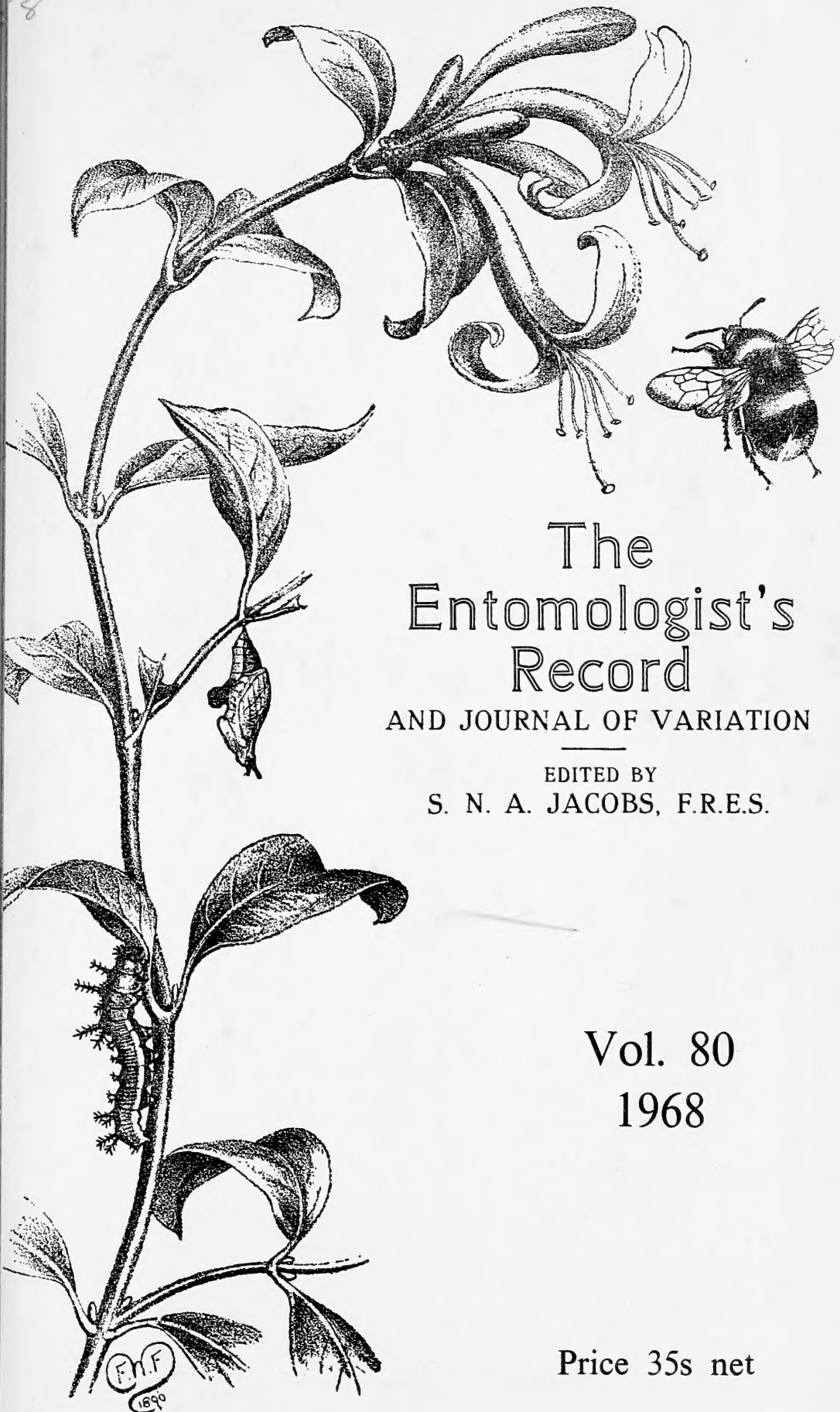


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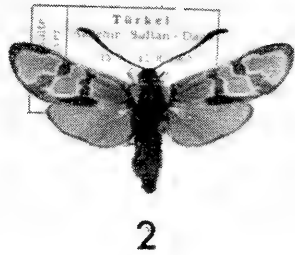
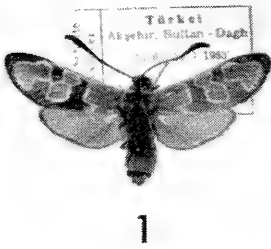


Fig. 1—*Zygaena ganymedes sultana* n. subsp., Holotype ♂, wingspan 24 mm.

Fig. 2—*Z. ganymedes sultana* n. subsp., Allotype ♀, wingspan 25.5 mm.

On a New Subspecies of *Zygaena* (*Agrumenia**) *ganymedes* Herrich-Schäffer (Lep., Zygaenidae)

By HUGO REISS, Stuttgart, and Dr. ADOLF SCHULTE, Hannover

Herrich-Schäffer originally illustrated *Zygaena ganymedes* Herrich-Schäffer in 1851 in the *Systematische Bearbeitung der Schmetterlinge von Europa* and described the species a year later in 1852 without quoting the exact locality. I have already written (Reiss, 1933a: 205) on *Z. ganymedes* and suggested that Zeitun in the Taurus mountains of Turkey should be taken as the type locality. On the coloured plate I figured a ♂ and ♀ from Zeitun. These specimens were also illustrated on the black and white plate where, in addition, a specimen labelled Armenia was figured. Later the same year (Reiss, 1933b: 267) I referred all populations from the Taurus to the nominate form of *Zygaena ganymedes* Herrich-Schäffer. Tremewan (1966: 31, pl. 1, fig. 1) designated a ♂ (26 mm. wing span), labelled Asia minor, as a lectotype of *Z. ganymedes* Herrich-Schäffer and illustrated the specimen together with the genitalia.

A series of 5♂, 2♀ labelled: Türkei, Ak-Sehir, Sultan Dagh, 15.vi.-15.vii.1963, leg. Leinfest, shows little variation. Until now, the species was unrecorded from this locality in the central region of Turkey. The specimens are smaller than *ganymedes* from Zeitun and have a wingspan of 24-26 mm. in the ♂ and 25 and 25.5 mm. in the ♀. In 1♂, 1♀, the red and connected forewing spots 1, 2, 2a, that reach the inner margin, are enlarged, spot 1 is separated from spot 3 only by the yellow edging. The antennae are blue-black, likewise the frons and the palpi. The patagia and tegulae are red, the latter mixed with yellow and in 2♂ with black scaling. On the abdomen, the last segment is blue-black, the remaining segments are red dorsally, but are red ventrally only on two to three segments. In 2♂ the red is even somewhat reduced on the upperside of the abdomen. The legs are mostly bone-yellow. Compared with *ganymedes* from Zeitun, the red coloration is less mixed with vermilion, the yellow edging of the forewing spots is stronger, also the red spots 5 and 6 are distinctly surrounded with yellow. While in *ganymedes* from Zeitun the margins of the forewings are blue-black in the specimens from Sultan Dagh the edges of the wings are yellow and in 2♂ and 2♀ the normally blue-black inner margin is likewise yellow. The fringes of the forewings are yellow, those of the hindwings are dark. On the underside of the forewings the coloration is duller, the forewing spots and their yellow edging are visible, between the spots the ground colour is dusted with yellowish scaling, the apex and the termen are blue-black.

We name this race **sultana** n. subsp. Holotype ♂, Türkei, Aksehir, Sultan Dagh, 15.vi.-15.vii.1963, leg. Leinfest, in coll. H. Reiss; allotype ♀, with the same data, in coll. A. Schulte; 4♂, 1♀ Paratypes with the same data in coll. H. Reiss and coll. A. Schulte.

The holotype ♂ and allotype ♀ are figured on the accompanying plate. These figures show the form and length of the antennae, the wing shape, the size and shape of the forewing spots and the hindwing border.

We are greatly indebted to Dr. Günther Reiss for preparing the original photographs reproduced on the plate.

*The placing of this species in the subgenus *Agrumenia* Hübner follows Reiss (1958).

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Dioryctria abietella Denis & Schiffermuller and *D. abietella* f. *mutatella* Fuchs. (Lep. Phycitidae)

By GEORGE H. YOUNDEN, F.R.E.S.

It appears that all British specimens supposed to be *Dioryctria splendidella* H.-S. (a synonym of *D. sylvestrella* Ratzeburg) which have been examined, have proved to be *D. abietella* D. & Schiff. Before reading Mr. M. Shaffer's paper (*Ent. Gazette* **17**: 20) I forwarded to him some of my larger, well marked specimens, some with prominent brown patches, which I thought were *splendidella*. Mr. Shaffer has kindly compared them with other material at the British Museum (Natural History) with the result that he has determined these larger specimens as *D. abietella*. He goes on to emphasise that the smaller specimens which in the past have been called *abietella* are referable to the form *mutatella* Fuchs.

This species does not appear in the local list of moths found in the Dover and Deal district of Kent, prepared by the late B. E. Embry and myself in 1949, as we could not find any records of its occurrence at that time. It has, however, been recorded from Kent (Barrett, *British Lepidoptera* **IX**:415).

The first record in the Dover area appears to be in 1955, in which year 15 came to my mercury vapour light trap—one on 9th July, 13 on 29th July, and one on 23rd August. This sudden appearance seems to suggest migration. The species does not occur regularly here, although the food plant, *Pinus sylvestris* is close by. The only other specimens I have recorded locally are one on the 22nd August 1959, and one on 20th June 1966.

Single specimens have been taken by Mr. D. G. Marsh, at Ickham, near Canterbury, on 31st July 1956, and 29th August 1961. If all recorded specimens refer to this species, it occurred in the Ashford, Kent, area in 1954, 1955, 1956 and 1957 (E. Scott annotated list of *Lepidoptera* 1964: 59) and I understand it has turned up fairly regularly in the Folkestone area (A. M. Morley, in litt.).

Specimens from Hailsham, Sussex, formerly in the collection of the late B. E. Embry, which I now have, appear to be smaller, and referable to form *mutatella* Fuchs., as indeed, are the majority of those taken by me in Rothiemurchus Forest, Inverness-shire, in July 1959.

My thanks are due to Mr. Shaffer for his help and for examining some two dozen specimens which I sent to him.

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Seven Weeks in Jamaica, Winters 1966-1967

By A. G. M. BATTEN and Mrs. A. M. BATTEN

We have been to Jamaica twice, for seventeen days in January 1966 and for nearly five weeks from the 3rd January 1967. Since Jamaica is north of the equator it should be realised that we were there in their mid-winter as well as our own, though winter conditions are, of course, different. Most of the time we spent at Good Hope, Falmouth, an 18th century Great House standing in its own 2400 acres, carrying mainly cattle, a small amount of sugar and many palm trees, with access to another 4000 acres for riding purposes. Falmouth is about 23 miles east from the resort of Montego Bay and our hotel was 5 miles inland at an altitude of 540 feet. This part of the island borders the so-called Cockpit Country, much of which is almost impenetrable. The vegetation is, of course, tropical—the rainfall is substantial.

On this last visit we left Heath Row by B.O.A.C. on 3rd January and flew to Kingston, Jamaica, stopping only for refuelling at Bermuda, a journey from door to door of about 14 hours. We spent three days in Kingston, on business, with little opportunity to look for lepidoptera. Nevertheless, on the morning after our arrival at Sheraton Hotel we walked through its long covered passage ways between the bedroom blocks and saw, some eight feet from the ground, a large moth which has since been identified as *Thysania lonobia*, Cram. This needed a net to dislodge it when it quickly made its way round a corner into thick herbage. On following up we saw what we took to be the same insect resting at a convenient height on a white wall and it was easily captured. No sooner was this accomplished than what was undoubtedly the first insect seen appeared fluttering about. It settled and was also captured. Both were in perfect condition and had probably only emerged the night before. We saw no more examples and despite a search of the hundreds of yards of corridors, found nothing else. The yellow lights used in the tropics to discourage insects seemed to us to have done their job all too well.

Before leaving Kingston we spent one day in the Blue Mountains (at 4000 ft.). However, no sooner had we arrived there than cloud descended and no insects were seen.

We then drove, in a small car made available to us, the 110 miles from Kingston to Good Hope. This took us inland from Kingston through Spanish Town and the mountains to Ocho Rios, passing through the extraordinary Fern Gully which exceptionally in the Island bears masses of tree ferns. The day was rather dull and windy and there was no opportunity to collect.

This year, for the first time, we used a portable moth trap, indeed, apart from having sent one by post we bought, and brought, another since we were told that the Jamaican Customs might delay the postal parcel for too long. (In fact, replacement tweezers sent by post took more than a month to reach us by airmail—and at an import duty cost of 4/4.) The portable traps now available in England and run off a 12 volt battery, have much to commend them. However, at home we have never found the vertical tube used in this device to be as effective as the 125 m.v. lamp. Transport and electric voltage problems precluded our taking the large trap although it would undoubtedly have given better results in every way. However, to the interest of our co-guests, only one of whom was entomologically conscious (he was an eminent coleopterist and warmly welcomed our

enterprise), we set up the moth trap nightly immediately in front of the hotel with an uninterrupted view of at least 7 miles of wooded and agricultural country unaffected by pesticides of any kind. The results were varied and, as usual, much affected by the moon for a part of the time. Wind often affected the early part of the evening but usually the wind dropped by 8 p.m. It was dark by 7 p.m.

Later in this note we shall record some of our catches. At this point it will suffice to state that the numbers of insects during an operating period of three hours were sometimes very great but that the number of species seen was not so many as might have been expected. We found that a sheet set up behind the trap was useful and, fortunately, most of the larger insects, despairing of entering the trap, rested, undamaged, on the sheet and were readily taken. Inside the trap itself chaos reigned and many insects destroyed themselves. They were not so prone, as at home, to settle down and await events. The presence of beetles and crickets, in the trap as well as outside, added to the confusion. A praying mantis thoroughly enjoyed the facilities.

One evening, having just set up the trap, we were admiring the last of the setting sun over the top of a Flame of the Forest tree (*Spathodea campanulata*) when a large hawk moth (identity uncertain) could be seen against the remaining light in the sky, visiting the tulip-like flowers one by one for some long time. We suspect that it came to the trap eventually. It was no doubt one of the largest sphingids and probably *Cocytius anteus*, which came that night.

We must now mention the butterflies. The Great House owned about two miles of sandy beach (complete with palm trees, blue lagoon and coral reef) about three miles east of Falmouth, all for the exclusive use of less than forty guests, and while we were there, for fifteen and sometimes less. Some 60 yards behind the beach there was a grassy cart-track with miscellaneous vegetation ranging from grass to small plants, flowering and otherwise, to shrubs up to 10 feet high and a few small trees. It was easy to pass to and fro along this track. To leave it was to risk the hazards of prickly pear (*Opuntia megacantha*), which abounded often just below the height of the grasses. Along this track most of our butterflies were caught. Our second visit was not so productive as the first because some of the attractive flowering shrubs had disappeared and had been replaced by wire fencing. Others seemed to have changed their flowering periods since the previous year. Quite unusually near-drought conditions prevailed during our visit which may have accounted for this and plants and shrubs wilted visibly.

A few hundred yards away was a disused road-stone quarry. This was ideal for hunting lepidoptera and movement was possible along those parts not yet overgrown. In a year or so many colonies of butterflies and moths will doubtless be established there. We found a number of caterpillars and some pupae but could not identify them. To us this quarry was noteworthy in that it was here that one of us saw his first Monarch (*Danaus plexippus*). These are not by any means very common in the north of Jamaica. More are found on the south coast.

Unfortunately, each day at about 10.15 a.m. wind was apt to arise. This militated against collecting and on some days resulted in there being nothing but small euresmas and tiny blues to be seen. These insects flew, close to the ground, from morning to night and seemed quite unworried by the wind.

Our butterfly collecting was confined to these two situations, both within 100 yards or so of mile-post 79 from Spanish Town to Montego Bay and, also, alongside the Martha Brae, a small river rising in the mountains and passing through the Good Hope estate to the sea.

We were advised by the owner of the Hotel, Mr Patrick Tenison—himself very knowledgeable on lepidoptera—to walk along the banks of the Martha Brae where swallowtails were to be found. We took his advice and on each occasion found a number of *Victorinas* fluttering about on the steep banks in dappled sunshine beneath the trees. We took some ten specimens. Those of 1967 were in far better condition than those of 1966—probably due to absence of rain storms. There were very few other butterfly species in this location.

The Zebra (*Heliconius charitonius*, Linnaeus) is very common in this neighbourhood. We heard many stories of their having been seen in vast numbers but did not really believe these tales until reliable witnesses who went for early morning rides on the Estate repeatedly reported having seen them. Undoubtedly this species came together at night in wooded areas, often near water.

Our most thrilling entomological experience concerned *Papilio homerus*, the largest and scarcest of the Jamaican butterflies. The hotel dining room was an extension from the main hotel, enclosed in mosquito netting with a steep drop of some 30-40 feet to the ground. This insect came to a Flame of the Forest tree daily while we were at lunch and remained there, wings folded hanging downwards for long periods. After a while, however, it would take off and settle on a palm tree—again only some ten feet away from the dining room and then return to its former perch. Sometimes it took off and settled on the angle of the roof within a few feet of us so that we could just see its two antennae hanging below the roof. This kind of thing happened for seven consecutive days always at the same time and on two of them the insect came to exactly the same point on the roof. One evening, at about 5.0 p.m. we saw a similar insect on the wing about a mile away. Good Hope is one of the places in the Island where the insect is not infrequently seen.

We took a number of examples of *Utetheisa bella* L., one or two at light but most of them in the quarry by day. The upper wings are almost identical with those of our own Crimson Speckled Footman (*Utetheisa pulchella*) but the hind wings of those caught were pink with black markings round the edges instead of white hind wings as recorded in this country. One example especially showed almost the same black markings on its hind wings as our own migrant. It is suspected that a bushy vetch is their food plant since many rose from the neighbourhood of such bushes when disturbed during the day, but not elsewhere in the quarry.

It should be noted that while Richard South ascribes our *pulchella* to many warm countries he does not mention the Americas.

