp. *macrosema*, Jord. but differs by the much narrower shape of the forewing in comparison with the figure of the type in Hampson's *Catalogue Suppl.*, Vol. II, pl. 70, fig. 1 (if this is really a ♂ as indicated!). Further, by the presence of the upper yellow spot of the postmedian row and the absence of the lowest one of the same row. Hindwings much brighter red-orange as in *macrosema*, Jord.; the black of the medial row enlarged and completely confluent with the submarginal black. White spots in the tornus larger.

Mell (p. 37) mentions *E. distincta*, ssp. *macrosema*, Jord. also from Yünnan. As his description agrees also well with ssp. *tatsienlouica*, it is possible that the specimens of the mountain range of Yünnan belong also to the latter subspecies.

Eusemia lectrix ssp. *sauteri*, Mell.

The *lectrix*-form from Formosa has the brightest and richest yellow hindwings of all other *lectrix* forms. It is almost identical in colour and designs with *E. beatrix*, Jord. and differs very much from the typical Canton-specimens of *lectrix*, but its black tip of the abdomen indicates its specific relationship with *lectrix*.

Matsumura (*Thousand Insects Jap. Suppl.*, 2, 1914) describes a "*beatrix* ssp. *formosana*" from Formosa. I never got any *beatrix* specimens from there and it is also not mentioned by Strand, who described the Agaristids of the Sauter Collection.

Mell (p. 36) and Wileman (unpublished catalogue notes) cite only the quotation of Matsumura's *beatrix* ssp. *formosana*. I am thinking, therefore, that it is not impossible that Matsumura's *formosana* is really a form of *lectrix* instead of *beatrix*. In this case the name *E. lectrix* ssp. *formosana* Mats. should be applied to the Formosan subspecies.

Eusemia lectrix, L. ab. **reducta**, ab. nov.

Under a series of typical *lectrix* from Canton is a male which has all black markings much extended. Antemedial spot absent. Medial spots reduced, well separated, measuring only 2×2 and 2×3 mm. Postmedial row also reduced, the upper spot measuring 1 mm., the lower two are very tiny. Spots of the submarginal row of normal size. Hindwing black; the three submarginal spots of normal size. A large anal orange spot divided by vein 1. A narrow antemedial orange band and an orange spot outside of the discal vein.

Holotype: 1 ♂, 64 mm. expanse. Canton, Eastern China.

In this specimen it seems worth mentioning that while the yellow and orange markings are reduced in size the white markings of the submarginal row are not, showing in this way that the pattern of this *Eusemia* consists of several different systems of markings which may vary independently from each other.

Eusemia adulatrix, Koll. ab. **postnigra**, ab. nov.

Forewing as in normal *adulatrix*, the spot of the medial row well separated (=ab. *sectinotis*, Btlr.). Hindwing without any orange markings, completely black from the base up to the submarginal row of very reduced white spots.

Holotype: 1 ♂. Assam.

Chelonomorpha japona, Motsch. ssp. **kansuana**, ssp. nov.

Forewing with the yellowish spots somewhat reduced in size. The two spots of the postmedian line always well separated. Hindwing with the black base less extended than in Japanese specimens. Spots beyond the cell conjoined; the anal one connected by a narrow stripe with the submarginal band. A long tooth of the submarginal band on vein 1 reaches the spot below the cell.

Cotypes: 1 ♂, expanse 48 mm.; 3 ♀♀, 54-59 mm. Min, Min-shan, 3000 m., July, S.E. Kansu.

Ch. ssp. *kansuana* resembles somewhat *Ch. austeni*, Moore from S. China by the fusion of the two black spots on the hindwing, but belongs specifically to *Ch. japona*, Motsch. as it lacks the yellow costal streak on the underside of *austeni* and has also the valvae of the male black at their base.

Chelonomorpha formosana, Miyake (*Annot. Zool. Jap.*, VI, p. 79, 1907).

Original description: Allied to *C. japona*, Motsch. especially in the markings of the hindwing. Forewing with the silvery blue spots much broader and more conspicuous; antemedial oblique line from costa to inner margin; some streaks on vein 1 and on median nervure; the quadrate patches much smaller and pure white instead of yellow. Apical patch of the hindwing also pure white. Exp. 65 mm. Taikokan, 10th August. I have a ♂ of this species from Taiheizan, Formosa, 10th May 1932, leg. Gressitt, which agrees perfectly with the description, but it measures only 58 mm. Besides the differences given by Miyake, I may add that the size of basal spot is 1.1 mm., and of the postmedial spots are 2.5/2.2 mm. in comparison with 3 mm. and 4.5/5 mm. as in *japona*. Underside with 8 marginal spots (in *japona* only 3 apical ones and one large anal one). On the hindwing only 4, the upper one being

absent. Black costal stripe larger than in *japona* and not connected with the round discal spot.

About the existence of this form seems to have reigned considerable doubt. Jordan (*Seitz*, Vol. VIII, p. 6), who does not know this form, places it among *C. japona*. Hampson (*Cat. Suppl.*, Vol. II, p. 592) even puts *formosana*, Miyake among the "unrecognized species." Strand (*Arch. f. Naturgesch.*, 1915, A.8, p. 34) does not mention it at all. Wileman seems not to have got it during his stay at Formosa, as in his manuscript catalogue he writes behind the name (= *Mimeusemia vilemani*?). Mell (p. 43) seems also not to have seen Formosan specimens and doubts somewhat the time of appearance in August. Retaining that *formosana*, Miyake is a local variety of *japona*, Mell (p. 41) uses this name also for the *japona*-specimens from Hunan and Kwangtung, but I am somewhat in doubt whether this is right. He does not give measurements of the size of the white spots of its Chinese "*formosana*," but from the sizes given for the transitional specimens between *japona* and *formosana* (p. 40) it is clear that these are so much larger than those in Formosan *formosana*, Miyake. Also the discal spot in the hindwing is not connected with the black costal area.

There can be no doubt that *C. formosana*, Miyake is a valid species and distinct from *C. japona*, Motsch. and its ssp. *kansuana*, By.-S., but here too I am not yet convinced that the true *formosana*, Miyake occurs outside of Formosa.

Seudyra subflava, Moore ssp. **japonica** ssp. nov.

The type of *Seudyra subflava*, Moore came from Kiukiang (Central China). I have Chinese specimens from Chi-feng-hsien (Prov. Tschili) and Lin-si-hien (Chingan Mount.) which agree well with Moore's description and the picture of Alpheraki's "*Zalissa jankowskii*" in *Romanoff*, Vol. IX, pl. IX, fig. 2, from Sidemi and Korea.

Specimens from Japan differ in several respects from the type form. Dark dorsal crests and middle spots of the abdomen much broader and on all segments well developed, not only in the basal 3 or 4 segments as in Chinese specimens. The yellow suffusion of the forewing is much less accentuated. Only the veins, the surroundings of the orbicular and reniform and the double postmedian line are narrowly bordered with yellow, giving the whole forewing a distinct uniform and dull aspect. Discal spot of the hindwing much larger, brown outer margin of the hindwing much broader, so that the orange anal patch lies completely inside the marginal band and does not touch the yellow central area. Also on the underside the marginal band is much broader than in Chinese specimens.

Cotypes: 1 ♂, 2 ♀♀. Hakone near Fuji, Japan Main, 1916, leg. Hoene.

I think *Zalissa jankowskii*, Alph., which had been until now sunk under synonymy with *Seudyra subflava*, Moore, may be also considered as a valid subspecies. The upperside is rather variable, ranging from the typical aspect of *subflava* to the dark *japonica* (one specimen labelled "Ussuri" in my collection). On the underside of the hindwing is a decided tendency for obliteration of the submarginal band, as described by Alpheraki (*Romanoff*, Vol. IX, p. 152) and pictured there (pl. XI, fig. 2), where this band is wanting completely. Also in my

Ussuri ♂ the anal half of the band is completely wanting and the costal half very pale.

Syfanía dubernardi, Obth.

Of this species Oberthur (*Et. Entom.*, XIX, p. 21, pl. VII, fig. 70, 1894) described only the ♀, which has the light spots on the forewing yellow and the hindwing "mikado orange." O. Bang Haas (*Ent. Zeitschr.*, XLVII, p. 99, 1933) received some ♂♂ from Kansu, which show that there is a remarkable sexual dimorphism in this species, the ♂♂ having all light spots and the hindwing light bluish white. Recently Mell (*Stett. Ent. Z.*, 97, p. 185, 1936), probably unaware of the aforesaid description of Bang Haas, gives a detailed description of a new subspecies, "*taipeishanis*" Mell, from S. Shensi, which agrees in every detail with my 2 ♂♂ Neocotypes from Kansu, ex coll. Bang Haas. Also the somewhat summary description of the ♀: "Forewing all spots large, light yellow, hindwing chrome-yellow, the black markings much reduced," agrees very well with the ♀ of *dubernardi*, Obth.

I retain, therefore, that ssp. *taipeishanis*, Mell is synonymous with *S. dubernardi*, Obth.

Cruriopsis funebris, Moore.

I have a ♂ from Hori Formosa, May 1934, leg. Gressitt, which does not agree with the ssp. *cognata*, Jordan from Horisha Formosa. It has not more white on the hindwing and the postdiscal spots on the forewing are not larger and whiter. On the other hand, the specimen agrees perfectly with the type of ssp. *vithorioides*, Leech in the British Museum and my specimens from Kansu. (Jerusalem.)

EXPLANATION OF THE PLATE.

1. *Eusemia nipalensis*, f. *hainani* f. nov. Type ♀, Ta Hian, Hainan.
2. *Eusemia lectrix*, ssp. *sauteri*, Mell. ♀, Hori, Formosa.
3. *Eusemia distincta*, ssp. *tatsienlouica* ssp. nov. Cotype ♂, Tatsienlou, W. China.
4. *Eusemia nipalensis*, ab. *semiclara* ab. nov. Type ♂, Naga Hills, Assam.
5. *Eusemia adulatrix*, ab. *postnigra* ab. nov. Type ♂, Assam.
6. *Eusemia lectrix*, ab. *reducta* ab. nov. Type ♂, Canton, E. China.
7. *Chelonomorpha japona*, ssp. *kansuana*. Cotype ♂, Min, Min-Shan, Kansu
8. *Chelonomorpha japona*, ssp. *kansuana*. Cotype ♀, Min, Min-Shan, Kansu
9. *Chelonomorpha formosana*, Miyake. ♂, Taiheizan, Formosa.
10. *Seodyra subflava*, Moore. ♂ upperside, Lin-si-hien, China.
11. *Seodyra subflava*, Moore. ♀ underside, Lin-si-hien, China.
12. *Seodyra subflava*, ssp. *japona* ssp. nov. Cotype, ♀ upperside, Hakone, Japan.
13. *Seodyra subflava*, ssp. *japona* ssp. nov. Cotype, ♀ underside, Hakone, Japan
14. *Seodyra subflava*, ssp. *jankowskii*, Alph. ♂ underside, Ussuri.

COLEOPTERA OF EASTON.

By T. F. MARRINER.

Easton is an area in north-east Cumberland. The centre of this area is along the 400 ft. contour line. The western part slopes from this to the Solway, and the eastern part rises gradually to the border of Northumberland along the top of the Pennine Range. The area is well watered, with patches of woodland studded about, and has a

varied flora. It has never been worked by the entomologist except for an occasional visit, and a lifetime of work would be required to even partly exhaust its possibilities, so that my list can only be a tentative one, embodying some five years' work.

Cychrus rostratus, L. was one of the first beetles I took here. I was sitting on a seat not far from Longtown when I noticed it crossing the road towards me.

Of genus *Carabus* we have four, though I hope to find two more. *C. catenulatus*, Scop. and *C. nemoralis*, Müll. appear to be the usual species of the lower western part of the area. *C. violaceus*, L. I have found most plentiful in the middle area, and *C. granulatus*, L. is fairly frequent in the higher east area.

The only *Notiophilus* I have got so far is *N. biguttatus*, F., which is quite common.

Leistus rufescens, F. occurs sparingly.

Nebria brevicollis, F. is very common, as is also *Loricera pili-cornis*, F.

Badister bipustulatus, F. I have only come across once.

I got one or two *Bradycellus placidus*, Gyll. when trimming my hedges.

Harpalus aeneus, F. is quite common.

Pterostichus cupreus, L. only occasionally seen. *P. versicolor*, Sturm. was very common on the roads in 1935 but I have not seen it very often since, possibly because the roads have been tar-macadamed and widened. *P. madidus*, F. common, as are also *P. niger*, Schall. and *P. vulgaris*, L., while *P. strenuus*, Panz. is perhaps the commonest of all.

Of *Amara* I have found four species. The commonest is *A. trivialis*, Gyll. *A. fulva*, De G. is rare. *A. apricaria*, Payk. is not very common, and *A. tibialis*, Payk. I have only once come across.

Calathus melanocephalus, L. and *Anchomenus dorsalis*, Müll. are common, while *A. albipes*, F. is somewhat rare.

Bembidion rufescens, Guer. is common by the Lyne side. *B. obtusum*, Sturm. occurs in moss at Easton. *B. guttula*, F. is taken freely in grass on the damp road verge opposite my house. *B. mannerheimi*, Sahl. is plentiful. *B. biguttatum*, Gyll. on wet surround of field pond, and *B. doris*, Panz. sparingly around the same pond. *B. shüppeli*, Dej. Lyne bank and along the Rae Burn. *B. lampros*, Herbst. common. *B. nigricorne*, Gyll., two on a moorland road near Mallsburn. *B. tibiale*, Duft., on both Liddel and Lyne banks. *B. atrocaeruleum*, Steph., common along Lyneside. *B. decorum*, Panz., taken sparingly on shingle by the Lyne; one specimen taken was a freak with six legs on one side. *B. nitidulum*, Marsh, two taken on some marshy ground near Yadhill Wood; Mr Day took this on Liddel side in the area in 1926. *B. monticola*, Sturm. on sand bank by the Esk. *B. bruxellense*, Wesm. Mr Day took this on the Black Lyne here and I have got it on Lyne side. *B. saxatile*, Gyll., found in numbers in one place by the Liddel. *B. littorale*, Ol., common on most of the stream sides. *B. bipunctata*, L. Mr T. C. Heysham took this by the Esk (Steph. *Illus.*). I have taken it by the Liddel not far away, but sparingly.

Trechus minutus, F. fairly common throughout the area.

Dromius linearis, Ol., have taken one. *Dromius quadrinotatus*, Panz. and *D. quadrimaculatus*, L. both occur in Yadhill Wood.

Metabletus foveola, Gyll. occurs but uncommonly.

I am afraid I have neglected the water beetles and Staphs up to the present, and hope to deal with them later. I have only taken one or two as they came my way when after other game.

Anacaena globulus, Payk. common in some of the ditches here.

Cercyon melanocephalus, L. common.

Gryphaena affinis, Mann. is frequent in fungi.

Creophilus maxillosus, not uncommon.

Lesteva longelytrata, Goeze., taken twice on a pool margin.

Dianous coerulescens, Gyll., got one by the Rae burn.

Geodromicus nigrita, Müll. was taken by Mr Day on the Black Lyne, on a visit to the area.

The burying and carrion beetles seem much commoner here than I found them in other parts of Cumberland where I have collected. They also strike me as being larger in size and more robust. The reason is, I think, that the animal and bird life have not yet got used to the recently introduced and much quicker moving road traffic and their mortality is great. Some of the roads can be seen quite strewn with corpses, especially in the evening and in the early morning. These corpses are either left lying or are simply thrown into the hedges, and provide food for crows, gulls, rats, and the beetles, which are thus never short of food.

Liodes humeralis, Kug. got from fungi, rare here.

Necrophorus humator, G., *N. mortuorum*, F. and the bow-legged *N. vespillo*, L. are all quite common.

Silpha tristis, Ill. is not common, and I got a single specimen of *S. quadripunctata*, L. on the edge of a nearby wood. *S. thoracica*, L. is fairly common and *S. atrata*, L. is perhaps the oftenest met with. Its var. *brunnea*, Hbst. is also quite common.

Choleva tristis, Pz. is often come across, while *Catops sericeus*, Pz. is not uncommon.

I have met with *Scydmaenus collaris*, Müll. once or twice, and got *Bythinus puncticollis*, Den. fairly commonly.

This has not, so far, proved a good area for my favourite *Coccinellidae*. The only species I have come across at all freely is *Adalia obliterata*, L. The type form of *Adalia bipunctata*, L. I have never seen here, though both vars. *4-maculata* and *6-pustulata* have occurred in my garden on two occasions.

Coccinella 10-punctata, L. I only once came across some four miles from home where timber was being cut and brought out of the Netherby Wood. *C. biabilis* has not occurred as yet, probably because *C. bipunctata* and *C. 10-punctata* have not as yet come together.* Among the specimens of *C. 10-punctata* I gathered was one without spots (var. *inornata*). I came across a small colony of *C. hieroglyphica*, L. when watching some workers draining a small moss on a fell farm. There are some mosses further away which I have not yet had an opportunity of visiting.

*Since writing the above, I took a single specimen of *C. biabilis* when sweeping on 19.v.39. This, so early in the year, had evidently come from winter quarters here.

Coccinella 7-punctata, L. I have only seen twice here.

Coccinella (Thea) 22-punctata, L. Just under a mile from my house the Netherby road descends a short, steep hill with high banks and hedges on each side. At the foot of this hill three roads meet. On the right is the Lamb's Hill road up a long, big hill with a pine wood on one side. To the left one enters by a right angle turn the down hill road to Netherby and Longtown. Just at this corner was a patch of undergrowth with a nettle bed, and there I came upon a nice colony of *22-punctata*. At the other side of the nettles was a nest of the Lesser Whitethroat (*Sylvia curruca*) not by any means a common Cumberland bird. I got quite a nice series of *22-punctata*, and it was well I made good use of my opportunity for by the following year this productive corner had been altered. The road was widened, the hedge had been replaced by metal railings and the herbage all cleared away, making the corner more acceptable to the motorist but useless for bird and insect life.

Mysia oblongoguttata, L. and *Anatis ocellata*, L. I have taken at Brackenhill, and I have one *Scymnus*, the species of which I am at present doubtful.

Chilocorus bipustulatus, L. has occurred sparingly.

I have taken two species of *Hister*. *H. carbonarius*, Ill. and *H. bimaculatus*, L., both seem rare.

Epuraea aestiva, L. has occurred commonly on the flowers in my garden, and of *Meligethes* I have got *M. aeneus*, F. and *M. picipes*, Sturm. commonly, while *M. viridescens*, F. is rare.

Rhizophagus bipustulatus, F. in Yadhill and other woods.

Lathridius lardarius, De G. has turned up among rubbish by the Rae burn.

Melanophthalma gibbosa, Hbst. and *Byturus tomentosus*, F. are taken fairly freely in the garden.

Cryptophagus dentatus, Hbst. and *C. affinis*, Sturm. have both occurred, the latter commonly.

Paramecosoma melanocephalum, Hbst. was got from grasses hanging on the bushes by the Rae burn.

Atomaria fuscata, Sch. and *A. analis*, Er. are both fairly common.

I have taken a single *Aphodius fossor*, L. *A. foetens*, F. I have found rather scarce, while *A. fimetarius*, L. and *A. punctato-sulcatus*, Sturm. are common.

Our species of *Geotrupes* seem like those of *Carabus* to be peculiar to the three areas. *G. stercorarius*, L. is most often found in the lower west of the district. *G. spiniger*, Marsh. is the most frequent of the middle area, and *G. sylvaticus*, Pz. is most often met with in the higher eastern area. I had a specimen brought to me from a farm near Bewcastle, which I took to be a female *G. vernalis*, L., but Mr Day of Carlisle, who saw it lately, judges it to be an undersized *G. spiniger*, Marsh.

Serica brunnea, L. is quite common, as also is *Cryptohypnus riparius*, F.

Hypnoides dermestoides, Hb. somewhat scarce.

Elater balteatus, L. is commonly met with in some of the woods, while *Melanotus rufipes*, Hbst. I have rarely seen.

Athous haemorrhoidalis, F. is common, and *Agriotes obscurus*, L. and *A. pallidulus*, Ill. are both quite common.

Corymbites cupreus, F. I have but seldom met with.

Cyphon coarctatus, Pk. has occasionally occurred in the sweep net.

Cantharis pellucida, F. is not uncommon. *C. bicolor*, Hb. common along a woodside. *C. figurata*, Mn. and *C. flavilabris*, Fn. both common, the first in the drier fields.

I took a specimen of *C. darwinianus*, Sh. on the wing near Longtown. This was doubtless wind driven or a stray from the Solway marshes near, where it is commonly found.

Rhagonycha fulva, Scop. is common on thistle, and *R. pallida*, F. frequent in the hedgerows.

Malachius bipustulatus, L. occurs sparingly in Yadhill Wood.

Cis boleti, Scop. is frequent in bole fungi.

There are a number of woods in the area which I have not yet had an opportunity of working, but I picked up *Saperda populnea*, L., *Clytus arietus*, L., *Liopus nebulosus*, L., and *Tetrops praeusta*, L. at a timber camp where a wood was being cut down; and *Tetropium gabrieli*, Wei. on a wood edge at Natherby in 1936.

Judging by the local flora this looked like a good area for *Chrysomelidae*, but I have not found it so very good up to the present.

Lema lichenis, Voet. is fairly general, and *Cryptocephalus aureolus*, Suf. I got in one or two stations not far from the old Cumberland locality, Bolton Fell. *C. labiatus*, L. on young birch near here but not freely. *Chrysomela polita*, L. is not uncommon, though *C. staphylea*, L. seems decidedly scarce. The broom is common here but *Phytodecta olivacea*, Först. does not occur on every plant.

Gastroidea polygoni, L. common when sweeping.

Phaedon tumidulus, Germ. common. *P. cochleariae*, F. got by the Rae burn.

Phyllodecta vulgatissima, L. common on sallow. *P. vitellinae* occurs on my hen run. (A piece of waste land where a wood was cut down in wartime.)

Hydrothassa aucta, F. and *H. marginella*, L. are common.

Luperus rufipes, Scop. not uncommon.

Lochmea crataegi, Först. common on hawthorn.

Galerucella tenella, L. fairly common.

Sermyla halensis, L. often got in sweeping road verges.

Longitarsus luridus, Scop. common, *L. pusillus*, Gyll. have not got commonly, *L. jacobaeae*, Wat. common.

Phyllotreta undulata, Kuts. common, and *P. exclamationis*, Thunb. fairly common.

Sphaeroderma testacea, F., and *S. cardui*, Gyll. are both fairly common.

Crepidodera transversa, Marsh., *C. ferruginea*, Scop. and *C. smaragdina*, Foud. are all quite plentiful.

Plectrocelis concinna, Marsh. is not uncommon.

Psylliodes chrysocephala, L. common in the garden in 1936.

P. napi, Koch swept in moist fields.

Cassida viridis, L. is the only one of the species got so far and it is common.

The *Curculionidae* is by far the most numerous and widely distributed family of the area.

Rhinomacer attelaboides, F. Got one specimen in Yadhill Wood.

Attelabus curculionides, L. I took this on a visit to a local timber camp.

Rhynchites aeneovirens, Marsh. a rare item here.

R. minutus, Hbst. only taken twice. *R. nanus*, Pk. plentiful.

R. uncinatus, Th. Two of my captures sent to be named were returned to me as this, but Mr F. H. Day, who has since seen them, refers them to the previous species.

Deporiis betulae, L. not rare.

Apion ulicis, Först. common. *A. miniatum*, Germ. This pretty weevil is one of my best captures here. *A. haematodes*, Kirb. not uncommon. *A. viciae*, Pk. rather scarce though vetch and trefoil are common. *A. apricans*, Hbst., *A. dichroum*, Bed., *A. nigritarse*, Kirb. and *A. carduorum*, Kirb. are quite common. *A. virens*, Hbst. and *A. aethiops*, Hbst. are often swept. *A. striatum*, Kirb. is common on broom. *A. immune*, Kirb. scarce. *A. ononis*, Kirb., *A. spencei*, Kirb. and *A. ervi*, Kirb. are common. *A. seniculum*, Kirb. I have got in one locality only. *A. gyllenhali*, Kirb. and *A. loti*, Kirb. not common. *A. tenue*, Kirb. found plentiful in two localities, but not seen elsewhere. *A. marchicum*, Hbst., *A. affine*, Kirb. and *A. humile*, Germ. have occurred freely. *A. violaceum*, Kirb. not uncommon. *A. hydrolapathi*, Kirb. taken once only.

Of genus *Otiorhynchus* three species are pretty common, *O. picipes*, F., *O. sulcatus*, F. and *O. ovatus*, L.

Strophosomus coryli, F. and *S. lateralis*, Pk. are common, while *S. retusus*, Marsh. has only been seen rarely.

Phyllobius provides *P. oblongus*, L., *P. urticae*, De G., *P. pyri*, L., *P. argentatus*, L., *P. maculicornis*, Germ., *P. pomonae*, Ol., *P. viridiaeris*, Laich. all fairly common, and *P. viridicollis*, F. but rarely.

Barynotus obscurus, F. has occurred occasionally.

The area has, so far, produced six species of *Sitones*, all quite freely: *S. regensteinensis*, Hbst., *S. tibialis*, Hbst., *S. hispidulus*, F., *S. flavescens*, Marsh., *S. sulcifrons*, Thunb., *S. lineatus*, L. *Hypera rumicis*, L. is frequently met with, and *H. polygoni*, L. is not quite so common.

Liosoma ovatum, Clair. appears to be the commonest weevil of the area.

Curculio abietis, L. occurs in such woods as I have so far tried.

Orchestes fagi, L. is fairly common, and *O. rusci*, Hbst. and *O. salicis*, L. are both common on my hen run.

Eriirhinus acridulus, L. is often met with.

Dorytomus pectoralis, Gyll. is the only species of this genus I have taken here.

Anoplus plantaris, Naez. is common.

Anthonomus ulmi, De G. Occurred to me on one occasion near Penton. *A. pedicularius*, L. is not uncommon.

Cionus scrophulariae, F. I have only once got here.

Orobitis cyaneus, L. rare.

Cryptorhynchus lapathi, L. One specimen got from an old willow stump.

Coeliodes rubicundus, Hbst. and *C. quercus*, F. are both fairly common, and *C. quadrimaculatus*, L. abounds on nettles.

Poophagus sisymbrii, F. on watercress by Rae burn.

Ceuthorhynchideus troglodytes, F. fairly common.

Rhinoneus pericarpus, L. and *R. castor*, F. are both common.

Balaninus salicivorus, Pk. common.

Calandra granaria, L. taken in a barn on a nearby farm.

Up to the present I have only taken two *Scolytidae*, *Hylastes ater*, Pk. and *Myelophilus piniperda*, L.

I have thanked by letter those who have helped in the naming and verification of the above. I have some further items which I hope to deal with later.

NAMES OF MICROLEPIDOPTERA.

By T. BAINBRIGGE FLETCHER, R.N., F.L.S., F.R.E.S., F.Z.S.

(Continued from p. 112.)

16. *NOTOCELIA ROSAECOLANA*, Dbl. 1850.

Spilonota rosaecolana, Doubleday, Zoologist, VIII, Appendix, p. cvi (1850).

Aspidia cynosbana, Dup., Lep. Fr., IX, 178-180, No. 1580, t. 245, f. 1 (1835).

Notocelia rosaecolana, Rebel, Cat. Pal. Lep., II, 115, No. 2061 (1901); Meyr., Rev. Handb., p. 541, No. 2 (1928).

The original coloured drawing (now in the British Museum, Nat. History) of Duponchel's t. 245, f. 1 leaves no doubt that this is his species. Joannis did not mention *cynosbana*, Dup., in his Revision in *Ann. S.E. Fr.*, LXXXIV (1915), probably because he did not consider it to be a new species, but Duponchel's name was prior to Doubleday's but was praeoccupied within the genus *Notocelia* by *cynosbana*, Fb. 1787 (nec Fb. 1775), a synonym of [*aquana*, Hb. =] *roborana*, Schiff. (non-descr.).

Rebel (Cat., No. 2061) quotes "Dbl. Zool., 1849, 2364," as the original reference, but this is incorrect; the reference, Zool., 1849, p. 2364, is a note by Douglas, "From rose leaves I reared *Spilonota aquana*, S. — n.s." This latter, his unnamed "new species," was described by Doubleday in 1850 as *rosaecolana* (see reference above).

Rebel (Cat., No. 2060) places *cynosbana*, Dup., as a synonym of what he calls *suffusana*, Zeller 1846 (actually described by Duponchel in 1843), but the larva of *suffusana*, Dup., feeds on *Crataegus*, whilst Duponchel states that his *cynosbana* feeds on *Rosa canina*.

17. *NOTOCELIA SUFFUSANA*, Duponchel 1843.

Aspidia suffusana, Dup., Lep. Fr., Suppl. IV, 416-417, t. 83, f. 10 (1843); Joannis, *Ann. S.E. Fr.*, LXXXIV, 133 (1915).

Tortrix trimaculana, Hw., Lep. Brit. [iii], p. 442 (1811) [nec *Tortrix trimaculana*, Don., Nat. Hist. Brit. Ins., XI, 25, t. 369, f. 1 (1806)].

Notocelia suffusana, Rebel, Cat. Pal. Lep., II, 115, No. 2060 (1901).

Notocelia trimaculana, Meyr., Rev. Handb., p. 541, No. 3 (1928).

Haworth's name was a primary homonym of Donovan's and hence invalid. Rebel misquotes Haworth's description as p. "412," ascribes the name *suffusana* to Zeller 1846, and wrongly includes the name *cynosbana*, Dup., in the synonymy.

(To be continued.)

COLLECTING NOTES.

HEPIALUS HUMULI.—I read with much interest the article of Dr Bytinski-Salz on *Hepialus* in the June number, p. 81, etc. It would perhaps not be out of place to draw attention to a form described by an Englishman after an English example. I refer to *H. humuli* ab. ♂ *subrosea*, Ckll., *Entomologist*, xxii, 2 (1889) [Reference: *E.M.M.*, xviii, 111, 1881-82] with the apical third of the forewing tinged with pink. No text book mentions this name. Ab. *albida*, By.-Salz is near, but not identical with, ab. *diversa*, Th. Mieg., *Ann. Soc. Ent. Belge*, liv, 386 (1910), after Milliere, *Icones*, plt. 94, fig. 5, white forewings with yellowish designs. I myself have named a Dutch ♂ form (white with red designs as in the ♀) ab. *rufomaculata* (*Tydschr v. Ent.*, lxxx, 303, 1938). This form is the cause that *thulensis* is erroneously mentioned from Holland.—B. J. LEMPKE, Oude Yselstraat 12III, Amsterdam, Z.

A NOTE FROM GRAAFF REINET.—We have had a fairly dry summer, and not nearly enough water to fill the dams, or anything like it. The big one here is very low at present. The larvae of *Loxostege frustalis* (Pyrale) did tremendous damage to the so-called Karroo-bush (*Pentzia incana*). At times after rains the moths are about in millions, and at night the windows are covered with them. The larvae eat out vast areas of veldt, which looks black and drought-stricken after attack. Many of the plants die. To find some method of control seems to be an almost impossible matter. It might be possible to save grazing worth a shilling at the expenditure of a guinea. This plant is a valuable grazing one and has made the karroo famous for wool and mutton.—J. SNEYD TAYLOR [M.A., F.R.E.S.], 30.v.39.

DIPTERA FROM NORTH KENT.—Whilst 1939 has so far proved a disappointing season in many respects, especially as regards Syrphids, Stratiomyids, and Muscids, I have taken some species of other families I think worth recording as a help to the still too little known distribution of British Diptera. Early in June in the Thames Marshes at Abbey Wood I took a single ♂ of **Helophilus versicolor*, F., the only species of the smaller-sized group of this genus I have seen in North Kent, with the exception of *H. vittatus*, Mg., which I took in the same locality many years ago, and have not seen since. At the same time I found the Trypetid *Orellia falcata*, Scop. and the Empid *E. decora*, Mg. fairly common in the restricted area where I had taken both species on previous occasions. On the 10th June, again in the Abbey Wood Marshes, I found the Dolichopid *Orthochile nigrocoerulea*, Ltr. on the flowers of the ox-eye daisy in abundance as to ♀♀, the ♂♂ being much scarcer; previously I had only taken one or two isolated specimens of this species. On 1st July I went to All Hallows-on-Sea at the extremity of North Kent, between the mouths of the Thames and the Medway. Here, amidst a number of common species, I found that local Dolichopid **Thinophilus flavipalpis*, Ztt., and took a small series with some difficulty, as it frequented the narrow muddy margin of one of the numerous dykes intersecting the marshes and was difficult to get without soaking one's net. On the 9th July, in the course of an un-

successful hunt for the Asilid *Eutolmus rufbarbis*, Mg. in its Farningham locality, I took a small series of the Empid **Oedalia stigmatella*, Ztt. hovering in the rides of the wood in company with *Hilara aëronetha*, Mik., *Chalarus spurius*, Fall., and *Chorisops tibialis*, Mg. As so often happens with "hovering" species, all I took were ♂♂. On a further visit to All Hallows on the 15th July I took the Trypetid **Myopites frauenfeldi*, Schin. swept from its food plant *Inula crithmoides*, L.; the Dolichopid *Poecilobothrus principalis*, Lw.; and found after I got home that I had taken two ♂♂ and 1 ♀ of the rare Dolichopid **Porphyrops antennata*, Carl.—H. W. ANDREWS.

*New to my N. Kent list.

PLATYCHIRUS TARSALIS, SCHUM. [DIPT.] IN SURREY.—During routine collecting of Diptera as part of an ecological survey of Limpsfield Common, Surrey, I caught a male of the rarely taken *Platychirus tarsalis*, Schum. on 4th June. At the time I was sweeping close to the floor of the small oakwood in the south-east corner of the Common (Area T, see "Survey of Limpsfield Common" in *Lond. Nat.*, 1936), and it may have been on low vegetation within six inches of the ground.

The species is easily recognised by its fore tarsi and hind tibiae from Verrall's description in *Brit. Flies*, viii, pp. 268-270. Owing to its superficial resemblance to *Platychirus peltatus*, Mg., being of the same size and having a shining thorax, it may be overlooked by collectors. The coloration of the abdomen, however, is noticeably different. Whereas in *peltatus* the black central line is of the same width as the black cross bars, in *tarsalis* the black central line is at its narrowest on the fourth segment, slightly wider on the third, whilst on the second broadens from where it joins the black cross bar until it almost reaches the side in the top corner, where it becomes dark brown. The cross bars are broad and slope upwards slightly to meet the central line.

In the British Diptera collection at the British Museum (Natural History) there are specimens from Painswick, Glos., a ♂ taken by R. C. Bradley, 14.5.96, from Weston-Super-Mare; Som., ♂ ♀ taken by Col. Jermyn, 13.5.21, and from Wood Ditton Wood, Cambs., a ♂ taken by Mr J. E. Collin on 22.5.26 and ♂ ♀ taken on 23.5.26 at the same locality (v. *Ent. Mo. Mag.*, 1926, p. 288).—L. PARMENTER, F.R.E.S., 94 Fairlands Avenue, Thornton Heath, Surrey.

CURRENT NOTES,

The following note from Brussels appeared recently in the *Times*:—
 "Proceedings have been begun against a Brussels street vendor on the ground of cruelty to insects. The hawker, a woman, sold bottles of powder for the destruction of parasites. As part of her stock-in-trade she exhibited to the crowd of potential customers a bottle containing insects fluttering about in a dying condition. A passer-by, however, declared that it was horrible to make insects suffer in that way, and fetched a police officer, who conducted all concerned to the nearest police

station. There the officer on duty could do no other than make out the charge-sheet on the allegations presented to him."—M. B.

Mr A. E. Tonge, F.R.E.S., after a long period of suffering, passed away at the beginning of August. He was well-known to many as the Treasurer of the South London Entomological Society for many years, and to others as a keen student of the eggs of Lepidoptera which he photographed with much skill. He was in his 69th year.

The world-wide known entomologist, and especial student of the Coleopterous Family *Cicindelidae*, Walther Horn, Hon. F.R.E.S., passed away on July 10th. He had been in failing health for some time.

The Cactus-feeding Phycitinae. This is the first of a series of papers to be issued by the United States National Museum dealing with the family *Phycitidae*; that group of the Lepidoptera to which the well-known *Cactoblastis cactorum*, so extensively made use of in S. Africa to control the "prickly-pear," belongs. The author, Carl Heinrich, stresses the importance of the study of this family since (1) so many of the species it contains are of "prime economic importance;" (2) the present "hopeless muddle" in its classification owing largely to the "fluid" nature of the structural characters used for determination. He refers to the serious defects of the only noteworthy attempt to classify this family by Ragonot in the monumental work "Monographie des Phycitinae and Galleriinae," 1893 (concluded by Hampson, 1901). This work was based mainly on male characters, venation, palpi, vestiture, and secondary male features, all characters varying greatly between the sexes, so that many females since discovered have been placed by guess work. The author finds in this study that the genitalia seem to be more constant, but must be used with caution. He treats of some 46 species and in illustration there are 29 plates with 139 excellent double-figures of structures, genitalia, antennae, palpi, venation, head profile, etc.

Parts 1, 2, 3 of Vol. VI of the *Trans. Soc. Brit. Ent.* have been received. Part 1, "A Check-List and Host-List of Ectoparasites recorded from British Mammals (excluding Bats)," by G. B. Thompson. Part 2, "The Taxonomic Value of Wing-Venation in the larger *Dytiscidae* (Col.)," by F. D. Goodliffe, with four excellent diagrammatic plates. Part 3, "Aspects of Ecology of Aquatic Insects," by H. P. Moon, with one plate. All three are typical examples of the excellent work which is being carried on by the members of this Society and of the efficient work of the editor in the presentation of this work. We note too that the editor, Mr F. J. Killington, D.Sc., has the rare recognition of his own work in the letters A.L.S. bestowed by the Linnean Society.

One of the most energetic of our Society Natural History workers, Capt. T. Dannreuther, has compiled a local list of the Dragonflies of his own area for the use of future observers, with a hint that "no one has made a study of the breeding places of the dragonflies of E. Sussex, and there are no records of the nymph stage." Many records are added as well as a List of Text and Reference books. It is well done.

THE LATE FATHER NAVAS, S.J.—It is with great regret that I have read the news of my old friend, Father Navas. It was in 1905 that I first met him, when he was paying a visit to the British Museum. I invited him to my flat, and gave him a good boxful of earwigs for his collection. He spent several hours with me, but declined all refreshment, even a glass of water. I was amused to read afterwards in his account of his journey his comment that this proved the falsity of the old saying that you can never get anything out of an Englishman. We corresponded occasionally in the old days, and I was glad to meet him in Madrid during the Congress when, somewhat to my surprise, he recognised me. When my friends asked him to guess who I was, he answered at once in his deep Spanish voice, "I know, it is Burrrrrrr-o." (Of course, a Spaniard has to put an O at the end of a word, and it does not matter that "burro" means donkey.) He was 70 then, and it is sad to think how his old age ended in misery.—M. B.

SOCIETIES.

A meeting of The Entomological Club was held at the Burford Bridge Hotel, Box Hill, Surrey, on 19th May 1939, Mr W. Rait-Smith in the chair. Members present in addition to the Chairman:—Mr H. Donisthorpe, Mr H. Willoughby-Ellis, Mr James E. Collin, Dr Sheffield Neave, Dr Richard R. Armstrong. Visitors present:—Mr E. C. Bedwell, Mr H. M. Edelsten, Mr F. W. Frohawk, Dr Karl Jordan, Mr W. J. Kaye, Rev. J. Metcalfe, Capt. N. D. Riley, Mr W. H. T. Tams. The members and guests arrived from 12.30 onwards and luncheon was served at 1.15 in the large restaurant. After luncheon in fine weather a walk over the Box Hill district was very pleasant and the well-known views were thoroughly enjoyed. This district, rich in memories of Stainton, is perhaps one of the most interesting entomological districts near London, and almost every entomologist has recollections of interesting captures from time to time. The party returned to the hotel about 5 o'clock, when tea was provided, and then broke up between 6 and 7 o'clock in the evening after an interesting day.—H. WILLOUGHBY-ELLIS, Hon. Secretary.

A meeting of The Entomological Club was held at Mill Green Park, Ingatestone, on the 24th June 1939, Dr Sheffield A. Neave in the chair. Members present in addition to the Chairman:—Mr Jas. E. Collin, Dr Harry Eltringham, Mr W. Rait-Smith, Dr R. R. Armstrong. Visitors present:—Mr H. E. Andrews, Mr H. W. Bedford, Mr H. S. Bushell, Mr E. C. Bedwell, Dr A. D. Imms, Dr Karl Jordan, Sir Guy A. K. Marshall, Mr A. M. S. Neave, Mr W. H. T. Tams. The party arrived in time for luncheon, after which Mr Jas. E. Collin exhibited a specimen of the Tachinid, *Subclytia rotundiventris*, Fln.—the first authentic British specimen, for though Dr R. H. Meade recorded the species in 1892 as "Rare—in Mr Dale's collection," the specimens standing under that name in the Dale Collection are specimens of *Myiobia* according to Mr C. J. Wainwright. *S. rotundiventris* is widely distributed on the Continent, including France and Denmark. It has been bred from the

Pentatomid Bug, *Elasmostethus griseus*, by Nielsen in Denmark, who states that there are two broods in the year. The specimen exhibited was taken at Farley Downs near King's Somborne, Hants, on 5rd June of this year. He further exhibited two pairs of the Syrphid, *Chryso-toxum octomaculatum*, Curt., one pair killed by weak sulphur fumes, the other in an ordinary cyanide killing bottle, in order to show how very much better the natural colours are retained in these yellow and black insects by making use of the former method. During the afternoon the weather was cold and dull and though there was little rain it was just enough to curtail the walk around the farm, the general object being to see the Aberdeen-Angus cattle. After tea at 4.30 the party broke up about 6 o'clock.—H. WILLOUGHBY-ELLIS, Hon. Secretary.

REVIEW.

Vol. 1 of the report of the VIIth International Congress of Entomology has come out with commendable promptitude. It is a massive tome and rich in interesting articles. Characteristic of the modern trend is the space taken by articles on Geographical Distribution in the widest sense, in time as well as space.

Herr Benick maintains that a species of Silphid beetle, *Choleva holsatica*, found in swarms in a cave in Holstein, has differentiated itself from the parent species in post-glacial times; that is to say that the species has been formed in a space of not more than 20,000 years. Eller analyses in detail the distribution of the races of the *Papilio machaon* group: Dr Franz gives an account of steppe relicts in south-east central Europe: Dr Heberdey discusses the significance of the distribution of certain beetles and Dr Lindroth approaches the subject from the Scandinavian point of view, while K. Mandl approaches from the distribution and races of European *Cicindelidae*, and J. Meixner from the Alpine and Balkan genus *Trechus*. These papers should be studied by all who are interested in the history of the European, including British, fauna during and since the glaciation.

E. Voss, using the distribution of certain weevils as his material, discusses the world-wide problem of Continental drift.

Fewer papers deal with systematics and biological problems. One has wandered outside pure Entomology to treat of Spiders and a baker's dozen deal with nomenclature and bibliography.—M. B.

The Report of the VIIth Intern. Congress (pp. 1348-1361) has an interesting article by Herr Weidner of Hamburg on an aspect of Entomology that has not received enough attention, the fauna of cities. He finds four biotopes, namely, the woodwork of buildings, which affords a home to one fauna and home and food to another; the walls and piping systems, floors, insulating layers, including carpets; cellars, and finally, flowers in pots, conservatories and gardens and parks. The development of central heating maintains a steady climate that, being warm and moist, is extremely suitable for many insects. This accounts for the discovery in Paris of the plague flea and in Hamburg of the termite, *Reticulitermes flavipes*.—M. B.

ab. *carillei*, Brandt, *Ent. Zeit.*, XXXVII, 148 (1934).

FIG.—b. & w. text fig. The figure is not very enlightening.

ORIG. DESCRIP.—“Colour as in the type form, but the brown scaling is wanting, and thus the whole ground is lighter. The post-medial runs out strongly to the costa towards the base, and cuts through the reniform stigma, the subterminal line is dark shaded on the inner side and this dark scaling is broken through by pale radial streaks of the ground colour, whereby a quite different appearance is given. On the fold between the stigmata there are black streaks.” Amata, Livland.

ab. *transversa*, B.-Salz., *Ent. Rec.*, li, 31 (1939).

ORIG. DESCRIP.—“Ground colour reddish or whitish ochreous, no dark quadrate marks present. Two very large transverse shades across the forewing. One middle shade between orbicular and reniform and another outside the post-medial line. Hindwings normal.” Cogne. Graian Alps. Abbot's Wood.

ab. *conjuncta*, B.-Salz., *Ent. Rec.*, LI, 31 (1939).

ORIG. DESCRIP.—“Orbicular and reniform broadly conjoined at the base.” “The form seems to be very rare. I have only one specimen which otherwise belongs to ab. *ochrea-virgata*, Tutt.” Aberdeen.

f. *orkneyensis*, B.-Salz., *Ent. Rec.*, LI, 31 (1939).

FIG.—l.c., plt. III, fig. D. 7.

ORIG. DESCRIP.—“♂♂ 37 mm. ♀♀ 34-36 mm. Ground colour a very rich ‘prussian red’ to ‘cameo-brown.’ The transverse lines slightly lighter, the submarginal line rather strongly contrasted ochreous. Reniform very distinct light ochraceous buff, also the orbicular circled with the same colour. Darker spots before and behind the orbicular. A small black dot at the end of the claviform. Hindwings as in *festiva*, sometimes a rather distinct light postmedial line present. Tip of the abdomen in the ♂♂ rufous.” Orkney Islands.

ab. *depicta*, B.-Salz., ditto, “with transverse lines obsolete, maculae of the ground colour, quadrate spots absent.”

f. *primuloides*, B.-Salz., *Ent. Rec.*, LI, 33 (1939).

ORIG. DESCRIP.—“Ground colour yellow-ochreous but with a dullish shade as in *primulae*. Designs less conspicuous and not so reddish. Spots before and behind the orbicular black. This form may be considered a very light f. *thulei*, Stdgr.” Unst.

f. *rufobsoleta*, B.-Salz., *Ent. Rec.*, LI, 33 (1939).

ORIG. DESCRIP.—“Ground colour bright red chestnut-brown; base, middle shade and marginal area sometimes darker. In most specimens lighter transverse lines present; reniform of the same colour as the ground, rarely somewhat lighter. No black marks present.” Shetlands.

f. *hethlandica*, B.-Salz., *Ent. Rec.*, LI, 33 (1939).

ORIG. DESCRIP.—“This is the same form but with dark marks before and behind the orbicular. The reniform and sometimes also the orbicular are often lighter than the ground colour.” Mainland and Unst, Shetland.

f. *maculata*, B.-Salz., *Ent. Rec.*, LI, 34 (1939).

ORIG. DESCRIP.—“As f. *thulei*, Stdgr., but the orbicular surrounded with light ochraceous and the reniform entirely ochreous. Submarginal line in the male obsolete, in the female rather distinct.” Shetlands.

f. *glabrina*, B.-Salz., *Ent. Rec.*, LI, 34 (1939).

ORIG. DESCRIP.—“The most beautiful form of all. Ground colour as in *thulei*. Basal line, ante- and post-medial lines light ochreous very distinct. Submarginal line and marginal area ochreous with dark longitudinal streaks along the veins. Fringes dark. Reniform and orbicular light ochreous, the latter with darker centre, end of the claviform distinct black. Resembles somewhat *Conistra vaccinii*, f. *glabroides*, Fuchs.” Shetlands.

f. *rufonigra*, B.-Salz., *Ent. Rec.*, LI, 34 (1939).

ORIG. DESCRIP.—“Ground colour a very dark ‘chocolate,’ surroundings of the orbicular, reniform and marginal area slightly lighter. Black marks before and behind the orbicular. This is the darkest form except *hethlandica* in which the forewing is entirely suffused with black.” Mainland (Shetland).

f. *unicolor*, B.-Salz., *Ent. Rec.*, LI, 34 (1939).

ORIG. DESCRIP.—“Ground colour a very dark ‘sepia.’ All lines slightly lighter. Maculae obsolete. Black spots absent.” Unst.

f. *nigra*, B.-Salz., *Ent. Rec.*, LI, 34 (1939).

ORIG. DESCRIP.—“Ground colour an almost black ‘sepia.’ Maculae very slightly lighter. Spots before and behind the orbicular and end of the claviform black, but not in much contrast.” Shetlands.

ab. *nigrostriata*, B.-Salz., *Ent. Rec.*, LI, 34 (1939).

ORIG. DESCRIP.—“Colour and markings as in f. *hethlandica* but with black streaks on the veins. Vein 1 black almost to the base, veins 2-4 black to the cell, veins 5-9 only to the submarginal line.” Shetlands.

Dr Cockayne reports (*in lit.*): “I have an ochreous one from Rannoch with a very distinct blackish band between the basal and ante-medial lines; the usual submarginal shade is present, but not stronger than usual. I have seen another like it. The blackening extends inward from both lines and runs along the costa, but fades off towards the inner margin.”

“I have also one with a dark grey band, in which the submarginal line and outline of the orbicular are over emphasized.”

HOMOEOSIS.—A fine example of homoeosis is recorded and figured in *Trans. Ent. Soc. Lond.* (1930), pl. 11, fig. 4, in which much dark coloration similar to that on the forewing is developed on the left hindwing, Dr E. A. Cockayne.

Noctua, L. (1758) Ochs. & Tr. (1816-25), Gn., Newm., Barr., Sth. [*Agrotis*, Ochs. & Tr. (1816-25), Meyr., Hamp., Stdgr., Splr., Culot: *Rhyacia*, Ochs. & Tr. (1816-25), Warr., Corti: *Graphiphora*, Ochs. & Tr. (1816-25), H.-S., Meyr.], *xanthographa*, Fb. (1787).

Tutt gave Fabricius, *Mantissa*, II, 171 (1787), as the authority for *xanthographa*; but this name occurs first in the *Verz.* of Schiff. (1775), p. 83. Illig. & Haf., *N. Ausg. Verz.*, I, 279 (1801), stated, on the evidence (1) of Schrank, *Fuess. N. Mag.*, II, 217, and (2) the comparison of the description and the insect in the Wien collection, that the *xanthographa*, Schiff., is *oculea* = *nictitans*. Thus to put *xanthographa*, Schiff., for the present species as many authors do (Seitz, etc.) is an error.

Curiously Fabricius in the *Ent. Sys.*, III (2), 100 (1793), is a riddle, through a big blunder in the text, caused by omission and transposition. (1) *convergens* 298 should be *alchymista* 299. (2) *leucomelas* 297 should be *convergens* 298. (3) *xanthographa* 296 should be *leucomelas* 297. (4) The description from the *Mantissa*, II, 171, should be inserted after line 4, *xanthographa* 296: *Cristata alis deflexis testaceis maculis ordinariis flavis. N. xanthographa*, Wien, *Verz.*, 83, 20.

Esp., *Abbild*, plt. CLI, f. 4 (1788?), pictures a small reddish brown insect with a square reniform stigma, both stigmata are clearly outlined in whitish; three perfect cloudy bands, the basal the widest, the hindwing with a narrow submarginal band not reaching the costa and a discal band of black points inside the band. To this figure is attached the name *radica*. This is undoubtedly *xanthographa*, teste Werneberg, *Beitr.*, II, 46. Thus *radica* should be the or a prior name, if the date on the title page of vol. IV (1), 1786, was correct. But as plt. 151 was probably published in 1788, or later, this leaves the name *xanthographa* as the prior.

H.-S., *l.c.*, says that *radica*, Esp., is *bella*, Tr., but Werne., *l.c.*, says that *bella* has not the light stigmata and has no row of black points on the hindwings, according to its description.

Esp., *l.c.*, plt. CXLIII, fig. 1-2, had used the name *radicea* for insects which are considered to be *simulans*, Hufn. (*pyrophila*, Tr.) and fig. 3 he named "var. of *radicea*." This can be ruled out although Wern. thought it might represent a *xanthographa*, *l.c.*, II, 45 (1864).

These quotations, and numerous statements of early authorities, are so conflicting and the spelling of the name as *xantographa* without the "h," that it has been considered better to retain the authority as Tutt gave, with the correct spelling.

Thus the authority for *xanthographa* remains Fab., *Mantissa* has been retained.

Tutt, *Brit. Noct.*, II, 124; IV, 118 (1892): Barr., *Lep. Br. Is.*, IV, 97, plt. 148, 1 (1897): Stdgr., *Cat.*, IIIed., 140 (1901): Hamp., *Lep. Phal.*, IV, 419 (1903): Splr., *Schm. Eur.*, I, 149, plt. XXXIII, 8 (1905): South, *Moths Br. Is.*, I, 228, plt. CXIV, 9-12 (1907): Warr.-Seitz, *Pal. Noct.*, III, 46, plt. 10d (1909): Culot, *N. et G.*, I (1), 45, plt. VII, 6 (1910): Corti-Drdt.-Seitz, *Pal. Noct. Sup.*, III, 80, plt. XIIb (1933).

Ernst & Engr., *Pap. d'Eur.*, VII, fig. 429 (1790), gave a figure, which is considered to be *xanthographa* by Wern., etc. It is much too highly coloured and the colours far too differentiated.

Hb., *Samml. Noct.*, 138 (1800-1803), gave a very red figure.

Haw., *Lep. Brit.*, 206 (1809), compared 2 examples of the red form figured by Hb., 138, but remarked that the form is very rare. It is

very similar to the *tetragona* he described on p. 205, and differs only in the stigmata being smaller and the more obsolete striga of the forewings owing to increase of the fuscous suffusion. "Alae posticae albicantes."

Dup., *Hist. Nat.*, VI, 107, pl. LXXX, 2 (1826), gave a good figure of this species except that the stigmata are too strongly emphasised in white.

Frr., *Neu. Beitr.*, III, 80, pl. 250 (1839), gave 2 good figures of forms of this species. (1) A very dark blackish-brown with stigmata clearly defined; (2) a rich chestnut-brown, with the submarginal line strongly edged on the outside with white. On pl. 232, *budensis* is figured: described on page 56.

H.-S., *Sys. Bearb.*, II, 341 (1851), f. 130, gave a varietal form, which he characterised by the "olive-brownish ground colour and with the waved line having a darker ground beyond it," this darkening is scarcely apparent in the figure which otherwise is a good one, the square spot between the stigmata is very distinct. He said that Frr., *Neu. Beitr.*, 250, figured 2 examples very different in colour.

Gn., *Hist. Nat. Noct.*, V, 247 (1852), placed *cohaesa*, H.-S., next to *Caradrina ambigua*, and said that from the description it appeared to resemble *xanthographa*, but from the figure it resembled *C. alsines*.

On p. 337, he attributed *xanthographa* to Schiff. and recognised the *tetragona*, Haw., as the same species. He noted the extreme variation of the ground colour.

Newman, *Brit. Moths*, 354 (1868), gave a good b. and w. figure of an average example.

Stdgr., *Cat.* (1901), 140, accepted Fb. (*Mant.*) as the authority for *xanthographa*, and *cohaesa*, H.-S., as of the same species, as well as *elutior*, Alph.

Hamps., *Lep. Phal.*, IV, 419 (1903), recognised a form "suffused with fuscous." Scotland, Forres. This is no doubt Tutt's *nigra*.

Splr., *Schm. Eur.*, I, 149, pl. 33, 8 (1905), gave a good figure.

South, *M.B.I.*, I, 228, pl. 114, 9, 10, 11, 12 (1907). These four figures stand out darker than others on the plate, but the suppressed orange brown is too strong.

Culot, *N. et G.*, I (1), 45, pl. VII, fig. 6 (1910), gave an excellent figure of a dull red-brown form.

Warr.-Stz., *Pal. Noct.*, III, 46, pl. 10d (1909), treated *tetragona*, Haw., *cohaesa*, H.-S., as synonyms, gave 7 forms, and five very fair figures, but the usually dark square spot between the stigmata is hardly clear enough. Genus *Rhyacia*.

Corti-Drdt., *Pal. Noct. Supp.*, III, 80, pl. 12b (1933), gave a better illustration of *budensis*, Frr., and added eight new forms, of which *almo-hada*, Wgnr., from Tunis is figured.

Of the Variation Barrett says, *l.c.*:—

"Always and everywhere variable, the commoner forms in the south being some shade of red-brown, pale brown, or drab; in some north-western districts, particularly the north of Ireland, deep dark brown, and in the Scottish Isles bright red-brown. In some specimens in all shades of colour the stigmata are both bright and distinct, in very many the reniform is so, but in other cases, even in the palest specimens,

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CONTENTS.

MORE NOTES ON KURDISH LEPIDOPTERA, <i>E. P. Wiltshire, F.R.E.S.</i>	133
A GYNANDROMORPH OF BUPALUS PINIARIA, <i>L., Dr E. A. Cockayne, A.M., F.R.E.S.</i>	138
SOME EASTON LEPIDOPTERA, <i>T. Fred Marriner</i>	139
COLLECTING NOTES:—Some New County Records for Orthoptera, <i>E. S. Brown</i> ; An Intersex of <i>Malacosma castrensis</i> , <i>J. O. T. Howard</i> ; Orthoptera from Cumberland, <i>T. F. Marriner</i> ; <i>Acanthomyops (Dendrolasius) fuliginosus</i> , <i>Fabr.</i> , at Heston, <i>Horace Donisthorpe</i> ; The Ghost Moth (<i>Hepialus humuli</i>) at Heston, <i>Id.</i> ; The White Admiral at Heston, <i>Id.</i> ; An Emigration of <i>Formica rufa</i> , <i>L., B. D. W. Morley</i>	143
CURRENT NOTES	145
REVIEW	147
SUPPLEMENT: The British Noctuae and Their Varieties, <i>Hy. J. Turner, F.R.E.S., F.R.H.S.</i>	(193)-(196)

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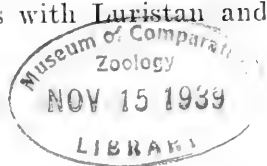
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MORE NOTES ON KURDISH LEPIDOPTERA.

With a description of a new race, and comparisons with Luristan and Alvand, Iran.

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

13820



(Concluded from page 103.)

Zephyrus quercus, Dal. ssp. *longicauda*, Riley. R.G., 12.vii. I believe this species only to occur in places where the oaks are allowed to grow to maturity.

Thecla ilicis ssp. *caudatula*, Z. D., 21.v. This species occurs even where the oaks are cut down to the ground every few years.

Thecla marcidus, Riley and *T. abdominalis*, Gerh. f. *gerhardti*, Stgr.

Apharitis maxima, Ruhl (det. Gabriel). Z., 8.vi. (Also Hamadan.)

Apharitis cilissa, Led. (det. Gabriel). R., 24.vi, c. 5000 ft., frequent by the roadside on the pass to Urmiah.

(*A. epargyros* ssp. *marginalis*, Riley was not taken but probably occurs in the district.)

Lycaena thetis ssp. *caudatus*, Stgr. R., 28.vii, 25.viii; S.A., 14.vii.

Lycaena alciphron, Rott. R., 16.vi. Numerous at 6000 ft. in a stream-bed, near Haji Omaran, especially at water-mint flowers.

Lycaena ochimus, H.S. R., 28.vii; S.A., ix.

I am indebted to Herr Ernst Pfeiffer for the determination of the following blues, except for *eurypilus* and *argiolus*. For this reason I use the generic name *Lycaena*, both for the above coppers (according to the nomenclatorial usage in England) and for the blues (according to that on the Continent).

Tarucus balkanicus, Frr. ssp. R.G. and D., 16.vii. Common around bushes of *Paliurus spina-christi*.

Lycaena eurypilus, Frr. ssp. The Kurdish race inclines to be larger than the Alvand, which, sec. Pfeiffer, is ssp. *iranica*. S.A. and R., 24.vi and 14.vii.

Lycaena sephyrus, Friv. ssp. S.T., 8.vi; R., 14 and 28.vii (5-8000 ft.); S.A. All females, in bad condition. A male from Alvand seems to differ somewhat from *sanoga*, Evans and *schwingenschussi*, Pffr., to which, doubtless, the Kurdish and Alvand forms, not necessarily identical, come closest. From Luristan (12.vi.38), one or two females similar to the Kurdish.

Lycaena loewii, Z. ssp. near *germaniciae*, Pffr. S.T., S.A., and R. (5000 ft.), vi.

Lycaena alcelo, Christ. ssp. R., 28.vii. Only females, so it is impossible to say if this is the same form as occurs on Alvand.

Lycaena panagaea, H.S. R., 14.vii (c. 8000 ft.).

Lycaena vicrama, Moore ssp. *clara*, Christ. R., 28.vii, Mr., on flowers of *Vitex agnus f. castus*, 18.vi.

Lycaena astrarche, Bgstr. ssp. A race characterised by the clear white distal rims to the hindwing lunules, and, in some examples, the white outline of the forewing cell-spot. These characters are less marked in the higher localities.

Lycaena anteros, Frr. ssp. R., 14 and 28.vii. Somewhat similar to the Armenian race, as noted by Herr Pfeiffer in the "Mitteilungen" of the Muench. Ent. Ges., 1938.

Lycaena icarus ssp. *persica*, Bien. This occurs everywhere, but the only remarkable specimens taken were 4 large examples caught on 16.vi at 9000 ft. on Mt. Kawdo, above R., in which the ♀♀ have the forewing vividly coloured with deep iridescent blue, except near the costal and outer margins, and the ♂ coloration is reminiscent rather of *actis* than a usual *icarus*.

Lycaena meleager ssp. *ignorata*, Stgr. The only place where I found this species was a damp orchard at Barbakarawa, just below R. (4000 ft., 28.vii).

Lycaena bellargus, Rott. ssp. R., 14.vii.

Lycaena ripartii, Frr. ssp. R. and S.A. Nervures standing out against a paler ground, and a less bold forewing cell-point, distinguish this race from the Syrian.

Lycaena mithridates, Stgr. ssp. near *saetosus*. Sh.; 17.vii.

Lycaena iphigenia, H.S. ssp. *zeituna*. Common at about 7000 ft. along mountain stream-beds, and also flying less commonly on the dry mountain-side. R.

Lycaena damone ssp. *damonides*, Stgr. Flying with the foregoing species, but less numerous. 14 and 28.vii, R.

Lycaena damone ssp. *damalis*, Riley. R., 14.vii. Flying with *zeituna*, but less numerous.

Lycaena actis, H.S. R., 14.vii.

Cyaniris argiolus, L.

Hesperia sp. near *proto*, Esp. R., 25.viii (three) and S.A., ix.35.

Hesperia tessellum, Hbn. R., 16.vi, two examples rather smaller than typical ones.

Adopaea actaeon, Rott. and *thauas*, Hufn.

Ochlodes venatus, Brem.-G. R., 16.vi.

Erynnis comma, L. ssp. *pallida*, Stgr. R., 25.viii, 7000-9000 ft., commonest at 8000. The Alvand race is somewhat less pale.

Erynnis tages f. *unicolor*, Frr. R., 28.vii.

HETEROCERA.

N.B.—Species mentioned in the previous article and also occurring in summer are here omitted.

Syntomis ? *wiltshirei*, B. Salz (ined.). Dr Salz regards this as a species distinct from *persica*, Koll., of which he regards the species occurring near Shiraz, which agrees with the figured type of *persica*, as a true representative.