We did not confine our collecting to the M.V. light. For nearly three weeks we sugared trees each night with a mixture of Jamaican molasses, Guinness and rum. The results were disappointing and the best we ever achieved in one evening was 45 insects of not more than five species. Moreover, we had to contend with our usual enemies, bats and toads. In addition, great slugs, some five inches long, came to sugar, as well as lizards. The latter managed to simulate the bark of the tree. Incidentally, lizards in our bedroom were a hazard when setting. They would jump

from the wall into the waste paper basket to retrieve each discarded specimen. No holds were barred.

Since our return most of the insects have visited the British Museum (Natural History) who retained one butterfly, *Achlyodes thraso mithridates* Fabricius, since this is very thinly represented in the National Collection.

Many of the moths have proved difficult. The accurate identification of the noctuids will require, in many cases, the preparation of the genitalia. This might, perhaps, be undertaken at a later date. Of the 100 or so specimens submitted to the Museum 39 were retained comprising 29 varieties. One of the Sphingids gave special satisfaction, *Madoryx oiclus*, Cramer. This may well prove to be a new sub-species of the examples already in the Museum.

The 13 Sphingids captured were:—

- Madoryx oiclus* Cramer.
- Pholus labruscae* F.
- Cocytius duponchel* Poey.
- Amolypterus gannascus jamaicensis* R. & J.
- Erinnyis ello* L.
- Manduca sexta jamaicensis* Butl.
- Erinnyis oenotrus* Stoll.
- Erinnyis alope* Drury.
- Pachylia ficus* L.
- Epistor lugutris* Roths. *latipennis*.
- Pseudosphinx tetrío* L.
- Cocytrius anteus* Drury.
- Xylophanes tersa* L.

Among the other moths recorded were more than 40 species including:—

- Ecpantheria nigriplaca* Walker.
- Pachydota iodea* H. Schaffer.
- Automolis delicata* Moshler.
- Ammaus insulata* Walker.
- Palpita hyalinata* L.
- Athysania velata* Walker.
- Paraote immanis* Walker.
- Sematura oegistus* Fab. (this is a swallowtail-like insect reminiscent of the butterflies, brown in colour and said to be much sought after by certain American museums).
- Euglyphia hieroglyphica* Cram.
- Spodoptera rubrifusa* Hampson.
- Spodoptera pulchella* H. Schaffer.

As already stated, many of the other moths, and especially the noctuids, were difficult accurately to identify.

We captured 27 species of butterflies which included the following (in addition to *Papilio homerus*, which we did not catch but only saw) and a number of very small Blues which we did not identify:—

- Heliconias charithonia* L.
- Urbanus proteus* R. & J.
- Cystineura doreus* Fabricius.

Andia jatsophe jamaicensis Moshler.
Victorina stelenes lavinea Fabricius.
Eurema alathea Cramer.
Colaenis julia Fabricius.
Dione vanillae L.
Phoebis aganthe antillia M. Brown.
Pyrrhanea troglodyta portia Fabricius.
Glutophissa drusillae castalia Fabricius.
Achlyodes thraso mithridates Fabricius.
Colias eurytheme Boisduval
Eurema nisa Latscille
Eurema nicippe Cramer
Eurema lisa Boisduval and Le Conte.
Marpasia petreus Cramer
Phoebis sennae Linnaeus
Appias drusilla Cramer
Precis lavinia Cramer

In conclusion, we are greatly indebted to our friends at the British Museum (Natural History) — and especially Mr A. H. Hayes — for their untiring efforts to help identify what were so often difficult subjects. Our thanks to Mr. Hayes are not in the least modified by the knowledge that his wisdom and charm persuaded us to part, to the Museum, with some 40 items of nearly 30 species.

Lepidoptera from the Stirling Area

By D. L. COATES

The following list of lepidoptera from an area centred on Stirling has been compiled from records gathered between 1962 and 1965 inclusive.

Stirling lies close to the borders of several other counties, hence the inclusion of some records outside Stirlingshire. The area is defined by a circle of twenty miles radius, centred on the town of Stirling. All records are from my suburban garden, which is situated about half a mile south of Stirling, unless otherwise stated. Night records other than from the aforementioned garden are entirely from (a) the street lights in Bridge of Allan, Stirlingshire, (b) an inn near Airdrie, Lanarkshire, (c) a friend's house in Brig O' Turk, Perthshire, and (d) my house near Aberfoyle, Perthshire, since moving here on 27th September 1965.

As far as I know, this is the first comprehensive list for this area. The only other list, which includes a number of Stirlingshire records, was published by Dalglish and King (1901, Macro- and Microlepidoptera, in Fauna, Flora and Geology of the Clyde area, pp. 233-257, British Association, Glasgow).

A mercury vapour light trap has been used at home since autumn 1962, on all suitable nights, excepting holidays, etc. A portable generator has not been used. Daytime operations have been limited, owing to the not unusual fact that an income has to be made in order to support a wife and family. From these facts alone it is patently clear that there is still a great deal to be discovered. Very little work has been done on the smaller moths, and what has been done only began in 1964. However, since moving to Aberfoyle, I have been lucky enough to discover a Tortricid moth

new to the British Isles, *Acleris abietana* Hübn. (*Ent. Rec.*, 79: 151). Other species rarely reported from Scotland include *Cucullia chamomillae* Schiff., *Zenobia subtusa* Schiff., *Mesoleuca albicillata* L., *Perizoma bifaciata* Haw., *Rheumaptera undulata* L., *Ennomos querinaria* Hufn. and *Eucosma ratzeburgiana* Saxesen. Also worth mentioning are *Enargia paleacea* Esp., *Apamea exulis* subsp. *assimilis* Doublt, and *Pyrrhia umbra* Hüfn., which I had not expected to find in this part of Scotland.

For no reason other than convenience, nomenclature and order are as follows:—Butterflies according to the "Revised List of British Butterflies according to the report of the Committee of the Royal Entomological Society of London on Generic Nomenclature (1934)". Larger moths according to "South (1961), the Moths of the British Isles, 4th Edition", except that the Lasiocampidae and Arctiidae have been brought back between the Saturniidae and the Notodontidae. Smaller moths according to "Ford (1949 and 1958), a Guide to the smaller British Lepidoptera and Supplement".

My sincere thanks are due to Mr. E. C. Pelham-Clinton of the Royal Scottish Museum, Edinburgh, without whose help with identification and general advice, this list would not have been possible to publish; also to Mr. David Simpson of "Dundarroch", Brig O' Turk, for allowing me to "plug in" whenever I wished, and for his never failing hospitality and supply of delectable "White Horse" whisky.

STIRLINGSHIRE

SATYRIDAE

- Maniola jurtina* L. Cambusbarron. July/Aug., local but common where found.
Coenonympha pamphilus L. Cambusbarron. May/Sep., widespread common.
C. tullia Müll. Flanders Moss. June/July, common in one area.
Aphantopus hyperantus L. Flanders Moss, July, locally common.

NYMPHALIDAE

- Argynnis selene* Schiff. Cambusbarron, June/July, local but fairly common where found.
A. aglaja L. Cambusbarron, July, in one area, uncommon.
Vanessa atalanta L. Sept./Oct., not seen every year.
Aglais urticae L. Widespread and fairly common.
Nymphalis io L. Widespread—uncommon.

LYCAENIDAE

- Polyommatus icarus* Rott. Cambusbarron. June/July, common in one area, single brooded.
Lycaena phleas L. June and Sept., widespread, uncommon, probably double-brooded only.
Callophrys rubi L. Easterton, May/June, local but fairly common where found.

PIERIDAE

- Pieris brassicae* L. Not seen every year.
P. rapae L. Very common.
P. napi L. June and Aug. Widespread, very common, double-brooded.

SPHINGIDAE

- Laothoe populi* L. Common.
Deilephila elpenor L. Bridge of Allan, occasional.
D. porcellus L. Occasional.

SATURNIDAE

- Saturnia pavonia* L. Probably fairly common in suitable places.

LASIOCAMPIDAE

- Poecilocampa populi* L. Fairly common.

ARCTIIDAE

- Nudaria mundana* L. Fairly common.
Spilosoma lubricipeda L. Very common.
Arctia caja L. Common.

NOTODONTIDAE

- Harpyia furcula* Clerck. Uncommon.
Cerura vinula L. Occasional.
Chaonia ruficornis Hufn. Fairly common.
Pheosia tremula Clerck. Uncommon, single-brooded.
P. gnoma Fab. Apr./Aug., fairly common, possibly double-brooded.
Notodonta ziczac L. Uncommon, single-brooded.
N. dromedarius L. Fairly common, single-brooded.
Lophopteryx capucina L. Fairly common, single-brooded.
Phalera bucephala L. Fairly common.

THYATIRIDAE

- Thyatira batis* L. Uncommon, single-brooded.
Tethea duplaris L. Fairly common.
Achylia flavicornis L. Common.

DREPANIDAE

- Drepana falcataria* L. Bridge of Allan, one only.

NOCTUIDAE

- Euxoa nigricans* L. Fairly common.
Agrotis segetum Schiff. Common.
A. exclamationis L. Common.
A. ipsilon Hufn. Fairly common, but numbers fluctuate.
Lycophotia varia de Vill. Fairly common.
Peridroma porphyrea Schiff. One only.
Graphiphora augur Fab. Fairly common.
Diarsia brunnea Schiff. Uncommon.
D. mendica Fab. Very common.
D. dahlii Hübn. Uncommon.
D. rubi View. Very common.
Ochropleura plecta L. Common.
Paradiarsia glareosa Esp. Fairly common.
Amathes baja Schiff. Common.
A. c-nigrum L. Fairly common.
A. triangulum Hufn. Fairly common.

- A. sexstrigata* Haw. Uncommon.
A. xanthographa Schiff. Very Common.
Axylia putris L. Fairly common.
Anaplectoides prasina Schiff. Occasional.
Eurois occulta L. Occasional.
Euschesis janthina Schiff. Abundant.
E. comes Hübn. Abundant.
Noctua pronuba L. Abundant.
Lampra fimbriata Schreber. Fairly common.
Cerastis rubricosa Schiff. Common.
Naenia typica L. Occasional.
Mamestra brassicae L. Fairly common.
Diataraxia oleracea L. Fairly common.
Ceramica pisi L. Fairly common.
Hada nana Hufn. Fairly common.
Hadena thalassina Schiff. Common.
H. bombycina Hufn. Fairly common.
H. bicolorata Hufn. Uncommon.
H. conspersa Schiff. Uncommon.
H. bicruris Hufn. Fairly common.
Orthosia gothica L. Very common.
O. cruda Schiff. Fairly common.
O. stabilis Schiff. Very common.
O. incerta Hufn. Very common.
Panolis flammea Schiff. Occasional.
Tholera popularis Fab. Kippen, one only.
Cerapteryx graminis L. Common.
Leucania pallens L. Common.
L. impura Hübn. Common.
L. comma L. Fairly common.
L. lythargyria Esp. Fairly common.
L. conigera Schiff. Fairly common.
Cucullia chamomillae Schiff. Once at light on 26.v.1963.
Bombycia viminalis Fab. Uncommon.
Aporophila lutulentula s.sp. *luneburgensis* Freyer. Uncommon.
A. nigra Haw. Common.
Xylena vetusta Hübn. Fairly common.
Allophyes oxyacanthae L. Common.
Griposia aprilina L. Fairly common.
Eumichtis adusta Esp. Common.
Dryobotodes eremita Fab. One only.
Dasypolia templi Thunbg. One only.
Antitype chi. L. Common.
Eupsilia transversa Hufn. Common.
Omphaloscelis lunosa Haw. Fairly common.
Agrochola lota Clerck. Fairly common.
A. macilenta Hübn. Common.
A. circellaris Hufn. Common.
Anchoscelis helvola L. One only.
A. litura L. Common.
Atethelia xerampelina Esp. Uncommon.
Tiliacea citrago L. Uncommon.
Citria lutea Ström. Fairly common.

- Cirrhia icteritia* Hufn. Fairly common.
Conistra vaccinii L. Very common.
Cryphia perla Schiff. Uncommon.
Apatele leporina L. Occasional.
A. psi L. Fairly common.
A. rumicis L. Fairly common.
Amphipyra tragopoginis Clerck. Common.
Rusina ferruginea Esp. Common.
Apamea lithoxylaea Schiff. Fairly common.
A. monoglypha Hufn. Abundant.
A. crenata Hufn. Common.
A. sordens Hufn. Common.
A. remissa Hübn. Common.
A. unanimitis Hübn. Occasional.
A. secalis L. Very common.
A. ophiogramma Esp. Occasional.
Procus strigilis Clerck. Common.
P. versicolor Borkh. Occasional.
P. fasciuncula Haw. Common.
P. literosa Haw. Uncommon.
P. furuncula Schiff. One only.
Luperina testacea Schiff. Fairly common.
Euplexia lucipara L. Common.
Phlogophora meticulosa L. Common.
Petilampa minima Haw. Fairly common.
Stilbia anomala Haw. Fairly common.
Caradrina morpheus Hufn. Common.
C. blanda Schiff. Occasional.
C. clavipalpis Scop. Fairly common.
Celaena haworthii Curt. Occasional.
C. leucostigma s.sp. *scotica* Cockayne, occasional.
Hydraecia oculea L. Fairly common.
H. lucens Freyer. Uncommon.
Gortyna micacea Esp. Very common.
G. flavago Schiff. Fairly common.
Cosmia trapezina L. Common.
Enargia paleacea Esp. One worn specimen at light on 16.viii.1964.
Zenobia subtusa Schiff. One at light in ix.1962.
Rhizedra lutosa Hübn. Uncommon.
Arenostola pygmina Haw. Fairly common.
Bena fagana Fab. Bridge of Allan, one only.
Nycteola revayana Scop. Uncommon.
Euclidimera mi Clerck. Cambusbarron, very local, uncommon.
Colocasia coryli L. Fairly common.
Plusia moneta Fab. Occasional.
P. chrysitis L. Common.
P. bractaea Schiff. Uncommon.
P. festucae L. Fairly common.
P. jota L. Fairly common.
P. pulchrina Hübn. Common.
P. gamma L. Varying numbers annually.
P. interrogationis L. Occasional.
Unca trigemina Wernberg. Occasional.

- U. triplasia* L. Fairly common.
Scoliopteryx libatrix L. Uncommon.
Phytometra viridaria Clerck. Balmaha, one only.
Hypena proboscidalis L. Fairly common, single-brooded.
Schranksia costaestrigalis Steph. One only.
Zanclognatha tarsipennalis Treits. Uncommon.
Z. nemoralis Fab. Uncommon.

GEOMETRIDAE

- Alsophila aescularia* Schiff. Common.
Geometra papilionaria L. Fairly common.
Scopula ternata Schrank. Balmaha, local but common where found.
Sterrrha seriata Schrank. Uncommon.
S. aversata L. Fairly common.
S. biselata Hufn. Uncommon.
Xanthorhoe montanata Schiff. Very common.
X. fluctuata L. Very common.
X. ferrugata Clerck. Balmaha, local and uncommon.
X. spadicearia Schiff. Balmaha, local and uncommon.
X. designata Hufn. Common.
Ortholitha mucronata s.sp. *scotica* Cockayne. Balmaha, local but common where found.
O. chenopodiata L. Uncommon.
Colostygia pectinataria Knoch. Easterton, local but very common where found.
C. salicata Hübn. Balmaha, one only.
C. multistrigaria Haw. Common.
C. didymata L. Widespread, very common.
Earophila badiata Schiff. Uncommon.
Anticlea derivata Schiff. Uncommon.
Mesoleuca albicillata L. One at light on 9.vii.1965.
Entephria caesiata Schiff. Bridge of Allan, fairly common.
Perizoma alchemillata L. Fairly common.
P. bifaciata Haw. One at light, 12.vii.1963.
P. flavofasciata Thunb. Uncommon.
Euphyia bilineata L. Widespread, fairly common.
Lyncometra ocellata L. Fairly common.
Lampropteryx suffumata Schiff. Bridge of Allan, fairly common.
Electrophaes corylata Thunb. Cambusbarron, local but fairly common where found.
Ecliptoptera silaceata Schiff. Fairly common, single-brooded.
Lygris pyraliata Schiff. Fairly common.
L. mellinata Fab. Uncommon.
L. prunata L. Uncommon.
L. populata L. Widespread, fairly common.
L. testata L. Fairly common.
Cidaria fulvata Forst. Fairly common.
Chloroclysta siterata Hufn. Fairly common.
C. miata L. Fairly common.
Dysstroma truncata Hufn. Very common, double-brooded.
D. citrata L. Very common.

(to be continued)

Number of Instars of the Larva of *Herse convulvuli* L.

By D. S. BUNN

On 16th September 1967 I was presented with a rather battered female *Convolvulus* Hawk Moth which had been caught in Preston, Lancs., about ten days previously. It was encouraged to feed on some sugar and water, and during the night laid about seven or eight pale blue eggs. Some of these were affixed to the *Convolvulus* leaves provided, the rest were loose in the bottom of the box. It was fed again on the following evening and laid a further half-dozen eggs during the night. The next morning it was dead, I think from over-feeding as its abdomen was prodigiously distended and oozing liquid. The eggs soon turned green and on 28th and 29th September six of them hatched. Two of the larvae were given away and the remaining four at the time of writing have burrowed into the soil to pupate.

Since the larvae went down I have seen the article in the *Entomologist's Record* (Vol. 71, No. 10) by C. M. R. Pitman entitled "Further Observations on Rearing *Herse Convulvuli* L." and as my notes will demonstrate, I have strong reason to suspect that the author was mistaken in his assumption that the larvae only moulted three times. In fact, Mr. Pitman says in the final paragraph that his two larvae had only three instars, but as he has described three moults they must have had at least four instars, and this remark must have been simply due to a slip of the pen. However, I submit that Mr. Pitman missed the first moult and that his larvae actually had the expected five instars. I also suspect that the captions beneath the photograph were mixed up, the description of (a) agreeing with the right-hand caterpillar which is labelled (b), and vice versa. So far as can be seen my own specimens resembled more the left-hand caterpillar which is the dark type.

Let us compare our independent descriptions of the most vigorous larvae in the following way:—

PITMAN

For the first few days of their existence growth was very slow. When hatched they were approx. 3 mm. long, dull whitish green in colour, with rough skin and a slightly curved pale greenish horn tipped with black. By the end of the first week (a) had attained a length of about 6 mm. with (b) slightly smaller, and both ate very little at this stage.