The present insect varies greatly in size, and somewhat in markings. It flies (in vi) in great numbers in the sunlight on the slopes of the mountains above R., 5-7000 ft. It is probably to be found along the whole of this frontier range, for there is a specimen in the British Museum labelled "Urmiah," which lies under the eastern slopes of the same chain a bit further north; this specimen was previously determined as *persica*. Neither it nor any of mine agree with the Seitz figure of *persica*. I saw no trace of this species on Alvand.

Zyguena.—Two species have been taken, but not yet determined.

Procris pruni, Schiff. A., 29.v.37.

Lithosia sp. ? B.G., 9.x.36. One male.

Lithosia muscula, Stgr. Sh., 14.vi and 29.viii.

Celama chlamitulalis, Hbn. Sh.A., 2.vi.37.

Roeselia toqatualis, Hübn. A., 28.v.37.

Lymantria dispar, L. D., 27 and 28.vi. At Alvand this species is a poplar-feeder, while in the Lebanon oak is the usual food plant. I have not observed its larvae in Kurdistan yet.

Ocnerogyia amanda, Stgr.

Leucoma wiltshirei, Collen. The two examples of this rather small semi-transparent white moth, attracted to light at R.G., 30.vii, and D., 31.vii, are, as far as I know, still the only known specimens of this species, which should, however, be found elsewhere in the Zagros.

Porthesia melania, Stgr. R.G., 15.vi.

Ocneria terebynthina, Stgr. 3 ♂♂♂, 1 ♀, S. and R.G., vi.

Ocnogyia bang-haasi (det. Daniel). A long and variable series of males, to light, D., iv.36. I have also taken it at Suleimani, S. Kurdistan.

Lacydes spectabilis, Tausch. S.A., ix.35.

Callimorpha quadripunctaria, Poda, ssp. *splendidior*, Tams. This lovely green-shot form occurs in shady stream-beds, in vii, at R.G., Sh.A., and elsewhere in Kurdistan. Since the title of the article whereby the author introduced this race mentioned Armenia, as being one of its homes, it should here be stated that Suwarra, from which one of the types came, and which was in the original description said to be in Armenia, is none other than Suwara Tooka (vide supra), and is a decidedly Kurdish, not an Armenian locality. It still remains to be seen therefore if this race can be called Armenian.

Eriogaster, sp. n.? A., ix. Daniel considers this a new species, but more material is needed before it could be named.

Saturnia pyri, Schiff.

Berytana kotschyi, Koll. Sh., 1.viii.

Macroglossum stellatarum, L.

Spatialia argentina, Schiff. A., 21.v.37.

Dysspessa bipunctata, Stgr. ssp. n. **marginepunctata**, Wilts. This race is distinguished by the constant presence of 12 black dots on the termen, marking the nervures. Holo-type: -♂, 20.iv.38, Ahwaz, Iran, in coll. m. Allo-type: ♀, 23.v.35, Diana, Iraqi Kurdistan, in coll. m. Para-types: 21, 22 and 23.v.35, Diana; 27.vii.35, Rayat; 19 and 22.iv.38, Ahwaz, etc., in coll. m., and in coll. Daniel.

Dysspessa ulula ssp. *pallidata*, Stgr. R., vi, vii and ix; Sh.A., 2.vi. The two examples from the latter locality were determined by Herr Daniel for me.

Zeuzera pyrina, L.

Cossus fereidum, Gr. Gsh. ssp. *osthelderi*, Dan. (det. Daniel). D., 23.v; R., very common to light near willows, vi and vii. (Also Alvand, vi and vii.)

Dipsospeciea paralariformis, Led. (det. Le Cerf.). D., 21.v.

Bryomima carducha, Stgr. (det. Brsn.). R.G., 15.vi.

Simyra dentinosa, Frr. Larvae from D. hatched in Bagdad on 22 and 28.iii.36.

Agrotis flavina, H.-S. D., 24.v. (Also Hamadan.)

Agrotis stigmatula, Kozh. (det. Brsn.). R., 24.vi.

Dichagyris fimbriola ssp. *zernyi*, Cti. (det. Brsn.). S., 8.vi.

Ogygia wiltshirei, Brsn. The two types were kicked out of astragalus bushes at about 8000 ft. above R., 14.vii. A female of the same species came to light at Alvand, 28.vi.38.

Dichagyris squalidior, Stgr. (det. Brsn.). S., 8.vi.

Dichagyris melanura, Koll. R., 27.vii, 6000 ft., to light.

Rhyacia forficula, Ev. (det. Brsn.) = *renigera* auctorum. The form occurring here and on Alvand inclines to black. R., 13.vii; D., 23.v.

Rhyacia lucipeta, Schiff. D., 19.v.36. A slate-grey specimen.

Triphaena ianthina, Esp.

Actinotia hyperici, Schiff.

Miselia dysodea, Schiff. Bred from larvae found at D. on *Lactuca scarioloides*, 14.vii.35, evidently a second brood. The species also occurs at Bagdad, in the form *innocens*, Stgr. (det Brsn.).

Harmodia bicruris = *capsincola*. Larvae found at 6000 ft. above R. on white lychnis (the same food plant as in England) on 16.vi.35, emerged some on 6 and 7.vii.35 and some on 23.iii.36 in Bagdad. They differed in no way from British examples. The species seems to exhibit no geographical variation, and I have taken it in identical form at Tehran, in vii.38.

Cucullia lychnitis, Rbr. I have taken parasitised larvae of this species at Z. and R.G.

Leucania l-album, L.

Parastichtis monoglypha, Hufn. *syriaca*, Osth.

Dyschorista fessipuncta, Haw.

Megalodes eximia, Frr. D., a long series to light in iv.36. The larva which burrows in hollyhock flowers in early summer is probably this species.

Margelana versicolor, Stgr. S.A., ix.35. Three examples, to light.

Sarrothripa revayana, Scop. Sh., 17.vii.

Earias irakana, Wilts. R., to light near willows, 24.vi. In the plains, from Mosul to Bagdad, and doubtless further south, *Populus euphratica* is the usual food plant. I have not seen this tree on the upper courses of Kurdish rivers, though I was wrong in my original description to imply that it did not grow at Mosul.

Porphyrinia ostrina, Hbn.

Porphyrinia albida, Dup. R., 24.vi.

Porphyrinia polygramma, Dup. R., 13.vii; S., 8.vi.

Porphyrinia suppuncta, Stgr. D., 23.v.; R., 13.vii.

Metaegle pallida, Stgr. (det. Brsn.). D., 23.v, 19.vi. Flies together with the following, which differs from it not only in its dark hindwing but in the structure of the frons.

Aegle rebeli, Schaw. D., 22.v. Occurs also in the desert plains of Upper Iraq together with the foregoing species.

Erastria trabealis, Scop.

Xantholeuca staudingeri, Standfss. S., 8.vi, two to light.

Thalerastria diaphora, Stgr. R., 28.vii, to light at 6000 ft.

Tarache luctuosa, Esp. D., 23.v.

Chloridea dipsacea, L. D., 23.v.

Phragmitiphila typhae, Thnbg. Meadows of Alana Su, above its entry into R.G. The pupae are much preyed on by water fowl.

Archana geminipuncta, Haw. (det. Brsn.), probably ssp. *orientalis*, Wgnr. D., 17.vi. A dark ♀, flying among reeds in a small stream-bed.

Catocala neonympha, Esp. Extremely common throughout the district in mid vi, both to light, and flying by day under shady trees by streams. In the desert it flies earlier in vi, while at Hamadan (6000 ft.) I have not seen it before 22.vii.

Catocala abacta, Stgr. ssp. *irana*, Brdt. One example, taken at Sh. by day in a shady stream-bed together with the more numerous *neonympha*, on 14.vi.35, must obviously, by reason of its strikingly bleached median area, be referred to the above race described by Brandt from near Shiraz in 1938, though rather smaller than the figures accompanying Brandt's description.

Ophiussa algira, L. R.G., 16.vii.

Grammodes stolidia, Fr. D., 12.vii.

Acantholipes regularis, Hbn. D., 28.vi and 29.vii.

Euloastra schah, B.-Salz & Brdt. R.G., 30.vii, etc. Also from Luristan, 11.viii.38.

Hypena obsitalis, Hbn. Two, 15.vi, R.G.

Chlorissa pulmentaria, Guen. Larvae common at D. in hollyhock flowers in early summer; imago to light, Sh., 17.vii; R.G., 30.vii. (Also Hamadan.)

Aplastis ononaria, Fuessl. D. and Sh., late viii.

Scopula beckeraria, Led. and *S. ochroleucata*, H.S.

Scopula ornata, Scop. R., 28.vii, a single lightly marked specimen. (From Alvand several more heavily marked examples.)

Scopula flaccidaria, Z. One specimen, smaller than Syrian, Sh., 17.vii.

Glossotrophia asellaria, H.S. ssp. Second brood common at D. and R.G. in x. I have taken the first brood in the desert near Mosul in vi and also at Maidan-i-Naftun in v.

Sterrrha marginepunctata, Goeze.

Sterrrha submutata, Tr. ssp. Lebanese examples of ssp. *taurilibanotica*, Whli. come between those from Alvand and those from Kurdistan in size, though all three races are similar in colour and design. The Kurdish form, whether first or second brood (R.G., 30.vii, and 8.x) is characteristically small.

Sterrrha ? ruficostata, Z. R., 5-6000 ft., vii. To light, fairly common.

Sterrrha textaria, Led. Sh., 1.viii and 29.viii.

Sterrrha flicata, Hbn. A., 21.v.; R., 8.x.

Sterrrha rufaria, Hbn. (det. Prt.). R., vi and vii, by day, 5-6000 ft. Rather pale examples, approaching the colour of *consanguinaria*.

Sterrrha politata, Hbn. f. *abmarginata*, Bhtsch. D. and Sh., vi and vii. One specimen from S. (vi) has the submarginal area clouded with grey, but not as dark as the nominotypical (Mediterranean) form of Hübner.

Cosymbia ruficiliaria, H.S. A larva beaten from oak at S.T. produced an imago on 16.vi.

Rhodometra sacraria, L.

Rhodostrophia tabidaria, Z. A., 23.v. Similar to Syrian examples.

Rhodostrophia sieversi, Christ. (det. Prt.). R., 24.vi, one damaged example.

Rhodostrophia badiaria. S.A. and R., 16.vi, at 6000 ft.

(?) *Lythria purpuraria*, L. Ma., 18.vi; R., vii, 7-8000 ft., in moist and grassy places.

Anaitis obsitaria f. *evanescens*, Whli. S.A. and R., vi, 5-6000 ft.

Anaitis plagiata L.

Cidaria bilineata, L. and *C. obstipata*, F.

Cidaria (Entephria) frustata, Tr. (det. Prt.). S.A., ix.35.

Eupithecia irritaria, Stgr. R., 27.vii, 6000 ft., to light.

Eupithecia ? *novata*, Dietze. R., vii, kicked from astragalus bushes at 8000 ft., also to light at 6000 ft.

Eilicrinia cordiaria, Hbn. R., 27.vii, and Sh., 1.viii, to light near willows; also flying by day in shady stream-beds; the yellow second brood. (Also at Hamadan, the 1st brood in vi, the 2nd in vii-viii.)

Dasycoarsa modesta, Stgr. D., 15 and 23.iv, ♂♂ ♀, to light. The Kurdish race, if these three are representative, is more suffused with lilac than the pale Lurish race (Khorramabad, 3.iv.38, ♂♂), but lacks the rich reddish purple of the Lebanese males. Since the species was described from Turkey, and Kurdish and Lurish examples differ less from Turkish than do Lebanese, it is perhaps best not to give any names to these two forms. The females are always paler than the males, the latter sex showing the richest coloration.

Dyscia conspersaria, Schiff. A., 23.v.37. One slightly brownish example.

Gnophos stevenarius, Boisd. Sh., vii and viii; S., 9.vi.

A GYNANDROMORPH OF *BUPALUS PINIARIA*, L.

By Dr E. A. COCKAYNE, A.M., F.R.E.S.

On 18th March 1939 I bred a gynandromorph of *Bupalus piniaria* from a larva beaten at Oxshott. The right side is male and the left side female, the female side being the smaller.

Schultz in his lists of Gynandromorphs of Palaearctic Lepidoptera gives references to 24 examples in this species, of which 8 are British. One of these (g) is not a gynandromorph, but is a female with coloration approximating to that of a male (Dunning. *Trans. Ent. Soc. Lond.*, 1864-5, 2, 109), and two (x, y) refer to the same specimen as (w). There are therefore 5 British examples in the lists, of which 3 are halved. Of the Continental ones 10 are halved.

The British records are:—

(1) B. Chittenden. 13.vi.1900. No locality given. Wings on right female, antennae, abdomen, and wings on left male. A later record suggests that it was from Kent (*Entomologist*, 1900, XXXIII, 266; 1901, XXXIV, 61).

(2) W. P. Blackburn-Maze. 1893. Newbury. R., male; L., female (*Ent. Record*, 1893, IV, 270. Barrett. Pl. 282, fig. 2 f).

(3) J. Warren of Waltham Cross. No locality given. One side male, the other female (*Ent. Record*, 1891, II, 198).

(4) T. Willson of Richmond. No locality given. Right side male, left forewing female, left hindwing mixed male and female, right antenna pectinated, left simple (*Ent. Record*, 1892, III, 178). This corresponds with an unlabelled specimen in my collection.

(5) H. B. Williams. 6.vi.1908. Oxshott (*Entomologist*, 1908, XLI, 182. *Ibid.*, 1909, XLII, 76; *Ent. Record*, 1909, XXI, 52).

The following specimens do not appear in Schultz's lists:—

(6) Mosley. *Illustrations of Varieties of British Lepidoptera*. *Fidonia*. Pl. 3, fig. 3. Clare Park, Farnham. Rev. Arnold Lilly's coll. Right side male, the anterior half of the left forewing chiefly female, the posterior chiefly male, left hindwing with male and female parts about equal; left antenna simple, right pectinated, abdomen male.

(7) Mosley in text referring to this plate mentions a similar specimen taken in Devonshire and now in Wellman's collection.

I have four more apparently unrecorded:—

(8) Left side predominantly male with a few streaks of female coloration in both wings, right forewing male with a few streaks of female colour, right hindwing female; left antenna male, right antenna and abdomen female. Suffolk.

(9) Right side male, left side female. West Wickham. 13.vi.1900.

(10) Right side male, left side female. Very large. Sir Vauncey Harpur Crewe. Warslow, Staffordshire. 1890.

(11) A female with pectinated antennae and a male frenulum on the right side. Baron Bouck. Kent. vi.1927. This resembles the specimen recorded by Keferstein (*Stett. Ent. Zeitung.*, 1869, 229).

SOME EASTON LEPIDOPTERA.

By T. FRED. MARRINER.

I have not made and kept a collection of Easton Lepidoptera, contenting myself with observing and noting all I came across, and only keeping and mounting anything new, rare, varied, or doubtful. The following is a list of such species as I have seen or kept during the last six years and, though it may contain nothing new, or very rare, yet it will add a new locality for most of the species mentioned as the area has not before been collected over. There is a lot of ground still unexplored and I have done but little with light or sugaring. My home, Yadhill, stands high, and as one keen lepidopterist told me, "a light in one of my windows should bring anything attractable in north Cumberland and Dumfriesshire" as the view from it ranges from Lake Mountains, across the Solway area, to the hills in the north of Dumfries county.

Except where otherwise stated, the following have occurred within a small radius around my home, situated at the centre of the Easton area.

Two well-known collecting areas occur on the outskirts of the district, Bolton Fell on the south-east and Longtown on the south-west. Two collectors, J. E. Thwaytes and F. H. Day, have many records from these two grounds in Mr G. B. Routledge's County List of Lepidoptera in the *Transactions of Carlisle Nat. Hist. Society*. For the sake of brevity I refer to their records as B.F. and L. My nomenclature and arrangement may be somewhat out of date as I have gone by Kirby's "Butterflies and Moths,"* the only Moth work of any standing in my small library.

*The current nomenclature has been inserted.—EDS.

RHOPALOCERA.

Pieris brassicae, L.—The appearance of this here is very variable. There were few in 1935. It occurred in greater numbers in 1936. In 1937 and 1938 I only made a single record, and this year, 1939, has proved the best for it since I came to the area.

Pieris rapae, L.—Fairly plentiful in the area each year.

Pieris napi, L.—Very common and in some variety.

Euchloë cardamines, L.—Only occurs sparingly though never altogether absent.

Brenthis selene, Schiff.—This I have only met with once. It occurred in some numbers along Netherby roadside in 1936.

Aglais (Vanessa) urticae, L.—This and *P. napi* are the commonest butterflies of the area. A freak specimen occurred in my garden this year (1939) in which the ground parts were dirty white. This insect hibernates in the house here each winter.

Vanessa atalanta, L.—Variable in appearance here. In 1935 and 1936 it was common. I never saw it in 1937, and only once in 1938.

Vanessa cardui, L.—I got a worn specimen sunning on a thistle top in September 1936.

Pararge megera, L.—Fairly common in August in most years.

Maniola (Epinephele) jurtina, L. (*janira*, L.).—Common.

Aphantopus hyperantus, L.—Common. Very few are of type form, the commonest form found is asymmetrical, and in many the spots are almost indistinguishable.

Coenonympha tullia (tiphon), Rott.—Not uncommon. Mostly of type form, though to the south-east near Bolton Fell, specimens all approximate to var. *laidion*, as has been noted by Mr F. H. Day in the County List (*Trans. Carlisle Nat. Hist. Soc.*, Vol. I).

Coenonympha pamphilus, L.—Not uncommonly met with.

Heodes (Rumicia) phlaeas, L.—This has not been by any means common here of late years.

Polyommatus icarus, Rott.—Common in most years.

Erynnis (Nisoniades) tages, L.—Not uncommon in Netherby and Carwinley areas.

Augiades sylvanus, Esp. (*venata*, Br. & G.).—Only once found on the roadside near Brackenhill.

HETEROCERA.

Sphinx pinastri, L.—The rarest items of my local collection are a stunted newly emerged specimen of this moth and the pupa case from which it emerged. The chrysalis was brought to me by a farm hand who had found it on 18th September 1938. I put it in a glass jar in my greenhouse and forgot about it until I happened to look at it when cleaning up, to find a pine hawk had emerged some time in early June 1939. I do not know the date. I mounted the moth and its dark brown pupa case. This moth has only once before been recorded for Cumberland (*Entomologist*, I, p. 231). Suffolk is its main British habitat, though Kirby also gives the south of Scotland.

Manduca (Acherontia) atropos, L.—A fine chrysalis of this was brought to me from a neighbouring potato field in September 1938. I put it in suitable quarters but nothing has come from it so far.

Hepialus humuli, L.—Common, and especially so in June 1939.

- Hepialus fusco-nebulosa*, De G. (*velleda*, Hb.).—Not uncommon.
- Orgyia antiqua*, L.—One taken near Longtown, 1936, but I have seen none in the old known locality at Bolton Fell.
- Dasychira fascelina*, L.—Not uncommon throughout the area.
- Parasemia plantaginis*, L.—In numbers about Netherby in 1936. I have one from Carwinley. It is given for B.F. and L. in the County List.
- Arctia caja*, L.—The larva is common on the roads, but I have never come across an imago. I have bred many from road larvae.
- Spilosoma lubricipeda* (*menthastri*, Esp.).—Several bred from larvae found on the roads in September 1936.
- Diacrisia* (*Spilosoma*) *lutea* (*lubricipeda*, Esp.).—A rarity here.
- Lasiocampa quercus*, L.—The form var. *callunae*, Palmer, is the usual form here and is fairly common at Bolton Fell and around Carwinley.
- Saturnia pavonia*, L.—J. E. Thwaytes used to find this at Bolton Fell. I have not seen it there but got a couple on Netherby Road.
- Drepana falcatoria*, L.—Not uncommon in 1936.
- Phalera bucephala*, L.—Fairly frequent.
- Pygaera pigra*, Hufn.—This is given for B.F. and L. in County List.

NOCTUIDÆ.

- Acronicta rumicis*, L.—Common.
- Acronicta psi*, L.—Fairly common here in August of 1935 and 1936.
- Acronicta menyanthidis*, View.—I have not seen this yet though it is recorded from B.F. and L. by Thwaytes (*Entom.*, XXX, p. 250).
- Leucania comma*, L.—Is found only sparingly in the area.
- Caradrina morpheus*, Hufn.—Given for B.F. and L. in the County List.
- Caradrina taraxaci*, Hub. and
- Caradrina cubicularis*, Bork.—Both given for B.F. and L. in the County List, and I got the latter at Carwinley, 1936.
- Taeniocampa gothica*, L.—Common on sallow.
- Taeniocampa stabilis*, Schiff.—Fairly common on sallow.
- Pachnobia rubricosa*, Schiff.—On sallow in spring.
- Triphaena pronuba*, L.—Common.
- Agrotis segetum*, Schiff.—This was common here in 1936, and in its old locality, Bolton Fell.
- Agrotis exclamationis*, L.—Common.
- Agrotis nigricans*, L.—Was in numbers on ragwort here in 1935, but apparently absent since.
- Agrotis strigula*, Thnbg. (*porphyrea*, Hb.).—This is given by Thwaytes at B.F. and L. in *Entom.*, XXX, p. 250. It is still found at Bolton Fell but I cannot find it around Longtown.
- Noctua* (*Agrotis*) *plecta*, L.—Still occurs as of old at Bolton Fell.
- Noctua* (*Agrotis*) *dahlui*, Hb.—This is listed for B.F. and L. and also occurs sparingly near Carwinley.
- Noctua* (*Agrotis*) *umbrosa*, Hb.—Not uncommon.
- Xylophasia* (*Hadena*) *rurea*, Fab.—Not uncommon at Netherby and listed at B.F. and L.
- Xylophasia* (*Hadena*) *monoglypha* (*polyodon*, L.).—The type and dark (black) forms are fairly common in about equal numbers.
- Hadena adusta*, Esp.—Sparingly in the area.

Apamea (Hadena) gemina, Hb. and

Apamea (Hadena) basilinea, Schiff.—Both recorded from B.F. and L. I have not seen either as yet.

Apamea (Hadena) secalis, L.—Common.

Celaena (Hadena) haworthii, Curt.—Bolton Fell by Thwaytes in County List.

Miana (Hadena) strigilis, L.—One of the first to come to sugar, and the commonest got there.

Miana (Hadena) fasciuncula, Haw.—Not uncommon at sugar.

Polia chi, L.—Common.

Mamestra pisi, L.—Not uncommon.

Mamestra brassicae, L.—Common.

Mamestra glauca, Hb.—B.F. and L. in the County List.

Mamestra nana, Hufn. (*dentina*, Esp.).—B.F. and L., and still found there.

Mamestra oleracea, L.—Common.

Phlogophora (Brotolomia) meticulosa, L.—Common in 1936, but rather scarce since.

Plusia pulchrina, Haw.—Fairly common.

Plusia gamma, L.—Fairly common in autumn.

Plusia interrogationis, L.—Not uncommon at Bolton Fell in 1936.

Anarta myrtilli, L.—Fairly common near Netherby and Carwinley. B.F. and L. in the County List. One in my garden in 1939.

Euclidia mi, L.—Somewhat scarce here.

Euclidia glyphica, L.—Not uncommon.

Hypena proboscidalis, L.—Frequent on nettles.

GEOMETRIDAE.

Opisthograptis luteolata, L.—Common.

Gonodontis (Odontopera) bidentata, Clerck.—Not common.

Boarmia repandata, L.—Scarce, Longtown, 1935; Nicolforest, 1936.

Pseudoterpna pruinata, Hufn.—One taken on furze, 1938.

Sterrha (Acidalia) dimidiata, Hufn.—Uncommon.

Sterrha (Acidalia) biselata, Hufn.—Plentiful, July 1939.

Acidalia ternata, Schrnk. (*fumata*, St.).—Rare, Bolton Fell, Nicolforest.

Cabera pusaria, L.—Common.

Cabera exanthemata, Scop.—Common.

Macaria liturata, Clerck.—Bolton Fell, near Penton; scarce.

Itame (Fidonia) wauaria, L.—Bred from larvae got in garden, 1936.

Dyscia (Scodiona) fagaria, Bois.—Bolton Fell (F. H. Day).

Perconia (Aspitates) strigillaria, Hübner.—Plentiful on small moss, Nicolforest, 1935; Bolton Fell, 1936.

Abrazax grossulariata, L.—Common. Some nice varieties bred from wild larvae.

Operophtera (Cheimatobia) brumata, L.—Not so common here as I found it around Carlisle.

Calostygia (Larentia) didymata, L.—Common.

Calostygia (Larentia) pectinitaria, Knoch (*viridaria*, Fab.).—Fairly common.

Epirrhoë (Larentia) tristata, L.—Hethersgill (Dawson in County List).

Epirrhoë (Larentia) alternata, Mull. (*sociata*, Bork).—Plentiful.

Xanthorhoë (Larentia) fluctuata, L.—Fairly common.

Euphyia (Camptogramma) bilineata, L.—Common.

Larentia chenopodiata, L. (*limitata*, Scop.).—Not uncommon.

Eupithecia palustraria, Dbldy. (*pygmeata*, Hb.).—Bolton Fell (F. H. Day).

Eupithecia nanata, Hb.—Bewcastle, Bolton Fell, rare.

Hydriomena furcata, Thnbg. (*sordidata*, Fab.).—Fairly common.

PYRALIDAE.

Botys fuscalis, Schiff.—Not uncommon.

Pionea forficalis, L.—Common in July 1936. Rare since.

Scopula lutealis, Hub.—Fairly frequent.

Scopula olivalis, Schiff.—Not uncommon.

Nomophila noctuella, Schiff.—Common.

There seems to be a good field here for the student of Micro-lepidoptera, but, for the present, I have left these alone.

COLLECTING NOTES.

SOME NEW COUNTY RECORDS FOR ORTHOPTERA.—*Acrydium vittatum*, Zett. Found in a disused quarry about 5 miles east of Shepton Mallet (Somerset).

Omocestus viridulus, L. Taken from two localities in Oxfordshire—Somerton and Lower Heyford. All these records were taken in 1939.—E. S. BROWN.

AN INTERSEX OF MALACOSOMA CASTRENSIS.—On 1st July I collected a number of *M. castrensis* larvae on one of the salt marshes near Southend. One of the resultant imagines which emerged on 5th August is an interesting specimen. It is an apparently normal ♀ in every respect, with the exception of the left antenna, which is a well-developed ♂ organ. The body has remained stout on drying, with little or no shrinkage, and would therefore appear to be full of eggs.—J. O. T. HOWARD.

ORTHOPTERA NOTE FROM CUMBERLAND.—On 26th July 1939 there occurred here, in a bunch of bananas from Jamaica, one of those casual visitors which add interest if not importance to our collecting. It was brought to me alive by our local itinerant storekeeper. I sent it to Dr Malcolm Burr, who returned it as *Periplaneta australasiae*, F., a tropical cockroach, not before appearing in Cumberland. The insect, according to Dr Burr, was just short of maturity. I have also been fortunate enough to add another grasshopper to our County List. In August 1939, when near Carwinley, I stopped to look over a high hedgebank into a sunk meadow bounded by a mound on one side and fairly high hedges on the others. Curlews were feeding about the centre of the meadow and as I watched through field glasses they appeared to be catching grasshoppers. I did not know they ate grasshoppers, but determined to investigate. I got permission at the nearest cottage and went into the meadow. The curlews, of course, rose when I appeared, but just about where they had been pick-

ing I got two grasshoppers, afterwards named for me as *Meconema thalassinum*, De Geer. On consulting Mr G. B. Routledge's "County List," *Trans. of Carlisle Nat. Hist. Society*, Vol. IV, I find he says this insect was recorded from Scotland in 1809 and 1813, and has been taken in Yorkshire. He further gives it as a species which might occur in Cumberland. Strangely enough, Dr Burr, in a letter I had from him about a year ago, said I ought to come across this and one or two other species he named, in sheltered parts of my area, so both were correct in their prognostication.

This has been a good season for grasshoppers here. I have seen quite a number of the species mentioned in a former note, notably *C. bicolor*, Charp., which has been very common, but the only one new to my former list is *Omocestus viridulus*, L., which I got not far from my house, and which is common in the county.—T. F. MARRINER.

ACANTHOMYOPS (DENDROLASIUS) FULIGINOSUS, FABR., AT HESTON.—On September 6th last I found a deâlated female, *A. (D.) fuliginosus* under a mat in the dining room in my house, the French windows of which open out into the garden. When discovered she was very active, and ran very fast. I placed her in an observation nest with some honey to see if she would lay eggs; but she unfortunately got drowned in the honey. It was a rather surprising find as I have never seen a trace of *fuliginosus* anyway near here in all my walks abroad. With their habit of walking in files they would at once be noticed; moreover, though it is not essential, there are very few old trees left, as they have all been cut down to make room for building operations. As *fuliginosus* is unable to found colonies unaided, the young females either return to their own nests, or seek out a *mixtus*, or *umbratus*, colony for the purpose after the marriage flight. It is therefore very difficult to account for the presence of this particular female in my house. Hampstead, an old record, appears to be the only locality I have noted for this species in Middlesex.—HORACE DONISTHORPE.

THE GHOST MOTH (HEPIALUS HUMULI) AT HESTON.—I am recording this capture more on account of the curious coincidence than for its presence at Heston, as I do not know if it is common in Middlesex or not. Late in July last I found a female "Ghost Moth" on a window-sill in my house, but the curious fact about it is this: I am writing a history of my life, chiefly as an entomologist, and the evening before I took the moth in question I had been describing my father's county house, "The Mansion," at Earl Shilton in Leicestershire. I had mentioned that the "Ghost Moth" was common in the orchard there, and to the best of my knowledge, I have never seen a "Ghost Moth" since (some 50 years ago) until this occasion! Both this insect and the ant mentioned above are now in the collections of the British Museum (Natural History).—HORACE DONISTHORPE.

THE WHITE ADMIRAL AT HESTON.—On 14th July, 1939, I saw a specimen of the "White Admiral" butterfly (*Limenitis camilla*) in a lane at Heston, Middlesex. It flew close by me twice, and then flitted over a hedge. It occurs in several localities in Windsor Forest, and Mr Perkins tells me it has spread considerably of late years. He has taken

it himself this side of Slough, but I was wondering if Heston were not the nearest record to London. I am told it has been recorded from Wimbledon Common, but would it have bred there? It is nice to know that such a beautiful butterfly is extending its range in spite of building operations everywhere.—HORACE DONISTHORPE.

AN EMIGRATION OF *FORMICA RUFA* L. By B. D. W. Morley, F.R.E.S., F.R.H.S.—On 17th September, while walking on Meyrick Park Golf Links, Bournemouth, I observed a long line of workers of *Formica rufa*, L. stretching up the hill beside a railway cutting from a tree near the fairway; the majority of the workers were travelling down the hill to the tree, where I found a newly formed nest, and were carrying other workers and pupae. I traced the other end of the trail to the railway cutting over the edge of which the ants disappeared. I could not, however, see the nest from which the ants were coming, but it must have been of a fair size since on 27th September the small new colony was firmly established, and an ordinary *rufa* track was connecting it with the parent nest. Polycalic colonies of *rufa* are common, and indeed I know of one at Limpley Stoke, near Bath, which must cover some 300 square yards of woodland and comprising 6 or 7 nests, some well over a hundred yards apart, though joined to the enormous parent colony by well peopled tracks. It would seem that such polycalic colonies start by just such an emigration as that recorded here, though I can find no record of an emigration to an apparently *new* nest, as this one appears to have been; in both the two cases of emigrations of *rufa* recorded by Donisthorpe in *British Ants* the secondary nest appears to have already been well established at the time of emigration.

CURRENT NOTES,

SPECIAL NOTICE.