BUNN

Dull yellow when first hatched with a long black tail, sometimes straight, or curved to a varying degree. After eating a little the larvae become green, especially in the thoracic region. Growth is very noticeable a few hours after hatching. The larvae eat holes in the leaves rather than starting from the edge. They tend to rest on the last two pairs of claspers only and take up a station on one of the basal leaf lobes. The green soon covers the whole caterpillar apart from the head.

A dark green longitudinal band develops along the back edged by two yellowish

1st
Instar
(4 days)

1st' and
?2nd
Instar
(12 days)

PITMAN

BURR

bands (one on each side), the remainder being a lighter green. The tail remains jet black. As the instar proceeds the yellowish bands become broad white bands. There are white rings between the segments and somewhat less noticeable white rings all along the body close together. These appear to be numerous folds of skin. The head remains pale green.

2nd
Instar
(5 days)

(a) was light green in colour with a black horn and *small black spiracles with a row of black dots above them and seven whitish oblique lines* along each side, with the skin a little rougher than before. (b) looked very much the same but the spiracles were deep green with no spots above them, the oblique stripes almost invisible and the horns brownish. For the next few days their appetites increased, eating voraciously; they grew to 16 mm. By now they were feeding both by day and night, but still continued to rest along the mid-rib of the leaf.

At first not unlike previous instar but soon begins to show typical hawk moth characteristics. The head is green and rough with a yellow inverted 'V' on it. The tail is mostly green but the basal half on top tends to be dark, and also the extreme tip, though there is much individual variation. The body becomes progressively a whitish green. The thoracic segments have two dorso-lateral whitish lines and the abdominal segments have the usual 7 *oblique stripes*; the lower edge whitish, the upper green. The darker green longitudinal stripe of the preceding instar gradually disappears. *The spiracles and a dot above them are sometimes conspicuously dark.* They no longer eat holes in the leaves.

3rd
Instar
(4 days)

2nd' but
?3rd
Instar
(4 days)

(a) Very rough pale apple green skin, *the horn green, tipped with black*, which had turned all black before the next moult; *the spiracles were bright orange ringed with black*, and the black dots above them were much longer and more distinct. The oblique stripes on the sides were of a darker green and edged inwardly with white. (b) (which took two days longer) also had undergone marked change when the ecdysis was completed. It was not much darker in general colour; the spiracles were dark green ringed with white and the horn brown, remaining brown. The oblique stripes were dark green with paler green edging. Very rapid growth was

The variability for which this caterpillar is noted is now very evident. All four larvae are different and no doubt if there were more there would be still further variations to observe. The lightest is not unlike a fourth instar Privet Hawk. The inverted 'V' on the head has a black outer edge. *The spiracles are orangish and ringed with black.* The 'rings' between the true rings are eight in number. The true legs are dark reddish and there is a dark spot on the claspers. The oblique stripes are lighter green with some dark colouration at the front edge. The tail is black, then *pale green near the tip, tip itself being black.* When it comes to describing the other,

4th
Instar
(4 days)

'3rd' but
?4th
Instar
(5 days)

PITMAN

now noticeable in both larvae and (b) was becoming much darker than (a), but still smaller, and the skin appeared to be much rougher. Small mauve spots began to appear above the spiracles before it moulted for the last time. (b) spent two days longer in this instar than (a).

(a) was a lovely rich green with smooth skin, heavily marked on its first four segments with two rows of black dots. Thick heavy oblique lines joined together on the back; *the spiracles were large and jet black*, the horn brown, tipped black, anal claspers black. The head was striped with a black line on each side. As it grew the markings became much better defined and it fed by both day and night. The colour of (b) was now shades of brown, being much darker on the back and whitish below the spiracles. *The horn black and markedly curved*; the oblique stripes dark brown to black edged broadly with white on the inside; the spiracles black ringed with white, and the head brown with black stripes on each side. Eventually (a) reached a length of c. $4\frac{3}{4}$ " and was very big in circumference. It became much darker in colour and the black markings were spread over a much greater area; the spots on the 2nd, 3rd and 4th segments had coalesced into stripes along the sides.

BURR

darker, specimens difficulties arise. They are very handsome. The amount of dark colour (dark grey) varies. The pattern on the back is as follows (a drawing). The marks on the claspers are better developed. The yellow inverted 'V' on the head is edged black on both sides. There is a smaller inverted 'V' within the first. The whole larva is covered with tiny light excrescences which give it a pretty frosted appearance.

Surprisingly, the four larvae are now all fairly similar. The larvae are basically a dull black. Along each side, low-down, is a pale pink wavy band running along the whole length of the body. A dark orange stripe runs dorso-laterally from each side of the head along the whole length of the caterpillar, being well-marked on the first three segments and much fainter afterwards. Along the centre of the body there is also a dark orange stripe, barely discernible in some of them. The sides of the prominence on which the tail is situated is orangish or pink, also the 'anal flap'. The oblique stripes are very faintly marked, are pink or orangish and there is a pinkish or orangish suffusion below the stripes. Both the true legs and claspers are black. The light marks on the head are now the same orange colour as the markings on the body. *The tail is curved and black. The spiracles are now all black.* In this instar they ate almost continuously.

'4th' but
5th
Instar

(a) 12
days
before
leaving
the food-
plant

(b) 11
days
before
leaving
the food-
plant

5th
Instar

7 days
for the
first 2
larvae,
8 for the
third and
9 for the
fourth
before
leaving
the food-
plant

It will be appreciated that in the final instar Mr. Pitman's larvae were of a different colour variety than mine, but there are still certain characteristics, such as the curved horn, which tend to suggest they were in the same instar. I have, however, put in italics the similarities throughout the descriptions in order to make them more obvious. It would indeed be remarkable if a larva so small as the newly emerged *Convolvulus Hawk Moth* could attain a length of $4\frac{3}{4}$ " after only three moults. If Mr. Pitman

did miss the first ecdysis, as he could very well have done owing to their small size, this would explain why the first instar appeared to last approximately twice as long as the second and third.

30.x.67.

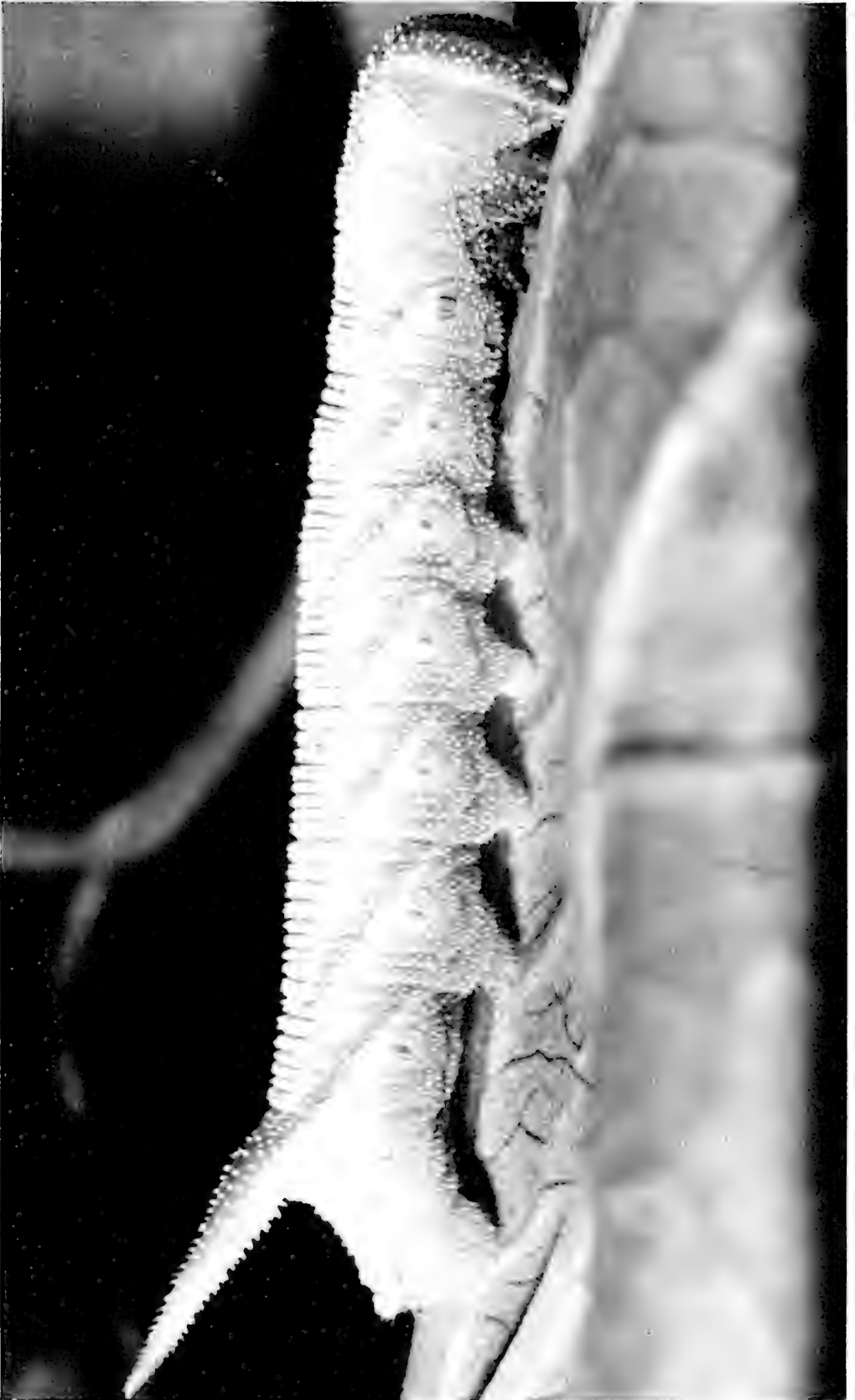
Mr Pitman has been shown the script, and he says that as he could only inspect his larvae in the mornings and evenings, being out at work during the daytime, he may well have failed to note the first ecdysis.—Ed.

In Search of *Erebia christi* Rätzer. July 1967

By C. G. M. DE WORMS, M.A., Ph.D., F.R.E.S.

Of the 44 species of the genus *Erebia* now recognised as occurring within the confines of Europe proper, *Erebia christi* Rätzer shares with *E. serotia* Descimon and De Lesse, of Pyrenean fame, the distinction of having the most restricted range among this large genus of mainly mountain butterflies. As yet *E. christi* is only known to exist in a few valleys south of the Simplon Pass within the borders of Switzerland, though there are reports that it has been taken on the Italian side of the frontier. Ever since it was first described at the end of the last century by Rätzer, collectors of many nations have visited its home and have studied its habits. They have even bred it *ab ovo* (cf. V. Stubenrauch, *Biologie der Erebia christi* 1935, *Mitt. munch. ent. Ges.* 25: 9-26). Though there have been many early accounts of the insect's habitat, of recent years it would appear that hardly any records of its present status and of its relative abundance have been published nor anything of the many other *Erebias* flying on the same ground with which *E. christi* can often be confused. The valleys in which this much sought insect exists, teems with butterflies, many of which are of especial interest.

It was with the intention of studying this *rara avis* of the butterfly world that Mr R. F. Bretherton and I planned to visit the Simplon area early in July 1967, the best period for the flight of *E. christi*. Before we set out on July 7 I had gleaned a lot of very helpful information from that eminent authority on the *Erebias*, Mr B. C. S. Warren who had collected this species on three occasions, in 1906, 1923 and in 1927. We chose as our haven the hotel he used to patronise, the Fletschhorn at Simplon-Dorf, at 5000 ft., seven miles south of the Simplon Kulm at the summit of the famous pass. We travelled by the Simplon-Orient Express direct to Brig via Calais, Paris and Vallorbe arriving at 9 a.m. in what was virtually a heat wave. Not having arranged for a car, we caught the postbus at 10 a.m. which took us up the steep and tortuous road via Schallberg and Berisal over the summit of the pass, landing us at our destination at Simplon-Dorf by 11.30 in glorious weather. But much less settled conditions welcomed us after lunch when we walked down the main road, the $1\frac{1}{2}$ miles to the Laquintal, the chief home of *E. christi*. At the start of this well-known valley we met several notable collectors. These included Dr. and Mrs. Hesselbarth from Germany who was accompanied by Dr. von Mester from Sweden. Also there was Dr. Epstein and his family, formerly of U.S.A., but now living near Lugano. We walked up the path for about a mile to the spot where *E. christi* is mainly found, a stretch bordered by some very ancient railings with a very precipitous slope downwards towards the ravine of the river and with an



Herse convoluta L. Third instar larva

equally steep grassy slope going upwards to the right. But little was flying except *Parnassius apollo* L. and *Erebia alberganus* de Prunner (ceto Hübn). There were a good many *Pararge petropolitana* Fab. (hiera Hübn), mostly past their best. But it was not till the following morning of the 9th that we were able to get a real appreciation of the wealth of lepidopterous life in this noted haunt. We were on the ground by 10 a.m. in beautiful sunny weather, but with a high wind blowing. It was not long before Mr Bretherton had netted a couple of male *E. christi* among the short tufts of grass on the rugged slope by the railings. On examining these insects their main characteristics were at once apparent, chiefly the four small spots always in a straight line in the orange patch at the apex of the forewings, though in a few species one or two of these spots are missing. This is the main distinction from *E. epiphron* Knoch, which has these spots in a slight curve. Also *E. christi* is noticeably larger with slightly more pointed wings, while the underside of the hindwings is paler towards the outer area and not uniformly dark as in *E. epiphron*, which incidentally we did not see that day. *E. christi* occurs for about half a mile along the path, especially where it is bordered by larch trees growing on the very sheer grassy slopes. Pursuit on this terrain is difficult and we found it better to waylay and snap up the insects as they flew upwards across the path. They were, however, nowhere numerous and were by no means easy to pick out on the wing from the eight other species of *Erebia* which frequented more or less the same ground. The small examples of *E. alberganus* de Pr. and of *E. mnestra* were particularly troublesome. This last species was flying both in this length of the path and further up it, some of the females being strongly spotted on the forewings. Besides these there were a few fresh males of *Erebia tyndarus* Esp. together with late specimens of *E. triarius* de Prunner (evias Godart). *E. euryale* Esp. was fairly numerous, while *E. montanus* de Prunner (goante Esp.) was just coming out. *Papilio machaon* L. was dashing about in company with some very dark females of *Pieris bryoniae* Ochs. The Argynnids were represented by *Clossiana euphrosyne* L. and *C. titania* Hübn. (*amathusia* Esp.) with *Melitaea dictynna*, Esp. well to the fore. Among the Blues *Lycaeides idas* L. was present in a very large and bright form, while *Cyaniris semiargus* Rott. and *Cupido minimus* Fuesslyn were in great plenty accompanied by a few *Eumedonia chiron* Rott. Another interesting denizen of this rich area was *Coenonympha darwiniana* Stdgr., an insect which seems to be in markings a mélange between *C. arcania* L. and *C. satyrion* Esp. On this occasion and also later we met Mr. Raymond Uffen, Mr. Peter Cribb and Mr. W. L. Coleridge which made it seem almost like an alpine reunion of the South London Entomological Society.

July 10 was an even better day when we revisited the Laquintal. On this morning even more insects were on the wing, as it was quite windless. We replenished our series of *E. christi*, taking several very striking females which are appreciably larger and more heavily marked than those of *E. epiphron*. We saw all the species seen on the previous day with the addition of *Erebia melampus* Fuessly and *Lysandra coridon* Poda. An unexpected capture by Mr. Bretherton was an *Oeneis aello* Hübn. The following day, July 11, was even finer and warmer when we set out by the early bus from Simplon-Dorf which landed us at Schallberg by 9.20. As we alighted, we at once ran into a lot of the big Satyrids *Hipparchia aleyone* D. & S. and *Satyrus cordula* Fab. We then made our

way to the nearby slopes covered with the special *Astragalus* which is the foodplant of *Plebeius lycidas* Trapp. We were delighted to see this fine Blue on the same ground as I had found it in June, 1954. It was flying there plentifully and was still in good order in both sexes. We even watched some laying on this plant. *P. argus* was about in numbers and it was while we were having our lunch that we noticed a Blue which turned out to be a female *Maculinea rebeli* Hirscke, being towed along the ground in a paralysed condition by several ants. This is noteworthy because this species like *M. arion* L. pupates in ants' nests from which this adult had presumably recently emerged. We did in fact see *M. arion* and also *Heodes alciphron* Rott. We caught the 2 p.m. bus as far as the summit at the Kulm whence Mr. Bretherton walked back the six miles to Simplon-Dorf, while I disported myself on the slopes above Kulm which were covered with Alpenrose. Here *Synchloë callidice* Esp. was dashing about, but as usual was very difficult to net. On the higher ground where there was plenty of *Vaccinium uliginosum*, *Colias palaeno* L. was also on the wing and was equally hard to catch. A few *Boloria pales* Schiff. were skimming over the herbage while a dark Skipper turned out to be *Pyrgus cacaliae* Rambur. I returned to our hotel by the late bus at 7.30 where I was met by Mr. Bretherton who had found the rich meadows between the col and Simplon-Dorf surprisingly devoid of butterflies apart from a few *Heodes virgaureae* L.

We thought it worth while to explore further to the south on July 12. So we took the bus via Gabi past the very well-appointed local hotel where most of the other collectors were staying. We travelled through the very narrow gorge for five miles to the small frontier town of Gondo near which some *E. christi* had been reported, but in spite of a very thorough search on the grassy slopes just outside the town, none of this species was forthcoming, since at this low level of some 2000 ft. they were probably already over. However, we walked nearly three miles up a quite steep road leading along the Zwischbergental. Among the wooded slopes were flying *Erebia ligea* L. and some very fine *E. montanus*. At a very shady spot by the local torrent where we had our picnic lunch, we took a very late female of *Parnassius mnemosyne* L. and saw many *Leptidia sinapis* L. On the downward walk we saw single examples of *Melitaea cinxia* L. and of *Lysandra dorylas* W.V., also one *Pyrgus alveus* Hübn. On the 13th, another sunny day, we paid our last visit to the Laquintal. *E. christi* was still about and in good condition. On this occasion we took one or two examples at rest on flowers which they seldom seemed to frequent. On our last two days in this area we collected in the Rossbodental at 6000 ft. This fine valley we reached by walking the 1½ miles up the road from Simplon-Dorf to the small hamlet of Eggen, then ascending the steep path for about a mile till some very sharp slopes are apparent covered with the familiar short tufts of grass. Here *E. epiphron* was flying in plenty. Among them, however, we were pleased to find and take several *E. christi* which has not often been reported from this valley. We walked up to the morain below the glacier emanating from the great massif of the Fletschhorn, but little was flying except one or two *Agriades glandon* de Prunner (*orbitulus* Esp.). On our final day, July 15, a good many *Pieris bryoniae* and *Maculinea arion* were on the wing in this region where we also took a single *Euchloë simplonia* Bdv. On both these days we were troubled by clouds which seemed to form and hang over the Fletschhorn glacier.