Will subscribers who have not yet paid for the current volume kindly do so at their earliest convenience and accept this notice in lieu of the customary circular letter sent out by the Hon. Treasurer.

After discussing the Variation in *Noctua xanthographa*, the "Noctua Supplement" will deal with the species *N. plecta*, *Panolis piniperda*, *Pachnobia leucographa*, and *P. rubricosa*, and then go on to the *Taenio-campa* species, all of which show excessive variation. If any reader can help with notes on the variation and aberration of any of the above species, the author would be very grateful.

Will readers please look up their collecting notes and send on aught that may be of general interest or unusual. There are many areas from which records have never been received. Recently one of our contributors has sent us records in different orders from an extreme corner of England from which no records have hitherto been made. Of course, many species are possibly common, but it is the common species which may vary, split into local races or even into subspecies. Surely a good many collectors in their experiences must have met with specimens more or less gynandromorphous. All such should be recorded.

"An inch-long caterpillar yesterday sounded an air-raid siren, and sent people in several towns scurrying into shelter. The caterpillar was found across the terminals of the control switch at Swinton sewage farm. Its body had acted as a conductor until it had been scorched to death."
—Daily Paper, 14.IX.39.

The second volume, containing a detailed account of some of the most remarkable economic activities carried on in the Laboratory of Agricultural Entomology at Portici in S. Italy, near Naples, has recently been published. It consists of more than 400 pages with 216 composite figures in the text. Vol. I, published in 1937, contained the Morphology, Anatomy and Histology of one of the most troublesome pests of the olive, the Scolytid (Col.), *Phlaetribus scarabaeoides*. Vol. II is a continuation of the investigation dealing with the biography of the species, the damage done, life-histories of the various enemy insects, and the results of experiments to mitigate the attack. The main portion of the work is giving closely detailed life-histories of the many insect enemies of the Scolytids, descriptions of the adult male and female, and the geographical distribution of each predator. Acari, Coleoptera, Hymenoptera (Formicidae, Chalcididae, Braconidae, etc.), are among the natural controls as well as Micro-fungi. This research is excellently described by Sign. Giuseppe Russo, and adequately illustrated by the publishers.

Earlier in this year three further parts of that wonderful mass of references, the *Lepidopterorum Catalogus*, published by the well-known firm, Dr Wm. Junk of the Hague, were issued. Part 89 is the first portion of the sub-family *Pyraustinae*, 224 pages dealing with about 90 genera, by A. Klima. Part 90 is the second portion of the sub-family *Hesperinae*, 80 pages dealing with about 44 genera, including *Carterocephalus*, by H. H. Shepard. Part 91 is the first portion of the sub-family *Charaxidinae*, 168 pages dealing with the genus *Charaxes*, by H. Stichel. The European *Charaxes jasius* has about twelve pages of references; a typical example of the completeness of the research carried out for this most essential basis of future lepidopterological work. Dr Junk is to be congratulated upon this huge undertaking which he has consistently carried on since 1911.

The popular S. London Entomological and Nat. Hist. Society has had to give up the very convenient and capacious quarters it has enjoyed for so many years owing to the Provision Exchange, by whom the building was owned, having removed to fresh premises. Although it had been expected for some time, the termination of the tenancy was very sudden and the Society had to remove and store its much consulted library and collections until new quarters could be obtained. Fortunately the Royal Entomological Society offered to house the collections temporarily and to afford the Society facility to hold its meetings. Convenient accommodation had been found close to London Bridge station, and it was hoped to begin meetings there in September, but under the present circumstances it has been decided that "all meetings of the Society are suspended until further notice."

The Society for British Entomology has just published Part 4 of Vol. VI of its *Transactions*. This contains a very important paper on "The Biology of the British *Pompilidae* (Hym.)" by O. W. Richards and A. H. Hamm, many of the new records being contributed by the latter. We quote from the Introduction that "The family is a very large one, of world-wide distribution; the British fauna (39 species) is but a sample of the European members of the group which, like so many other Hymenopterous families, is best developed in warmer climates. Nevertheless, we have representatives of nearly all the chief sub-families, so that a survey of the British species gives a good idea of the diversity of habits within the family." Practically the whole of these solitary wasps prey upon spiders. Such articles as this are of incalculable value in the spread of the knowledge of various groups, and a great impetus to further faunal work. There are 64 pages of matter with 4½ pages of references.

The July-August number of *Lambillionea* of Belgium contains 2 plates. Plate VIII, aberrant examples of Belgian *Lycaenidae*, and Plate IX, 15 forms of *Cabera pusaria*, the latter to illustrate the article by M. B.-J. Lempke of Amsterdam, in which is summarised the variation shown in the species.

REVIEW.

THE INSECT LEGION. By Malcolm Burr, D.Sc., F.R.E.S., etc. James Nisbet & Co., Ltd., London. 336 pp., 27 figures. Svo., 12/6 net.—In this book the insect world is described in quite an original way by an author thoroughly well acquainted with the subjects of the treatise in many lands, and whose versatile acquirements and experiences, added to his literary skill, have produced a work of a most attractive nature. No tedious descriptions, no technicalities, no long stories, and yet a continuous unfolding of an interesting series of natural facts and phenomena, interspersed throughout with the comments and personal contacts of the author.

In the Prologue the author gives a very short autobiography of his career as an entomologist, his "recreation in prosperity and consolation in adversity" during a long and busy professional life.

Part I: *The Insects Themselves*. Here it is shown how Insects "contend with Man for the Mastery of the Earth;" "The Significance of the Insignificant;" "Calpables de Tout," such as larvae living on strychnine, larvae living 30 years or more, living a series of generations in a stoppered bottle for at least a dozen years, the incredible reproduction of a pair of flies in one season if all survive (5,598,720,000,000). etc. Then follow two chapters entitled "Queer" and "Still Queerer." The former tells of the extraordinary feats of jumping, flying, speed, sounds and their production, life in water, with a short notice of distribution and mass movement, the latter dealing with the production and control of light by insects, the prodigious swarms of midges, locusts, ants, etc., general and special coloration (protective, warning, and bluff), with

many striking examples from the author's own personal observations. The "Senses" are considered in the next chapter; their mechanism, facts and theories, with abundant illustration from the experiments and observations of eminent specialists; the interdependence of hearing and feeling on vibration and the chemico-dependence of smell and taste are both discussed. The initial remark of the next chapter, "Private Lives of Insects," is worth repeating, "The more that insects are studied, the more surprising is it to come across any point, either of structure or function, which they have in common with the rest of the animal kingdom and least of all with human beings." The striking and wonderful results of Dr Wigglesworth's experiments with the substance known as "hormones" secreted in the back of the head of blood-sucking bugs are summarised: two insects grafted together producing a monstrous twin, mosaic insects made by grafting, etc. The strange procedure of the male in presenting a sealed packet to his bride to occupy her attention that she may not make a meal of him before the actual wedding is considered. The chapter, "A Flea Has Smaller Fleas . . ." deals with the remarkable associations of Parasitism in Insects. Many of the more spectacular associations are collected here, including the marvellous adventures of the larva of the "Large Blue," *Lycaena arion*, in its association with ants. "Behaviour of Insects" is the subject of the next Chapter: the current opinion that all insects are more or less mechanistic in their behaviour, and are guided mainly by reflexes, tropisms, and instinct, possessing no mind, no reason, with no conscious purpose and without all emotion, is freely discussed with numerous conflicting and inexplicable records of behaviour and reactions under stimuli.

Part II: *Insects and Man*. The chapter on "The Destroyers" can be illustrated by a quotation used by the author regarding the pestilent distributor, the mosquito. "The male mosquito is a gentleman, who sips daintily of nectar, and minds his own business, while madame, his spouse, is a whining, peevish, venomous virago, that goes about seeking whose nerves she may unstring, and whose blood she may devour. . . . The female mosquito is not only a blood-sucker but an incorrigible wine-bibber as well. It will get hopelessly fuddled on any sweet wine, such as port, or on sugared spirits, while of gin it is inordinately fond. Such disreputable habits, the querulous singing, the poisoned sting, the thirst for blood, and the practice of getting dead drunk at every opportunity are enough of themselves to make the mosquito a thing accursed." The Chapters "Plague and Pestilence;" "Our Persecutors" (flies, tsetse, etc.); "The Economic Front," have a wealth of information and interest, and are succeeded by a chapter, "But some are Useful," and one entitled "Food and Medicine."

Part III: *Insects and Life*, contains one chapter, "A Sense of Proportion," and is mainly geological.

Part IV: *The History of Entomology*, is divided into two chapters. 1, "Ancient," commences with a crude sketch found in a cave in Valencia showing a man climbing a cliff by a rope in the act of robbing the honey of a bee, with the angry bees around him. The last chapter, "Modern," begins with Wootton, 1492, and the subsequent publication of Moufet's work, and continues with mention of the chief items in the history of Entomology since.—H. J. T.

13820
 these are obscured or even imperceptible. When they are present the intermediate spot varies from red-brown to black, and where this is dark there is often a blackish cloud outside the reniform stigma, and a blackish-brown costal triangle before the apex. I have one specimen from the north of Ireland of a pale drab with very little trace of either stigma, but having the first and second lines and the attendant dots very prettily distinct. Others from the same district are of a light brick-red, and of the usual dark brown forms of that country many are almost devoid of marking of any kind, and are not always easy to recognise. Some examples from Durham are almost black; from Yorkshire they range from rich red to black-brown; some from Shetland are of very coarse texture of scales and of a deep black-brown with a gloss of reddish and distinctly yellow stigmata. Others from the East of Scotland uniform smooth black-brown, almost black but scarcely showing the stigmata. Some of the red forms are totally devoid of the transverse lines, while in others they are very conspicuous; and every variety seems to be connected with the rest by all possible gradations."

He reports a specimen "from Shoeburyness, outside the mouth of the Thames, of a pale greyish-drab, almost greyish-white and with the hindwings pure white."

Another "in which the orbicular stigma is elongated into a long wedge-shaped spot."

"The hindwings in the male vary from pure clear white to forms having a strong grey-brown hind marginal band."

Another specimen "From the N. of Ireland of a pale drab with very little trace of either stigmata, but having the first and second lines and the attendant dots very prettily distinct."

He gives figures of 5 forms on pl. 148.

The Names and Forms to be considered are:—

[*xanthographa*, Schiff. (1775), *Verz.*, 83.]

xanthographa, Fb. (1787), *Mant.*, II, 170.

radicea, Esp. (1788?), *Abbild.*, IV, pl. 143, f. 3 (1788?), *Text*, p. 453 (1792-).

radica, Esp. (1788?), *Abbild.*, IV, pl. 151, 4; IV (2), *Text*, p. 497 (1792-).

tetragona, Haw. (1809), *Lep. Brit.*, 205.

f. *budensis*, Frr. (1839), *New. Beitr.*, III, 56, pl., 232, 1 ♀.

f. *cohaesa*, H.-S. (1851), *Sys. Bearb.*, II, 209, figs. 95-97.

race *elutior*, Alph. (1887), *Stett. e. Zt.*, 168.

ab. *rufescens*, Tutt (1892), *Brit. Noct.*, II, 126.

ab. *rufa*, Tutt (1892), *l.c.*

ab. *obscura*, Tutt (1892), *l.c.*

ab. *nigra*, Tutt (1892), *l.c.*

ab. *obsoleta-rufa*, Tutt (1892), *l.c.*

ab. *obsoleta-nigra*, Tutt (1892), *l.c.*

race *palaestinensis*, Kalchb. (1897), *Iris*, X, 168.

ab. *funerea*, Gauckler (1901), *Ent. Jahrb. Kranch.*, 153, fig.

race *meridionalis*, Splr. (1905), *Schm. Eur.*, I, 149, pl. 33, 8.

ssp. *almohada*, Wagnr. (1918), *Zt. Oest. Ent. Ver.*, III, 43.

f. *xanthostaxis*, Dnhl. (1925), *Ent. Zt.*, Dnhl., XXXIX, 123.

ab. *astixis*, Dnhl. (1925), *l.c.*

ab. *margine-ornata*, Dnhl. (1933), *Ent. Zt.*, XLVI, 246.

Tutt dealt with (1) the pale greyish *cohaesa*; (2) the dark greyish-fuscous *xanthographa*; (3) the pale reddish or pale reddish-grey *rufescens*; (4) the bright red, *rufa*; (5) *obsoleta-rufa*, unicolorous; (6) dark reddish-black, *obscura*; (7) *obsoleta-obscura*, marking obsolete; (8) *nigra*, intensely black, no red tinge.

ab. *tetragona*, Haw., *Lep. Brit.*, 205 (1809).

ORIG. DESCRIP.—“*Alis subfuscis macula quadrata inter stigmata, strigisque obsoletis tribus fuscis, unaquæ postica pallescente.*”

“*Pallide fusca ani barbâ lutescente. Alae anticae pallide fuscae, strigis duabus undatis sive fractis fuscis ante medium: tunc stigmata ordinaria lutescentia: pone haec striga arcuata pectinata, vel punctorum nigrorum: denique marginem posticum versus striga alia vix conspicua paulo undulata pallescens, ciliis fuscis. Posticae alae albicantes fimbriâ paulo saturatiore, ciliis lutescentibus.*”

“*Strigae omnes subinde plus minus oblitteratae sunt.*”

This he called “The square-spot Rustic.”

Haw. then went on to describe two other forms of *tetragona*.

β (the rusty Square-spot Rustic) “*Thorace alisque griseis, sive sordide subferrugineis; posticis albo-lutescentibus striga obsoleta pone medium punctorum subfuscorum aliaque cinerascete ad marginem posticum; caeteris ut in α .*”

γ (the bordered Square-spot Rustic) “*Posticis alis fimbria lata fusca, caeteris ut in β .*”

race *budensis*, Freyer, *Neu. Beitr.*, III, 56 (1839).

FIG.—plt. 232, 1.

ORIG. DESCRIP.—“*It has the size of *baia*. The thorax and forewings are black-grey, the latter somewhat darker in the middle. The usual bands are obsolescent. Each vein bears, as in *neglecta*, a distinct streak, which streaks taken together form a distinct band. Between this and the fringe appears a paler washed out band, which forms an obtuse angle not far from the costa, of its whole width. The orbicular stigma is distinctly recognisable and pale margined, the reniform stigma is dark and doubtfully seen. The hindwings like the abdomen are brown-grey. The antennae filiform. The underside is brown-grey on the costa with a rusty-brown margin.*”

Hamps., *Cat. Lep. Ph.*, IV, 420 (1903), “Greyish.”

race *elutior*, Alph., *Stett. e. Z.*, 168 (1887).

ORIG. DESCRIP.—“*Varietas major, alis latioribus, anticis (cum thorace) pallide-cinnamoneis, macula reniformi albido-circumscripta; posticae cum ciliis albidae ad marginem sordide-grisescetes; subtus alae omnes pallidiores.*”—Taschkent.

Hamps., *Cat. Lep. Ph.*, IV, 420 (1903), “Cinnamon or greyish ochreous.”

race *palaestinensis*, Kalchb., *Iris*, X, 168 (1897).

ORIG. DESCRIP.—“*While up to the present I have obtained only 1 ♂ of the type form, 12 specimens have been sent me of which the males are coloured lighter grey on the fore-wings than in the Sicilian *meridionalis*, but on the other hand there were very sharp transverse lines and an inner shading to the waved line strongly emphasised, far more striking*

than in the ab. *cohaesa*, H.-S. The reniform stigma stands out prominently on account of its dark filling-in. The females have, in opposition to the males, quite darker, unicolorous forewings than the typical *xanthographa*, also the basal portion of the hindwing is wholly dark." Haifa, Syria.

Hamps., *Cat. Lep. Ph.*, IV, 420 (1903), "Pale grey, with the markings distinct."

ab. *funerea*, Gauckler, *Krancher's Ent. Jahrb.* (1901), p. 153.

FIG.—*l.c.*, fig.

ORIG. DESCRIP.—"A very dark aberration, which occurs constantly and characteristically with the typical form, and which I venture to designate *funerea*. The ground colour of the f.w. is a dark, almost black-brown, with a suggestion of violet. All marking is sharply defined; between the orbicular and reniform the space is filled in clearly with blackish; the pale waved line near the marginal area is, for the most part, only slightly in evidence. The reniform, as a rule, is only filled in yellow in the middle, or wholly dark and only yellow-margined. The orbicular remains dark suffused; fine yellow-margin. The lower wings are coloured as in normal examples. In rare cases this pretty form varies in this way, the black-brown upper-wing at the base, as also in the marginal area, is crossed by a paler curved band and the nervures in the central and marginal areas are blackish powdered and stand out."

race *meridionalis*, Splr., *Schm. Eur.*, I, 150 (1905).*

ORIG. DESCRIP.—"Forms from Portugal which are light with the outer dark transverse line broken up into spots."

ssp. *almohada*, Wgnr., *Zt. Oestr. Ent. Ver.*, III, 43 (1918).

FIG.—♂ and ♀, b. and w., poor.

ORIG. DESCRIP.—Wagner recognised the form he obtained at light and sugar from Tunisia as that which C. Ribbe had described, but not named, in his "Fauna Andalusiens," *Iris*, XXIII, 234 (1910), as follows:—

"The Andalusian examples give quite the impression of a distinct species. The specimens are very small, the upper-side of the forewing is reddish, but of a different tone to that found in the usual German examples; the marking is obsolescent. The hindwings are nearly quite white and on the outer margin there appears no visible band of streaks."

f. *xanthostaxis*, Dnhl., *Ent. Zeit.*, XXXIX, 123 (1925).

ORIG. DESCRIP.—"There are in all shades of colour specimens in which, besides the strongly emphasised clear yellow submarginal transverse band, the two stigmata are completely filled in, appearing as clear yellow drops, forms which thus appear the more noticeable, especially when specimens so marked are of a unicolorous ground colour, and particularly those that are naturally dark varieties like ab. *obscura* and ab. *nigra*. I note extreme examples of such appearance, which are certainly very rare, with the name *xanthostaxis*." S. Tyrol.

*This form is referred to by Kalschb. in 1897 and hence must have been earlier than 1905.

ab. *astixis*, Dnhl., *Ent. Zeit.*, XXXIX, 123 (1925).

ORIG. DESCRIP.—“Among the just described cases (*xanthostaxis*) there appear those in which the marginal area of the stigmata is obsolescent; the boundary of the stigmata is not perceptibly darker and the stigmata are in no way in contrast with the uniform ground colour, so that a typically otherwise unicolorous form remains.” S. Tyrol.

ab. *marginata-ornata*, Dnhl., *Ent. Zeit.*, XLVI, 246 (1933).

ORIG. DESCRIP.—“In this example the antemarginal light band stretches out appreciably into the yellow colour of the stigma. This pretty aberration can occur in all forms of this variable species, but is naturally found commonest in specimens with strongly developed stigmata, such as *xanthostaxis*, Dnhl.” S. Tyrol, Bozen.

Noctua, L. (1758), Barr., Smith, many authors. [*Agrotis*, Ochs. & Tr. (1816-25), Btlr., Meyr., Hamp., Splr., Stdgr., Culot: *Graphiphora*, Ochs. & Tr. (1816-25), Meyr.: *Rhyacia*, Hb. (1821), Warr.-Stz.: *Ochropleura*, Hb. (1821)] *plecta*, L., 1761.

Two European species, which bear a very close resemblance to *plecta*, were early much confused with that species. Hübner definitely figured *musiva* as a species, *Samml. Noct.*, 118 (1800-3), $\frac{1}{3}$ larger than *plecta*; Freyer, *Neu. Beitr.*, I, 38, plt. 21 (1833), described and figured an insect from Vienna as *leucogaster*.

Hb., *Samml.*, 118 (1800-3), on the same plate figured under the name *musiva* an insect, almost an enlarged copy of f. 117 *plecta*, a resemblance quite emphasised by the figures on plt. 8 f. of Warr.-Seitz. The textual difference appears to be ♂ antennae of the former with “sessile fascicles of cilia,” and of the latter, ♂ antennae “ciliated,” with increased size, and a deeper shade in the basal ground colour. It occurs with *plecta* in the more elevated parts of Central Europe.

In 1833, Freyer, *Neu. Beitr.*, I, 38, plt. 21, described and figured an insect with remarkable resemblance to *plecta* and easily confused with that species. This he named *leucogaster*, because of “the pure white abdomen and hindwings on the upperside. The black streak from the thorax enclosed the stigmata and was extended in a very fine clear point beyond the reniform towards the hind margin, a feature not present in *plecta*. There is also no trace of a waved transverse line beyond the reniform. The head, patagia, and a broad streak on the costa of the forewing (up to the black streak, but not reaching the apex) are pale reddish grey. A somewhat larger insect than *plecta*.”

Kleeman, *Beitr.* (Rosel., V = I), plt. XXIII, 1-7 (1761-) gave a very large figure of *plecta* from a bred example which might be taken for *musiva*, were it not that the larva, also figured, is not that of *musiva* [of Splr., *Schm. Eur.*, plt. XLVIII, 22 (1910)], and much more like the green form figured by Buckler, *Larvae*, V, 5c (1893).

Treit., *Schm.*, V (1), 248 (1825), in referring to Kleeman's figure suggests that he might have had a larva of *musiva* from which he bred either a small or a crippled specimen easily confused with *plecta*.

The remarks of Werneburg, *Beitrage*, I, 298 (1864), confirm the opinion that this figure must be *plecta* and add the further confirmation of Wiew., *Tab. Verz.* (1790), in the description of the larva given there.

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CONTENTS.

NEW AMATIDAE FROM ASIA, <i>H. Bytinski-Salz, Ph.D., F.R.E.S.</i> (Plate)	149
LIST OF TRYPETIDAE (DIPTERA) TAKEN IN NORTH KENT, <i>H. W. Andrews, F.R.E.S.</i>	153
NAMES OF MICROLEPIDOPTERA, <i>T. Bainbrigg Fletcher, R.N., F.L.S., F.R.E.S., F.Z.S.</i>	156
SOME HEMIPTERA OF EASTON, <i>T. Fred Marriner</i>	160
COLLECTING NOTES:—Autumn Notes, <i>M. E. Miller</i> ; Notes on Breeding <i>Pyrausta nubilalis</i> , <i>Hübner</i> , <i>S. Wakely</i>	162
CURRENT NOTES	163
SOCIETY	164
SUPPLEMENT: The British Noctuae and Their Varieties, <i>Hy. J. Turner, F.R.E.S., F.R.H.S.</i>	(197)-(200)

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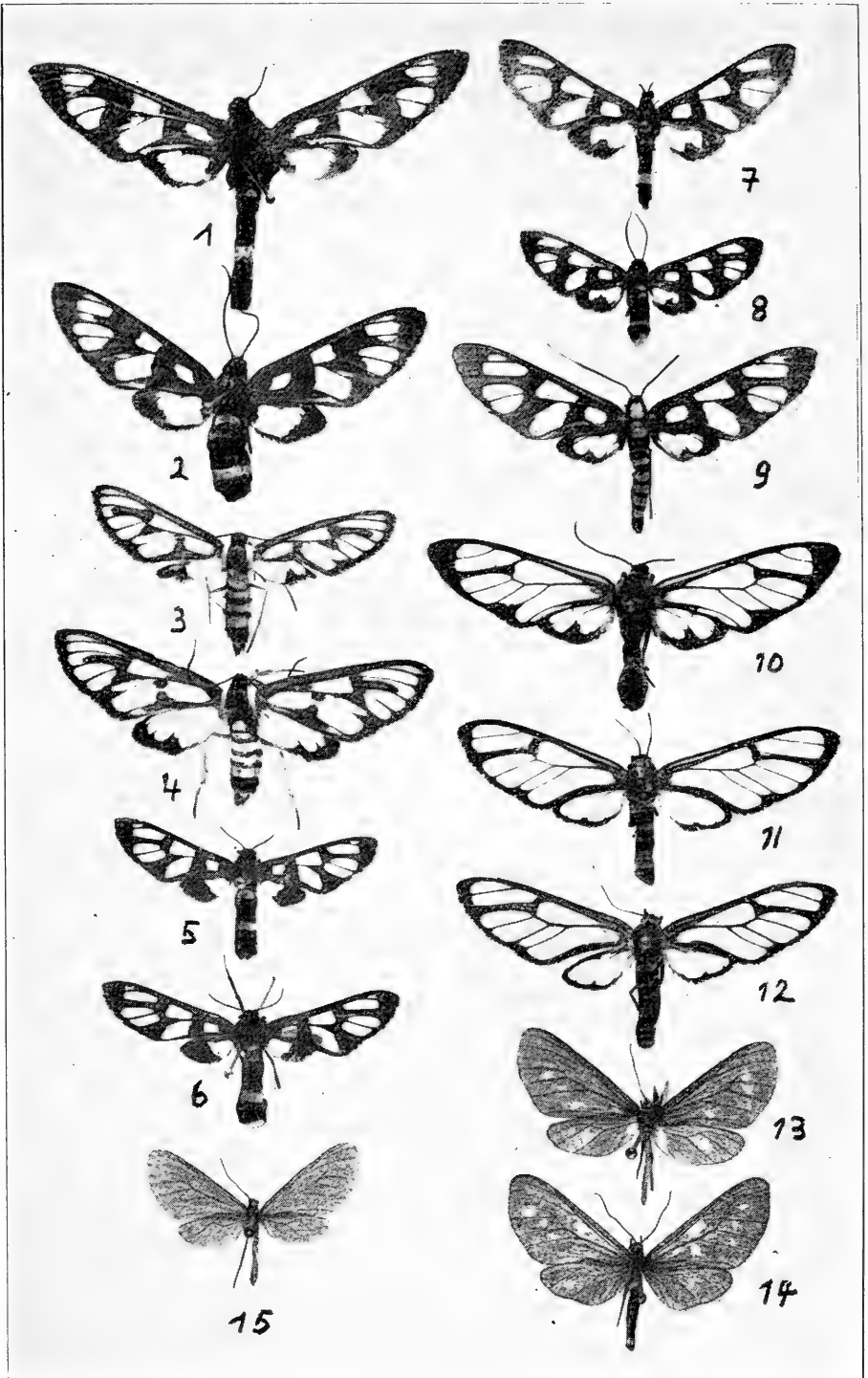
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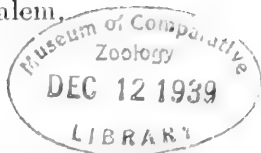
NEW AMATIDAE.

NEW AMATIDAE FROM ASIA.

By H. BYTINSKI-SALZ, Ph.D., F.R.E.S., Jerusalem.

(Plate X.)

13,820

*Callitomis dimorpha* sp. nov.

♂: Antennae simple and pubescent. Frons, thorax and abdomen orange yellow, segments 5 to 7 of the latter black at the base. Wings broad, semihyaline, dull black. Spots orange yellow, very variable as in *C. syntomoides*, Btlr. In the forewing the male type lacks the basal spot; lower medial spot small, occupying only half of the space between vein 1 and 2. Discal spot obsolete; two submarginal spots between veins 4/5 and 5/6. Hindwing with the subbasal spot orange yellow, much larger than in *C. syntomoides*. Submarginal spot large.

♀: Frons, thorax and abdomen black. Segments 1 and 5 of the abdomen with yellow bands, the latter closed below. Wings broad, semihyaline, dull black with orange yellow spots. In the type the subbasal spot absent, the lower medial spot small as in the male. Discal spot very large, rectangular, elongated in the direction of the cell. Of the two submarginal spots the upper one smaller than the lower. In the ♀ paratype the lower medial spot dotlike, the discal spot also small and from the two submarginal spots only the lower present. Submarginal spots small, very inconspicuous.

Holotype: ♂; 25 mm. span, Armenia, Agri Dagh, 2500-3000 m., VII.1935, leg. Kotsch.

Allotype: ♀, 25 mm. span, Armenia, Agri Dagh, 2500-3000 m., VII.1935, leg. Kotsch.

Paratype: ♀, 19 mm. span, Armenia, Aktash, 2800 m., 10-20.VI.1935, leg. Kotsch.

Callitomis dimorpha, By.-S., f. **nigerrima** f. nov.

One male has no markings whatever on both wings. They are entirely semihyaline, dull black.

Holotype: ♂, 19 mm. span, Armenia, Agri Dagh, 2500-3000 m., VII.1935, leg. Kotsch.

This new species is the western representative of a genus which has its distribution mainly in India and the Malayan region. The nearest species known, *C. syntomoides*, Btlr. flies in the Sind Valley, Kashmir, and the N.W. Himalayas. *C. dimorpha* is of special interest for its sexual dimorphism, the ♂♂ having orange yellow body, the ♀♀ a black one with two yellow stripes on the abdomen. Furthermore, the ♂♂ have a large subbasal spot on the hindwing which the ♀♀ lack. *C. dimorpha* differs from the nearest *C. syntomoides* by the yellow abdomen and the larger subbasal spot in the hindwing of the ♂ and the large discal spot in the ♀. Perhaps this new species is also near the "*Amata*" *xanthograpt*a, Hmps. (*Cat. Lepid. Phalaena Suppl.*, Vol. I, p. 32, Plate III, fig. 6) from Kashmir, which according to its broad shape of the wings seems to me to belong also to *Callitomis*. *C. dimorpha* differs from this species by its smaller size (19-25 mm. instead of 28 mm.), by the abdomen which is designed in the *xanthograpt*a ♂ as in the *dimorpha* ♀, i.e., black with two yellow bands, but perhaps Hampson's type was a ♀? Assuming this, the *dimorpha* ♀ differs from Hampson's figure 6 by the

lack of the subbasal spots and by the lower medial and the submarginal spots, which are much smaller. It may be worth mentioning that *C. dimorpha* has two pairs of spurs on the hind tibiae, whereas Hampson in *The Fauna of British India, Moths, Vol. I, p. 209*, gives as distinctive character between *Syntomis* and *Callitomis* the presence of 2 pairs of spurs in the former and in the latter one pair of spurs on the hind tibiae. I have not examined any other species of *Callitomis*, but judging from f. 139 on p. 224 of the same work, which shows distinctly 2 pairs of spurs, it seems to me that *C. syntomoides* has also 2 pairs like *C. dimorpha*.

Amata susa sp. nov.

♀: Tips of the antennae black, not grey as in *A. bactriana*, Ersch. All hyaline blotches enlarged and increased. Spot 1 drawn out to a point against the base, outer margin oblique and not straight as in *bactriana*. Spot 3 rectangular, straight on the inner and outer side, not oval as in *bactriana*. Above and below two accessory spots. The lower one can be drawn out towards the base. Spot 4 also with two accessory spots below and above, considerably larger than in *bactriana*. Spot 5 divided by vein 4, the upper one elongated towards the cell. Between spot 4 and 5 only a narrow bridge of black. Hind wing with a very large white spot almost reaching the hind margin and extending above vein 3, that is much more dorsally than in *bactriana*.

Holotype ♀, 42 mm. span, Kasakstan, Targaïsk, Kan-dyk-tan, 1400 m., July.

Paratype: ♀, 37 mm. span, Kasakstan, Targaïsk, Kan-dyk-tan, 1400 m., July.

A. susa comes nearest to the f. *repicta*, Trti. of *A. bactriana*, Ersch. It differs from this species by the dark tips of the antennae, the shape of spots 1 and 3, and especially by the enormous size of these, which let the dark interspace between the spots 2, 3, 4, and 5 appear as a dark blotch on light background, especially in the holotype.

Amata wiltshirei sp. nov.

Head and thorax black, tegulae, pectus and legs yellow, tarsi black. Abdomen with yellow patches on the 1st and 2nd segment, yellow rings on the 3rd, 4th, and 5th, but only the last one closed on the ventral side. Dorsal yellow patch on the 7th segment. Wings cream yellow with reduced black markings. Costa, termen, inner margin up to vein 1 and all veins of the forewing black. Cell yellow, a black transverse streak from below the middle of the cell to the hind margin, sometimes interrupted (fig. 4). A black mark along the discal vein extending into a triangular spot along vein 3. A black bar from the cell into the interspace of veins 5 and 6 never reaching the blank termen. Termen with a black tooth along vein 2 and sometimes also along vein 3, nearly confluent with the elongated spot below the disc (fig. 4). Hindwing with the veins hyaline and the termen on the outer margin black. A large black tooth along vein 2, and 2 little teeth along veins 3 and 5.

Cotypes: A series of ♂♂ (span from 30-36 mm.) from Rayat Kurdistan, Iraq, 24.VI-14.VII.1935, taken by E. P. Wiltshire in coll. Wiltshire, Daniel, and coll. mea.

It is not possible to place this striking new Amatid in Hampson's system (Vol. I, p. 78) as it has 5 or (with the mark on the 7th segment) 6 abdominal bands and head and thorax black. It may conveniently be placed near *A. persica*, Kell. but its general aspect is quite different. *A. persica* is a black species with 5 hyaline spots, while *A. wiltshirei* is a hyaline species with a few black bars. I saw a fresh specimen of *A. persica* taken by Mr Fred Brandt near Shiraz which absolutely agrees with the type figured in Hampson's *Catalogue*, Vol. I, Pl. IV, No. 5. There can be no doubt that *persica* is a good species which varies little. Also *wiltshirei* varies little and the two specimens figured on the plate are about the extremes of variation. They concern the extension of the termen along vein 2 and 3 and the rupture of the cross bar below the cell.

Amata sinana sp. nov.

Antennae ciliated, black with white tips; head black; frons, base of the collar, and thorax yellow; tegulae black, yellowish at their base. Pro- and metathorax with lateral yellow spots. Abdomen with 6 yellow bands, the last 5 ones completely closed below. Tip of the abdomen black; first joint of the hind tarsi whitish.

Forewing blackish brown with a small orange yellow spot at the base. Hyaline spots very large, slightly yellow; the first quadrangular, the second large, truncate, filling almost the entire cell. The subcellular rhomboid touching veins 1, 2 and the cell. Subterminal blotches very large, the lower heart-shaped between veins 3 and 5 and divided by the black vein 4, the apical one between veins 6 and 8 triangular. Hindwing with the hyaline blotch very large, from vein 1 to 4, its outer edge incised on vein 2.

Holotype: ♂, span 35 mm., Szechuan, Ginfu Shan, 4.VIII.1930, leg. Friedrichs.

Allotype: ♀, span 38 mm., Tibet, Menia, Hotshu-River, 2500-3000 m., June-August.

Paratype: ♂, span 38 mm., Tibet, Menia, Hotshu-River, 2500-3000 m., June-August.

A. sinana comes nearest to *A. berinda*, Moore but differs by having all hyaline spots much larger, by having the discal spot elongated and not quadrate, and by the huge hyaline patch in the hindwing which fills out more than the dorsal 2/3 of the wing. *A. sinana* seems to resemble much *A. jankowskii*, Rothsch. from Southern and Central China, but has the frons yellow and not black, the tegulae not entirely yellow and the 5th abdominal ring closed below, while in *jankowskii* segments 4 and 5 reach only the ventral side.

Amata sperbius, F. ssp. **septentrionalis** ssp. nov.

The type form of *A. sperbius*, F. has been described from "East Indies," the type of *A. atkinsoni*, Moore, from Moulmein, Tenasserim.* I have a series of *sperbius* from Kwantung, S. China, which agree equally

*In *P.Z.S.* (1878), 845, Moore recorded *Syntomis atkinsoni* from "Above Ahsown: Naththoung to Paboga," in Upper Tenasserim, but *S. atkinsoni* was originally described by Moore (*P.Z.S.* (1871), 245-346, pl. 18, f. 2) from Yunnan.—T. B. F.

well with the description given by Hampson (*Catalogue Phal.*, Vol. I, p. 106), which is based on the examination of Fabricius' type made by Aurivillius, and the figure of Moore's *A. atkinsoni*.

Specimens from Western China and Tibet differ remarkably from the type form by the absence of the hyaline spot above vein 7. Hyaline patch on the hindwing very large with a large spot above vein 2 reaching even into the cell. Below vein 1 a large stout tooth from the black margin into the hyaline area. Base and inner margin only narrow and slightly yellowish.

Holotype: ♂, 25 mm. span, S.E. Szechuan, Ginfu Shan, 5.VIII.1930, leg. Friedrichs.

Allotype: ♀, 22 mm. span, Szechuan, Mountains near Ning yen fu.

Paratype: 1 ♂, Tibet, Menia, Hotshu-River, 2500-300 m., June-August.

Amata sperbius, F. ssp. **gressitti** ssp. nov.

Forewing as in *A. sperbius*, F., with the spot above vein 7 always present. Hindwing with the hyaline patch much reduced, occupying less than the inner half of the wing; outer border straight. The anal two-thirds of the patch richly coloured with bright yellow.

This form has already been noted as different by Seitz in *Indoaustralische Spinner und Schwärmer*, p. 68, but not named. It represents undoubtedly a valid subspecies.

Cotypes: 2 ♂, 1 ♀, 24-28 mm. span, Hainan, Nodoa, 30.V.1935, leg. L. Gressitt.

Amata compta, Wlkr. f. **szechuana** f. nov.

Differs from the description and figure given by Hampson (*Cat.*, Vol. I, p. 99, pl. V, fig. 1) from Assam, Khasi Hills, by its more yellowish ground colour. All black marks more pronounced, especially on the veins; apex and bar between veins 5 and 6 broader black. On both wings an extremely large black tooth along vein 2, which in Hampson's figure is feebly indicated on the forewing.

Holotype: 1 ♀, 40 mm. span, Szechuan, Ginfu Shan, 1800 m., 20.V.1930, leg. Friedrichs.

Amata menia sp. nov.

Nearest to *A. compta*. Tips of the antennae white; frons, collar, tegulae, ventral side of the thorax and tarsi orange. Black designs similar to *A. compta* but less broad on the apex. Cross vein above vein 6 broader black. Black margin narrow, very little enlarged on vein 2. Inner margin entirely black up to vein 1, whereas in *compta* only the basal half is black. Fringes below the apex white. Hindwing with a narrow black termen.

Holotype: ♂, 37 mm. span, Tibet, Menia, Hotshu-River, 2500-300 m. June-August.

Allotype: ♀, 37 mm. span, Tibet, Menia, Hotshu-River, 2500-300 m. June-August.

Paratype: 1 ♂, 37 mm. span, Tibet, Menia, Hotshu-River, 2500-300 m. June-August.

EXPLANATION OF PLATE X.

1. *Amata susa*, sp. nov. ♀ Holotype.
2. *Amata susa*, sp. nov. ♀ Paratype.
3. *Amata wiltshirei*, sp. nov. ♂ Cotype.
4. *Amata wiltshirei*, sp. nov. ♀ Cotype.
5. *Amata sperbius*, ssp. *gressitti*, ssp. nov. ♂ Cotype.
6. *Amata sperbius*, ssp. *gressitti*, ssp. nov. ♀ Cotype.
7. *Amata sperbius*, ssp. *septentrionalis*, ssp. nov. ♂ Holotype.
8. *Amata sperbius*, ssp. *septentrionalis*, ssp. nov. ♀ Allotype.
9. *Amata sinana*, sp. nov. ♂ Holotype.
10. *Amata compta*, f. *szechuana*, f. nov. ♀ Holotype.
11. *Amata menia*, sp. nov. ♂ Holotype.
12. *Amata menia*, sp. nov. ♀ Allotype.
13. *Callitomis dimorpha*, sp. nov. ♂ Holotype.
14. *Callitomis dimorpha*, sp. nov. ♀ Allotype.
15. *Callitomis dimorpha*, f. *nigerrima*, f. nov. Holotype.

LIST OF TRYPETIDAE (DIPTERA) TAKEN IN NORTH KENT.

By H. W. ANDREWS, F.R.E.S.

This list makes no pretence of being complete and consists solely of such species as I have captured or bred in the course of collecting in my home district. This district is bounded on the North by the R. Thames; on the West by the county boundary between Kent and Surrey; and on the South by the line of chalk downs to Wrotham, then eastwards to Rochester and the R. Medway. It includes marshlands, woodlands, and chalk downs.

In view of the attractive appearance of Trypetids and the fact that the majority of species can be collected in their early stages and bred, it is a pity that there is no up-to-date work in English on the family. As regards the early stages, however, there is a recent paper by Mr Niblett, of outstanding value, giving the food plants, where known, of all our recorded British species, and also those of a number of species, hitherto unrecorded as British, but whose food plants occur in this country. Local Lists of *Trypetidae* have been published by Mr Audcent (Bristol District); Mr Hamm (Oxford District); Mr Saunt (Warwickshire); and Mr Thornley (Cornwall); and I have put the initials A., H., S., and T. against such N. Kent species as are also recorded in their Lists. In a brief bibliography at the end of this paper I give details of these Lists and of some other works dealing with Trypetids.

The following diagnosis of the family is quoted from "Bristol Diptera" by kind permission of Mr Audcent:—"Medium to small flies, mostly with banded or latticed wings. Costa with two breaks, one at apex of humeral cross vein, the other further from base about where subcostal should end: second longitudinal vein (R_1) often turned up suddenly at apex. Two basal cells, the lower one often prolonged to a point along the anal vein: a row of fronto-orbital bristles close to the eye; no preapical bristle on tibiae. Female ovipositor long (as a rule). Larvae live in plants, some forming galls in stems and flowerheads, others mining stems and leaves."

The nomenclature and arrangement of this List follows that of Mr Niblett's paper.

- Euribia (Urophora) cardui*, L. Generally common in larval galls. Perfect insect rarely taken. Bred from various localities. (A., H., S., T.)
- E. jaceana*, Hering. Common and generally distributed. Bred and captured. This species (formerly recorded under *U. solstitialis*) is one of those with variable wing pattern. (A., H., S., T.)
- E. quadrifasciata*, Mg. Generally distributed but not common. Bred and captured. (H., S.)
- E. stylata*, Fab. Generally distributed and very common. Bred and captured. One of the most variable species as regards wing pattern. (A., H., S., T.)
- Myopites longirostris*, Lw. (*frauenfeldi*, Sch.). Swept from its food plant, *Inula crithmoides*, L. Near All Hallows-on-Sea, 15.vii.39.
- Rhagoletis (Spilographa) alternata*, Fab. A few bred (1935) from wild rose hips taken at Darenth, 1934; not seen since in larval or imaginal stages, though often looked for. (A., S.)
- Trypeta zoë*, Mg. Bred and captured. Widely distributed but not too common, usually taken in single specimens. (A., H., S., T.)
- Phagocarpus permundus*, Harr. (*Anomoea antica*, Wied.). A small series bred from pupae from hawthorn berries near Wrotham, given to me. This species was formerly considered rare but seems to have extended its range in recent years, and has occurred in many localities, including Norwood, S.E.
- Acidia cognata*, Wied. Only captured once, Thames Marshes, September 1934. Several attempts to rear it from mined leaves of coltsfoot have failed. (H., S., T.)
- Philophylla (Acidia) heraclei*, L. Generally distributed. Bred and captured. Varies in body colour. Both the light form, *onopordinis*, Fab., and the dark form, *centaureae*, Fab., occur. (A., H., S., T.)
- Ceriocera ceratocera*, Hendel (*Trypeta cornuta*, Fab.). Bred and captured. Eynsford, where its food plant, *C. scabiosa*, L., is common. (A., H., T.)
- Chaetostomella (Trypeta) onotrophes*, Lw. (syn. *Orellia cylindrica*, R.-D.). Generally distributed and common. Bred and captured. Wing pattern somewhat variable. (A., H., S., T.)
- Terellia serratulæ*, L. Bred and captured. Not common but widely distributed. (A., H., S., T.)
- Orellia (Trypeta) colon*, Mg. Bred and captured. Eynsford, on *C. scabiosa*. Extremely variable in colour ranging from forms with antennae and legs mainly black, and black-tipped palpi, through intermediate forms, to specimens with antennae, palpi, and legs mainly pale. The intensity of the wing markings also very variable but not in correlation with antennae, legs, etc. (H., T.)
- Orellia falcata*, Scop. Confined so far as I know to one small locality in the Thames Marshes near Abbey Wood. Wing pattern somewhat variable.
- O. ruficauda*, Fab. (*florescentiae*, L.). Common and widely distributed. Wing pattern somewhat variable in intensity. (A., H., S., T.)
- O. tussilaginis*, Fab. Generally distributed and not uncommon. Bred and captured. (A., H., S., T.)
- O. winthemi*, Mg. Bred and captured, from chalk districts only.

- Xyphosia (Tephritis) miliaria*, Schr. Very common and generally distributed. (A., H., S., T.)
- Paroxyna misella*, Lw. Thames Marshes near Dartford, swept from wormwood (*A. absinthium*, L.).
- P. loewiana*, Hendel. Once only, at Farningham.
- P. plantaginis*, Hal. Bred and captured in one locality in the Thames Marshes near Dartford, where its food plant, *Aster tripolium*, L., occurs plentifully.
- P. parvula*, Lw. = *absinthii*, of the British List. One or two odd specimens swept in same locality as *P. plantaginis* above.
- Sphenella marginata*, Fln. Common and generally distributed. (A. H., T.)
- Ensina sonchi*, L. Common and generally distributed. Bred and captured. (A., H., T.)
- Tephritis bardanae*, Schr. Bred from heads of burdock from Halsted. Given to me. (A., H., S., T.)
- T. hyoscyami*, L. Hybernated specimens swept sparingly from heather in March and April. Not taken otherwise. (H., T.)
- T. leontodontis*, De G. Hybernated specimens swept commonly as above. Occasionally taken in summer months. (A.)
- T. vespertina*, Lw. Hybernated specimens swept commonly as above. Taken also in summer months. (A., H., S., T.)
- Trypanea (Urellia) stellata*, Fues. Odd specimens swept in Thames Marshes; once found in abundance at Farningham by sweeping camomile, *Anthemis arvensis*, L. (T.)

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*Out of print for some years.

†A limited number of reprints of this paper are on sale. See "Ent. Record Publications" inside front cover.

NAMES OF MICROLEPIDOPTERA.

By T. BAINBRIGGE FLETCHER, R.N., F.L.S., F.R.E.S., F.Z.S.

(Continued from p. 127.)

18. *NOTOCELIA AQUANA*, Hb. 1796-1799.

Tortrix aquana, Hb., Samml. Eur. Schmett., Tortr. t. 4, f. 17 (1796—24.xii.1799).

Tortrix roborana, Schiff., Wien. Verz., p. 131, No. E. 34 (1775) [*nomen nudum*: only noted as a *nondescript* larva on *Quercus robur*].

Pyralis cynosbana [nec Fb. 1775], Fb., Mantissa, II, 238, No. 127 (1787) ["*roborana* Wien. Verz. 131-34"]; Fb., Ent. Syst., III, ii, 283, No. 167 (1794) [*partim*: "*roborana*, Wien. Verz. 131-34," but excluding other refs. to Linn. and de Geer].

Hedya cynosbatana, Hb., Verz., p. 380, No. 3661 (1826) ["*Aquana* Hübner. Tor. 17"].

Penthina roborana, Treits., Schmett. Eur., VIII, 30-31, No. 5 (1830) [Descr., but doubtful; a mixture of spp. under synonymy: Tr. says larva *Rosa canina*].

Notocelia roborana (S.V.) Tr.: Rebel, Cat. Pal. Lep., II, 115, No. 2062 (1901) ["*Aquana* Hb. 17"].

Notocelia roborana, Treits.: Meyr., Rev. Handb., p. 541, No. 4 (1928).

Schiffermüller's name has no validity and Hübner's name *aquana* seems applicable to this species.

19. *EUCOSMA MERCURIANA*, Frölich 1828.

Tortrix mercuriana, Fröl., Enum. Tortr. Württ., pp. 73-74, No. 170 (1828); Geyer in Hübner's Samml. Eur. Schmett., Tortr., t. 51, f. 322 (ix—31.xii.1830).

Sericoris subsequana, Steph., Ill. Brit. Ent., Haust., IV, 136 (1834); Wood, f. 1021.

Coccyx monticolana, Dup., Lep. Fr. Suppl., IV, 408-409, t. 83, f. 3 (18.viii.1843).

Pamplusia alticolana, Steph., List Brit. Anim. B.M., X, pp. 52, 100 (1852).

Steganoptycha mercuriana, Hb.: Rebel, Cat. Pal. Lep., II, 112, No. 2001 (1901).

Eucosma mercuriana, Hb.: Meyr., Rev. Handb., p. 546, No. 2 (1928).

This species must be ascribed to Frölich, not to Hübner.

20. *EUCOSMA RUBIGINOSANA*, H.S. 1851.

Steganoptycha rubiginosana, H.S., Schmett. Eur., IV, 282, No. 449 (1851), t. 26, f. 185 ["*rubiginosana*" only] (1848).

Poecilochroma bouchardana, Stainton, Manual, II, 238 (1.i.1859); Willk., Brit. Tortr., p. 186, No. 3 (1.v.1859).

Steganoptycha rubiginosana, Rebel, Cat. Pal. Lep., II, 112, No. 2000 (1901).

Eucosma rubiginosana, Meyr., Rev. Handb., pp. 546-547, No. 5 (1928).

The synonym *bouchardana* was validated by Stainton. It appears in Doubleday's *Synonymic List* (ed. ii: 1859), p. 22, col. 3, as *Mixodia bouchardana*, Dbl., without any reference to synonymy, but was apparently never described by Doubleday.

21. *EUCOSMA GRISEANA*, Hb. 1796-1799.

Tortrix griseana, Hb., Samml. Eur. Schmett., Tort., t. 21, f. 135 (1796-24.xii.1799).

?*Orthotaenia lepidana*, Westw., Brit. Moths, II, 172, No. 7, t. 99, f. 11 (1844).

Sphaleroptera diniana, Guenée, Ann. S.E. Fr., (2) III, 167 (x.1845), Eur. Microlep. Index, p. 33 (v.1846).

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Grapholita pinicolana, Zeller, Isis, XXXIX, 242-243 (iv.1846).

?*Sciaphila abieticolana*, Bruand, Mém. Soc. Emul. Doubs, III (5 and 6), p. 8, No. 1012 (1850: ?1849): *id.*, Cat. Microlép. Doubs, p. 42, No. 1012 (1850).

?*Sciaphila nigrofasciana*, Bruand, Mém. Soc. Emul. Doubs, III (5 and 6), p. 8, No. 1013 (1850: ?1849): *id.*, Cat. Microlép. Doubs, p. 42, No. 1013 (1850).

Cydia pseudotsugana, Kearfott, Canad. Ent., XXXVI, 110 (1904).

Semasia diniana var. *desertana*, Kennel, Pal. Tortr., p. 488, t. 19, f. 28, ♀ (1916).

Steganoptycha diniana, Rebel, Cat. Pal. Lep., II, 110, No. 1977 (1901).

Zeiraphera diniana, Heinrich, U.S. Nat. Mus., Bull. 123, pp. 171-172, No. 3, t. 43, f. 287 (1923) [♂ genit.].

Eucosma diniana, Meyr., Rev. Handb., p. 547, No. 7 (1928).

This is standing in the B.M. Collection as *griseana*, Hb., and Hübner's figure agrees with some specimens of this variable species. Probably Bruand's two names also apply here, as this may easily be mistaken for a *Cnephasia* (*Sciaphila*).

22. *EUCOSMA MYRTILLANA*, Westwood 1844.

Sericoris myrtillana, Westw., Brit. Moths, II, 146, No. 14, t. 89, f. 15 (1844).

Grapholitha vacciniana, Zeller, Isis, XXXIX, 248-249 (1846).

Steganoptycha vacciniana, Rebel, Cat. Pal. Lep., II, 111, No. 1987 (1901).

Eucosma vacciniana, Meyr., Rev. Handb., p. 548, No. 9 (1928).

Westwood's *British Moths* is quoted as "1851" in Staudinger's Catalogue (p. xxvi). Volume II was published in parts in 1844-1845 (all the Tortricina apparently in 1844), and Continental authors have been misled by quoting later editions of Westwood. Rebel correctly quoted *myrtillana* as being the same species as *vacciniana*, but apparently did not realize that Westwood's name, which was not praeoccupied, has two years' precedence over Zeller's.

23. *EUCOSMA RATZEBURGIANA*, Saxesen 1840.

Coccyx ratzeburgiana, Saxesen in Ratzeburg's Forst. Ins., II, 227-228, t. 12, f. 3 (1840).

This species was described by Saxesen. Cataloguers have contracted the reference to "Ratz. Forst. Ins.," and copiers have therefore attributed the description to Ratzeburg. On p. 215 of Ratzeburg's book it is plainly stated, "Die Beschreibung der Fichtenwickler rührt von Hrn. Saxesen her."

24. *ARGYROPLOCE CORTICANA*, Schiff. 1775.

Tortrix corticana, Schiff., Wien. Verz., p. 131, No. E.29 (1775).

Tortrix corticana, Hb., Samml. Eur. Schmett., Tort., t. 3, f. 13 (1796-24.xii.1799).

Apotomis turbidana, Hb., Verz., p. 380, No. 3664 (1826) ["*Corticana*, Hüb., Tor., 13"].

Tortrix picana, Frölich, Enum. Tort. Württ., p. 49, No. 101 (1828) ["*T. corticana*, Hüb., Tort., t. 3, f. 13, opt. "]

Olethreutis corticana, Hb.: Rebel, Cat. Pal. Lep., II, 103, No. 1865 (1901).

Argyroploce corticana, Hb.: Meyr., Rev. Handb., p. 570, No. 5 (1928).

Both Rebel and Meyrick list two species as "*corticana*, Hb.," although obviously the double employment of the combination *Tortrix corticana* by Hübner was not allowable; Hübner himself was apparently aware of this, as he renamed both these species in his *Verzeichniss*, and Frölich also renamed this species for the same reason, but in any case the combination *Tortrix corticana* was praeoccupied by Schiffermüller in 1775, so that neither of Hübner's names (*corticana*) can stand. The question is, what was *corticana*, Schiff.? This was not among the species redescribed from the Schiffermüller collection by Fabricius in 1787, and in 1801 Illiger (*Wien. Verz.* (ed. ii), II, 66) marked it "†" [=not then present in the collection] but quoted "*T. corticana*, Hüb., Wickl., t. 3, f. 13," against *corticana*, Schiff., without any query. In 1821 Charpentier and Zincken (*Zinsler*, etc., pp. 85-86 and footnote 105) commented on a specimen [apparently of an *Evetria* sp.] which was then placed under No. E.29 in the Vienna Collection; but, as this was evidently not Schiffermüller's original specimen, which was not there when the collection was gone over by Fabricius and Illiger, their remarks on it have little value in this connection. Werneburg (*Beitr. Schmett. Kunde*, I, 462-463, and p. 554, Note 294) in 1864 thought that *corticana*, Schiff., was probably the same as *corticana*, Treits. [*i.e.*, *Eucosma*], but this was merely a guess. It seems best to accept Illiger's definite citation of Hb., t. 3, f. 13, as exemplifying *corticana*, Schiff., Illiger's statement to this effect probably being founded on a local tradition as to what *corticana*, Schiff., really was, and to use *corticana*, Schiff., for this *Argyroploce*, thus merely changing the author and not the specific name.

25. *EUCOSMA ISERTANA*, Fb. 1794.

Pyralis isertana, Fb., Ent. Syst., III, ii, 281-282, No. 163 (1794).

Tortrix communana, Hw., Lep. Brit. [iii], p. 443, No. 157 (1811).

- Tortrix corticana*, Hb., Samml. Eur. Schmett., Tort., t. 33, f. 209 (1811-20.vi.1813) and t. 43, f. 270 (1.i.1818-21.i.1819).
- Tortrix adustana*, Hb., Samml. Eur. Schmett., Tortr., t. 34, f. 218 (1811-20.vi.1813).
- Epinotia kuhlweiniana*, Hb., Verz., p. 377, No. 3624 (1826) [“*Corticana*, Hübn., Tor., 209 ”].
- ?*Pyralis communana*, Fb., Ent. Syst., III, ii, 259, No. 69 (1794) [Italy].
- ?*Pyralis cuviana*, Fb., Ent. Syst. Suppl., p. 478, No. 94/95 (1798) [Kiel].
- Steganoptycha corticana*, Hb.: Rebel, Cat. Pal. Lep., II, 110-111, No. 1978 (1901).
- Eucosma corticana*, Hb.: Meyr., Rev. Handb., p. 548, No. 11 (1928).

The name “*corticana*, Hb.” cannot stand for this species, being twice praeoccupied (see under No. 24). It is rather doubtful what is the first valid name which is applicable to this common and variable species, but the first description known to me, which seems to fit it, is that of *isertana*, described by Fabricius from woods in Denmark. This greenish-fuscous form is relatively scarce but one does find specimens of this *Eucosma*, which agree with this description, and these generally occur in wooded districts. Rebel quotes *isertana* with a query, but it seems reasonably certain that *isertana*, Fb. = *corticana*, Hb., f. 209, this figure being coloured green and fuscous. In 1811 Haworth described this species as *Tortrix communana* under ten different forms, remarking “maxime variat,” and quoted it as “*Pyralis communana*, Fab., Ent. Syst., 3, 259, 69 ?.” Haworth noted his form *epsilon* as “*P. cuviana*, Fb. ?” [really *cuviana*, named after Cuvier] and his form *zeta* as ? *marmorana*, Fb. [which is apparently a synonym of *Ancylis achatana*]. The name, *Pyralis communana*, Fb., 1794, may apply to this species (and, if so, has precedence over *isertana*) but the description is not sufficiently exact to be certain of it. There is no doubt about this species being Haworth’s *Tortrix communana* (not a primary homonym of *Pyralis communana*, Fb., should these be different species): it was redescribed as *communana* by Stephens in *Poecilochroma* (*Ill. Brit. Ent. Haust.*, IV, 139-140, 1834), and figured by Wood (*Index Ent.*, t. 34, f. 1029, 1836). Those who do not like to use *isertana*, Fb., for this species can use *communana*, Haw., or *adustana*, Hb., but certainly not *corticana*, Hb.

26. *EUCOSMA HOHENWARTIANA*, Schiff. 1775.

- Tortrix hohenwartiana*, Schiff., Wien. Verz., p. 129, No. D 15 (1775).
- Tortrix pupillana*, Hb., Samml. Eur. Schmett., Tort., t. 4, f. 20 (1796—24.xii.1799) [nec *pupillana*, Clerck 1759, which is also an *Eucosma*].
- Tortrix scopoliana*, Hw., Lep. Brit. [iii], p. 456, No. 198 (1811) [nec *Tortrix scopoliana*, Schiff., Wien. Verz., p. 129 (1775), which is a synonym of *Eucosma foenella*, Linn.].
- Epiblema hohenwartiana*, Schiff.: Hb. Verz., p. 375, No. 3598 (1826) [“*Pupillana*, Hübn. Tor. 20 ”].
- Epiblema scopoliana*, Hw.: Rebel, Cat. Pal. Lep., II, 116, No. 2085 (1901).
- Eucosma scopoliana*, Hw.: Meyr., Rev. Handb., p. 554, No. 31 (1928).

The correct name for this species seems to be *hohenwartiana*, Schiff., the name (sometimes *hohenwarthiana*) which was applied to it by

Hübner, Guenée, Herrich-Schäffer, Doubleday, and Wilkinson. Illiger (*Wien. Verz.* (ed. ii), II, 58: 1801) definitely quoted against *hohenwartiana*, Schiff., Hübner's figure 20 (*pupillana*) and also *strigana*, Fb.; but, as Charpentier explained (*Zinsler*, etc., pp. 65-66: 1821) the Schiffermüller Collection contained three specimens, the first two being *pupillana*, Hb., f. 20, the other being [*strigana*, Fb. 1775=] *hypericana*, Hb., f. 23, Schiffermüller having considered the latter (of which he says "man findet ihn auch goldgelb") as a variety of the former "Graubrauner Wickler mit silberfärbigten Untenrandhäckchen" (= *pupillana*, Hb.). In view of Illiger's definite statement in 1801 (corroborated by Charpentier in 1821 and by Hübner himself in 1826), after examination of Schiffermüller's specimens, that *hohenwartiana*, Schiff., was the same species as *pupillana*, Hb., f. 20, I do not see how we can refuse to accept their identification.

SOME HEMIPTERA OF EASTON.

By T. FRED. MARRINER.

Easton is an area of North-east Cumberland hitherto neglected by the naturalist except at one or two points of its outskirts, because of its inaccessibility. I am endeavouring to learn something of its natural history. Unless otherwise stated, all the following have been got within a small radius of my house "Yadhill," Easton, and there is much of the area further afield still to be collected over.

HETEROPTERA.

- Picromerus bidens*, L.—Two mature specimens at Fallend, 29.viii.36.
- Acanthosoma interstinctum*, L.—Not uncommon in 1936 and 1937.
- Elasmotethus griseus*, L.—I came across a cluster in September 1935 but only managed to secure a couple.
- Neides tipularius*, L.—A single specimen turned up in my garden on 18th April 1939. A strong westerly wind was blowing, and had done for a few days, and the insect had probably come with it, as it is only known on the coast here. I had a similar experience with the Coleopteron, *Cantharis darwinianus*, Sh., which I took on the wing near Longtown, probably blown from the Solway marshes, a known habitat.
- Orthostira (Acalypta) parvula*, Fall.—Taken on several occasions in the sweep net.
- Dictyonota strichnocera*, Fieb.—I got two specimens of this beautiful insect from whin in August 1935. These whins have since been cleared and burnt and I have not found the insect elsewhere.
- Monanthia cardui*, L.—Beds of thistle are all too common here and yield this insect fairly plentifully.
- Gerris lacustris*, L.—Is common.
- Nabis limbatus*, Dahl.—A common insect here.
- Salda scotica*, Curt.—Not uncommon by some of the streams. It was taken years ago at Bewcastle, by the late G. B. Routledge.
- Salda saltatoria*, Curt.—Not uncommon on Lyneside and by Raeburn in August 1936.

- Miris calcaratus*, Fall.—Occurs often in the sweep net.
Miris holsatus, Fab.—Swept fairly frequently off grass.
Phytocoris longipennis, Flor.—Fairly common.
Phytocoris ulmi, L.—Common on bramble and nettle, less frequently on hawthorn.
Calocoris bipunctatus, F.—Swept commonly.
Calocoris sexguttatus, F.—Fairly common on nettle in middle and lower areas, scarce in the higher eastern area.
Plesiocoris rugicollis, Fall.—Got two specimens on currant bushes in garden, 1936.
Lygus pratensis, L.—Common.
Zygimus (Camptozygum) pinastri, Fall.—Sparingly on fir.
Liocoris tripustulatus, F.—Commonly taken among nettles and in hedge-row sweeping.
Anthocoris confusus, Reut.—Common.
Phylus melanocephalus, L.—Got sparingly from oak in July 1936.
Psallus ambiguus, Fall.—Fairly common on alder in lower and middle areas.
Plagiognathus chrysanthemi, Wolff.—Swept fairly commonly.
Poecilosecytus (Charagochilus) gyllenhalii, Fall.—Scarce on nettle.
Cryptostemma alienum, H.S.—Mr F. H. Day of Carlisle found this common by the Liddell at Penton in May 1926 (*Trans. of Carlisle Nat. Hist. Society*, iv, p. 118).
Actorhinus angulatus, F.—Not infrequent on alder.
Piezodorus lituratus, F.—Was fairly common on whin here in 1936.

HOMOPTERA.