During our last three nights at Simplon-Dorf, one of which, the 12th, was very mild and still, we ran a Heath mercury-vapour light in a narrow road leading downhill from the back of our hotel. It was amazing how the moths flocked to it for the first couple of hours after dark. In some ways it might have been in the Scottish Highlands judging by the familiar species which came to this source of attraction. These included *Hadena bombycina* Hufn., *Apatele euphorbiae* Fab., *Perizoma blandiata* Schiff and *P. minorata* Treits. A very outstanding visitor on the 13th was a huge female of *Deilephila vespertilio* Esp. Several *Plusia variabilis* Piller graced the sheet together with *Bryophila algae* Fab. and the large noctuid *Hadena maillardi* Bdv. There was a spate of the large Crambid *Catoptria conchella* Denis.

On the evening of July 15 we took the late bus to Brig where we stayed at the Victoria Hotel which had been recently renovated. Early the next morning we caught the train on the Andermatt line to Gletsch where the Grimsel and Furka passes meet. It was again a glorious day and we made for the path among the short alders just across the railway track which had proved to be productive during my visit in 1959. It was not long before we saw some small *Erebias* among the alders which turned out to be some very early *E. eriphyle* Freyer, but only seven in all proved to be this species. *Boloria napaea* Hffmsg, was also already on the wing together with *Palaeochrysophanus hippothoë* L. and several *Colias phicomone* Esp. The Rhone glacier was looking at its best in the bright sunshine and was being patronised by a large section of the populace on holiday. We returned by the same route that evening in great warmth and set out even earlier on the 17th to escape the impending heat. We travelled by train to Zermatt up the very attractive valley where many butterflies could be seen flying. It was once more an ideal day and on reaching Zermatt we at once ascended by the steep rack railway to the Gornergrat at 10,000 ft. where we had a magnificent view of the Matterhorn in all its glory towering above the huge massifs of surrounding peaks and glaciers. After a brief break for refreshments at the hotel at the head of the railway, we decided to descend on foot to the next station at Riffelberg, as had been recommended by Mr. Warren who had had some very good collecting en route in bygone years. No sooner had we set out than we found *Erebia gorge* Hübn. flitting about the screes in plenty just below the hotel. As we proceeded down the rough path, often covered by the remaining snowdrifts, this little *Erebia* became very numerous among the rocks but, as usual, was very hard to net. Similarly difficult to catch were fewer *E. glacialis* Esp. (*pluto* de Prunner). Slightly further down a few worn *Euphydryas cynthia* Schiff, were careering low over the short herbage accompanied by a fair number of *Erebia pandrose* Borkh. (*lappona* Esp.). *Boloria pales* Schiff. was very numerous flying along a small stream. We joined the train at Riffelberg which took us to Zermatt in time to catch the express back to Brig. After dining there we caught the night express which reached Paris early on July 18 and were back in London that afternoon after what had been a most profitable and really successful ten days owing to our great good fortune in striking a spell of glorious conditions which is very unusual in these alpine regions in the height of the summer.

The following is a list of the species of butterflies (83 in all) seen between July 7 and 17.

- Papilio machaon* L. A few in most parts of the Simplon area.
- Iphicleides podalirius* L. Only one seen in the Zermatt valley on July 17.
- Parnassius apollo* L. Fairly numerous in all areas.
- Parnassius mnemosyne* L. One late female in the Zwischbergental.
- Leptidea sinapis* L. A few on the wing near Gondo.
- Anthocharis cardamines* L. Some late specimens in Laquintal.
- Euchloë simplonia* Bdv. One taken near Eggen on July 15.
- Synchloë callidice* Esp. Few on Col du Simplon on July 11 and at Riffelberg.
- Pieris rapae* L. Occasional at high levels.
- Pieris bryoniae* Ochs. Fairly common in Laquintal and Rossbodental.
- Pieris brassicae* L. Fairly common in the meadows and in the tals.
- Aporia crataegi* L. Numerous at all levels on the Simplon.
- Colias australis* Verity One seen near Zermatt, 17th July.
- Colias phicomone* Esp. A few at high altitudes.
- Colias palaeno* L. Only seen on Col du Simplon on 11th July.
- Euphydryas cynthia* Schiff. A few specimens on Riffelberg, 17th July.
- Melitaea cinxia* L. Only seen worn in Zwischbergental on 12th July.
- Melitaea diamina* Lang (*dictynna* Esp.) Fairly numerous in the tals.
- Mellicta athalia* Rott. A few in Laquintal and in Rossbodental.
- Mellicta parthenoides* Kef. Only seen near Schallberg.
- Boloria pales* Schiff. A few on Col du Simplon and near Riffelberg.
- Boloria napaea* Hfmsg. Flying at Gletschon 16th July.
- Clossiana euphrosyne* L. Late examples flying in Laquintal.
- Clossiana titania* Hübn. (*amathusia* Esp.) Not many in the Simplon area.
- Fabriciana niobe* L. Only in the Zwischbergental.
- Vanessa atalanta* L. A few in Laquintal.
- Inachis io* L. Only seen near Schallberg.
- Aglais urticae* L. Widespread in the Simplon region.
- Polygonia c-album* L. In the Laquintal on 9th July.
- Agapetes galathea* L. Only observed at Schallberg on 11th July.
- Pararge aegeria* L. Seen only in Zwischbergental on 12th July.
- Pararge maera* L. Fairly common in the tals.
- Pararge petripolitana* Fab. (*hiera* Hübn.) Worn specimens in Laquintal and Rossbodental.
- Oeneis aello* Hübn. One taken in Laquintal on 10th July.
- Hipparchia alcyone* D. & S. Common at Schallberg on 11th July.
- Satyrus cordula* Fab. Plentiful at Schallberg.
- Maniola jurtina* L. Scarce in the tals.
- Coenonympha darwiniana* Stdgr. Very common at all high levels.
- Erebia ligea* L. Only seen near Gondo, 12th July.
- Erebia euryale* Esp. Fairly common in the valleys.
- Erebia eriphyle* Freyer. A few just out at Gletsch on 16th July.
- Erebia christi* Rätzer. Only in Laquintal and Rossbodental: about three dozen recorded.
- Erebia epiphron* Knoch Common, especially in Rossbodental, also on col du Simplon.
- Erebia melampus* Fuessly Fairly numerous in the tals.
- Erebia triarius* de Prunner (*revias* Godart). Worn examples in the tals.
- Erebia alberganus* de Prunner (*ceto* Hübn.) The commonest *Erebia*, flying in all parts.
- Erebia glacialis* Esp. (*Pluto* de Prunner) Few on the Gornergrat, 17th July.

- Erebia gorge* Hübn. Plentiful on the Gornergrat.
Erebia mnestra Hübn. Common in Laquintal and Rossbodental.
Erebia tyndarus Esp. Fairly numerous at high levels.
Erebia montanus de Prunner (*goante* Esp.) Common in all the tals.
Erebia pandrose Borkh. (*lappona* Esp.) Only at Riffelberg, 17th July.
Callophrys rubi L. A few worn in Laquintal.
Heodes virgaureae L. In meadows near Simplon-Dorf.
Heodes tityrus Poda. Only noted at Schallberg.
Palaeochrysophanus hippothoë. Only observed at Gletsch on 16th July.
Cupido minimus Fuesslin Very common in a large form in Laquintal.
Maculinea arion L. Many of the dark mountain form in the high valleys.
Maculinea rebeli Hirschke. One female taken at Schallberg.
Lycæides idas L. A large and bright form in the tals.
Plebeius argus L. Mainly on the wing at Schallberg.
Plebeius lycidas Trapp. Fairly common near Schallberg on 11th July.
Aricia allous G.-H. Uncommon in Laquintal.
Eumedonia chiron Rott. Fresh specimens at high levels.
Agriades glandon de Prunner (*orbitulus* Esp.) Only in Rossbodental.
Cyaniris semiargus Rott. Very common in all the valleys.
Polyommatus icarus Rott. Numerous on the high ground.
Lysandra escheri Hübn. Only seen at Schallberg.
Lysandra dorylas Schiff. Only in the Zwischbergental, 12th July.
Lysandrus bellargus Rott. Only observed at Schallberg.
Lysandra coridon Poda A few in Laquintal.
Erynnis tages L. Numerous in the valleys.
Pyrgus cacaliae Rambur. Taken on the Col du Simplon and at Riffelberg.
Pyrgus carthami Hübn. A very large form at Schallberg.
Pyrgus alveus L. Only seen in Zwischbergental.
Pyrgus malvoides E. & Ed. A few in the alpine valleys.
Pyrgus serratulae Rambur Seen on Riffelalp on 17th July.
Carterocephalus palaemon Pall. One taken in Laquintal on 10th July.
Adopaea lineola Ochs. A few at high levels.
Adopaea flava Brunnich (*thaumas* Hufn.) Common in Laquintal.
Ochlodes venata Brem. & Grey A few seen in Laquintal.
Hesperia comma L. Only seen in Laquintal.

The moths recorded at Simplon-Dorf mainly at light on 12th, 13th and 14th July included the following species:

A large female of the spectacular sphingid *Deilephila vespertilio* Esp., the Thyatirid *Tethea* or Schiff. and the Noctuids *Apatele euphorbiae* Fab., *Bryophila algae* Fab., *Euxoa grisescens* Fab., females of *Euxoa simplonia* Bdv., also *Heliophobus calcatrippae* View., *Euchmichtis adusta* Esp., *Hadena bombycina* Hufn., *Hadena nana* Hufn., *Hadena compta* Fab., *Hadena caesia* Borkh., *Hadena proxima* Hübn., *Hadena lateritia* Hufn. and the very local *Hadena tephroleuca* Bdv., many *Hadena zeta* Fab. (*pernix* L.), *Hadena maillardii* Bdv., *Leucania comma* S.V., *Plusia ain* Hochenwarth, *Miselia serratilinea* Treits., and *Plusia variabilis* Piller.

The Geometers comprised *Coenotephria berberata* Schiff., *Perizoma blandiata* Schiff., *Perizoma minorata* Treits., *Calocalpe montivagata* Dup., *Larentia infidaria* Lah., *Larentia frustata* Treits., *Larentia aptata* Hübn., *Eupithecia venosata* Fab., *Eupithecia subfulvata* Haworth, *Gnophos obfuscata* Schiff., *Gnophos dilucidaria*, *Scopula incanata* L.

By day *Parasemia plantaginis* f. *hospita* Schiff. was careering about on high ground with the footman *Setina aurita* Esp. The only Burnets seen

were *Zygaena transalpina* Esp., *Zygaena purpuralis* Brunn., while *Zygaena exulans* Hoch. was in plenty on the Col du Simplon. The large Crambid *Catoptria conchella* Denis was about in long grass which also produced *Pyrausta aerealis* Hübn. An interesting species among the smaller lepidoptera was the black *Melasina lugubris* Hübn., the larva of which lives in a tube, covered with granite grains, in which it pupates.

Three Oaks, Woking. 16.xi.1967.

Geology as an ecological Factor in the Distribution of Insects

By ALAN E. STUBBS.

(Continued from Vol. 79., p. 316)

GEOLOGICAL ASPECTS OF DISTRIBUTION

Thirty-one records are sparse evidence, and any conclusions drawn can only be tentative. However, the predominance of localities on chalk and limestone outcrops is very marked. There are twenty-two records known to be from such outcrops, five are interpreted as probables and only four are from other rock types. Of these four, one is the East Bexington locality which could be interpreted as a calcareous clay or even a limestone. Oxwich Bay, for which I have no habitat data, includes calcareous dunes and limestone hillsides. Therefore the highest possible ratio in favour of calcareous districts may be 29:2. The two remaining localities may have been on clay or alluvium.

A preference, though not a restriction, to certain geological conditions is already recognised in a related family, the Asilidae, many of whose species like sandy districts. Like the Rhagionidae, they have soil dwelling larvae, and one may mention *Isopogon brevivirostris* (Mg.) as an example of a species which is possibly restricted to chalk grassland in the south. I am not aware of any previous suggestion of a soil preference for British Rhagionidae, but there is no reason why it should not exist in some species. It is of interest that none of the records for *S. immaculata* are clearly related to acid soils, if one may count clay and alluvium as neutral. The major outcrops of sandy formations appear to be avoided, as are the acid and neutral superficial deposits occurring on the Chalk outcrop. Actually, two ambiguous records were sent to me, one from woodland on the Dartmoor Granite and the other from boggy ground in the New Forest. Both these records were from very acid areas and no previous records had been received from woodland or boggy ground. Also, the New Forest is well-worked ground, on clays, sands, gravels and alluvium, and one would have expected supporting records. The specimens were checked and it was found that both these records were *Ptiolina obscura* Fall. whilst several records from chalk grassland sent by the same collector proved to be genuine *Symphoromyia immaculata*.

Geology is an important ecological factor, particularly in a species with a soil dwelling larva. The soil is derived from the underlying geological deposits, indeed on steep chalk slopes the soil may be so thin that the chalk is almost on the surface. The rock type is often a dominant factor in the topography of the countryside, in Southern England the chalk

and limestones forming high ground whilst the clays often occupy the lower ground and, of course, some superficial deposits such as alluvium are restricted to the valleys and flats. Thus a species which prefers hillsides, perhaps because of their better drainage, or aspect to sunshine, will often show a preference for the outcrops of the rocks forming these hillsides. Chalk is porous and well jointed, whilst many other limestones are themselves impervious but permit good drainage by their jointing. Chalk and limestone thus produce relatively dry soils, from the nature of the rock and the sloping ground they provide. Also hillsides are more exposed to the wind which can act as an important drying factor on the soil and could more than compensate for the additional rainfall which high ground attracts. In the case of *S. immaculata*, high ground formed by sands and gravels is avoided, though these deposits have similar properties of drainage and aspect, so the ecological factors controlling distribution may not lie in this field. Clays, forming the lower ground, often tend to form marshy ground, even on a slope, but their poor drainage can be compensated, in dry summers at any rate, by low rainfall, fairly high temperatures and sometimes drying wind, especially near the coast.

The geology is partly responsible for the structure and physical and chemical characteristics of the soil (the other major factors being climate, vegetation and land use history). To a soil dwelling larva, these are important factors, for it must move through the soil to find its food, which may itself be restricted by soil properties.

The relationship between geology, soil and vegetation is already well recognised. The vegetation occurring above the soil will be important to the adult insect, whether it be short chalk grassland or a lush water meadow flora, but one must remember that the roots of the vegetation are an important feature in the life of a soil dwelling larva, and the vegetation will partly control the microclimate within the soil.

The geology may also have a considerable effect on local climate. The question of aspect and rainfall has already been mentioned in relation to the gross features of topography related to geology. An important factor easily overlooked is the relationship between geology and air temperature, which is easily appreciated with reference to the susceptibility towards fog and frost. Plants are known to react to these factors, such as the date of the flowering in the spring of plants having different aspects or growing on different soils. Chalk and limestone warm up in the spring more rapidly than a clay, mainly because of their greater porosity and a lesser quantity of interstitial water. Hilly country gives a greater range of aspect than flat clay country, giving a species a greater chance of finding locally suitable climatic conditions. In the cooler part of the year low ground underlain by clay and alluvium is often more susceptible to fog and frost as a 'cold' soil than the high ground from which cold air tends to 'drain off'. Sand can also be regarded as a 'cold' soil, which may explain the absence of *S. immaculata*.

That the character of the soil with regard to the drainage and soil water content is important can be demonstrated by an example given to me by Mr. A. Brindle. He considers that larvae in a dry soil should be less susceptible to mould than those in a damp soil, and that this factor is less important when the larvae are active than in winter when they are hibernating. He has found that the larvae of the cranefly *Tipula subnodicornis* Zett. in mosses or soil on the moors around Manchester are often heavily infected with mould after a damp winter, producing

an estimated mortality of 80%, whereas after a cold dry winter the mortality was below 20%. Any influence of geology and aspect on microclimate and drainage may be important.

CLIMATIC ASPECTS OF DISTRIBUTION

This is a particularly difficult subject on which to reach firm conclusions, since though the gross climatic condition of Britain is known, the relevant factor is local climate or, more specifically, the microclimate in which the species is living. Climatic recording falls well short of these requirements. As indicated above, questions such as geology and soil, aspect, drainage and vegetation are all important factors modifying local climate or microclimate, but their influence cannot be adequately assessed.

It would be of little practical value to consider in detail the monthly and average charts of rainfall, temperature, etc. The known distribution of *S. immaculata* is within the more continental part of lowland Britain, with fairly warm summers and low rainfall. There appear to be two climatic factors of particular note, especially in relation to the apparent geological preference of *S. immaculata*.

The potential water deficit, i.e. desiccation over precipitation, is high within the range of the species. Data is still very scanty on which to base a map for this climatic factor, but the distribution almost fits within the line for a deficit of greater than five inches, or possibly one should say the four inch line to include the fringe localities, on the map published by F. W. Green (1964, *J. appl. Ecol.*, 1: 151-8), though four inches is the best line on a revised unpublished map. It is of note that the small area around Oxwich Bay has the highest potential water deficit in Wales—either two or three inches. The highest deficit within the known range is six to seven inches in the St. Margaret's Bay, Ringwould and Dover areas. The 'Thames Marshes' record comes from an area with a deficit of seven inches and the clay/alluvium record from the Oxford District has about five inches deficit. This factor conforms with a preference for the dry soils of chalk and limestone.