- Philaenus spumarius*, L.—Very common and in variety. Sometimes appears for a few days in big numbers.
Megophthalmus scanicus, Fall. Fairly commonly swept.
Evacanthus interruptus, L.—Got freely in one place, 7.vii.35.
Bathoscopus (Oncopsis) alni, Schr.—A friend took this when sweeping with me.
Bathoscopus (Oncopsis) rufusculus, Fieb.—Rather scarce.
Bathoscopus (Oncopsis) flavicollis, L.—Not uncommon.
Macropsis lanio, L.—Rather rare.
Idiocerus confusus, Flor.—Got two specimens, 6.vi.36.
Agallia puncticeps, Germ.—Swept sparingly on road verge.
Acocephalus nervosus, Schr.—Has only occurred to me once.
Athysanus grisescens, Zett.—Swept by a friend near my house.
Thamnotettix prasinus, Zett.—Not uncommon.
Empoasca smaragdula, Fall.—Fairly common.
Cixius nervosus, L.—Apparently rare here.
Conomelus limbatus, Fall.—Once got, 21.iv.36.
Dicranotropis hamata, Boh.—Scarce here.
Livia juncorum, Latr.—Not uncommon.
Psylla försteri, Flor.—Taken freely in August 1936, but have not seen since.
Psylla melanoneura, Först.—Not uncommon.
Arytaena genistae, Lat.—Not found plentiful but odd specimens have turned up at times.
Trioza urticae, L.—Common.

COLLECTING NOTES.

AUTUMN NOTES.—This autumn has been remarkable for the abundance in our garden here (Chelmsford) of *Vanessa atalanta* and *V. c-album*. On 10th September, no less than 15 *atalanta* were flying and feeding upon fallen plums, and a very pretty sight it was. All were in fine condition and had probably, most of them, recently emerged. Then a week later, on 17th September, ten fine fresh *c-album* made their appearance, all feeding upon fallen plums, and flying about the garden. Wasps, bees, flies and butterflies, jostled each other in trying to get their share of the fruit. Even to-day, 2nd October, there are six "Commas" still flying in this garden, and I have seen to-day only one or two *atalanta*. There are also several large dragonflies flying about the same part of the garden, and on 25th September I picked up a forewing of a fine *atalanta* and wondered whether the dragonflies had caught the butterfly! Yesterday afternoon, 1st October, about 3.30, I was watching the "Commas," and noticed one of them flying right away towards some weeds. I followed it, and saw it alight upon a sow-thistle. When I got there, I saw the "Comma" settled head downwards upon a dead leaf of the thistle; the plant was half-dead and some of the leaves were quite brown and dead, and so much like the butterfly's underside that it was most difficult to see the insect at all, if one did not know it was there. The sun was still shining brightly, and shining upon the "Comma," but the butterfly had evidently settled for the night. At first the antennae were showing, but after about a quarter of an hour, and although the sun was still shining on it, it folded its antennae between its wings, and was motionless. It did not change its position, for I visited it from time to time during the evening, and it was still there this morning until eleven o'clock, although it was a bright sunny morning. It had flown, however, by twelve o'clock. I was also watching another "Comma" yesterday afternoon, sunning itself upon a currant bush. I left it there at 4.30 in the afternoon, and at 6.30 went again to have a look round and to my astonishment, saw the same butterfly with wings and antennae folded and quite settled for the night! It was sitting right across the middle of the upper part of a currant leaf, and quite exposed to the weather. This morning it was in the same position until 10.20 a.m., when it flew off, no doubt feeling the warmth of the sun on it. Last night was cold, the wind being easterly. Until 1934 I had not seen *c-album* in this district.—M. E. MILLER, "The Croft," Rainsford Lane, Chelmsford.

NOTES ON BREEDING PYRAUSTA NUBILALIS, HÜBN.—As recorded in the January number of the *Entomologist's Record*, I collected a number of stems of *Artemisia vulgaris* tenanted by larvae of the above species at Benfleet, Essex, in October 1938. At that time the majority appeared, by their size, to be nearly full fed. They were kept outdoors and supplied with stems of *Artemisia* cut to convenient lengths. The larvae were very active and industrious, excavating tunnels in the stems with great energy, the excavated material forming little heaps where it fell. During the cold weather the larvae remained inactive in the hollowed stems. It was noticed that in April and onwards the larvae became active again, and some more dead stems of *Artemisia* were introduced,

into which some of the larvae immediately burrowed. Others appeared to be satisfied with their shelters, and by the end of June a number of the larvae had pupated. The first of my moths emerged on 7th July, but I was informed they were already flying by this date at Benfleet, where no doubt they had been subject to more direct sunlight than had my batch. Some of the larvae were still active the first week in August, and the latest date of emergence was 23rd August. The males of this species are quite dark (fuscous) in colour, and contrast with the pale straw-coloured females.—S. WAKELEY, 4 Auckland Road, Upper Norwood, London, S.E.19 (19.x.39).

CURRENT NOTES.

Our long-time friend and correspondent, Kenneth J. Hayward, F.R.E.S., F.Z.S., F.R.G.S., continues his work on the Lepidopterous fauna of the Argentine. Recently he has sent us another half-a-dozen separates, of which three deal with the Hesperioidea. Parts III and IX of the "Hesperiids of the Argentine" contain descriptions of species newly recognised as being found in the country and newly found or differentiated species, in which he has received much help from the authorities of the British Museum. The third pamphlet treats of the genus *Butleria*, Kirby, with seven species. The fourth separate is an annotated list of "Rhopalocera taken in the Yungas de Bolivia" in 1931, March and April, some 250 species. The *Hesperiidae* await further study. The fifth separate is an account of the "*Riodinidae* (*Erycinidae*) of the Argentine" with new species and forms; this is condensed into about 60 pp. The sixth is the Description and Biology of a Noctuid, of which he kindly sent us examples when he first met with the species. It is *Speocropia smilacis*, Hayw., belonging to the Acronyctinae. This work is the more commendable being carried on in the country by one in touch with all the Lepidopterists and collections in the State.

The Royal Entomological Society will continue the normal services of the Society to its Fellows with certain changes of date and time of meeting of which notice will be sent to each member.

The Society for British Entomology, whose headquarters are in Southampton, has been compelled to suspend all meetings owing to the dispersal of so many officers and members on various duties, and no election of new officers will take place until the Council consider it practicable, but the publications will be carried on so long as suitable matter comes to hand.

The intensive work on the biology of Ants and on the Distribution of Coleoptera in Britain by our colleague, Mr H. Donisthorpe, gets recognition and appreciation from specialists in other lands. We cull from two letters. Mr M. R. Smith, of the U.S. Department of Agriculture, writes: "Several days ago we received a letter requesting considerable information on the Biology of the Ant, *Formica fusca*, L. The desired information was obtained from *British Ants*, a copy of which I keep on my desk for reference at all times." From S. Africa, a well-known

coleopterist, Mr Omer Cooper, comments on the "charming work on Windsor Forest, a real monument of industry and marvellous skill in collecting."

The South London Entomological Society have been unable to hold their Annual Exhibition of Varieties this October owing to the proprietors of the Exchange Buildings having removed suddenly in June last, and the Society has been homeless. Mr S. G. Castle Russell, who has so long interested himself in varieties of Lepidoptera, has suggested that in order to get all records of such, which may have been met with this season, and would in all probability have been shown, he would be willing to do all he could to obtain such information, with the view of publishing it in the "Entomologist's Record" if willing to accept it. This we should be willing to accept, and we could also say that the reports would not have to be cut as might possibly be necessary on account of expense in the "Proceedings" of the Society. Arrangements might be possible by which the Society could have reprints and add additional and correctional notes, with plates if needed, in their "Proceedings." I trust all prospective exhibitors will communicate with S. G. Castle Russell, Esq., "Cotswold," Forest Gardens, Lyndhurst, Hants.

SOCIETY.

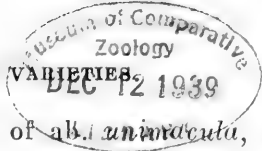
On Saturday, 4th November, the S. London Entomological and Nat. Hist. Society held its first meeting in its new quarters, the Chapter House of St Saviour's Cathedral, in St Thomas Street, Southwark, situated only about 200 yards from the building which had for so many years housed its collections and Library. In spite of the incidental difficulty in crossing London on that particular afternoon, about fifty members assembled. A considerable discussion took place as to limited arrangement and the Council were given instructions to make all arrangements for future meetings, etc. General satisfaction was expressed as to the position of the rooms, as to convenience of access, and as to the amenities for the carrying on of all the usual activities of the Society, Meetings, Consultation of Library and Collections, Use of the Lantern, and in a future year, if circumstances permitted, a special hall was available for the Annual Exhibition.

SPECIAL NOTICE.—May we again remind those readers who have not yet paid their subscription to the current volume that the Treasurer would be pleased to hear from them.—6 Footscray Road, Eltham, London, S.E.9.

Owing to temporary difficulties in distribution the magazine has been unusually late in October and November.

CORRECTION.—P. 147, line 10 from the bottom, read "Capables" not "Calpables."

13820



Splr., *Schm. Eur.*, I, 152, 1905, remarked of ab. *unimacula*, Stdgr. (Spain), "Probably another species."

H.-S., *Bearb.*, II, 340 (1851), grouped the three European species together and figured *leucogaster* on plt. I, 1 (1843). His main differences between *plecta* and *musiva* are size $\frac{1}{3}$ larger, the whitish costal area in the former goes beyond the reniform, in the latter it ends at the reniform, the marginal line is devoid of dots, and the light collar is heavily black margined behind, while in the former it is black margined in front.

Gn., *Noct.*, I (V), 326 (1852), placed *plecta*, *leucogaster*, [*ochrogaster* (N. America)], and *musiva* grouped together. He refers to the "extreme resemblance of *leucogaster* to *plecta*."

Hufn., *Berl. Mag.*, III, 300 (1766), described an insect under the name *ignobilis*, which was believed to be this species, but Rott., *Naturf.*, IX, 120 (1776), says that the evidence is not sufficient to recognise *plecta*.

Tutt, *Brit. Noct.*, II, 126 (1892). Smith, *Cat. Noct. N. Am.*, 74 (1893): Barr., *Lep. Br. I.*, IV, 40, plt. 141, 2 (1897): Stdgr., *Cat.*, III ed., 142 (1901): Hamp., *Lep. Phal.*, IV, 405 (1903): Splr., *Schm. Eur.*, I, 152, plt. 33, 27 (1905): South, *Moths Br. Is.*, I, 228, plt. 110, 7 (1907): Warr.-Stz., *Pal. Noct.*, III, 44, plt. 9k (1909): Culot, *N. et G.*, I (1), 55, plt. 8, 13.

Most authors have given satisfactory figures of this generally distributed species.

Ernst & Ingr., *Pap. d'Eur.*, VII, 20, f. 419 (1790), mixed the two species together (*plecta* and *musiva*) and gave figures of the two previously figured larvae, but could give no decision as to specific status.

Esper, *Abbild.*, IV (1), plt. 143, 4-5 (1788?), gave two crude, but recognisable, figures. Text, IV (2, 1st), p. 455.

Godt., *Hist. Nat.*, V, 166, plt. 60, f. 3 (1824), gave an excellent figure.

Freyer, *Neu. Beitr.*, VII, plt. 678 (1851), gave very good figures of both *plecta* and *musiva*.

Barrett, *l.c.*, IV, 40, plt. 141, 2 (1897), gave two good normal figures.

Holland, *Moth Book.*, p. 184, plt. 22, 6 (1901), gave a good figure of an American example of this "circumpolar species."

Splr., *l.c.*, I, 353 and addend., notes that ab. *rubricosta*, Fuchs, has a red costal streak, which is "separated from the ground colour by somewhat paler colour."

Splr., *l.c.*, I, plt. 33, 27, gave a figure in which the stigmata were quite suppressed or represented by a smudge.

Culot, *N. et G.*, I (1), 55, plt. 8, 13, (14), (15) (1910), gave excellent figures of *plecta*, *leucogaster* and *musiva*, so that one can readily see the characteristics of the three species.

Warr.-Seitz, *Pal. Noct.*, III, 44, plt. 9k and 10a (1909), gave 5 figures quite good: *plecta*, *unimacula*, *glaucimacula*, *ignota*, ♂ and ♀. The figures hardly emphasise the differences sufficiently if at all.

Warr.-Seitz, *l.c.*, plt. 10a (1909), figure the *leucogaster*, Frr., ♂ and ♀, practically only minutely separable from *plecta*. The only difference apparent, beyond a slightly different shade in the costal streak, is a slight whitish streak below the reniform towards the outer margin. The base of the inner margin is also whitish as in the f. *ignota* of *plecta*. Most authors treat *leucogaster* as a species (H.-S., Warr.-Seitz, Hamps.,

Corti, Draudt). It occurs in the same areas as *plecta* in the S. of Europe.

Of the Variation Barrett says:—"Not very variable, beyond the presence or absence of the outer transverse lines, but occasionally the collar is of the pale tint of the costal stripe of the forewings, which thus becomes continuous. Specimens from the North of England—Durham particularly—frequently have the costal stripe reddish and the stigmata obscured."

Barrett records a specimen which "has the forewings and thorax of a brilliant deep purple, except the costal stripe which is contracted and shaded with purple;" and another which "hardly shows a trace of the two stigmata."

Barrett, *l.c.*, plt. 141, has a good typical figure and 2a is one with reddish collar and costal streak.

plecta, L. (1761), *Fn. Suec.*, 321.

ssp. *vicaria*, Wlkr. (1856), *Lep. Het.*, X, 409.

ab. *unimacula*, Ramb., *Cat. And.*, plt. 11, f. 3 (1858), no text. Stdgr. (1859), *Stett. e. Ztg.*, 213.

ssp. *costalis*, Mr. (1867), *P.Z.S.*, 56.

r. *anderssoni*, Lamp. (1885), *Ent. Tidskr.*, 54.

r. *glaucimacula*, Graes. (1888), *Berl. e. Zts.*, 321.

r. *ignota*, Swinh. (1889), *P.Z.S.*, 411.

ab. *rubricosta*, Fuchs (1900), *Jahrb. Nassau*, LIII, 216.

ab. *fuscicosta*, Hirschke (1910), *Verh. z. b.*, LX (413).

ab. *strigata*, Hirschke (1910), *l.c.*

f. *plectella*, (Hamp.) Strnd. (1915) [*Lep. Phal.*, IV, 405 (1903)], Strnd., *Arch. Naturg.*, LXXXI, A, 12, 145.

f. *fasciolata*, Heinz (1916), *Deut. e. Zt.*, 512, plt. 4, 9

r. *mucidata*, Dnhl. (1925), *Ent. Zts.*, XXXIX, 128.

Tutt dealt with (1) *plecta*, typical; (2) r. *anderssoni*, violet brown; and (3) ab. *unimacula*, Ramb. (Stdgr.).

ssp. *vicaria*, Wlkr., *Cat. Lep. Het.*, X, 409 (1856).

ORIG. DESCRIP.—"Foem. Rufescens, vertice, thoracis fascia abdomineque albido-testaceis; alae anticae costa albido-testacea, striga basali sub-interrupta nigra orbicularem parvam subrotundam includente, reniforma distincta, lineis transversis indistinctis, guttis marginalibus nigris; posticae albae."

"Female. Reddish. Vertex whitish testaceous. Thorax with a band of the same hue, and with some brown hairs in front. Abdomen whitish testaceous. Forewings whitish testaceous along three-fourths of the length of the costa, with a black slightly interrupted basal stripe, which includes the orbicular spot, and extends as far as the reniform; orbicular nearly round, rather small; reniform of the usual shape; transverse lines indistinct; a row of black marginal dots. Hindwings white. South Africa."

ssp. *costalis*, Moore, *P.Z.S.* (1867), p. 56.

ORIG. DESCRIP.—"Pale pinkish testaceous; forewing with a broad testaceous-white costal streak bordered below by a parallel black streak, interrupted by well-defined small pale-centred orbicular and reniform

marks; exterior margin with a row of black dots; hindwings white. Head and front of thorax pale pinkish testaceous, divided by a black line, two small black spots between the base of the antennae; hind part of thorax dark pinkish testaceous. Abdomen pale testaceous." $1\frac{3}{4}$ in. Darjeeling. Atkinson.

race *glaucomacula*, Gräs., *Berl. ent. Zeit.*, 321 (1888).

ORIG. DESCRIP.—“ I bred about 80 examples which on the average are somewhat smaller than average *A. plecta*. They varied so considerably in their appearance from the European specimens that I think it is only right to give this constant local form a separate name. The ground colour of the forewing is a much darker chocolate brown in *glaucomacula*; that of the hindwings is not white, but clay yellow, on the forewings well powdered dark-grey, on the outer margin and the fringes suffused for the most part reddish. It is particularly distinguished from the type-form by the wholly unicolorous grey-blue not curved stigmata, which are not distinctly pale as in *plecta*. The underside of all the wings is here much darker than in the latter; the hindwing always with more distinct transverse line and round blackish discal spot.”

Hamps., *Cat. Lep. Ph.*, IV, 405 (1903). “Forewings with the stigmata entirely grey, the ground colour of purplish-fuscous; the hindwings yellowish, often with more or less developed postmedial line and terminal band.” Amur; Japan.

r. *ignota*, Swinh., *P.Z.S.*, 411 (1889).

ORIG. DESCRIP.—“ Palpi, antennae, thorax and forewings chocolate brown; palpi grey in front and at the tips; top of head grey; collar dull ochreous, abdomen dull ochreous grey; forewings with the colour paling slightly towards the outer margin, with a broad grey stripe on the costa from the base along two-thirds of its length, touching the upper portions of the orbicular and reniform marks, which are formed of prominent grey ringlets; the orbicular round the reniform oblong, excavated on the outside, almost ear-shaped; the rest of the costal border to the apex marked with five or six yellow points; a discal outwardly curved slightly sinuous line, of the same colour as the wing, but slightly darker; fringe pale reddish chocolate, interlined. Hind-wings white tinged with flesh colour, with a flesh-coloured marginal line and an interline in the fringe. Nearly allied to *O. costalis*, but darker coloured forewing.” Ceylon.

Hamps., *Cat. Lep. Ph.*, IV, 405 (1903), “Forewing with the black in cell absent.”

ab. *rubricosta*, Fuchs, *Jahrb. Nass. Ver.*, LIII, 216 (1900).

ORIG. DESCRIP.—“ The costa of the forewing widely purple-red (instead of whitish yellow), the colour of the rest of the wing normal.” Bornich, at light with many normal examples.

ab. *fuscicosta*, Hirschke, *Verh. z. b. Gesell.* Wien, LX, 413 (1910).

ORIG. DESCRIP.—“ This aberration wants the characteristic broad whitish costa streak, of which in this specimen only a short whitish basal trace remains. The other marking is as in the typical form.” At light in Hochschwabgebiet, Austria.

ab. *strigata*, Hirschke, *Verh. z. b. Gessell. Wien*, LX, 413 (1910).

ORIG. DESCRIP.—“ This aberration forms a counterpart to ab. *fuscicosta* in as much as it is strongly bright coloured and as a consequence has produced a new element of marking; for a distinct transverse line margins the central area on the outer side on the upper surface of the forewing, which slight bowed extends from the costa to the inner margin. In the marginal area there lies clearly a triangular dark spot, just as the marginal dot on the limbal-line. The dark basal streak is very distinct, extending up to the transverse line, in which lie the orbicular and reniform spot. On the upperside of the hindwing the costa is somewhat darker than in the typical form.” Austria.

ab. *plectella*, [Hamp., *Cat. Lep. Ph.*, IV, 405 (1903)], Strnd., *Arch. Naturg.*, LXXXI, A, 12, 145 (1915).

ORIG. DESCRIP.—“ Forewing with the costal area purple, leaving white streaks on subcostal and median nervures.”

ab. *fasciolata*, Heinz, *Deut. e. Zt.*, 512, plt. 4, 9 (1916).

ORIG. DESCRIP.—“ For a distance of about 3 mm. from the margin the veins on the hindwings above are powdered with black for a distance of 2 or 3 mm., reaching from the costa not quite up to the anal-angle, with the uninterrupted band running parallel with the margin of the wing.”

r. *mucidata*, Dann., *Ent. Zeits.*, XXXIX, 128 (1925). &

ORIG. DESCRIP.—“ Examples of the size of the fine (schonen) *leucogaster*, Frr., are not uncommon and from the great tendency of the species it readily varies, since it often occurs with white hindwings and very prominent white costal streak. Examples with obsolescent stigmata (which themselves vary in size and colour, fall partly under the form *anderssoni*, Lampa, partly under *unimacula*, Stdgr. There also occur specimens in which the stigmata are completely wanting, the costal marginal streak broadened to cover the location of the stigmata, and at the same time extended very pale to the outer margin, and thus appears covered with dull yellow. Hindwings are yellow-grey with a more apparent row of dots across the discal area. This variety from Bozen, Terlan and Upper Bavarian moorland I name *mucidata*.

Both *leucogaster*, Frr. and *musiva*, Hb. occur with *plecta* in Bozen and Terlan respectively.

Noctua, L., *flammatra*, (Fb.) Schiff., *Verz.*, 80 (1775).

Tutt gave a few lines on this central and southern European species. Years ago 3 specimens were taken in this country at different times. The evidence of their occurrence appears to be exceedingly well authenticated. It will be of little service to the British lepidopterist to give details of its variation, so we pass on to the next species.

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triopas ♂♀. *Desiderata.*—*Ornithoptera tithonus*, *Clotildeae cubana*, *Argynnis*
diana ♂♀, *Papilio schmeltzi* ♂♀. British *Gros. v. varleyata*, *Pub.* and
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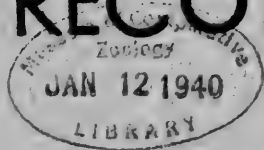
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CONTENTS.

NEW SPECIES AND FORMS OF PALAEARCTIC BOMBYCINE MOTHS, <i>H. Bytinski-Salz, Ph.D., F.R.E.S.</i>	165
CICINDELA CAMPESTRIS, LINN., AB. CONJUNCTA, D. TORRE, AND V. CONNATA, HEER, <i>Raymond R. U. Kaufmann</i>	167
AUGIADES SYLVANUS, ESP. (1777) AND ITS "NICKNAME" OCHLODES VENATA, BREM. & GRAY (1852); <i>Hy. J. Turner, F.R.E.S., F.R.H.S.</i>	168
EPAGOGE GROTIANA, FB., IN GLOS.: AND ITS LARVAL HABITS, <i>T. Bainbriggé Fletcher, R.N., F.R.E.S., F.L.S., F.Z.S.</i>	169
COLLECTING NOTES:—Parthenogenesis in <i>Lasiocampa (Bombyx) quercus?</i> , <i>Richard W. Atwood</i> ; Diptera Bred from a Wasps' Nest, <i>H. W. Andrews</i> ; Notes on Forcing, <i>C. Q. Parsons</i> ; Variation in <i>Zygaena lonicerae</i> , Esp., <i>Thomas Greer</i> ; <i>Colocasia coryli</i> Larva on Apple, <i>T. Bainbriggé Fletcher</i> ; Late Date for <i>Monima gothica</i> , <i>Id.</i> ; <i>Metrioptera brachyptera</i> , Linn., in Glos., <i>Id.</i> ; <i>Acronicta aceris</i> , <i>P. B. M. Allan</i> ; Occurrence of the Earwig, <i>Apterygida albipennis</i> , in Mid-Kent, <i>R. M. Greenlade</i>	171
CURRENT NOTES	175
SOCIETIES	176
INDEX	177
SUPPLEMENT:—The British Noctuae and Their Varieties, <i>Hy. J. Turner, F.R.E.S., F.R.H.S.</i>	(201)-(204)

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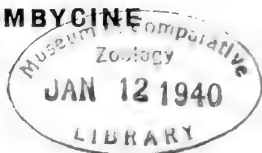
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By H. BYTINSKI-SALZ, Ph.D., F.R.E.S.



Arctornis l-nigrum, Müller ssp. **ussurica** ssp. nov.

Specimens of *A. l-nigrum* from Ussuri and Corea differ from European specimens by the black discocellular mark, which is much larger and has the upper branch of the black "L" of almost the same length as the ventral one, forming a broad V-shaped figure. The angle of the V is very sharp and not curved as in most European specimens.

Cotypes: ♂ ♀, Narva, S. Ussuri, 15-25.VII.1921, leg. Kardakoff; ♀, Seishin-Olto, N. Corea. Collenette (*Proc. R. Ent. Soc.*, vol. 7, p. 211, 1938) mentions another form from China (Chekiang and N. Yunnan) in which the upper branch of the black "L" is entirely obsolete. Similar specimens are also sometimes found in Europe (♂ ♀, Usedom, Pomerania; ♀, Altenburg, Thuringia, in col. meâ).

Euproctis karghalica, Moore ab. **nigrofasciata** ab. nov.

Moore's description (*Ann. Mag. Nat. Hist.*, 5.I, p. 231, 1878) and figure (*Res. Sec. Yarkand Mission*, p. 7, pl. 1, fig. 18, 1879) of *E. karghalica* show a form with very pale yellowish markings; the discocellular circle with a large white centre, the submarginal row of spots broadly interrupted. I have similar specimens from Samarkand, Ili, and Karghalik.

One ♀ has the discal spot reddish brown, completely filled with brown, and the submarginal row of spots complete, somewhat confluent and of a blackish brown colour.

Type: ♀, Samarkand, leg. Herz, 1892.

Euproctis karghalica, Moore ab. **depuncta** ab. nov.

Discal spot brown; row of submarginal spots absent, only a tiny speck at the apex and a somewhat larger at the anal angle.

Type: ♀, Samarkand.

Lasiocampa quercus, L. ab. **defascia** ab. nov.

Forewing as in normal *L. quercus*, L. Marginal area of the hindwing only slightly lighter yellow, the postmedial band completely absent. Marginal area on the underside broad dull yellowish.

Type: ♂, Offenbach, Germany.

Similar to f. *semimarginata*, Wagn., which however belongs to the ssp. *alpina*, Frey., and has no yellow marginal area on the underside of the hindwing.

Lasiocampa quercus, L. ab. **bifasciata** ab. nov.

One ♀ belongs to the f. *ochracea*, Tutt, but has the postmedial band of the forewing very broad and divided by a band of the ground colour. It gives the impression as if there are two parallel postmedial lines present.

Type: ♀, Thuringia, Germany, 1912, ex coll. Thurau.

Drepana falcataria, L. var. **scotica** var. nov.

Ground colour very light yellowish, less suffused with brown; all marks very dark and distinct.

Cotypes: 8 ♂♂, 8 ♀♀, Rannoch, Scotland, 1909, leg. Newman.

This Scotch form differs from *D. falcataria* from Middle Europe and Scandinavia by the much lighter ground colour, the lack of the brownish suffusion and the very dark and distinct marks. This form is not identical with *f. pallida*, Steph. as all marks are very distinct. It seems to be very constant at Rannoch, but is not the prevalent form in Great Britain; specimens from New Forest *f. i.* belong to the *v. infernalis*, Hoffm. I have also a ♀ from Beuscha, Germany, which agrees with *v. scotica*, but this is the only one among my 40 odd specimens of *falcataria*. Dr Cockayne reports it from Inverness and Aberdeenshire (*in lit.*).

Drepana curvatula, Bkh. *f. gaedei f. nov.*

Gaede mentions in the *Seitz Suppl.*, Vol. II, a very dark suffused *curvatula*-form from Berlin, which he compares with the figure of *D. muscularia*, Wkr. in *Seitz*, Vol. II, pl. 30 f. I have similar specimens which are dark "warm sepia" brown with a purplish hue. All lines obsolete, only the postmedial line somewhat darker. *f. gaedei* is a rare form also at Berlin, where typical *curvatula* specimens are prevalent.

Types: ♂, Kiewice, Wollhynia, 7.VII.37, leg. Prosnin; ♀, Environment of Berlin, Germany.

Pseudomicronia tibetana sp. nov.

♀: Head, thorax and abdomen white. Forewing white, with 3 basal lines, 2 + 3 confluent at the hind margin. 4 submedial lines: 1 + 2 confluent at the hind margin. Then a short streak from the costa to the subcosta. 4 medial lines: 1 + 2 and 3 + 4 confluent at the hind margin. 8 postmedial lines: 1 + 2 united by an oblique line or confluent; 3/4, 5/6 and 7/8 fused from the middle of the wing. 5/6 + 7/8 touching each other at the hind margin. 2 marginal lines, united by numerous oblique lines. 2 subterminal lines; terminal line with thickenings on the veins. Hindwing white with 2 pale greyish streaks along vein 1, an oblique streak along vein 2 across the cell up to the costal margin. Oblique band outside of the cell from the anal angle to the costal margin very broad in its lower half, then constricted. 2 dark terminal and marginal lines, both double. Termen with 3 large black spots on veins 2, 3 and 4, and 3 smaller ones on veins 5, 6 and 7 united by a faint black terminal line.

Underside white, hindwing with 3 small black spots on veins 2, 3 and 4.

Type: ♀, Tibet, Tschang-Tang, Dsagar Mts., 4500 m., July.

P. tibetana comes nearest to *P. coelata*, Moore but differs in having on the forewing the number of stripes enlarged, and the lines much darker and narrower. Hindwing with an anal spot instead of a band and instead of the dark terminal band from vein 3 to the upper angle only 3 small venal dots. The forewing resembles superficially *Strophidia fasciata*, Cram., while the hindwing comes nearest to *P. trimaculata*, Warr.

As I have only a ♀ specimen, I am not sure whether *tibetana* belongs generically to *Pseudomicronia* or *Micronia*, but its designs agree much better with other species of the first genus.

Methystria nigromacularia, Leech ab. **nigrofasciaria** ab. nov.

Forewing normal. Hindwing with the subterminal and terminal rows of black spots united and confluent into a single black band; the third inner row of spots separate from the black band. Fringes whitish.

Type: ♀, Tibet, Tschang Tang, Dsagar Mts., 4500 m., July.

Exaereta ulmi, Schiff. var. **istriaca** var. nov.

♂♂ span 44-45 mm. Size much larger than all other *E. ulmi* specimens, which measure from 35-38 mm. in the ♂♂. Ground colour lighter than specimens from Vienna, hindwing less suffused with brown on the upper angle.

Cotypes: ♂♂, Rovigno d'Istria, Italy, 24-25.IV.1932-33, leg. Bytinski-Salz.

Odontosia sieversi, Mén. ssp. **ussurica** ssp. nov.

♂♂ span 43-44 mm., ♀♀ 47-48 mm.; somewhat larger than European *sieversi* Mén., which span from 36-41 mm. in the ♂♂ and 36-44 in the ♀♀. Ground colour lighter than in *sieversi*; in the Ussurian ♂♂ as in European ♀♀ of typical *sieversi*, in the Ussurian ♀♀ as in the light form *grotei*, Stich., but more greyish instead of brownish.

Cotypes: 2 ♂♂, 3 ♀♀, Sedanka, Wladiwostok, S. Ussuri, 20-24.IV.1921-27, leg. Kardakoff.

I do not agree with the opinion of Gaede in *Seitz Suppl.*, Vol. II, who considers *patricia*, Stich. to be a form of *sieversi*, Mén.; *patricia* is a valid species which differs much from the Ussurian form of *O. sieversi*. It has e.g. the antennae shortly branched as in *carmelita*, Esp. Both species are flying at the same locality but *O. patricia* flies a month later than *O. sieversi* ssp. *ussurica*; my specimens of *patricia* taken also by Kardakoff were caught from 12th-22nd May.

ab. *arnoldiana*, Kard. (*Entom. Mitt.*, Vol. 17, p. 418) is not a synonym to *patricia*, Stich. as Gaede states, but belongs as a dark form of *ussurica* to *sieversi*. In colour, it corresponds, roughly speaking, to the type form of *sieversi*, Mén., while the more common ssp. *ussurica* would correspond to the European *sieversi* f. *grotei*, Stich.