Another reasonably good fit is found with the map for the date of last air frost in the Spring (1952, *Climatological Atlas of the British Isles*, H.M.S.O.). With the exception of the Sharpshoe record, this date is not usually later than 1st May, a date soon before the earliest recorded emergence of the adult. This factor must reflect soil temperature as well but, unfortunately, there are no maps for annual or seasonal soil temperature. The map demonstrates later frosts over Wiltshire and western East Anglia, where the species has not been recorded despite the presence of active dipterists. A lobe of earlier latest frosts extends up into the area of the records near Oxford. Oxwich Bay and the Doncaster district are relatively mild. This factor fits the concept of a preference for chalk and limestone related to the faster warm up of these soils in the Spring—a factor which may be important to a continental species on the edge of its range. There appears to be no climatic reason why the species should be absent from East Suffolk and north Norfolk.

A COMPARISON OF DISTRIBUTION WITH *Symphoromyia crassicornis* (Panzer)

Before considering the biology of *S. immaculata* and the possible factors affecting its life history, it is worth considering what is known of the only other British species in the genus *Symphoromyia*, *S. crassicornis*.

S. immaculata has a southern and eastern distribution in Britain, and on the Continent is known to occur in France and Central Europe but is unknown in the Scandinavian Region. (Modification to Verrall, information kindly provided by Mr. J. E. Collin.) *S. crassicornis*, on the other hand, has a western and northern distribution in Britain and on the continent is recorded by Verrall as extending from extreme North Europe to Italy.

It has not been my purpose to look thoroughly into the distribution of *S. crassicornis*, but the only area I am aware of where the ranges of the two species meet, is in the Gower, Glamorgan, where *S. crassicornis* has been taken by Mr. Fonseca. Reference to Verrall and the British Museum Collection suggests a wide distribution in Scotland, as well as the Lake District, Yorkshire, Wales (Brecknock), and Cornwall. An important aspect is that there is clearly no relationship in geology of the localities, a wide range of rock types being concerned, acid and basic. No records occur from Mesozoic limestones, but these are mainly of eastern and southern distribution. Mr. Brindle informs me that *S. crassicornis* occurs on the moorlands near Manchester and that it likes marshes, including a limy marsh, though he has never actually succeeded in finding the larva in marsh soils. He also mentions an *S. crassicornis* record for Humphrey Head, on the North Lancashire coast, which is a headland of Carboniferous Limestone.

From this sparse information on the distribution of *S. crassicornis* one may conclude that the larva and its food are not limited by soil type, the larva is probably able to live in marshy soils whereas this does not appear to be the case with *S. immaculata* where adults have generally been taken over drier soils. In Britain the distribution of *S. crassicornis* is western and northern whereas *S. immaculata* is continental.

THE LIFE HISTORY, BIOLOGY AND ECOLOGY OF *S. immaculata*

One must say straight away that virtually nothing is known of the life history of this fly. One can, however, assemble the sparse direct and indirect information and build upon this some lines of thought for future study.

From the distribution data, the preferred habitat can be summarised as chalk or limestone grassland with long grasses, often with associated scrub.

(a) THE EGG

Nothing appears to be known of this stage, yet observation of the oviposition habits of the female could readily provide a key to the whereabouts of the larva. A study of the ovipositor itself may give some lead as to where the eggs are laid, as in the work by Melin on Asilidae (1923, *Swedish Asilids*, Uppsala). However, it will be direct observation of the female that will show any preference for certain floral communities, whether the eggs are laid in the soil between or under tussocks of grass, if they are laid directly in the soil at all, or perhaps a site is chosen in the shade and more humid conditions under a bush. This information could provide a short cut to tearing up many square yards of turf looking for the larva. A study of the egg itself would yield much interesting information, such as its resistance or otherwise to desiccation in chalk soil.

Current Literature

The World of an Insect by Rémy Chauvin, translated from the French by Harold Oldroyd.

World University Library, 14/- (in U.K. only), 254 pp. with 57 diagrams and 20 photographs.

The Introduction explains the scope of this book and gives several examples of "insect worlds". It pays special attention to the differences between the societies of insects and of man and the larger animals. Attention is also given to the fantastic numbers of individuals often concerned in an "insect society". The text of the book is divided into six chapters with the self explanatory titles of "The microclimate of an insect", "Counting populations", "In the laboratory", "Populations in nature", "The fauna of the soil" and "The battle against insects".

In Chapter 1, the problems attached to devising instruments suitable for measuring temperature, humidity, etc., in microclimates in close proximity are discussed. The chapter goes on to show how the structure modifications of some plants can create small microclimates within the plant differing widely from one another. The differences between various levels in forests, from tree-tops to ground level, clearings and rides are also mentioned. These examples are only a sample of the many microclimates discussed; tables and graphs illustrate the chapter. Chapter 2 opens with remarks about the differences which exist between laboratory and field naturalists (these are not so marked in this country, where the two get on very well together) and laboratory insects are discussed. Naturally crickets, locusts, *Drosophila* and *Tribolium* receive considerable notice, but many other interesting subjects for experiment are also mentioned; experiments are suggested and results tabulated.

Populations in nature are cited in many interesting and stimulating paragraphs, the charting of results being explained, and Chapter 5 deals with the relations between soil populations and the chemical composition of the soil, and also some very interesting notes on the repopulation of areas treated with insecticides, while Chapter 6 makes welcome mention of the need, if insecticides have to be used, to see that natural predators do not suffer, for these are more reliable in the long run. It finishes with the very wise lines: "The populace of insects is only the enemy of man because he does not behave intelligently and make use of it". S.N.A.J.

Opuscula Entomologica 32. Parts 1-3, 1967.

Christine Dahl, in a paper on the Trichoceridae of the arctic and sub-arctic Canada, Greenland and Alaska describes 2 new species of *Metatrachocera* and one *Trichocera* with figures and redescriptions of others including *T. hiemalis* Deg. mentioning the variation of the genitalia of this species that is on the British List, and describes the larva of *T. columbiana* Alex. There is some discussion of the ecology of the species. In another paper, on Swedish Trichoceridae, Dahl describes 2 new species of *Metatrachocera* and gives keys to the Swedish species of this genus including 2 additions to the Swedish List. Distributional notes on seven species of *Trichocera* include one species new to Europe, *T. japonica* Mats. with figures of the ovipositor of this species and a figure of the ovipositor of *T. parva* Meig. that is on the British List. *T. excilis* Dahl is sunk as a synonym of *T. japonica* Mats.

H. Anderson lists, with habitat data, 131 species of 30 families of diptera

from Iceland. Many known also from Britain. There is a detailed discussion with figures of three species of *Scatella*—*stagnalis* Fall., *tenuicosta* Collin and *thermarum* Collin and figures of part of the genitalia of *Scatophaga litorea* Fall. include one of a specimen from Kent, England. In a short note on 7 species of diptera added to the Swedish List Anderson mentions *Sicus abdominalis* Kröb. as "known from the British Isles" (It was found in the Hamm collection and recorded by M. Chvála in 1965. *Acta Univ. Carol. Biol.*, 1965, with a redescription and a key to the genus in English).

Bo Tjeder has restudied the British specimens previously regarded as *Rhabdomastix parva* Siebke by Dr. F. W. Edwards. They have been found to belong to a new species and named *R. edwardsi*. A fresh description with ten figures is given. The same author gives the reason for renaming our *Erioptera flavescens* L. as *E. gemina*. H. Andersson claims 2 species new to Sweden on the basis of galls attributed to *Agathomyia wankowiczi* Schnabl on *Ganoderma/Polyporus/applanatus* R.H. (with photo) and *Zeuxidiplosis giaridi* Kief. on *Hypericum perforatum* R.H.

Contarinia kanervoi Barnes, a Cecidomyiid attacking Timothy grass, is added to the Swedish List by M. Raatkainen and A. Tinnilä. F. Vaillant in recording *Dixa nebulosa* Meig. and *D. puberula* Lw. from north of the Arctic circle in Sweden gives figures of the male genitalia of both species which are also known from Britain. L.P.

Notes and Observations

AN IMMIGRANT PLUSID—I am pleased to report the capture at my mercury vapour light trap near Sherbourne, of a specimen of *Plusia acuta* Walker. This was on 25th September 1967; the specimen was identified by Dr. I. W. B. Nye at the British Museum (Natural History) on 3rd November. The species is normally found in the southern half of Africa.—C. W. D. GIBSON, Lyon House, Sherborne, Dorset. 7.xi.1967.

MOTHS AT LIGHT IN EARLY DECEMBER—A large number of moths appeared at my light traps in early December 1967. The weather conditions were perfect; the temperature during the three nights, 30th November-1st December, 1st-2nd December and 2nd-3rd December, varied between 8°C. and 10°C. and there was no wind throughout. The first night was foggy and two traps were run, one in my garden and the other in a wood 1½ miles away, producing 42 and 71 moths respectively. Only one light was run on each of the other nights, once at each site. The total catches of the eight species recorded were:—77 *Poecilocampa populi* (including 2 females), 4 *Agrochola macilenta* Hübn., 1 *Dysstroma truncata* Hufn. (first night), 20 *Operophtera brumata* L., 2 *Operina dilutata* Schiff., 6 *Colotois pennatata* L., 29 *Erannis aurantiaria* Hübn., 11 *E. defoliaria* Clerck. The *D. truncata* could have been a specimen of the third generation. It is perhaps noteworthy that no hibernating species were tempted out. One *Phlogophora meticulosa* L. was taken on the night preceeding this very mild period.—TREVOR B. SILCOCKS, 3 Kenmeade Close, Shipham, Somerset. 5.xii.1967.

AN EARLY APPEARANCE—Further to my notes of 5.vii.1967, I was surprised to find a *Grapholitha ornitopus* Hufn. at my trap on 13.xii.1967 in view of the very cold weather of the previous few days.—T. B. SILCOCKS, 3 Kenmeade Close, Shipham, Somerset. 13.xii.1967.

TWENTY-TWO SPECIES OF LEPIDOPTERA AT LIGHT IN DECEMBER—In view of the mild weather, I ran a 125 watt mercury vapour lamp during the nights of 2nd and 3rd December at Garnons, Byford, Hereford. The bag was as follows:—17 *Poecilocampa populi* L., 2 *Peridroma porphyrea* Schiff., 1 *Agrotis ipsilon* Hufn., 20 *Phlogophora meticulosa* L., 9 *Agrochola macilenta* Hübn., 6 *Conistra ligula* Esp., 4 *C. vaccinii* L., 1 *Eupsilia transversa* Hufn., 1 *Plusia gamma* L., 1 *Chloroclysta siterata* Hufn., 3 *Thera variata* Schiff., 48 *Operophtera brumata* L., 17 *O. fagata* Scharf., 1 *Colotois pennaria* L., 33 *Erannis aurantiaria* Hübn., 17 *E. defoliaria* Clerck, 1 *Emmelina monodactylus* L., 1 *Acleris sparsana* Schiff., 2 *Mompha subbistrigella* Haw., 5 *Lithocolletis messaniella* Zell., 1 *Ypsolophus radiatellus* Don. and 1 *Plutella maculipennis* Curtis.—D. W. H. FENNELL, Martyr Worthy Place, Winchester, Hants. 4.xii.1967.

A "WRECK" OF FEVER FLIES, *DILOPHUS FEBRILIS* L. (DIPT., BIBIONIDAE), AS FOOD OF SWALLOWS, ETC.—On 29th August 1966, a hot and sultry day at Clevedon, Somerset, Mr B. King (1967, *British Birds*, 60) saw about a 100 Swallows, *Hirundo rustica*; 65 House Martins, *Delichon urbica*, and a Sand Martin, *Riparia riparia*, feeding on small black flies stranded on the calm surface of the Bristol Channel stretching as far as a half mile from the shore. Ten specimens of the flies were collected and sent to me and proved to be one male and nine females of *Dilophus febrilis* L. It is a species that emerges in large numbers and captured by several species of Empid flies. I found 209 specimens in the balls of food of nestling Swifts obtained in the Oxford University Museum Tower in 1952 (1954, *J. Soc. Brit. Ent.*, 5) and J. F. Thomas found it to be regularly fed to nestling Swallows in Carmarthenshire (1934-40, *British Birds*, 27-33).—L. PARMENTER.

SEA-SHORE FLIES AS FOOD OF SNOW BUNTINGS—In October, Mr. B. King saw four Snow Buntings, *Plectrophenax nivalis* on the rocks and beach at Tresco, Isles of Scilly, feeding on winged insects. He collected three specimens similar to those that the birds appeared to be eating and sent them to me for identification. They proved to be a male *Aphrosylus raptor* Walk. (Dolichopodidae), a male *Fucellia maritima* Hal. (Muscidae), and a female *Orygma luctuosa* Meig. (Coelopidae).—L. PARMENTER.

Current Notes

THE BUTTERFLIES AND MOTHS OF KENT. VOLUME 3: GEOMETRIDAE.—Commencing Volume 3 of the above work, I have decided after much consideration to follow the nomenclature and classification of the "New Kloet and Hincks List", to be published sometime in 1968. I therefore take this opportunity for thanking Mr. D. S. Fletcher (British Museum, Natural History) for most kindly making available to me the typescript of the new list and for permission to follow it prior to its publication.

This excellent list has been produced by a number of prominent members of the staff of the British Museum (Natural History). It is a far superior list to any other, and will undoubtedly remain the standard one for many years to come.

J. M. C.-H.

H. nana Hufn.

p. 163—

Scott (*Ent. Rec.*, **77**: 37-39) compares results from m.v. trapping at Dungeness in 1962-64, of this species with *H. w-latinum* Hufn., *H. bicolorata* Hufn., *H. albimacula* Borkh., *H. conspersa* Schiff., and *H. lepida* Esp.

H. trifolii Hufn.

p. 164—

Massee (*Rpt. E. Malling Res. Stn.*, **1947**: 137) states that at Teynham (div. 7), larvae were found feeding on apple fruit still hanging on trees, and that change of diet was owing to clearance of *Chenopodium alba* from under trees before picking started.

H. w-latinum Hufn.

p. 165—

see *H. nana* (above).

H. suasa Schiff.

p. 166—

Aylesford (div. 11), 1951 (1), 1953 (4), June 17, 1956 (1); E. Malling, 1951 (G. A. N. Davis). Dungeness (div. 15), August 29, 1963 (1), June 13, 1964 (1) (R. E. Scott). Preston (div. 4), several, August 22, 1965 (C.-H.).

H. thalassina Hufn.

p. 167—

Dungeness (div. 15), one, June 19, 1964† (R. E. Scott); is presumably casual (C.-H.).

H. contigua Schiff.

p. 168—Meopham (div. 6), one, July 8, 1961† (J. Ellerton). Aylesford, July 12, 1955 (1), July 2, 1956 (1), July 11 (1), 14 (1), 1957; taken in m.v. trap by G. A. N. Davis (C.-H. coll.).

H. bicolorata Hufn.

p. 170—

see *H. nana* (above).

H. albimacula Borkh.

p. 170—

see *H. nana* (above).

H. conspersa Schiff.

p. 171—

see *H. nana* (above). Shorne Ridgeway (div. 6a), one, July 25, 1964 (E. E. J. Trundell).

H. compta Schiff.

p. 172—

St. Mary Cray (div. 1), ♀ in m.v. trap, September 14, 1964 (R. G. Chatelain); Farningham Wood, one at *Lychnis dioica* bloom, July 10, 1967 (B. K. West). Westwell (div. 7), July 13, 1962 (E. Scott). Hothfield (div. 12), larva on *Dianthus*, August 1, 1963 (E. Scott); Willesborough, June 22-July 22, 1963 (4), June 10-29, 1964 (5) (W. L. Rudland).

line 4 up—for "Ashfield" read: Ashford.

H. lepida Esp.

p. 174—

line 17 up—for "carophaga" read: **carpophaga**.

p. 175—

see *H. nana* (above). Pinden (div. 6), one, "all white". taken by E.

- J. Hare (de Worms, *Lond. Nat.*, **1964**: 32).
- H. albicolon* Hübn.
p. 176—
Dungeness, 1963 (1), 1964 (1) (R. E. Scott).
- H. reticulata* Vill.
p. 177—
Scott (1964, 19) gives *Saponaria officinalis* as the foodplant, but in a letter to me subsequently, invalidates this (C.-H.). Ashford, 1903 (Jeffrey, *Trans. E. Kent. nat. Hist. Soc.*, **1903**: 25). Orpington (div. 1), 1953 (L. W. Siggs); St. Mary Cray, 1955 (R. G. Chatelain).
- T. cespitis* Schiff.
p. 179—
Ovenden (*Ent. Rec.*, **16**: 269) remarks on the larval habits of this species [in the Rochester district]. Dungeness, August 31-September 24, 1963 (78), with max. (14) on September 15; August 28-September 23, 1964 (118), with max. (19) on September 7 (R. E. Scott).
- C. graminis* L.
p. 179—
Wrotham (div. 6), 1965 (1) (T. Peet). Willesborough (div. 12), 1957 (9), 1958 (1) (W. L. Rudland). Dungeness (div. 15), July 25-August 23, 1964 (5) (R. E. Scott). Dartford Heath, 1967 (D. O'Keeffe).
- O. populeti* F.
p. 184—
Broad Street (div. 7), at light, April 4, 1955 (1) (E. Philp). Ham Street (div. 12), June 2, 1965, larvae quite numerous on larger aspens (R. G. Chatelain).
- O. advena* Schiff.
p. 186—
Bromley (div. 1), two in 1965, the second on May, 27; 1966 (3); 1967 (1) (D. R. M. Long); Orpington, April 27, 1966 (1), in m.v. trap (I. A. Watkinson).
- P. flammea* Schiff.
p. 187—
St. Mary Cray (div. 1), 1964 (1) (R. G. Chatelain); Bromley, 1960 (3), 1961 (1), 1962 (4), 1964 (4), 1965 (12), 1966 (5) (D. R. M. Long). Willesborough (div. 12), April 18, 1958 (W. L. Rudland). Jeffrey (*Trans. E. Kent. nat. Hist. Soc.*, **1910**: 10) records finding on this species in Kent, the fungus *Isaria farinosa*, and gives details.
- L. favicolor* Barr.
p. 189—
Pinden (div. 6), July 16, 1956 (1), July 10, 1958 (1), July 1959 (1) (Hare, *teste de Worms, Lond. Nat.*, **1959**: 108). Doubtless casuals (C.-H.).
- L. pudorina* Schiff.
p. 191—
Willesborough (div. 12), one, June 17, 1957 (W. L. Rudland). In addition to marshes and heaths, this is also in Kent a species of chalk slopes (C.-H.).
line 7 down—for "June 18" read: July 19.
- L. obsoleta* Hübn.
p. 191—
Preston Marshes (div. 4), a larva on *Phragmites communis*, August 22, 1965 (C.-H.).

L. litcralis Curt.

p. 192—

Dungeness (div. 15), July 31, 1964 (1) (R. E. Scott). Lydd Town, 1965 (D. W. H. Fennell).

L. comma L.

p. 192—

line 21 up—for "1924" read: 1928.

L. uinipuncta Haw.

p. 192—

R. A. French (*in litt.*) states that despite the discrepancy, both records in *Entomologist*, **98**: 76, refer to the same capture, i.e., Hayward's at Dungeness, September 21, 1963. 1964: Dungeness (div. 15), September 26 (1) (T. W. Harman); October 5 (1) (R. E. Scott). 1966: Otford (div. 6) in m.v. trap, September 11 (1) (W. B. L. Manley). Dover (div. 8), in m.v. trap, September 8 (♂), 20 (♂) (G. H. Youden). Ashford (div. 12), in m.v. trap, September 18 (1) (P. Cue).

L. albipuncta Schiff.

p. 197—

1967: Folkestone (div. 16), one, July 21 (A. M. Morley).

R. lutosa Hübn.

p. 199—

Willesborough (div. 12), 1957 (3), 1963 (11), 1964 (1) (W. L. Rudland).

A. pygmina Haw.

p. 200—

Willesborough (div. 12), August 27-September 15, 1957 (3), August 31-September 29, 1963 (5), September 23-24, 1964 (2) (W. L. Rudland). Dungeness (div. 15), August 20-September 4, 1963 (3), August 14-28, 1964 (5) (R. E. Scott).

line 32 up—for "Fen" read: Fenn.

A. fluxa Hübn.

p. 201—

Dungeness, on the night of August 6, 1965, under suitable conditions, I examined unsuccessfully for this species, a hundred or so flower-heads of *Calamagrostis epigeois* (C.-H.).

line 22 up—for "two, including one" read: ♂.

A. morrisii Dale

p. 201—

Apparently *Festuca arundinacea* is the sole pabulum, since Tugwell (*Entomologist*, **11**: 252) seemingly misdetermined the plant from which Nicholls' bred the species (cf. Knaggs, *Entomologist*, **30**: 318), as *Arrhenatherum elatius*. And it is also noteworthy that G. M. Haggatt, who worked unremittingly for the larva, categorically states he found it only on *F. arundinacea*.

A. phragmitidis Hübn.

p. 203—

Willesborough (div. 12), August 1-4, 1963 (2) (W. L. Rudland); Brook (Duffield, *vide* Scott (1964: 20)), Dungeness (div. 15), August 3-6, 1964 (2) (R. E. Scott). Dover (div. 8), July 31 (1), August 6 (1), 1951, July 29, 1963 (1); all in m.v. trap (G. H. Youden).

N. sparganii Esp.

p. 204—

East Kent [Reculver (div. 4)] (Battley, *Trans. E. Kent nat., Hist.*

Soc., 1904: 35). Dover (div. 8), August 28, 1958 (1), in m.v. trap (G. H. Youden).

N. geminipuncta Haw.

p. 208—

[Reculver (div. 4)], very common (Battley, *Trans. E. Kent nat. Hist. Soc.*, 1904: 35). Dungeness (div. 15), August 11 (1), 21 (1), 1964; Boulderwell, August 12-22, 1966 (4) (R. E. Scott). First Record, 1874: Cliffe (Fenn, *Diary*), replaces, that given.

N. dissoluta Treits.

p. 207—

Bromley (div. 1), one in m.v. trap, August 3, 1964 (D. R. M. Long). Preston (div. 4), August 22, 1965 (2) (C.-H.). Greatstone (div. 15), July 20, 1963 (1) (C.-H. & Wakely, *Ent. Rec.*, 76: 94). Dungeness, August 6, 1964 (2); Boulderwell, August 21, 1966 (1) (R. E. Scott); Lydd Town, August 1965 (D. W. H. Fennell). First Record, 1904: East Kent [Reculver (div. 4)] "*N. neurica* and var. *dissoluta*" (Battley, *Trans. E. Kent nat. Hist. Soc.*, 1904: 35), replaces that given.

C. rufa Haw.

p. 209—

Willesborough (div. 12), 1955 (1), 1957 (1), 1964 (1) (W. L. Rudland). Dungeness (div. 15), July 17, 1964 (2) (R. G. Chatelain); August 6, 1964 (R. E. Scott); August 28, 1964 (T. W. Harman). Bromley (div. 1), July 20, 1967 (1) (D. R. M. Long).

C. maritima Tausch.

p. 209—

Battley (*Trans. E. Kent nat. Hist. Soc.*, 1904: 35) records it from East Kent [Reculver (div. 4)].

C. ambigua Schiff.

p. 212—

line 13 up—delete: "Sandwich, September 6 (A. J. L. Bowes)".

p. 213—

Willesborough (div. 12), 1957 (6), 1958 (2), 1963 (3), 1964 (1) (W. L. Rudland). Dungeness (div. 15), 1964 (6), 1967 (1) (R. E. Scott). Bromley (div. 1), 1965 (1), 1966 (5), the first on June 5; 1967 (3) (D. R. M. Long).

L. exigua Hübn.

p. 216—

Willesborough, June 19, 1958 (1) (W. L. Rudland). Boulderwell (div. 15), June 2 (1), August 11 (1), 12 (1), 16 (1), 21 (1), 1966 (R. E. Scott). Dover (div. 8), September 11, 1966 (♂) (Youden, *Ent. Rec.*, 79: 60).

D. scabriuscula L.

p. 217—

Dungeness (div. 15), July 20, 1964 (1) (R. E. Scott); is presumably casual (C.-H.)

P. littoralis Boisd.

p. 218—

Chatelain (*Proc. S. Lond. ent. nat. Hist. Soc.*, 1964: 16) states the early stages were imported with chrysanthemum cuttings from the

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Brief Visits to Austria, Malta and Sicily in 1967

By J. A. C. GREENWOOD, O.B.E., F.R.E.S., and Mrs. D. F. GREENWOOD

We hope that some brief notes may be helpful to those considering collecting trips to these areas.

AUSTRIA

We made our base at the Alpenhotel Lamm in Seefeld, not far from Innsbruck. We arrived on the 9th June and for the first week the weather was poor with much cloud and periods of long heavy rain. The second week was very much better and we enjoyed really hot sunshine.

Seefeld is some 4,000 feet above sea level and the collecting areas rise steeply so that we should probably have found a good many more species had we been there a week or so later. As compensation, the spring flowers were superb and the snow stretching down the mountains was very beautiful, although this had almost vanished by the end of our stay.

We found much the best area to be a large, south facing hillside some two miles towards Innsbruck.

We recorded the following butterflies:—

Erynnis tages L. A few.

Pyrgus malvae L. A few.

Pyrgus alveus Hb. A few.

Leptidea sinapis L. Common.

Anthocaris cardamines L. Very abundant, some very small specimens.

Pieris brassicae L. Common.

Pieris rapae L. Common.

Pieris bryoniae Ochs. Common.

Colias australis Vty. (*calida* Vty., *alfacariensis* Ribbé). Fairly common and very fresh.

Clossiana euphrosyne L. A few just emerging at end of period.

Vanessa cardui L. Only two.

Vanessa atalanta L. Only one.

Inachis io L. Only one.

Aglais urticae L. A few.

Hemearis lucina L. Fairly common.

Pararge aegeria L. Fairly common.

Pararge petropolitana F. (*hiera* Hb.). Numerous in clearings in woods.

Coenonympha arcania L. One only.

Coenonympha pamphilus L. Very few.

Erebia medusa Schiff., ssp. *hippomedusa* Ochs. Very abundant and variable.

Callophrys rubi L. Three only, very worn.

Palaeochrysophanus hippothoë L. (*chryseis* Schiff.). A pair.

Cupido minimus Fuesslin (*alsus* Schiff.) Very abundant.

Scolitantides orion Pall. (*battus* Schiff.). A few.

Aricia allous G.-H. Common.

Cyaniris semiargus Rott. (*acis* Schiff., *cimon* Lewis). Very few.

Polyommatus icarus Rott. (*alexis* Anett.). Abundant.

Lysandra bellargus Rott. (*thetis* Rott., *adonis* Schiff.). Very few at

end of period.

Moths were not numerous. Mr. and Mrs. Pryor, who were also in Seefeld for part of our stay, were with us one evening when a commotion in the bar drew our attention to a large *Herse convolvuli* L. which may have been resting on one of the logs used to stoke the blazing fire. On the street lamps we found many specimens of the ghost swift *Hepialus humuli* L.

MALTA

We arrived in Malta on the 13th September at the end of a dry summer. Thanks to the great kindness of Mr Anthony Valletta, F.R.E.S., and his son Albert, we were shown much of the island and the best collecting areas during our four days' stay, which were hot and sunny.

The new Sheraton Hotel was very comfortable and well placed. Its gardens were watered freely and proved a useful collecting area. Half a mile away, in complete contrast, a neglected garden, overgrown with weeds and dried by the sun, also provided some specimens. On the other side of the island the Buskett area, which is heavily wooded and partly irrigated, was also excellent.

We were surprised that so late in the season we were able to find quite a large number of butterflies and indeed recorded a considerable proportion of the total number of resident species.

Syntarucus pirithous L. (*telicanus* Lang), the attractive little blue, has become quite common on the island and was particularly abundant round the flowers of the blue plumbago. We observed females ovipositing on the shoots and brought a sprig back to this country. Three larvae hatched and were tried on a variety of leguminous plants, including gorse, which is stated to be one of the food plants. All of these were refused and we had no plumbago. However, we managed to persuade them to eat the seeds of a small shrub in the garden, *Caryopteris clandanensis* which, like plumbago, has blue flowers. One pupa was obtained.

Moths were not numerous in Malta either. Several specimens of *Rhodometra sacraria* L. were captured. We saw no Hawk moths except *Macroglossum stellatarum* L. but there were evident signs of the old eating by larvae of *Celerio euphorbiae* L. We found a very dark *Herse convolvuli* L. at rest in the transit lounge at Naples Airport where we changed planes. We were lucky enough to see a number (and capture three) of specimens of *Catocala elocata* Esp., a very fine red underwing resembling our own *C. nupta* L. This moth was regarded as extremely rare in Malta until Mr. Valletta discovered its habit of resting by day on expanses of rock, and particularly under culverts and in caves and grottoes. Mr. Valletta showed us these areas and the moths were quite abundant.

SICILY

We moved on from Malta on the 17th September and, having landed at Catania, drove some 45 miles to Taormina. In Sicily the weather was delightful and our hotel, the Timeo, very comfortable with a large garden of several acres of flowers, shrubs and olive trees. This was an excellent

collecting area.

We found that there were more butterflies between Taormina and the sea, a 700 ft. descent, than there were higher up. Again, bearing in mind the lateness of our visit, numbers were good.

The most surprising incident was when we went up to the active craters at the top of Etna (10,800 feet). The encyclopaedias state that there is no life for the last few thousand feet, and this certainly seemed to be so as we climbed the slopes of loose lava which did not have even a patch of lichen. At the summit the most active cone was exploding and throwing out showers of white hot rocks at intervals of about one minute. The whole atmosphere was reeking of smoke and sulphur fumes. Suddenly, in the midst of the smoke, we saw a small tortoiseshell flying quite happily. Within a few minutes two more specimens flew across the path. These *A. urticae* were very fresh and brightly marked.

Mr. Bretherton informs me that he investigated the lower slopes of M. Etna earlier in the year and that *urticae* was the commonest butterfly there. It is, however, interesting that they should have flown up some 5,000 feet or more and several miles in order to reach a completely barren area torn by icy winds of high velocity created by the heat rising from the burning hearts of the craters. Strangely enough, these three specimens were the only *urticae* which we saw in Sicily.

We saw several *M. stellatarum* and were given (by a workman who noticed our nets) a dead *H. convolvuli*.

The following butterflies were taken in Malta and Sicily respectively:

	Malta	Sicily
<i>Gonepteryx cleopatra</i> L.	Two males seen.	
<i>Aricia agestis</i> Schiff. (<i>medon</i> Hufn., <i>astrarche</i> Byster.)	A few.	
<i>Gegenos pumilio</i> Hffmsg	Very few.	Very few and elusive
<i>Papilio machaon</i> L.	Four seen.	Very few.
<i>Pieris brassicae</i> L.	Abundant, heavily marked	Fairly common.
<i>Pieris rapae</i> L.	Common.	Scarce.
<i>Colias crocea</i> Fourc.	One seen.	Very few.
<i>Vanessa cardui</i> L.	Several.	Several.
<i>Vanessa atalanta</i> L.	One seen.	Several.
<i>Pararge aegeria</i> L.	Several at Buskett.	Common.
<i>Pararge megera</i> L.	A few.	Several.
<i>Maniola jurtina</i> L.	Common.	Common.
<i>Lycaena phlaeas</i> L.	Several.	Common.
<i>Syntarucus pirthous</i> L. (<i>telicanus</i> Lang)	Abundant in gardens.	Scarce.
<i>Lampides boeticus</i> L.	Scarce.	Only one worn male.
<i>Lycaenopsis argiolus</i> L.	Several.	Common.
<i>Polyommatus icarus</i> Rott. (<i>alexis</i> auctt.)	Common, well marked.	Common.
<i>Carcharodus alceae</i> Esp.		Scarce.
<i>Sloperia proto</i> Ochs.		One only.

<i>Ochlodes venata</i> Brem & Grey (<i>sylvanus</i> Esp.)	One only.
<i>Pontia daplidice</i> L.	Scarce.
<i>Pieris manni</i> Mayer (<i>manni</i> Stdgr.)	Very few.
<i>Colias australis</i> Vty. (<i>calida</i> Vty., <i>alfracariensis</i> Ribbé)	One seen.
<i>Gonepteryx rhamni</i> L.	Scarce.
<i>Pandoriana pandora</i> Schiff. (<i>maja</i> Cramer)	Several in hotel gardens.
<i>Polygonia egea</i> Cramer	A few outskirts of Taormina.
<i>Polygonia c-album</i> L.	Two on walls at Taormina.
<i>Aglais urticae</i> L.	Three at summit of M. Etna.
<i>Brintesia circe</i> F.	Two seen.
<i>Pyronia cecilia</i> Vallentin (<i>ida</i> Esp.)	Very worn males common.
<i>Coenonympha pamphilus</i> L.	Several.

The Effect of Wind Direction on the Index of Diversity of Night Flying Lepidoptera in a Particular Area

BY J. HARLING

(Department of Zoology, University of Durham)

It has been noted (Robinson, 1967) that there may be certain limitations to the general inference that from a reasonably large sample catch of insects it is possible to predict the statistical content of catches of different sizes taken at the same place within short periods of time. This prediction is based on Williams' (1943) suggestion that a random catch of insects falls into a logarithmic series whose form is a function of the index of the diversity of the area in which the catch is taken. The same author has more fully discussed the use of the logarithmic series, as applied to insect and other animal data, in a later work (Williams, 1964).

It was tentatively put forward by Robinson (1967) that occasional abnormal meteorological conditions might increase the activity of insects and extend their "normal range" of distribution. These conditions could lead to the temporary recruitment of insects to a homogenous area (with its particular index of diversity) from another homogenous area, thus creating a new, although temporary, index of diversity in the area where catches are being made.

Such an effect, even in relation to "normal" meteorological conditions of wind direction, was noted by the present author when trapping night flying lepidoptera at Carlisle from 17th July to 20th September, 1964. During this period 2,803 specimens, representing 110 species, were trapped in a Robinson-type mercury vapour lamp light trap. An analysis of the meteorological factors affecting the activity of night flying Macrolepidoptera, based on the afore-mentioned trapping period was made

(Harling, in press) and the findings were similar to those of Williams (1940). It must be emphasised here that no single meteorological factor can be completely isolated as independently influencing activity. However, a factor like the wind, which has a directional component, may influence "range of activity" in flying insects when other meteorological factors, e.g. heavy rainfall, are not present in full force. In the above analysis it was noted that the wind direction pertaining on a trapping night did appear to influence the numbers of specimens caught during that night. When east winds (from NNE to SSE) and west winds (from NNW to SSW) were considered, catches appeared to be higher on nights with east winds than on those with west winds. If nights where the rainfall was greater than 0.1 inches, and where wind force was greater than force 3 (factors which became more influential above these values) were ignored, then the average catch per night of east wind was 62.8 (mean of 16 nights) and for nights of west wind 39.5 (mean of 15 nights). Differences in the index of diversity on particular nights were also noted to be correlated with the wind direction pertaining on those nights. A summary of the composition of catches and the wind direction pertaining when each was made can be seen in Table I.

TABLE I

Summary of catches of night-flying Lepidoptera and wind directions pertaining on respective trapping nights for the period July 17-Sept. 20, 1964.