CICINDELA CAMPESTRIS, LINN., AB. CONJUNCTA, D. TORRE AND V. CONNATA, HEER.

AN ABERRATION, AND A VARIETY NEW TO GREAT BRITAIN.

By RAYMOND R. U. KAUFMANN.

An aberration and a variety of *Cicindela campestris*, Linn. are occasionally found with the type. In all probability examples, which are readily distinguished from *campestris*, will be found mixed with it in British collections. They are the ab. *conjuncta*, Dalla Torre and the v. *connata*, Heer. Many Continental vars. and abs. have already been described and figured, and there is no good reason why some of them, at any rate, should not occur in this country.

Dalla Torre's original description is to be found in the Linz Year Book for 1877, and the v. *connata* (= *confluens*, Dietr.) was described by Heer from Swiss sources. Past British and Continental authors have

observed that the elytral maculations vary considerably, and their remarks *in toto* refer to such variations in the shape of confluencies either at the elytral apex or on its disc.

Characters:—

1. With the two apical spots confluent at the margin and the black discoidal spot absent, in the ♂ only ab. *conjuncta* D. Torre.
2. With the discoidal spot joined to the central marginal spot by a thin wavy band and the black discoidal maculation sometimes absent, in both sexes v. *connata*, Heer.

Examples *in coll. meâ*:—

- ab. *conjuncta*, Dalla Torre.—Fairly rare. From moorlands, flying over heather or running on sandy paths. Brimham Rocks, 30/6/33 (A. K. Charlton). Recorded by West: see *Proc. I. of W. Nat. Hist. Soc.*, 2, Pt. vi, p. 476 (1935). Goathland, 7/5/39 (R. S. Johnson), 9/5/39.
- v. *connata*, Heer.—A single specimen from under a stone near a stream edge at Darnholm, near Goathland, 17/5/39 (C. M. Rich).

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AUGIADES SYLVANUS, ESP. (1777) AND ITS "NICKNAME" OCHLODES VENATA, BREM. & GRAY (1852).

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

In a criticism of the New List some years ago (*Ent. Record*, 1935, p. 48) I wrote that I had for some time had the opinion that these two were one and the same species. On the substitution of the name *venata* for *sylvanus* I wrote "the misapplication of the homonym rule cuts out *sylvanus* although there has been no chance of confusion for more than 120 years at least," but I then investigated the question no further. I have now looked up the literature and find that two species of Lepidoptera were named *sylvanus*, the one in 1773 by Drury in "Illustrations," Vol. II, plt. 3, the other by Esper in 1777, in "Abbild.," II (1), p. 343, plt. 36. The point is how, at the time, did the ancients classify these two, in order to distinguish them in their literature, etc., both being species of the great "Papilio" section of Linnaeus' scheme of the Lepidoptera? I found that no difficulty whatever was likely to arise. Drury placed his species in the section "Pleb. Rur.," i.e., *Papilio*

Plebeius Rurales. (I note that Drury used the word "genus" for this section.) Esper placed his species in the section "Pleb. Urb.," that is *Papilio Plebeius Urbicolae*. Thus the old entomologists could find no difficulty to distinguish or refer to the two species named *sylvanus*. There was no confusion. The then classification amply distinguished them, the Urbicolid *sylvanus* and the Ruralid *sylvanus*. There is no reason whatever to bring in the homonym rule. It was unnecessary and therefore stupid.

Hence *sylvanus*, Esp. is a perfectly valid name for the "skipper" to which it has been attached for at least 150 years. The name *venata* Brem. & Gray, must, as before, be treated as that of a subsp. of *sylvanus*.

The genus *Augiades*, Hb. (1819), *Verz.*, 112, was erected for the species *criniscus*, *arcalaus*, *comma*, *sylvanus*, *helirius*, and *euribates*.

Stephens, *Cat. Brit. Lep.* (1850), used *Augiades* for *sylvanus*, *comma* and *vitellius*, only two of which were in the original genus, the others having been eliminated and *vitellius* is a new importation. [Here is where the "Generic Names of Hol. Butt" goes wrong by omitting this reference.]

Kirby, "List of Brit. Rhop.," 1858, used it for *vitellius* only, a quite invalid action as the typical form of the genus must be one of the two original species which remained, i.e., either *sylvanus* or *comma*.

Butler, *Ent. Mo. Mag.*, 1870, also overlooked Stephens' restriction to these two valid names and choose *criniscus* the type of *Augiades*, a quite invalid action.

Scudder, *Sys. Revis.*, 58, 79 (1872), selected as the type of *Augiades* the species *sylvanus*.

[It was overlooked also that *comma* had been selected as the typical representative of the genus *Urbicola* by Barbut in 1781, *Gen. Ins. Linn.*, p. 173.]

[It was also overlooked that Schrank in *Faun. Boica*, II (1801), erected the genus *Erynnis* for *alceae* (*malvae*), *malvae* (*fritillum*), *tages*, *comma*, *thaumas* (*linea*), and *morpheus* (*speculum*). Before 1832 all these had been eliminated except *comma* which thus became the only original representative left as typical of the genus.]

In 1872 Scudder erected the genus *Ochlodes*, *Sys. Rev.*, 57, for the species *nemorum*, *agricola*, and *sonora*, all N. American species to which others have been added from the same area (see Seitz).

For what reason *sylvanus* is placed in *Ochlodes* is nowhere apparent. All we are told is "The correct (*sic*) generic name for the latter species is *Ochlodes*, Scud. (1872)." *Generic Names*, 160. An unsupported dictatorial statement.

EPAGOGE GROTIANA, FB., IN GLOS.: AND ITS LARVAL HABITS.

By T. BAINBRIGGE FLETCHER, R.N., F.R.E.S., F.L.S., F.Z.S.

In our List of Microlepidoptera of Gloucestershire (*Proc. Cotsw. Field Club*, XXVI, 302: 1939) *Epagoche grotiana* could only be noted as "included in Perkins' List without locality or remark." Recently Mr Clutterbuck sent me some MS. notes on Davis' collection, now in the

Bristol Museum, and one of these referred to *E. grotiana* as having been taken by Davis at Pope's Wood, Longhope, on 11.vii.1912, and at Grange Court on 15.vii.1912. I also took a rather worn example at May Hill on 12.vii.1939. This species can therefore be included definitely in our County List.

The early stages of *E. grotiana* seem to be very little known in England. In his *Revised Handbook*, p. 501, No. 2, Meyrick gave no description of this larva but indicated its food plants as *Quercus*, *Crataegus*, *Rubus*, etc. Barrett (*Lep. Brit. Is.*, X, 213: 1905) stated that the larva was "apparently unknown. It is, indeed, a well-known puzzle, and no one seems as yet to have any satisfactory clue to its habits," and goes on to state that the moth seems to be attached in some districts to horn-beam or maple, in others to hawthorn or oak. Kennel in 1910 (*Pal. Tortr.*, p. 110) stated that the larva, still undescribed, feeds on *Crataegus*, *Quercus*, *Ulmus*, *Rubus*, *Vaccinium*, and as far back as 1805 Bechstein and Scharfenberg had given *Crataegus* as the food plant. The only reference to its biology in the English magazines seems to be a note by Huggins, in *Entom.*, LVIII, 98 (1925), who stated "the food plant is at present unknown but I should think . . . that it is certainly oak," to which Sheldon added a note, giving the food plants stated by Kennel and considered ash also to be a food plant of the larva, which is probably a general feeder. Yet in 1897 Chrétien had described the life history at length in *Le Naturaliste*, XIX, 258-260 (No. 257, 15.xi.1897).

This paper is too long to reproduce *in extenso* but may be summarized as follows. The egg, laid in small groups of two or three, is shaped like a spherical skull-cup, but very flat and relatively broad: surface shagreened, colour bright white with the rounded parts dull; the eggs touch one another but overlap very little. Oviposition is usually in July and the egg hatches after ten days. The young larva is very active, rather elongate, slightly attenuated posteriorly, slightly reddish-grey, head pale yellowish-brown, thoracic shield darker, warts indistinct, alimentary canal reddish, distinct on segments 7-9. The young larva spins a tube of white silk and feeds on the ground on fallen leaves, by preference on discoloured and even dry ones. It grows very slowly, and towards the end of October, when still only about half-grown, it ceases to feed and commences to hibernate in a leaf-fold lined with silk. In March it recommences to feed on vegetable rubbish, dead leaves, dead insects, as well as on fresh leaves of low plants. After moulting about the beginning of April, it pupates about the end of April in a small cocoon formed under or amongst leaves on the ground. The full-grown larva is about 14 × 2 mm., slightly attenuated at extremities, with well-marked segments: colour a livid brownish-grey, darker dorsally, each segment with two darker transverse dorsal bands, the anterior one broader, paler on sides, beneath and on incisions; warts very indistinct, of the ground-colour, small, and (at least the trapezoidals) with a minute blackish dot emitting a pale hair; head rather flattened anteriorly, rounded on vertex, of a bright honey-yellow, suffused yellowish-brown towards epistome, ocelli blackish; a dark rusty-brown wedge-shaped lateral nuchal marking; prothoracic plate anteriorly concolorous with head, posteriorly and laterally blackish-brown; anal plate brown. Pupa rather elongate, cork-coloured, each segment dorsally with fine transverse serrulations, each with a short stiff spinule.

The beak-shaped cremaster is broad, flattened at either extremity, truncated almost transversely, ferruginous-brown, with small stiff hooks on its sides and tip. The pupal period is about three weeks. Apparently there is only one brood. The reason why this larva has been overlooked is that it does not live on trees but on the ground, feeding on low plants and on dead and rotten leaves and also on fallen fruits (*e.g.*, of apple). Thus said Chrétien, but unfortunately his papers in *Le Naturaliste* are neither well-known nor very accessible to most entomologists.

I may note that this species was first described by Fabricius in 1781—not in 1787, as stated by Wocke (1871) and restated by numerous later authors of Catalogues (Rebel 1901, Kennel 1910, Meyrick 1912, 1913, Lhomme 1939). Rebel (Cat., No. 1494) and subsequent authors also omit the synonym *ochreana*, Stephens 1834.

Rodborough, Glos., 9.xi.1939.

COLLECTING NOTES.

PARTHENOGENESIS IN *LASIOCAMPA* (*BOMBYX*) *QUERCUS*?—On the 16th July 1938 Mr R. E. Warrier, of the South London Entomological Society, gave me twenty ova of *Bombyx quercus*, the result of a crossing between a North Cornish male and a Dorset female. The resulting larvae were very healthy and strong and three female and eleven male imagines were bred.

The females were lighter in colour than the Kent and Essex forms that I have, but the males were darker with a more sinuate outer margin to the bands. The nervures crossing the band were darker and more distinct, giving a somewhat rayed effect. The males closely resemble the variety "*callunae*" shown in "South."

On the 18th July 1939 a female emerged and, as I was desirous of using her for assembling purposes, she was isolated in a separate box, which I kept in my bedroom. She remained quiescent until the night of the 20th July, when I was awakened by the noise of the moth flying and hitting herself against the sides of the box. On turning on the light I noticed she had laid a number of ova, which were scattered on the sand at the bottom of the box. I left her until daylight, when she again started flying, and as I saw she had damaged herself and might spoil as a specimen I placed her in the cyanide bottle.

As the female had not paired I did not trouble about the ova, but on examining the box on the 22nd August 1939 I found two larvae on the leno gauze covering the box and on the 23rd August there were about sixty more. In all seventy-three larvae were hatched.

To the best of my belief no male had paired with this female. Certainly none of the males that I bred. There is, however, a possibility that while I was away during the day a male *Bombyx quercus* may have flown through the open window and paired through the leno gauze covering the box, but this I think very unlikely. I have never seen *Bombyx quercus* in Sydenham nor do I think there is any suitable locality within a reasonable distance of Sydenham from which a male could be attracted. It seems to me to be a case of parthenogenesis.

The second female from this brood emerged on the 22nd July 1939 and was taken to South Benfleet, Essex, on the occasion of the Field Meeting of the South London Entomological Society. This female attracted ten males.

The third female emerged while I was travelling, and, owing to the smallness of the tin in which the cocoon was confined, was badly crippled. This female lived for four days and I tried her for assembling purposes in various localities near Ashendon, Buckinghamshire. The weather was not very propitious for assembling, being dull and cloudy for the most part with strong cold winds. This female was very comatose, and, thinking that the cold winds were possibly the cause, I repeated an experiment which I had previously tried on a female *Orgyia gonostigma* and which was successful in obtaining a pairing. I focussed the sun through a lens on the body of the insect and passed the lens slowly over and along the body of the moth, taking care not to focus the heat too intensely. In a short while she began expanding and contracting her body, fluttering her crippled wings, crawled to the top of the grass stem and seemed to be going through the process of calling. This experiment was tried on succeeding days and each time the focussing of the warmth of the sun on the body appeared to stimulate the calling process. Unfortunately, however, no males were attracted so it was not possible to discover whether the warmth, apart from stimulating activity, also stimulated the calling process.—RICHARD W. ATTWOOD.

DIPTERA BRED FROM A WASPS' NEST.—In May this year my friend Mr S. Wakely sent me the remains of "a wasps' nest taken from a hollow willow trunk" at Norwood, S.E., from which "numbers of flies were emerging." I put these into a cardboard box in my room and during May and June the following Diptera emerged in some numbers:—*Scatopse fuscipes*, Mg. (Bibionidae); *Tephrochlamys tarsalis*, Ztt. (Helomyzidae); *Fannia lineata*, Stein. (Anthomyidae); also single specimens of two other Anthomyids:—*Hydrotaea dentipes*, F. and *Acanthip-tera (Sphecolyma) inanis*, Flin.

Of these Diptera only the last—*A. inanis*—is definitely known to breed in wasps' nests. The other species are probably saprophagous in the larval stage, living as scavengers on the detritus of the nest or on the rotting willow wood. The larva of *H. dentipes* is predacious, feeding on other dipterous larvae. Mr Collin informs me that he has bred *tarsalis* from birds' nests, and *lineata* from wood debris.

Two or three specimens of the micro-lepidopteron *Endrosis lactella*, Schiff, also emerged from the nest. Of this species Mr Wakely says: "Very common in birds' nests, and a common house moth; also frequently found in bee honey-combs."—H. W. ANDREWS.

NOTES ON FORCING.—In August 1938 I obtained a batch of ova of *Hadena suasa*, the larvae pupating early in October. At the end of that month I kept the pupae at a temperature of 70° for a period of five weeks with no results, when I gave up the experiment and left them in the temperature of a room without a fire until the following February. I then repeated the experiment; this time they responded and hatched early in March. The previous forcing had no fatal effect upon them,

though it was distinctly disappointing. I thought, if a partial second generation in the year, why not under favourable conditions a third.

In September 1938 I got some ova of *Aporophyla lutulenta*. The larvae eat grass in my possession and invariably die in the second or third instar at the latest. This mortality generally coincides with a period of cold weather early in December. On this occasion I tried keeping them at a temperature from 65° to 70°, which hastened their progress, but in the third instar, in spite of warm surroundings, they obviously got tired of grass. A few just died, some prolonged their existence by eating the legs of their neighbours in preference to ground-sel and dock which they refused, and soon died also without any sign of diarrhoea, cramp or other ailment. Perhaps they wanted budding whitethorn, but there was none available.

My third application of heat in the case of *Noctua brunnea* has been more successful. A female, which came to light on 17th July, obliged with a large batch of ova. The larvae I kept indoors in a fairly cool room. Two of the larvae fed up rapidly on dock and burrowed early in September. The others were then kept at a temperature of 60° to 65° and progressed at varying rates, the last being now in the final instar on the 28th October. The first moth appeared on the 21st October and another a day later, followed by a third on the 27th. The cocoons which I have unearthed contain pupae in various stages of advancement.—C. Q. PARSONS, Torquay.

VARIATION IN ZYGAENA LONICERAE, ESP.—In a marshy meadow here in early July 1939 I met with a large number of blotched forms of this usually unvariable species; these were resting and feeding on the Marsh Thistle, *Cnicus palustris*. The commonest blotched form has the lower basal spot 2 (see Tutt's British Zygaenidae) joined to the lower median spot 4, forming a streak along the inner margin of forewings; another less common form has spot 3 connected to the outer spot 5; in a third form the two central spots 3 and 4 are united; the most extreme form has the outer spots 3, 4, 5 confluent, and connected to the basal spot 2 by a long red streak. *Plusia bractea* was also fairly common at these same thistles at dusk.—THOMAS GREER, The Bungalow, Dungannon, Co. Tyrone; 7.xi.39.

COLOCASIA CORYLI LARVA ON APPLE.—The larva of *C. coryli* is common enough hereabouts and usually found on Beech or Hazel. On 28.ix I found a nearly full-grown larva feeding on leaves of Apple, which is not noted as a food-plant in the text-books.—T. BAINBRIGGE FLETCHER, Rodborough, Glos.; 29.x.39.

LATE DATE FOR MONIMA GOTHICA.—On 22.v.39 a fairly fresh female *Monima gothica* came to light here. I have found this before during the first week of May but this seems an unusually late date.—T. BAINBRIGGE FLETCHER, Rodborough, Glos.; 29.x.39.

METRIOPTERA BRACHYPTERA, LINN., IN GLOS.—On 22.vii.39 I took one specimen, not quite mature, of this long-horned Grasshopper at Woodchester, near Stroud. This is apparently the first record for the county.—T. BAINBRIGGE FLETCHER, Rodborough, Glos.; 29.x.39.

ACRONICTA ACERIS.—Is this species sometimes double-brooded? Dr F. J. Buckell recorded (*Ent. Rec.*, I, 130) that he took a specimen on 25th May 1890, and this year (1939) I found one, as fresh as paint, on 5th August. In *The Entomologist* for 1890 (xxiii, 344) there is a record of the moth *at sugar* on 17th September. Barrett gives June and July as the time of emergence, Stainton June, Newman and Leeds June and the first half of July, and Newman "8th to 23rd June." Dr Chapman, in his monograph on the Genus *Acronicta*, makes no mention of the time of emergence, but remarks (*Ent. Rec.*, I, 99) that "it is not unusual for this species to pass a second year in the pupa state." Is it possibly the second-year pupae which give rise to the early summer emergences?—P. B. M. ALLAN, No. 4 Windhill, Bishop's Stortford.

OCCURRENCE OF THE EARWIG *APTERYGIDA ALBIPENNIS* IN MID-KENT.—It may be of interest to record the occurrence of the earwig *Apterygida albipennis*, Megerle, at East Malling, near Maidstone. This is some fifteen miles west of the Charing district, where the species was taken by Chitty, and about the same distance south-east of Eynsford, where it was taken in 1933 at a field meeting of the South London Entomological and Natural History Society. I found this earwig on 13th October by beating apple-trees and by sweeping a narrow strip of herbage bordering the orchard, but it was restricted to two small areas each of about 100 yards by 20 yards. Within these areas it was common, occurring in the proportion of one to every three or four *Forficula auricularia*, but elsewhere it could not be found, though *F. auricularia* was equally common all over the orchard. At first both sexes were present, the females being the more numerous, but by the 18th October after heavy rain no males could be found and but few females. A further spell of cold wet weather with a few frosty nights sent them all into hiding, since when only a few females have been found in broken stems of Umbelliferae and under some paper bands, which had been tied round the trunks of apple-trees.

The very local type of distribution could easily lead to *A. albipennis* being overlooked and it is probably much more common than the published records seem to indicate. It may have been more numerous this autumn than usual, as I have worked the orchard in question at all seasons for the past seven years, during which time I have also been on the lookout for *A. albipennis* in this district. Furthermore, the orchard belongs to the East Malling Research Station and at least a dozen entomologists have been interested in the insects occurring on the apple-trees since they were planted twenty years ago. It therefore seems unlikely that a species which is so distinct on the beating-tray should have been overlooked in this well-worked locality had it always been as numerous as I found it to be this year.

As *A. albipennis* is supposed to be associated with hop gardens, I should add that one of the small areas mentioned was about a quarter of a mile from an existing garden and about two hundred yards from a former one. The other area was about three hundred yards further from both.—R. M. GREENSLADE.

CURRENT NOTES.

CORRECTION.—On p. 155, line 4, “ wormwood ” should be “ mugwort ” and “ (*A. absinthium*, L.) ” should be “ (*A. vulgaris*, L.) ”

Our colleague, T. Bainbrigge Fletcher, in conjunction with C. G. Clutterbuck, the well-known lepidopterist of Gloucestershire, in June last contributed to the *Proceed. Cotteswold Club* 20 pages continuation of an annotated “ List of the Micro-lepidoptera of Gloucestershire. This list will no doubt be very useful, and with Mr Fletcher’s keen knowledge is more correct than are many local lists of Micro-lepidoptera.

There has recently been founded a Society, “ The Freshwater Biological Association of the British Empire. ” Their first publication is a Key to the British species of the water Hemiptera, the *Corixidae*. In its 28 pages the pamphlet contains, besides the necessary letterpress, a large number of detail diagrams. There is a series of ecological notes on each species, and a Bibliography of 25 items. This appears to be a very good practical work and should prove useful.

A couple of interesting pamphlets have reached us from Haslemere, Surrey. The first is an account of the “ Rise and Development of the Haslemere Natural History Society, ” giving an account of 50 years steady progress in the spread of scientific knowledge in an area of rich and interesting surroundings; and the second “ The Educational Museum at Haslemere, ” which, founded by the great surgeon, Sir Jonathan Hutchinson, is a valuable adjunct to the work of the Society. These are written by E. W. Swanton who, for more than 20 years, has been the permanent official in all the activities of the Society and of the Museum. Many eminent men have helped in the undertakings, including Tyndall, Geikie, and Rendle. Entomologists remember also that the late C. G. Barrett resided in and worked the Lepidoptera of the district for years.

Dr Emilio Berio appears to be carrying on the investigation of the Lepidopterous Fauna of the North African possessions of Italy, in continuation of the long series of such memoirs published by our valued correspondent the late Conte Turati. In the recently issued *Memorie Soc. Ent. It.*, XVII, fas. 1, the Doctor has contributed an annotated List of the species collected in Eritrea during 1934-7 by Sigr. Vaccuro, with numerous descriptions of new species and forms. There will be 2 plates of 25 figures of these to appear in the next section of the *Memorie*. In the same part Conte F. Hartig and Dr H. G. Amsel have contributed a long article on new forms of Lepidoptera obtained in the Island of Sardinia; the descriptions are almost all of the micro-lepidoptera. Various diagrammatic illustrations are added.

GEOMETRID NAMES.—The Supplement, by Mr Prout, to the Geometrid Section of Seitz’s *Macrolepidoptera of the Palaearctic Fauna* contains some alterations of names, which should be noted by British collectors. *Hemistola immaculata*, Thunberg = *chrysoprasaria*, Esper = *vernaria*, Hübner: Meyrick 212/3; South II, t. 40, ff. 2, 3. *Eupithecia intricata*, Zett. 1839 = *helveticaria*, Boisduval 1840: Meyrick 231/36; South II,

t. 96, ff. 3, 4: the North British race is *millieraria*, Wnukowsky = *anglicata*, Mill. nec H.S. The generic name *Collix*, Guenée, cannot be used for *sparsata*, Treits. = *sparsaria*, Hb. (praeocc.), and Mr Prout has constituted (Suppl. IV, 212) a new genus, *Anticollix*, for this species: Meyrick 235/1; South II, t. 102, ff. 1, 2.—T. B. F.

Part II of the *Proceedings of the Zoological Society of London*, Vol. 109, Series B (August), contains (pp. 131-152, 3 figs., 4 maps) a paper by S. Maulik on the Distribution of the European Hispine Beetles, and in Parts II and III of Vol. 109, Series A (July), Professor W. E. Agar describes (pp. 139-140, tab. 1) a gynandromorphic Long-horned Grasshopper from Australia.—T. B. F.

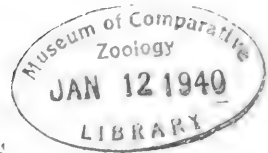
In *Novitates Zoologicae*, Vol. XLI, No. 3 (August), Dr K. Jordan has a paper (pp. 212-216) in German on the Nomenclature of the two German *Procris* species with sharp-pointed antennae, in which he applies the name *tenuicornis*, Zeller 1847, to the English species referred to as *globulariae* [nec Hübner] by most British authors. In another paper (pp. 251-291, figs.) on the constancy and variability of the differences between the Old-World species of *Utelheisa*, Dr Jordan points out the characters of *U. pulchella* and other superficially similar species, some of which have been mixed with *pulchella*.—T. B. F.

Volume I of the *Journal of the Entom. Society of South Africa* contains a paper (pp. 78-130, tt. 4-6) by Prof. A. J. T. Janse on the South African Cuculliae. This is apparently the first part of a Journal issued by a newly-founded Society in South Africa.—T. B. F.

Another Entomological Society, in India, was founded in 1938 and Vol. I, parts 1 and 2 (under one cover), of its new publication, *The Indian Journal of Entomology*, has recently come to hand.—T. B. F.

SOCIETIES.

A meeting of The Entomological Club was held at "Woodhouse," Stroud, on 26th July 1939, Dr Harry Eltringham in the chair. Members present in addition to the Chairman—Mr H. Willoughby-Ellis, Mr James E. Collin, Mr W. Rait-Smith. Visitors present—Mr Austin Richardson, Mr T. Bainbrigge Fletcher, Mr H. W. Holloway, Mr Colbran J. Wainwright. The party arrived during the morning and notwithstanding the extremely bad weather that had recently been experienced the flower gardens presented a wealth of colour and a walk around the greenhouses afforded much interest. Luncheon was served at 1 o'clock after which an inspection of Dr Eltringham's well equipped laboratory as usual gave pleasure to the guests. During the afternoon a car drive along the crest of the hills overlooking the Severn valley presented what is probably one of the most beautiful views in this country, and was much enjoyed. On return tea was served about 5 o'clock, after which those who could not stay the night returned to their destination after an interesting and happy day.—H. WILLOUGHBY-ELLIS, Hon. Secretary.



PAGE	PAGE
Aberations (unnamed): <i>E. atomaria</i> , 12; <i>E. stylata</i> (Dip.), 2; <i>T. gracilis</i> (pure white), 57; <i>L. cannae</i> (pale salmon pink), 89; <i>C. potatoria</i> (yellow males), 93; <i>P. icarus</i> (xanthie), 140; <i>A. hyperantus</i> (asym.), 140; <i>B. pinitaria</i> (gynandromorphs) 138	Colorado Beetle 115
Abundance at sugar, 9; at light, 93; of <i>C. ambigua</i> 108	Congress of Entomology, Report of the VIIIth: rev. M.B. 132
Abnormalities 10	"Continuous Breeding," H. B. D. Kettlewell 7, 39, 58, 89, 106
Additions to the British Fauna ... 8, 30, 31, 33, 34, 37 (Col.), 81, 82, 83, 84, 85, 85 and 86 (Col.), 165, 167 (Col.).	"Cornborer," The European 4
"Amateur Entomologist," Content of	Corrections, Corrigenda ... 39, 97, 164, 175
"Ants in the North of Scotland," L. H. Weatherill 5	"County Records for Orthoptera, New," E. S. Brown 143
Argentine Hesperiidæ 163	Current Notes ... 10, 26, 43, 62, 77, 95, 114, 129, 145, 163, 177
"Asiatic Phalaenoidea, New and Little-known Amatidae," Dr Bytinski-Salz 117	Danish Lepidoptera by Skat Hoffmeyer 10
Assembly, Mass, of Coccinellids 106	Description of, the wing markings of <i>E. stylata</i> (Dip.), 1; " <i>H. pisi</i> , ab. <i>striata</i> ," Dr E. A. Cockayne, 8; Iraq localities, 13; the Kurdish Mts., 14; Rosegg Valley and Schafberg, 21; Muottas Muraigi, 22; <i>M. aubrooki</i> (Col.), 37; the locality Boston Manor, 42; Downlands of Sussex, Kent, and Hants, 45; new aberrations of Tabanidae (gadflies), 54; new Hepialus forms, 81; Coccinellid Aberrations, 85; Kurdish localities, 99; Easton locality, 139; New Amatidae, 149; N. Kent area, 159; New Bombycine Moths and Forms, 165; abs. of <i>C. campestris</i> (Col.) 167
" <i>A. sylvanus</i> and its 'Nickname,' <i>Ochlodes venata</i> ," Hy. J. Turner 168	Desert species in Iraq 16
"Autumn Notes" (<i>V. atalanta</i> and <i>V. c-album</i>), Miss E. Miller 162	Diagnosis of the Family Trypetidae (Dip.) 153
Beneficial Insects 80	"Diptera, captured at Boston Manor, Ealing," A. M. Low, 42; "bred from a wasp's nest," H. W. Andrews 172
Bibliography of the Trypetidae (Dip.) 155	Dispersal, Mass, of Coccinellids 104
Biology of, Orthoptera. Review, 10; <i>P. chryson</i> , 109; <i>D. irregularis</i> , <i>D. andalusica</i> , <i>L. exigua</i> and <i>L. c-album</i> 110	Distributed species in Bagdad, Generally 15
"Black <i>C. edusa</i> (?)," P. B. M. Allan, 25; A. H. Hamm 61	Distribution of <i>R. festiva</i> 35
"Blowflies, 2 rare," J. E. Collin 64	"Double-brooded, Is <i>A. aceris</i> sometimes?" P. B. M. Allan 174
Breeding, <i>L. trifolii</i> , H. B. D. Kettlewell, 7; <i>O. rubiginea</i> , <i>id.</i> , 39; <i>C. cribrum</i> , <i>id.</i> , 58; <i>D. nana</i> (<i>conspersa</i>), <i>id.</i> , 89; <i>T. gracilis</i> , <i>id.</i> , 106; <i>Pyrausta nubilalis</i> , 162; <i>L. quercus</i> 171	Duplication, of a forewing 44
Brood, Double, <i>H. syringaria</i> , 42; <i>A. aceris</i> ? 174	Dutch Lepidoptera, Catalogue of 27
Cactus-feeding Phycitinae 130	"Early Observations," Messrs T. Bainbrigge Fletcher and Austin Richardson 61
Catalogue, of Publications, Junk, 61; of Lepidoptera, Staudinger, 61; Catalogus Lepidopterorum, Junk 146	Earwigs of Malay States 44
Chinese Entomology 10	"Earwig, <i>Apt. albipennis</i> in Mid Kent, Occurrence of," R. M. Cresslade 174
Classification of the Tineae of Linné 37	"Emigration of <i>F. rufa</i> ," B. D. W. Morley 145
"Coccinellid Notes," T. F. Marriner, 85; of Easton 123	Entomological Club (See Societies).
"Coleoptera of Easton," T. F. Marriner 121	" <i>Epagoge grotiana</i> in Glos. and its larval habits," T. Bainbrigge Fletcher 169
Collecting Notes ... 8, 23, 40, 55, 59, 76, 89, 94, 107, 113, 128, 143, 162, 171	
"Collecting Notes, 1938," A. J. L. Bowes 55, 89, 107	

	PAGE		PAGE
Fabricius "Systema Glossatorum" ..	96	captures in Surrey, etc.,	55; British Trypetidae, 69; Spotless forms of Coccinellidae, 86; Kurdish localities, 99; Kurdish Rhopalocera, 101, 133; Coleoptera of Easton (Cumb.), 122; Kurdish Heterocera, 134; Gynandromorphs of <i>B. piniaria</i> , 138; Trypetidae (Dip.) taken in N. Kent
Fauna of Denmark	95	"Literature of Science," rev.	11
"Flight of <i>F. curicularia</i> (Orth.)," B. Embry	8	Localities :—Aviemore, 56; Bishops Stortford, 9, 65; Bagdad, 13; Bernina Houses, 22; Boston Manor, Ealing, 42; Brandon, 90, 93; Bude, 108; Camberley, 23, 40; Chiddingfold, 91; China, 117; Denmark, 95; Dungeness, 107, 109; Deal, 107; Easton (Cumberland), 104, 122, 139, 143, 160; Folkestone, 12; Forres, 57; Fens, 90; Formosa, 117; Gloucestershire, 87; Godalming, 109; Hoy Is., 5; Havant, 91; Heston, 144; Iraq, 13, 97; Japan, 117; Kurdish Mts., 14, 97, 133; Kent, 107; Kent, North, 153; Lewes, 90; Morteratsch Glacier, 22; Muottas Muraigi, 22; Malay States, 44; Mullion, 108; Norway, 42; Orkneys, 5; Pontresina, 20; Punt Muraigi, 22; Purbeck, I. of, 95; Portland, 109; Palaeartic Region, 165; Scotch Glens, 6; Shetland Islands, 29, 33, 81; Storrington, Sussex, 42; Sussex Downs, 45; Savoy Alps, 49; Surrey, 55; Struan, 56; Sandwich, 107; Wales, Mid, 9; Weesen, 20; Worthing, 48; Wood Walton Fen, 89; Windsor Forest	153
"Foodplants of the Larvae of British Trypetidae, Notes on," M. Niblett	69	Mass-Movement, <i>F. rufa</i> (ant), 145; Coccinellids	104
"Forcing, Notes on," Capt. C. Q. Parsons	172	Melanic, " <i>C. pyrastris</i> (Dip.) in N. Kent," H. W. Andrews, 25; <i>C. edusa</i> ?	25
Forms of, <i>E. telmessia</i> , 103; <i>L. sephyrus</i> , 133, <i>L. icarus</i>	134	" <i>Micrambe aubrooki</i> , a beetle new to science," H. Donisthorpe	37
Fossils	78	"Microlepidoptera, Names of," T. Bainbrigg Fletcher, 18, 111, 127, 156: "new to Gloucestershire in 1938," <i>Id.</i>	76
"Gadflies of the Savoy Alps," P. A. H. Muschamp	49	Mosquito Pest, The	148
"Genonym, A new," T. Bainbrigg Fletcher	25	"Movements of Coccinellidae" (with map), T. F. Marriner	104
"Ghost" Moth (<i>H. humuli</i>) at Heston	144	New, ab. <i>striata</i> (<i>H. pisi</i>), 8; Genonym, 25; forms of <i>R. festiva</i> , 30, etc.; species of <i>Micrambe</i> (Col.), 37; aberrations of gadflies (Tabanidae), 51; forms of <i>Hepialus</i> , 81-85; forms of Coccinellids, 85; forms of Asiatic Phalaenoidea, 117; Amatidae from Asia, 149; Bombycidae	165
"Grasshoppers," T. F. Marriner	60	"New and little known forms of <i>Hepialus</i> ," Dr H. Bytinski-Salz ...	81
"Gynandromorphs of <i>I. zonaria</i> ," Dr E. A. Cockayne, 113; <i>P. lapponaria</i> , 113; "of <i>B. piniaria</i> ," Dr E. A. Cockayne, 138; Grasshopper	176		
Habit of, <i>P. chryson</i> larvae, 58; " <i>Labidura riparia</i> ," M. Burr, 94; <i>L. brevilinea</i> , 92; <i>E. grotiana</i>	169		
"Hemiptera of Easton, Some," T. F. Marriner	160		
Hibernation records	61		
"House, Note on the, Cricket," T. F. Marriner	113		
Hybrid, <i>D. erminia</i> ♂ × <i>D. vinula</i> ♀	79		
"Insect Legion, The," Malcolm Burr (rev.), Hy. J. T.	147		
"Intersex of <i>M. castrensis</i> ," J. O. T. Howard	143		
"Larvae, Notes on the, of British Moths," E. E. Green, 23, 40; of Trypetidae, 69; of <i>C. coryli</i> on apple	172		
"Lepidoptera of a Bagdad Orchard," E. P. Wiltshire	13		
Life-history of, <i>P. nubilalis</i> , 4; <i>L. trifolii</i> , 7; <i>O. rubiginea</i> , 39; <i>C. cribrum</i> , 58; <i>D. nana</i> (<i>conspersa</i>), 89; <i>T. gracilis</i> , 106; <i>P. nubilalis</i> , 162; <i>E. grotiana</i>	169		
Light	90		
"List of Trypetidae (Dip.) token in N. Kent," H. W. Andrews	153		
List of, Aberrations in wing markings of <i>E. stylata</i> , 2; Captures at sugar in a Bishops Stortford Garden, 9; exhibits at the Folkestone Exhibition, 12; species recorded near Bagdad, 15; species in the Pontresina, etc., area, 24; larvae beaten in September 1927, 25; species (Brit.) in recent parts of Seitz Supp. with new varieties, 26, 79; more prevalent forms of <i>R. festiva</i> , 36; Zeller's genera of Hübner's Tineae, 38; captures in Norway, 42; Diptera captured at Boston Manor, Ealing, 42; Early			

	PAGE		PAGE
"New and little known Asiatic Phalaenoidea," Dr H. Bytinski-Salz	117	<i>varia</i> , 12; <i>E. arcas</i> , <i>L. euphemus</i> , 21; <i>E. flavafasciata</i> , 21; <i>P. callidice</i> , 22; <i>B. cinctaria</i> (in Scotland), 57; <i>C. germanorum</i> and <i>C. uratensis</i> (2 Blowflies), 64; <i>A. nireus</i> , 76; <i>A. decrepitana</i> , 76; <i>C. gysseleii</i> , 76; <i>L. riparia</i> (Orth.), 94; <i>D. apollinus</i> , <i>M. larissa</i> , and <i>S. pelopea</i> , 102; <i>P. climene</i> , <i>E. telmessia</i> , and <i>E. lupinus</i> , 103; <i>L. exigua</i> , 107, 109; <i>H. oditis</i> , 109; <i>D. barrettii</i> , 109; <i>Subclytia rotundicentris</i> , 131; <i>S. pinastri</i> (Cumberland), 140; <i>M. atropos</i> (Cumberland), 140; <i>Neides lipularius</i> (Hem.), 160; <i>E. grotiana</i> , 169; Earwig, <i>A. albipennis</i> ...	174
"New Amatidae from Asia," Dr H. Bytinski-Salz	149	'Request, S.E. Kent," A. J. L. Bowes	43
"New Species and Forms of Palearctic Bombycine Moths," Dr H. Bytinski-Salz	165	Reviews: " <i>P. bryoniae</i> and <i>P. napi</i> ," Muller & Krautz, Hy. J. T., 64; "Some Beneficial Insects," W. R. Thompson, Hy. J. T., 80; Fabricius "Systema Glossatorum," Hy. J. T., 96; "Report of the VIIIth International Congress of Entomology," M.B., 132; "The Insect Legion," M. Burr, Hy. J. T.	147
Nomenclature ... 10, 18, 111, 127, 156, 168, 175		Reviews and Short Notices ... 10, 26, 43, 62, 78, 95, 114, 130, 132, 145, 147, 163, 175	
"Notes, on <i>Pyrausta nubilalis</i> ," S. Wakely, 3; "from Mid Wales," P. B. M. Allan, 9; on <i>S. dipotamica</i> , 20; on larvae of British Moths, 23, 40; on chief species near Bagdad, 16; "on a holiday in Norway," Dr G. S. Robertson, 42; "from Storrington, Sussex," Dr G. S. Robertson, 42; " <i>Euxoa cinerea</i> ," A. J. Wightman, 45; "More, on Kurdish Lepidoptera," E. P. Wiltshire, 97, 133; "the breeding of <i>P. nubilalis</i> ," S. Wakely, 162; Forcing, Capt. C. Q. Parsons	172	" <i>Rhyacia festiva</i> and its subspecies," Dr Bytinski-Salz	29
Obituary: Comm. J. J. Walker, R.N., F.R.E.S., F.L.S. (H. Donisthorpe), 17, 67; Dr C. J. Gahan, M.A., 17; Conte Turati, 78; R. P. L. Nevas, 115, 131 (M.B.); Sir G. Kenrick, F.R.E.S. (G.T.B.-B.), 116; A. E. Tonge, F.E.S., 130; Walther Horn, Hon. F.R.E.S.	130	Race of <i>C. quadripunctaria</i> , A new ...	135
"Odour of <i>A. fuliginosus</i> ," B. D. W. Morley	60	Second generations	44
Orchard Lepidoptera in Bagdad	15	Seitz, recent issues	10, 26, 79
Oriental Lepidoptera, Early Stages (rev.)	78	Societies: British Entomology, 11, 78, 130, 147, 163; Entomological Club, 11, 28, 63, 79 (Verrall Supper), 96, 131, 176; Folkestone Nat. Hist., 12; Lancashire and Cheshire Entomological, 63; Amateur Ent. Soc., 80; S. London Entomological and N.H.S., 146, 164; Royal Entomological Society, 163; Haslemere Nat. Hist. Soc.	175
"Orthoptera, near Worthing, A Few," Dr M. Burr, 48; "A Few Records of," E. S. Brown, 76; "in Gloucestershire," T. Bainbrigge Fletcher, 87; From the I. of Purbeck," W. D. Hincks, 94; New county records for, 143; from Cumberland	143	Staudinger's New Catalogue	62
"Oviposition of <i>O. ochracea</i> (<i>flavago</i>)," P. B. M. Allan	73	"Stridulation in a W. African moth," Dr K. Jordan	28
Pairing, Irregular	61	"Sugaring in a Bishops Stortford Garden," C. S. Colman, 9; in the Fens	90
Papilionidae of S. China	27	Swarming of Coccinellids	105
Parthenogenesis in <i>L. quercus</i> ?	171	Table of, contrasted forms of <i>R. festiva</i> in Shetland, Gt. Britain and the Continent, Statistical, 35; dark shaded forms of <i>E. cinerea</i> , 47; forms of <i>v. thulensis</i> (of <i>H. humuli</i>),	83
Pests of the Olive tree in S. Italy	146	Teratological specimen, of a Carabus, 28; of a Saturniid	44
'Plume larvae in May-June," T. Bainbrigge Fletcher	76	Type form, of <i>R. festiva</i> , 29; of <i>H. humuli</i> var. <i>thulensis</i>	82
Pterophoridae of France, rev.	115	"Variation in the Wing-markings of the Trypetid Fly, <i>E. stylata</i> ," H. W. Andrews	1
Pupa digging in Mid Wales	9		
"Pupa digging and some moralising," P. B. M. Allan	65		
Rare and local species noted:— <i>A. ononaria</i> , <i>S. albipuncta</i> , <i>S. vitellina</i> , <i>L. exigua</i> , <i>H. peltigera</i> , <i>A. ambigua</i> , <i>S. unipuncta</i> , <i>M. sativalis</i> , <i>L. l-album</i> , <i>C. exulis</i> , <i>H. humuli</i> , f. <i>hethlandica</i> , <i>R. sac-</i>			

	PAGE		PAGE
Variation in, <i>R. festiva</i> , 30; Shetland <i>R. festiva</i> , 33; the gadflies of the Savoy Alps, 50; <i>C. pusaria</i> , 147; <i>Orellia colon</i> (Dip. Tryp.), 154; " <i>Z. lonicerae</i> ," Thos. Greer	173	" Wasps nest, Diptera bred from a," H. W. Andrews	172
Venation in <i>E. stylata</i>	2	What is <i>Procris cognata</i> ?	44
		" White Admiral " at Heston, H. Donisthorpe	144
		" Zeller's Versuch: March 1839," T. Bainbrigge Fletcher	37

LIST OF CONTRIBUTORS.

	PAGE		PAGE
Andrews, H. W.	1, 25, 128, 153, 172	Kettlewell, H. B. D.	7, 39, 50, 89, 106
Allan, P. B. M.	9, 25, 65, 73, 174	Kaufmann, R. U.	167
Attwood, R. W.	171	Low, A. M.	42
Burr, M.	10, 44, 48, 94, 129, 132	Lempke, B. J.	128
Bytinski-Salz, Dr H.	29, 81, 117, 165	Muschamp, P. A. H.	49
Bowes, A. J. L.	55, 89, 107	Morley, B. D. W.	60, 145
Brown, E. S.	76, 143	Marriner, T. F. ...	85, 104, 121, 139, 143, 160
Bethune-Baker, G. T.	116	Miller, Miss M. E.	164
Cockayne, Dr E. A.	8, 138	Niblett, M.	69
Colman, C. S.	9	Parmenter, L.	129
Collin, J. E.	64	Parsons, Capt. C. Q.	172
Donisthorpe, H.	37, 67, 114, 144	Richardson, Austin	61
Embry, B.	9	Robertson, Dr G. S.	42
Ellis, H. Willoughby ...	11, 28, 63, 80, 96, 131, 176	Scott, Dr E.	20
Fletcher, T. Bainbrigge ...	18, 25, 37, 76, 87, 111, 127, 157, 169, 173, 176	Sterling, D. H.	80
Green, E. E.	23, 40	Turner, Hy. J. ...	10, 26, 43, 61, 62, 77, 80, 95, 114, 129, 145, 147, 163, 168, 175
Greenslade, R. M.	174	Taylor, J. Sneyd	128
Greer, Thos.	173	Wakely, S.	3, 162
Harris, Dr H. G.	20	Walton, J. W.	12
Hamm, A. H.	61	Weatherill, L. H.	5
Hincks, W. D.	94	Wiltshire, E. P.	13, 20, 97, 133
Howard, J. O. T.	143	Wightman, A. J.	45

SUPPLEMENTS.

- " The British Noctuae and their Varieties," Hy. J. Turner, F.R.E.S., F.R.H.S.,
II, (161)-(204). (2 new forms.)
- " Butterfly Races and Zygaenae of Macedonia," Dr Roger Verity, F.R.E.S.,
(17)-(20) end. (5 new forms.)

PLATES.

- I. Variation in Wing Markings of *E. stylata*, to face p. 1.
- II. Rosegg Valley; Schafberg; to face p. 20.
- III. *Rhyacia festiva*, Schiff., to face p. 29.
- IV. Variation in Savoy Gadflies, to face p. 49.
- V. Com. J. J. Walker, R.N., M.A., F.R.E.S., F.L.S., to face p. 67.
- VI. Aberrations of Coccinellids, to face p. 85.
- VII. Forms of *Heptalus*, to face p. 81.
- VIII. Migration of *A. bipunctata* (Col.), 1925, to face p. 104.
- IX. New and little-known Asiatic Phalaenoidea, to face p. 117.
- X. New Amatidae, to face p. 149.

Panolis, Hb. (1821), most authors. [*Achatia*, Hb. (1809) Steph.: *Trachea*, Ochs. & Tr. (1816-26): *Achatea*, Curt. (1826)] *piniperda*, Panz. (1786) [= *griseo-variegata*, Göze (1781)] = *flammea*, Schiff. (1775).

Tutt did not trace the *flam(m)ea*, Hb. to *flammea*, Schiff.

In his *Text Hüb.* corrected the spelling to *flammea*.

Schiff., *Verz.*, 87 (1775), described a "pale gold coloured red suffused" Noctua under the name *flammea*. But, as pointed out by Treit., *Schmet.*, V (2), 77 (1825), this description was so indefinite that Fabr., *Mant.*, II, 124 (1787), described the species under the name *Bombyx spreta*, and *l.c.* 164 redescribed it from the Schiff. collection as *Noctua flamma*. Esper (1788?) and Borkhausen (1792) were the first authors to suitably describe the species, under the name *piniperda*. It was Hübner who discovered the earlier name *flam(m)ea*, *Samml. Noct.*, 91, 92. But another species had already been named *flammea (empyrea)* (1785) so that he, Treit., was still using the name *piniperda*.

This early confusion was emphasised by an apparent error of Fab., *Ent. Sys.*, III (2), 85 (1794), who redescribed *flammea*:—"Minor *N. oo.* Alae anticae ferrugineo flavoque variegatae, apice albido striatae, etc." and omitted all reference to *ochroleuca*. Of this Illiger, in 1801, said "The whole description of Fab. evidently shows that under *flammea* he included this species [*ochroleuca*]. Probably this is an error in overlooking the above name, which might be easily done, since both species stood next to one another in the Schiff. collection."

Error seems to follow this species; for Hübner's fig. 91, obviously our *piniperda*, is labelled *ochroleuca*, obviously also from the confusion caused by the above error of Fab. in the *Ent. Sys.*, and fig. 92, obviously *ochroleuca*, is labelled *flammea*. In his *Text Noct.*, 185-6, Hb. corrected both the legends and the spelling to *flammea*, and noted that his fig. 476 appeared to show an extremely rare aberration of this species.

Tutt, *Brit. Noct.*, II, 128 (1892): Barr., *Lep. Br. Is.*, V, 181, pl. 200, 2 (1899): Stdgr., *Cat.*, III ed., 202 (1901): Hamp., *Lep. Ph.*, V, 461 (1905): Spr., *Schm. Eur.*, I, 242, pl. 45, f. 11 (1905): South, *M.B.I.*, I, 324, pl. 155, 1-3 (1907). Warr.-Stz., *Pal. Noct.*, III, 253, pl. 50 d (1911): Culot, *N. et G.*, I (2), 68, pl. 50, f. 16-17 (1914).

Ernst & Engr., *Pap. d'Eur.*, VII, 115, fig. 489 (1790), gave 5 good figures, two of which c. and d. were of the *griseo-variegata* form.

Loschge., *Naturf.*, XXI, 27, pl. 2 (3?) (1785), contributed a very full and detailed account of this pine feeder, covering about 30 pages, but did not mention its scientific name. His figures were quite good, especially of the larva as it appeared on a pine twig.

Esper., *Schm. Abbild.*, IV, 343, pl. 125, 1-6 (1787?), gave good figures of imago (2), larvae (2) in situ; and pupae (2), as *piniperda*, Panz. He stated that neither Linn. nor Fab. (*Sp. Ins.*) gave this species and that the species in the *Verz.* of Schiff., which a few considered to be this, was that known as *porphyrea [flammea]* of a different genus, but he noted that Fab., *Mant.*, II (1787), had named it *spreta*.

Hübner's figure, *l.c.*, 91, is an excellent one, f. 476 is a very rare and very extreme aberration.

Hb., *Verz.*, 214 (1821), used the name *flammea*, Schiff.

Dup., *Hist. Nat.*, VI, 436, pl. 100, 2-3 (1826), gave two average figures.

Meyr., *Hand.*, 76 (1895), used *piniperda*, Panz. in both editions, and the genus *Panolis*, Hb.

Splr., *Schm. Eur.*, I, 242, pl. 45, 11 (1905), gave an intermediate figure, dull red, but not grey under the name *griseo-variegata*, Göze. It is certainly not typical, nor the *grisea*, Tutt.

South, *Moths Br. Is.*, I, 324, pl. 155, 1-3 (1907), used *griseo-variegata* = *piniperda*. He gave 2, ♂ and ♀, moderately red figures, average British, and one very grey example.

Warr.-Seitz, *Pal. Noct.*, III, 253 (1911), treated *piniperda*, Loschge., *telifera*, Payk., *spretta*, Fb., *pini*, de Vill., and *ochroleuca*, Hb. as synonyms and said that the *grisea*, Tutt (1892) was the *griseo-variegata*, Göze (1781). They gave no further form. The species they recognised as *flammea*, Schiff. (1775).

Warr.-Seitz, *l.c.*, pl. 50 d (1911), gave a large ♀ with considerable amount of white, a very red ♂ with only the orbicular whitish and a large *griseo-variegata*.

They, *l.c.*, gave the genus name *Panolis*, Hb., and placed it in the *Heliothidinae* next to the genus *Anarta*.

Culot, *N. et G.*, II, 68 (1914), used the name *griseo-variegata*, Göze, and gave two nice figurēs, *l.c.*, pl. 50, 16, a grey one, and fig. 17, a typical red one. In the text he referred to the type *flammea*, Schiff., as represented by his figure 17, although he did not use this priority name.

Barrett says of the Variation:—

“The Variation in the male is usually in the depth of the orange-red ground colour of the forewings and in the degree of pale clouding upon them; often the orange stripe along the hind-margin is pale and throws off broad similar dashes into the cilia, or the white dashes on the nervures toward the hind-margin are more conspicuous. Greater uncertainty in colour is found in the female, which, in addition, is often tinged from the base with greenish-grey or purplish-grey to the exclusion of the orange colouring, or its restriction toward the hinder area. In Scotland the variation is from brick-red to purple-grey and grey-green.”

He records a specimen which has the ground colour of the forewings pale grey-green to the second line, which is dark chestnut, and is followed by a rich dark chestnut transverse stripe, much toothed outwardly, beyond which is again pale grey-green; the two stigmata very large, silvery white; hindwings nearly black.

The Names and Forms to be considered are:—

flammea, Schiff. (1775), *Verz.*, 87.

f. ab. *griseo-variegata*, Göze (1781), *Beitr.*, III (3), 250 (1781).

piniperda, Panz. (1786), *Mön. Kob.*, 51, pl. 1, 1-12 (1786).

f. *telifera*, Payk. (1786), *Vet. Acad. Stockh.*, XLVIII, 60 (1786).

spretta, Fab. (1787), *Mant.*, II, 124.

flamma, Fab. (1787), *l.c.*, 164.

pini, Vill. (1789), *Linn. S.N.*, II, 278.

flam(m)ea, Hb. (1800-3), *Saml. Noct.*, 91, 476. Text 186.

ab. *grisea*, Tutt (1892), *Brit. Noct.*, II, 128.

ab. *purpureo-fusca*, Preiss. (1922), *Verh. zoo.-bot. Wien*, LXXII (93).

race *insulata*, Brund (1925), *Ent. Tidskr.*, XLVI, 36.

race *sutschana*, Drdt.-Stz. (1935), *Pal. Noct. Supp.*, III, 199, pl. 22 h.
ssp. *japonica*, Drdt.-Stz. (1935), *l.c.*

Tutt dealt with (1) the *piniperda*, of Panzer; (2) the *flam(m)ea*, Hb., an extreme red form; (3) ab. *grisea*, Tutt, = [(4) f. *griseo-variegata*, Göze]; (5) the *spretta*, Fab., a typical form.

f. ab. *griseo-variegata*, Göze, *Ent. Beitr.*, III (3), 250 (1781). De Geer, *Ins.*, II (1), p. 410.

FIG.—*l.c.* (De Geer), pl. 6, f. 23 (1761).

ORIG. DESCRIP.—“A grey variegated Phalaena with two white spots.”
“Filiform antennae, orange-yellow wings variegated with grey with two large white spots on each.”

f. *telifera*, Payk., *Vet. Acad. Stockh.*, XLVIII, 60 (1786).

FIG.—pl. 2, 2-3.

ORIG. DESCRIP.—“Phal. Noct. Spirilinguis, cristata, alis deflexis superioribus rubro. flavo brunneoque variegatis, telo longitudinaliter fisso, albo.” “Larva, 16 poda, laevis, nuda viridia; lineis tribus dorsalibus niveis, unaque laterali concolor, margine inferiore fulva. Subtus lineis duabis obsoletioribus flavescentibus. Capite pedibusque anterioribus subferrugineis.”

pini, d. Villers, *Linn. Ent.*, II, 278 (1789).

ORIG. DESCRIP.—“Alis rubro, albo fuscoque variegatis, puncto albo.”
“Alae superiores rubellae, sed albo fuscoque colore variegantur. Thorax alis superioribus concolor. Macula reniformis rubra, rotunda alba. Subtus omnes fuscae.”

ab. *purpureo-fusca*, Preiss., *Verh. zoo.-bot. Wien*, LXXII (93) (1922).

ORIG. DESCRIP.—*l.c.*, LXV (201) (1915), “A strongly darkened ♀ example bred from the Rottalmoos, Litschau, Austria. Forewing up to the pale grey area behind the yellow waved line and which in normal specimens have pale markings are blackish red-brown with black and white fringes. Hindwings nearly black with white fringes, body and underside darker than in typical examples.”

ab. *insulata*, Brund, *Ent. Tidskr.*, XLVI, 36 (1925).

FIG.—*l.c.*, fig. 1 (b. and w.).

ORIG. DESCRIP.—“En ♂, tagen vid Vaxjo 3.v.18, avviker darigenom att ringflachen ar inat utdragen i en spets samt förenad med njurflacken bade framtill och baktill.”

The area usually occupied by the stigmata is a clear markingless ground, formed by the extension and union of the white stigmata, except for a small black blotch in the centre, the clear space extended to a point near the base and to a broad space near the outer marginal area pointing obliquely to the apex. The outer marginal area is marked by radiated darkish streaks much more pronounced on the left forewing than on the right. There is a submarginal darkening on the left hindwing but no trace of it on the right. The hindwings are somewhat lighter than the forewings. (Description of the figure cited.)

f. *sutschana*, Draudt-Seitz, *Pal. Noct. Sup.*, III, 199 (1935).

FIG.—*l.c.*, plt. 22 h.

ORIG. DESCRIP.—“Has somewhat narrower and more pointed wing contour with more oblique margin. Ground colour is more heavily admixed with olive green especially in anal area, the transverse lines are almost obsolete especially the posterior line, which is only indicated by a few whitish scales. The subterminal line is quite absent, in place of same there are long white rays in marginal area, as a prolongation of the white checks of fringes. These are situate on each side of the black streaks on veins and extend to post-median. Hindwings paler grey-brown.” Sutshanski Rudnik.

f. *japonica*, Drdt., *l.c.* (1935).

FIG.—*l.c.*, 22 h.

ORIG. DESCRIP.—“Somewhat resembles the previous form by the white marginal rays and the absence of the subterminal line. The ground colour is a bold red, all markings standing out boldly from the carmine red ground by a heavy appression of chalky white scales.” Kobe, Japan.

ab. **albojuncta**, ab. nov. “I have one from the New Forest with a clear white stripe joining the stigmata. A beautiful and distinct form. The markings are red.”—E. A. C.

Pachnobia, Gn. (1852), *Stdgr.*, South, Culot, etc. [*Triphaena*, Ochs. & Tr. (1816-25), Meyr. (1) and (2): *Mythimna*, Ochs. & Tr. (1816-25), Hamp.: *Orthosia*, Ochs. & Tr. (1816-25), Bdv., H.-S.: *Cerastis*, Ochs. & Tr. (1816-25), Warr.-Stz.: *Taeniocampa*, Gn. (1852), Gn.: *Sora*, Heinemann (1859), Splr.]: *leucographa*, Schiff. (1775).

The genus *Pachnobia* was established (1852) by Gn. for the species *carnea*, *hyperborea*, *carnica* (*tecta*) all species, which on account of their spined front tibia, etc., belonged to the genus *Agrotis* and to which they were removed by Aurivillius. Gn. had placed both *leucographa* and *rubricosa* in the genus *Taeniocampa* (1852). Heinemann placed *leucographa* in *Pachnobia*, but established the genus *Sora* for *rubricosa* (1859). Splr. said that the genus name *Pachnobia* could not be used, when all the original species had been removed and adopted the genus name *Sora*, Heine. for the two species *leucographa* and *rubricosa* (1905).

Tutt took the figure of Hüb., 411, as the type, whereas Schiff. *Verz.*, was the author of the name for a “purple-brown whitish marked *Noc-tua*.” p. 83 (1775).

Tutt, *Brit. Noct.*, II, 122 (1892): Barr., *Lep. Br. Is.*, V, 225, plt. 214, 1 (1899): *Stdgr.*, *Cat.*, IIIed., 153 (1901): Hamps., *Lep. Phal.*, IV, 604, f. 105 (1903): Splr., *Schm. Eur.*, I, 165, plt. 45, f. 12 (1905): South, *Moths Br. I.*, I, 325, plt. 155, f. 4 (1907): Warr.-Seitz, *Pal. Noct.*, III, 60, plt. 14 b (1909): Culot, *N. et G.*, I (1), 94, plt. 15, f. 18 (1911).

Esper, *Abbild.*, IV (1), plt. 150, 5 (1788-9); IV (2), p. 491 (1791?), gave a figure which may be anything. Werneburg even suggested *oler-acea*, L. (*suasa*, Tr.), *Beitr.*, II, 46. The text of Esper is no help.

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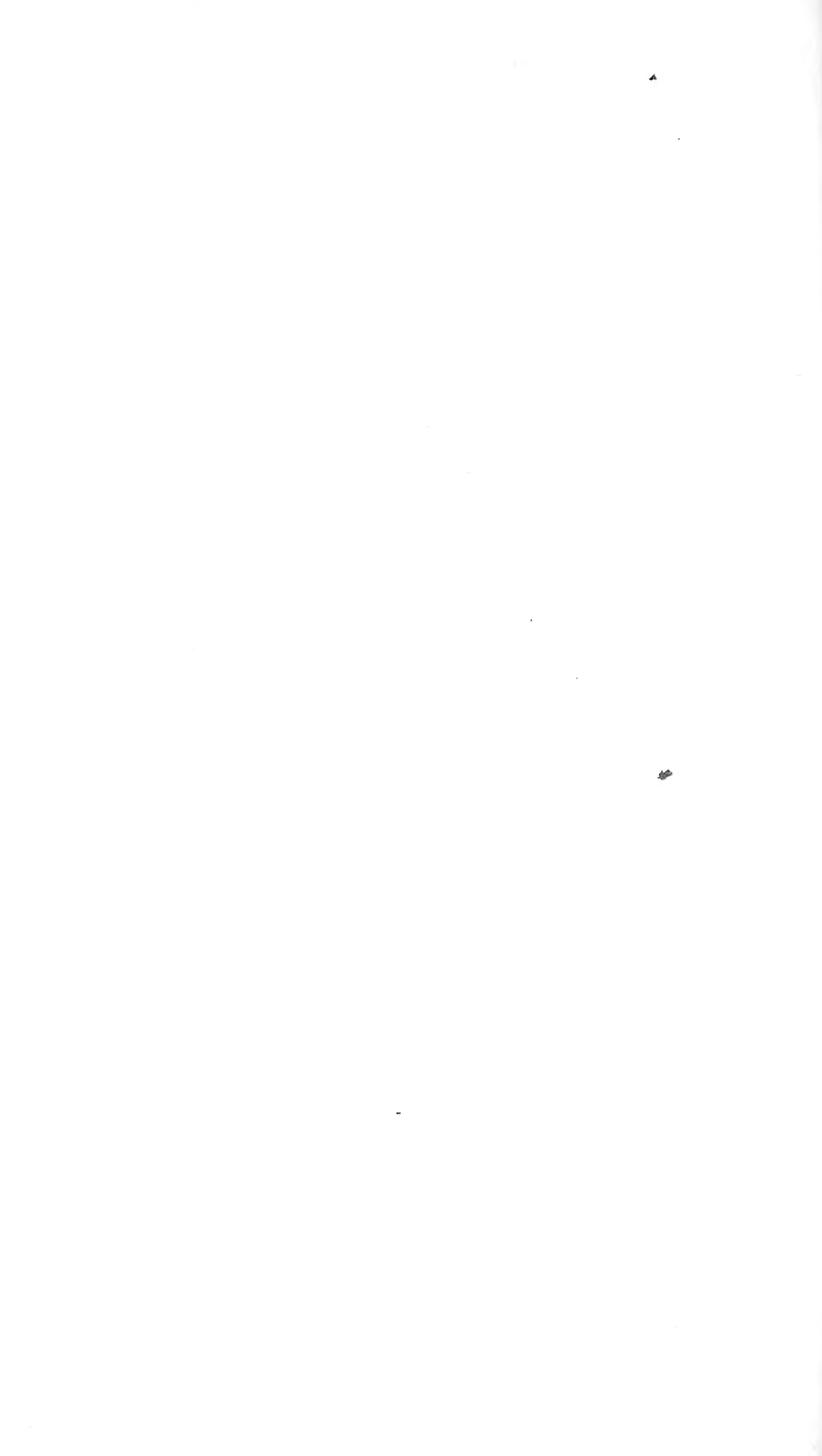
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