Date	Number of specimens	Number of species	Wind direction*	Date	Number of specimens	Number of species	Wind direction*	Date	Number of specimens	Number of species	Wind direction*
17 vii	134	24	E	8 viii	29	17	E	1 ix	25	12	E
18-20 vii	no data			9 "	46	17	N	2 "	34	16	E
21 vii	150	34	E	10 "	33	12	—	3 "	102	24	E
22 "	145	29	E	11 "	43	16	N	4 "	67	0	—
23 "	93	31	W	12 "	128	23	E	5 "	50	15	—
24 "	85	27	W	13 "	63	25	E	6 "	20	8	W
25 "	71	27	W	14 "	116	27	E	7 "	32	11	W
26 "	85	33	W	15 "	89	24	E	8 "	26	13	W
27 "	79	26	W	16 "	65	21	E	9 "	4	4	W
28 "	18	12	W	17 "	78	27	E	10 "	11	8	W
29 "	112	35	E	18 "	67	22	E	11 "	13	6	W
30 "	59	26	W	19 "	23	12	N	12 "	12	6	E
31 "	63	25	W	20 "	7	5	W	13 "	3	3	E
1 viii	no data			21 "	4	4	W	14 "	37	14	E
2 "	59	21	W	22 "	16	8	W	15 "	4	3	E
3 "	23	11	W	23 "	33	7	W	16 "	2	2	W
4 "	64	23	W	24-29 viii	no data			17 "	2	2	W
5 "	151	35	W	30 viii	10	9	W	18 "	2	2	W
6 "	40	18	W	31 "	18	11	E	19 "	0	0	W
7 "	52	24	W					20 "	3	3	W

*Wind direction:

E=East wind (from range NNE to SSE)

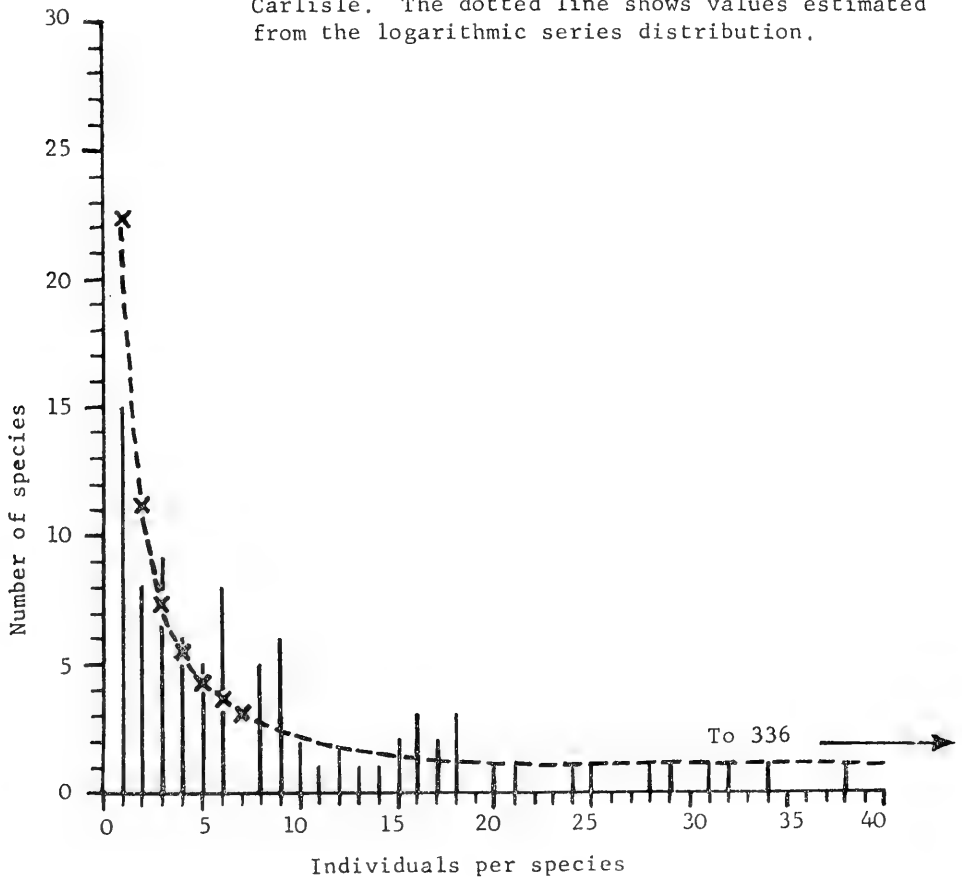
W=West wind (from range NNW to SSW)

TABLE II

The number of species of night-flying Lepidoptera with different numbers of individuals in catches taken during the trapping period July 17 to September 20, 1964

Individuals per species	No. of species		Individuals per species	No. of species observed	Individuals per species	No. of species observed
	observed	estimated (log. series)				
1	15	22.4	19	—	54	1
2	8	11.1	20	1	56	1
3	9	7.4	21	1	57	1
4	6	5.5	22	—	66	1
5	5	4.3	23	—	68	1
6	8	3.6	24	1	70	1
7	—	3.0	25	1	71	1
8	5	2.6	26	—	74	1
9	6	2.3	27	—	83	1
10	2	2.1	28	1	91	1
11	1	1.9	29	1	92	1
12	2	1.7	31	1	94	1
13	1	1.6	32	1	107	1
14	1	1.4	34	1	119	1
15	2	—	38	1	123	1
16	3	—	41	1	138	1
17	2	—	49	1	169	1
18	3	—	50	1	336	1

Fig. 1. Frequency distribution of species of night-flying Lepidoptera, with different numbers of individuals, from catches in a mercury vapour light trap at Carlisle. The dotted line shows values estimated from the logarithmic series distribution.



If all the trapping data was analysed according to the number of species, with different numbers of individuals represented (see Table II), then the relationship between the observed frequency of distribution of species and that estimated for the logarithmic series distribution (from the index of diversity for the catches over the whole trapping period) was found to bear poor correlation. This is especially noted in the graphical comparison seen in Fig. I.

The differences between the observed distribution data and that estimated for the log. series distribution indicates that a single value for the index of diversity may not have been a constant factor throughout the trapping period. That this was so can be seen in a comparison of the trapping data from different night's catches. Several nights with reasonably large catches (over 70 specimens) are compared in Table III.

TABLE III

Comparison of the Index of Diversity for various nights during trapping period

Date	Wind direction	No. of specimens	No. of species	Index of diversity
17 July	E	134	26	10.31
21 July	E	150	34	14.84
22 July	E	145	29	10.91
12 August	E	128	23	14.46
3 Sept.	E	102	24	11.33
23 July	W	93	31	16.42
25 July	W	71	27	17.77
26 July	W	85	33	21.25
17 July-20 Sept.	—	2,803	110	22.61

It can be seen that the index of diversity was higher for nights with west winds than for those with east winds. If the wind does affect the distribution of active moths it may thus have been instrumental in causing the dispersion of moths from another area into the area where trapping was taking place, resulting in fluctuations about the calculated index of diversity of the whole trapping period.

The actual trapping took place in a suburban garden, to the east of which was a built up area extending for 3 miles, and 200 yards to the west of which was open countryside extending with little interruption to the Solway Firth. East winds may therefore have been responsible for contributing specimens mainly from the housing area while a more diverse species contribution from the countryside resulted from nights of west wind.

It is not suggested that wind direction is a major factor in influencing the prediction of the statistical content of catches of different sizes taken in the same place, but the above discussion may indicate that fluctuations of the type mentioned tentatively by Robinson (1967) do exist to some extent even under normal meteorological conditions.

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The Macrolepidoptera of Inverness-shire : Newtonmore District

By Commander G. W. HARPER, R.N. (Retd.), F.R.E.S.

(See *Ent. Rec.*, **66**: 58, 90, 124; **67**: 91; **69**: 52; **71**: 115; **72**: 14; **73**: 60, 61;
74: 59, 60; **77**: 83)

SUPPLEMENT No. 9

ARCTIIDAE

Arctiinae

Diacrisia sannio L. A slightly worn but undamaged male of this species was in my m.v. light trap at Newtonmore on 10th July 1966. It was of the very distinctive Scottish race with very dark hind wings. This species is local in small colonies in the West of Scotland, but frequent search has failed to reveal it in this area; I am therefore inclined to think this specimen a vagrant from the West.

This addition increases the total number of species of the Macrolepidoptera on my Badenoch List at the present date, 15th March 1967, to 371.

THE STATUS OF SOME BADENOCH RARITIES AT 1967

Fifteen years having elapsed since I settled in Newtonmore and thirteen since I published this List followed by nine supplements, I think that a few comments may now be timely and of interest. I shall confine my remarks mainly to the apparent changes that have occurred in this area of the Scottish Highlands during that period to the climate, to the physical state of habitats, and to populations of some of the species of Macrolepidoptera that are now apparently rare.

CLIMATE. Broadly speaking the area is a very cold one in winter with spells of temperature falling below zero F., and considerable snow falls lasting for weeks at a time. Summers are mainly cloudy and cool, every month producing a day or two of slight ground frost, but also short spells of sunshine. Only one year of the fifteen, 1955, produced a real "Summer", and that in the latter half. With the single exception of the very severe winter of 1962-3, the last few years have exhibited a marked lessening of contrast between summer and winter by an increase of mildness of the winters, very severe frost being much reduced. There has also been a marked increase in wind.

HABITATS. One of the greatest fascinations of collecting Lepidoptera is the task of ferreting out our prey in their habitats and the Badenoch area is especially rich in species which are more than elsewhere confined to small suitable spots for breeding. An example of the pleasure thus derived was my eventual discovery that *Hadena conspersa* Schf., far from being the apparent rarity it had seemed to be, was in fact breeding commonly on *Silene maritima* growing only on the shingle banks in the River Spey. Many other species, however, do in fact seem to be rare as well as local; examples are *Cupido minimus* Fues. and *Eupethecia distinctaria* H.-S. of which I only know of one colony each. Such very small and rare habitats are particularly vulnerable to human interference which is

increasing alarmingly even here in the far North. The worst culprit is, at present, undoubtedly the Forestry Commission. Every year they fence off and plant more and more lovely hillsides, bogs and other good insect habitats with their serried rows of alien conifers. They have already exterminated one fine colony of *Endromis versicolora* L. near Kincaig. The local County Council is also responsible for the destruction of an increasing number of roadside verges by their so-called road improvements, even where quite unnecessary to secondary roads. The long term effects of the Hydro-Electric Board water diversion and dams also can only be awaited with grave misgivings.

LEPIDOPTERA POPULATIONS. I now return to my Badenoch List. In my paper "Inverness-shire in 1966" (*Ent. Rec.*, 79: 101) I gave the total numbers of moths trapped in my garden and spinney annually for the last ten years, showing significantly an increasing fall which began in 1964, and I shall here confine comment to the present position of the rarer species in 1967. These fall naturally into three main categories; first is that containing doubtful records which I have been unable to confirm in my fifteen years residence, and the number of species here is very small; secondly, those rare or very local species of which I have learned more since I compiled my list and which seem to be reasonably secure including some migrants, and questionable vagrants from other areas; and thirdly those species which seem to have disappeared altogether.

My comments on this third and unfortunately increasing category must of course be treated as pure opinions not untainted with anxiety, for many more years experience will be needed to provide genuine evidence of local extinction, or more happily of long period fluctuations in population density, for which there is some already.

DOUBTFUL RECORDS REQUIRING CONFIRMATION. Four Geometrid and two Agrotid species all recorded on only one occasion comprise this small section. The latter are *Triphaena interjecta* Hübn. to which some of the very small local race of *T. comes* Hübn. bear a considerable resemblance and *Apamea infesta* Ochs. The four Geometrids all occur in other parts of Scotland, some in more northerly districts, but may also be misidentifications. They are *Sterrrha dimidiata* Hufn., *Scopula floslactata* Haw., *Perizoma affinitata* Steph., and *Ourapteryx sambucaria* L.

RARITIES

Cupido minimus Fuess. It is pleasant to record that Dr. Waller's original colony is still holding its own. It is a very small one and I have not yet found another. The race is single brooded and flies in June.

Aricia artaxerxes (allous C.Hb.) Fab. The researches of Hoegh-Guldberg and Jarvis have established this butterfly as a good species distinct from *A. agestis* Schiff. and my list should be amended accordingly.

Pieris brassicae L. A single brooded race flying in July, most specimens seen being immigrants from Scandinavia seen flying up the Moray Firth whence they sometimes penetrate up the Spey valley. Progeny are then produced emerging the following July in some good years. Like *Vannessa atalanta* L. it probably needs immigration to sustain it.

Pieris rapae L. Another uncommon immigrant probably in the same class as *P. brassicae*, but even rarer, and I have not been able yet to check it by breeding.

Erynnis tages L. Very local to the north of Aviemore. I have been unable to find any other colonies.

Pterostoma palpina Cl. Our rarest Prominent; only one record when I took a male in 1954. It occurs rarely in the West of Scotland, and I think it is probably present in Badenoch in very small numbers.

Phalera bucephala L. Equally rare; I took one specimen in 1956. I think it also is probably a vagrant from the West coast but unlikely to be established here.

Habrosyne pyritoides Hufn. (*derasa* L.). Very rare, one specimen taken at m.v. light near the railway at Aviemore in July 1958 by Mr. R. Fairclough being the only modern Scottish record. A very old Clydesdale record exists. I think it most likely that the Aviemore specimen was imported accidentally by train.

Comacla senex Hb. Extremely local; I know of only one small locality near Boat of Garten discovered by Mr. Noble in 1959. It is, I think, the most northerly station in Great Britain for this species, which is not common anywhere in Scotland, and it is the only Footman to be found in Badenoch.

Spilosoma lubricipeda L. This species is interesting; it has been recorded only twice in Badenoch, once at Aviemore in 1955 and I had no less than three fresh specimens in my m.v. trap in 1960. As it is very common on the West coast, I feel sure that it is a sporadic vagrant from that area but which cannot maintain itself normally here due to low temperatures.

Diacrisia sannio L. See first paragraph of this supplement.

Callimorpha jacobaeae L. A single dismembered specimen was taken on his m.v. trap in 1960 by Mr. A. J. Wightman. This species is far from common and very local even in Southern Scotland, and I am inclined to think our visitor came by train, though it may be a vagrant.

Agrostis segetum Schf. Very rare, only noted by me in 1953; probably it is a rare vagrant from the South-west.

Agrostis exclamationis L. Uncommon and sporadic in appearance, and never abundant as in England, but probably native.

Peridroma porphyrea Schf. (*Saucia* Hb.) A rare and sporadic immigrant only seen twice in the last fifteen years.

Rhyacia simulans Hufn. Rare but definitely native. The form is a very fine melanic one.

Axyليا putris L. Extremely rare only seen once, a female in my m.v. trap in 1955. Probably a rare vagrant from the South-west.

Triphaena orbona Hufn. Apparently extremely rare but native, as a specimen was bred about 1947 by Dr. de Worms from a larva found near Aviemore. It occurs at Findhorn on the Moray Firth.

Lampra fimbriata Schreb. (*fimbria* L.). Probably a rare native; I only have two records, from Dalwhinnie and Kincaig.

Polia nebulosa Hufn. Apparently rare as I have only seen two specimens, both of the typically Scottish silvery white form. It occurs commonly in the West and may have been a vagrant from that area.

Hadena trifolii Hufn. Very rare, probably a vagrant from the West, where it is not common.

Hadena serena Schf. Uncommon and apparently very local; I found an imago and Mr Crawford larvae on Hawkweed both in 1946 and only at Aviemore. Not seen since.

Hadena cucubali Schf. Uncommon except near Aviemore where there is a colony of its favoured foodplant, *Silene inflata*, by the railway. Mr. A. J. Wightman found larvae there a few years ago.

Orthosia cruda Schf. Very rare, a single specimen in my m.v. trap in 1955 being the only record. Probably a rare vagrant from the West.

Tholera cespitis Schf. Very rare, only one record, a specimen taken at Aviemore in August 1955 by Dr. de Worms. Probably a vagrant from Moray area.

Luperina testacea Schf. Also very rare, a single specimen taken at Aviemore also by Dr. de Worms in August 1955. Probably a vagrant too.

Cucullia chamomillae Schf. Very rare and a most Northerly British record, a single fresh specimen in my m.v. trap in April 1954. Perhaps a vagrant.

Apamea unanimitis Hb. Very local and uncommon. I have only found it in one very small habitat containing *Digraphis arundinacea*, which has this year, 1967, been destroyed by County Council so-called road improvements. There may be a few other suitable habitats left.

Bombycia viminalis Fab. Not rare as I originally recorded. Fairly common everywhere, a very silvery form being dominant, with a fine dark brown and richly marked form also present.

Caradrina blanda Schf. A rare species, only seen in one year, 1958, single specimens simultaneously at Aviemore and Newtonmore in July at m.v. light. It is not uncommon all round the central Highlands and these two specimens were very probably vagrants.

Caradrina morpheus Hufn. Very rare, only taken on one night at m.v. trap at Newtonmore on 5.v.1956, most curiously two specimens. It has not been seen before or since! Probably a rare resident.

Hydraecia petasitis Dbld. Very rare, only one record when a fresh male was taken at my m.v. trap at Newtonmore on 18.viii.1955. A small patch of *Petasitis fragrans* grows about three miles away, but Coltsfoot is not uncommon and might perhaps be an alternative foodplant.

Rhizedra lutosa Hb. Rare. I have taken a fresh male in m.v. trap in each of two years. I consider that the species does breed in small colonies in the Spey valley reed beds although I have not succeeded in finding them, and the reeds do not often provide good habitats as they are mostly in deep water.

Nonagria typhae Thun. Very rare, only one male specimen in m.v. light trap. No suitable foodplants, probably a vagrant from North.

Ectypa glyphica L. Very rare, only one specimen recorded by Dr. de Worms in May 1945, possibly breeding locally.

Phytometra viridaria Cl. Not rare as previously thought, but local.

Chloroclystis rectangulata L. This species seems to be associated with Birdcherry as a local food preference to Apple, uncommon.

POSSIBLE EXTINCTIONS. Lastly, I must append the list of species which I have not seen for at least three years, and which I fear must be on the danger list of possible extinctions, although I continue to hope for recovery. It must not be forgotten that even many of the commonest species have also shown a marked decline in populations. *Nymphalis io* L., always rare not seen for twelve years; *Lycaena phlaeas* L., three years; *Lasiocampa quercus* L., *Endromis versicolora* L., *Anarta myrtilli* L., *Panolis flammea* Schf., *Leucania pallens* L., also at least three years and all erstwhile common or not uncommon species, as also was *Polychrisia*

moneta Fab. which has not been recorded for twelve years.

Finally, I would like to emphasize that this area of Badenoch is particularly interesting as a very high proportion of the recorded species are clearly on the edge of their normal range of distribution; four good examples are *Erebia epiphron* Kn. and *Coenocalpe lapidata* Hb. which do not occur East or North, and *Anthocaris cardamines* L. and *Brephos parthenias* L. South or West of the district. From this undoubted characteristic of the Badenoch area I would expect to find a marked fluidity in the population densities corresponding with the ebb and flow of favourable and unfavourable factors such as climate and habitat changes. Most unhappily these seem at present to be all unfavourable.

Nedaich, Newtonmore, Inverness-shire. 22.xi.1967.

Thoughts on *Hyperanthus* and Other Things

By H. SYMES.

Major General Lipscomb's article on Variation in *Aphantopus hyperanthus* L. (Ent. Rec. 79: 127) has roused at least one entomologist to examine his series of Ringlets and try to sort it out.

I find I have ten aberrations of *hyperanthus*, of which five are undoubtedly Fuch's *caeca* and two are Müller's *arete*. The remaining three must, I think, be Seitz's *centrifera*, although no two are alike. No. 1 has two pale rings round a black spot with a white centre similar to but much smaller than those on normal undersides, on the fore wings, and one similar ring and three white dots on the hind wings. No. 2 has one very small pale ring and two white dots on the fore wings and four white dots on the hind wings. No. 3 has one faint ring and no dots on the left fore wing, which is not perfectly developed, three minute and very faint rings on the right fore wing, four small rings on the left hind wing, and four small rings and one dot on the right hind wing.

Caeca appears to be widely distributed and is found in totally different types of habitat. Two of mine were taken near Wantage, two in Hell Coppice near Oxford, and one in Broadley Enclosure in the New Forest. The Wantage locality was on the chalk, a very small area not more than about twenty yards square, close to the B4494 road from Wantage to Newbury: it was about 600 feet above sea level on the Berkshire downs, and very dry. I was present when a fine *caeca* or *arete* was taken at an even higher altitude (about 800 feet) on the limestone of the Cotswolds. This type of habitat is very different from Hell Coppice and Broadley, both on heavy clay soil and very damp. My two *arete* came from the same Wantage locality, and so did one of the *centifera*, I never saw anything else of interest there, but it was a good little place for *hyperanthus*. I did not think that anybody else knew of it, and I hope it has not yet been destroyed.

Reading Mr. Heslop's mention of the occurrence of *Strymonidia pruni* L. at Southampton (Ent. Rec. 79: 301) has revived my memory of an incident which occurred rather more than twenty years ago, and which has never been solved to my satisfaction. I remember every detail of the event and its locality, but unfortunately cannot find a written record of the date. But the year was about 1944 and I am quite sure that the date was in the second week of July.

I was taking a walk in the New Forest and stopped on a bridge across the Ober Water about a mile from Brockenhurst. To my left was an impenetrable mass of tall blackthorns, and high up on a branch overhanging the water, and about ten or twelve feet from the surface was a small butterfly at rest with its wings closed. I saw at once that it was a hairstreak, and from its colour and the pattern on the underwings it could only be the Black (*S. pruni* or the White Letter (*S. w-album* Knoch)). To have any chance of capturing and identifying the insect, one would have needed a net, a long stick, and a pair of waders. I had none of these things. I remember thinking that the date was rather late for *pruni* and early for *w-album*. Afterwards, however, on looking up my records, I found that I had taken *pruni*, at Hell Coppice, as late as 10th July, and *w-album*, near Wantage, as early as 11th July, so that neither species is ruled out. Neither species is included in the list of Rhopalocera at the end of J. R. Wise's classic work on the New Forest (published in 1862), or in V. C. H. (1900). I do not know if *w-album* has been taken in the Forest in more recent years, but I have never seen it there myself (Badbury Rings is the nearest locality where I have found it) and there are not many wych-elms about. On the whole, I am inclined to think that the insect I saw was *pruni*.

In the same article on Blackmoor Copse, I was much interested and rather surprised to read of a colony of *Polygonia c-album*: (Comma) at Whiteparish that fed on willow and produced a fine large race. I have never seen or heard of this larva feeding on willow, although I have found it on wych-elm, gooseberry and currant, as well as the more usual nettle and hop, both wild and cultivated.

Manx Entomology

BY J. M. CHALMERS-HUNT

INTRODUCTION

A visit to the Isle of Man this year from July 8th to 21st fortunately coincided with some fine warm weather, though for a few days a fairly strong breeze tended to hamper collecting operations. We stayed at the picturesque town of Port Erin situated on the south-west coast, and from thence daily excursions were made to various parts of this attractive island.

A total of some 640 species of Lepidoptera had been recorded from Man, but as approximately two-thirds of this number were macros, my efforts were chiefly directed towards working the lesser known groups. This resulted in the discovery of 36 species of microlepidoptera (indicated by asterisks) that so far as I am aware have not previously been recorded from the island.

The nomenclature and classification followed is that of the Lepidoptera portion of the new "Kloet and Hincks", to be published sometime in 1968. I am most grateful to Messrs J. D. Bradley, D. S. Fletcher and P. E. S. Whalley, of the British Museum (S. Kensington), for kindly permitting me to avail myself of this excellent list prior to its publication, and take this opportunity for thanking them.

In addition to Lepidoptera, I managed to collect, *en passant*, a few species of some other Orders, a list of which is appended.

Finally, I must thank the following specialists for most kindly undertaking a number of determinations: Mr. A. A. Allen, Mr. D. E. Allen, Dr. R. R. Askew, Mr. J. D. Bradley, Mr. J. P. H. Brenan, Mr. A. G. Carolsfeld-Krausé, Mr. R. L. Coe, Mr. P. A. Goddard, Mr. A. M. Hutson, Mr. J. Huxley, Mr. S. N. A. Jacobs, Mr. D. E. Kimmins, Dr. W. J. Knight, Dr. A. Melderis, Mr. G. E. Nixon, Mr. L. Parmenter, Mr. E. C. Pelham-Clinton, Dr. J. F. Perkins, Mr. A. C. Pont, Dr. F. Rose, Mr. M. Shaffer, Mr. W. G. Tremewan, Mr. R. W. Uffen.

LEPIDOPTERA

ZUGLOPTERA

Micropterix aruncella (Scopoli), Brada, one; Langness, one; Garey, 2 ♂♂ flying about and settling on ash leaves. This species has only once previously been recorded from Man.

MONOTRYZIA

Hepialus (Phymatopus) hecta (L.), Port Erin, one. *H. (Korscheltellus) fusconebulosa* (Degeer), Port Erin, ♂, ♀, the latter a dark variegated form.

NEPTICULIDOIDEA

**Nepticula sorbi* Stainton, Glen Helen, mines in *Pyrus aucuparia*, 10.vii.

**N. confusella* Wood (det. A. G. Carolsfeld-Krausé), Sky Hill, Lezayre, mine in birch, 13.vii; Glen Helen, mine in birch, 10.vii.

ZYGAENOIDEA

Zygaena (Zygaena) filipendulae L. ssp. *anglicola* Tremewan (det. W. G. Tremewan), Calf, two flying in a marshy spot; Cregneish, plentiful very locally. *Z. (z) trifolii* (Esp.) ssp. *decreta* Verity (det. W. G. Tremewan), Cregneish, plentiful but mostly rather worn, flying in two sloping dry fields near the cliff-top together with the preceding. Fleshwick Bay, a few noted on the high ground.

TINEOIDEA

**Blabophanes imella* (Hübner), Point of Ayre, one disturbed from marram grass halms, 18.vii. *Leucoptera laburnella* (Stainton), mines abundant on *Cytisus laburnum* at Bride and Rushen Abbey. **Lyonetia clerkella* (L.) (det. S. N. A. Jacobs), Lezayre, numerous empty mines in leaves of cherry, 13.vii. **Caloptilia (Caloptilia) elongella* (L.), Glen Helen, larvae on alder, 10.vii, reared 5-6, viii. **C. (C.) betulicola* (Hering), Glen Helen, larvae on birch, 10.vii, reared 1, 4, viii. **C. (C.) stigmatella* (Fab.). Ballaugh Curraghs, mines in *Salix*, 18.vii, from which a single pale imago reared. *C. (Gracillaria) syringella* (Fab.), Port Erin, larvae on *Ligustrum ovalifolium*; Union Mills, larvae on lilac; Laxey, larvae on *L. ovalifolium* and lilac; Lezayre, Ballaglass and Tholt-y-Will, larvae on ash. **Phylonorycter oxyacanthae* (Frey), Port Erin, mine in hawthorn, 9.vii. imago reared 22.vii. **P. sorbi* (Frey), Glen Helen, mines in *Pyrus aucuparia*, 10.vii. **P. viminiella* (Sircom), Ballaugh Curraghs, two mines in *Salix*, 18.vii, imagines reared 25.vii. *P. maestingella* (Müll.) *faginella* Zell., Laxey Glen, mines in beech, reared. *P.*

alnifoliella (Hübner), Glen Helen, numerous mines in alder, 10.vii., reared. **P. stettinensis* (Nicelli), Glen Helen, a few mines in alder, 10.vii.

YPONOMEUTOIDEA

Anthophila fabriciana (L.), Croitecaly; Calif. **Argyresthia* (*Argyresthia*) *brockeella* (Hübner), Lezayre, one, 13.vii.; Tholt-y-Will, one, 18.vii. A. (A.) *albistria* (Haw.), Port Erin; Ballaglass.

GELECHOIDEA

Coleophora lixella Zell., Bradda, 2 ♂♂; Cregnish, near The Chasms, in afternoon sun, 2 ♂♂ flying, ♀ observed ovipositing on *Thymus drucei* and afterwards imbibing from the flowers. *C. discordella* Zell., Bradda, one; Langness, several cases and signs of many others, on *Lotus corniculatus* growing in rock crevices. **C. striatipennella* Tengström=*apicella* Staint (det. R. W. Uffen), Bradda, one. **C. flavaginella* Zell. (det. R. W. Uffen), Point of Ayre, one disturbed from marram grass halms, 18.vii. *Elachista argentella* (Clerck)=*cygnipennella* (Hübner), Peel Castle; The Lhen; Port Erin; Ballakilpheric; Langness. *E. atricomella* Staint. (det. E. C. Pelham-Clinton), Port Erin, ♂. *E. luticomella* Zell. det. E. C. Pelham-Clinton), Langness, 12.vii., flying in numbers in a boggy hollow. *E. albifrontella* (Hübner) (det. E. C. Pelham-Clinton), Port Erin; Ballakilpheric. **Cosmiotes freyerella* (Hübner)=*nigrella* auct. (det. E. C. Pelham-Clinton), Port Erin, ♀, at base of cliffs, 21.vii. *Endrosis sarcitrella* (L.), Port Erin, one. *Hofmannophila pseudospretella* (Staint.), Port Erin. *Depressaria apiella* (Hübner)=*nervosa* sens. auct., larvae abundant on *Oenanthe crocata* at Port St. Mary, Langness, Garey, Port Greenaugh, Calif, Port Soderick. *D. pastinacella* (Dup.)=*heracliana* sens. auct., larvae abundant on *Heracleum spondylium* at Port Greenaugh, Garey, Niarbyl. *Agonopterix heracliana* (L.)=*applanata* (Fab.), Peel Road Station, larvae on *Heracleum spondylium*, reared; Rushen Abbey, larvae on *Aegopodium podagraria*, reared; The Lhen, larvae on *Conium maculatum*, reared. **A. ciliella* (Staint.), Fleshwick Bay, larvae on *Angelica sylvestris*, 21.vii., imago reared 21.viii. *A. pupurea* (Haw.), Bride, larva on *Chaerophyllum temulum*, reared. *A. rotundella* (Douglas), Perwick Bay, larvae on *Daucus carota*, reared. **Microsetia sexguttella* (Thunberg)=*stipella* sensu Hübner., larvae shore at Port Grennaugh, 12.vii, reared; larvae in leaves of *Artiplex* sp. (det. J. P. H. Brennan), in the enclosures at Peel Castle, 10.vii., reared. **Briotropha* (*Mniophaga*) *umbrosella* (Zell.) (det. P. A. Goddard), The Lhen, three, smoked out of marram grass halms, 18.vii. **B. (M.) senectella* (Zell.) (det. P. A. Goddard), Port Erin, a single specimen in m.v. trap, 12.vii. (Note: The specimen conforms to Goddard's "*senectella* (b)" i.e. the "dark form", as compared with Goddard's "*senectella* (a)" the "pale form".) *B. (Bryotrophia) terrella* (Denis & Schiff.) (det. P. A. Goddard, Calif, one. **Scrobipalpa netentella* (Fuchs)=*seminella* Pierce & Metcalf (det. P. A. Goddard), Langness, two disturbed from amongst *A. hastata* (det. D. E. Allen), 12.vii. **Anarsia spartiella* (Schrank), Laxey, larvae and pupae in shoots of *Ulex europaeus*, 11.viii., reared. **Hypatima rhomboidella* (L.)=*conscripta*

tella (Hübner), Laxey Glen, larva on hazel, 11.vii., reared. **Brachmia rufescens* (Haw.), Calf, one, 15.vii.

TORTRICOIDEA

Laspeyresia (*Laspeyresia*) *succedana* (Denis & Schiff.), Calf, Ballakilpheric. *L. (L.) aurana* (Fab.), Niarbyl, pair in cop. *Eucosma* (*Eucosoma*) *hohenwartiana* (Denis & Schiff.) (det. J. D. Bradley) Spanish Head; Port Erin. **Epiblema* (*Notocelia*) *cynosbatella* (L.) = *tripunctana* (Denis & Schiff.), Bradda, one at rest on *Rosa spinosissima*, freshly emerged, 9.vii.; Ballakhaigan, one ovipositing on underside of leaf of cultivated rose, 14.vii. **Epinotia* (*Hamuligera*) *trimaculana* (Don.) (det. J. D. Bradley), Sky Hill, Lezayre, one worn specimen, 13.vii. **E. (Evetria) immundana* (Fisch. v. Rossl.), Glen Helen, larvae on alder, 10.vii., reared 5(1), 8(1), viii. **E. (E.) tedella* (Clerck), Glen Helen, one beaten out of conifer, 10.vii. **Ancylis* (*Anchylopera*) *myrtillana* (Treits), Injebreck and Snaefell, larvae on bilberry, 13 and 19.vii, respectively, reared. *Bactra lancealana* (Hübner), Rushen Plantation; Langness; Injebreck; Ballakilpheric. *Lobesia* (*Lobesia*) *littoralis* (Humph. & West.), Calf Sound; Port Erin. **Hedya pruniana* (Hübner), Port Erin, numerous imagines in a sloe thicket, including one captured by the Dipteron *Scatophaga stercoraria* L. *Olethreutes* (*Argyroproce*) *lacunana* (Denis & Schiff.), Croitecaly; Langness; Port Greenaugh; Garey; Niarbyl; Ballaglass Glen; Cregneish. Small specimens, often with suffused markings. *Archips rosana* (L.), Port Erin, larva on *Ligustrum ovalifolium*, reared; larva on sloe, reared. *Aphelia* (*Aphelia*) *viburnana* (Denis & Schiff.), Ballakilpheric; Injebreck. *A. (Zelothereses) paleana* (Hübner), Spanish Head, larva feeding on *Agrostis tenuis* (det. A. Melderis); Langness; Port Erin. *Pseudargyrotoza conwagana* (Fab.), Ballaglass Glen. *Cnephasia* (*Cnephasia*) *conspersana* Douglas (det. J. D. Bradley), Calf Sound, one freshly emerged, 15.vii.; Langness, larvae in flower heads of *Tripleurospermum martimum* (det. F. Rose), 12.vii., reared. **C. (C.) octomaculana* Curtis (det. J. D. Bradley), The Lhen, larvae in flowers of *Leontodon leysseri* (det. F. Rose), 18.vii., imago reared 6.viii. *Eana penziana* (Thunberg & Becklin) ssp. *colquhounana* Barrett, Langness, a larva and a pupa in roots of *Armeria maritima* growing on sea-sprayed rocks, imagines reared. *Tortrix viridana* (L.), Sky Hill, Lezayre, one, 13.vii., and only the second Manx record. *Acleris caledoniana* (Steph.), Injebreck, larvae on bilberry, reared. **Aethes* (*Aethes*) *rubigana* Treits. = *badiana sensu* Hübner., Niarbyl, one, 13.vii.; Spanish Head, one, 20.vii.; Calf, three disturbed from *Arctium vulgare*, 15.vii. *Eupoecilia angustana* (Hübner.), Bradda, one.

PYRALOIDEA

Chrysoteuchia culmella L. = *hortuella* Hübner.; Langness; Port Erin, *Crambus pascuella* L., Ballakilpheric. **C. uliginosellus* Zell. (det. M. Shaffer), Ballakilpheric, numerous, mostly worn, 19.vii. *C. perlella* Scop., Port Erin; f. *warringtonellus* Staint., Langness, several on saltmarsh. *Agriphilia straminella* Denis & Schiff. = *culmellus sensu auct.*, Old Laxey; Langness; Ballakilpheric; Creg-

neish; Port Greenaugh. *A. tristella* Denis & Schiff., Port Erin. *Scoparia arundinata* Thunberg=*dubitalis* Hübn. (det. M. Shaffer), Langness, fairly plentiful, including several dull brownish examples. *S. ambigualis* Treits. (det. M. Shaffer), Glen Roy, Rushen Plantation. **S. truncicolella* (Staint.) (det. M. Shaffer), Port Erin, one, 20.vii. *Eurrhyncha hortulata* L.=*urticata* L., Calf, two. *Udea lutealis* Hübn., Port Erin, larva on *Plantago lanceolata*; several larvae on *Filipendula ulmaria*, reared; Perwick Bay, larva on *Centaurea nigra*; Ballaglass, imago. *Aphomia sociella* L., Port Erin. **Anerastia lotella* Hübn., The Lhen, two smoked out of marram grass halm, 18.vii. *Pempelia dilutella* (Hübn.) (det. M. Shaffer), Calf Sound, one. *Rotruda saxicola* Vaughan (det. M. Shaffer), Langness, one. *Platyptilia pallidactyla* Haw., Port Erin, one. *Stenoptilia bipunctidactyla* Scop., Ballakilpheric, one. *Emmelina monodactyla* L., The Lhen, one.

PAPILIONOIDEA

Pieris rapae L., Andreas; Laxey. *P. napi* L., Rushen Abbey. *Polyommatus icarus* Rott., Spanish Head. *Argynnis (Mesoacidalia) aglaja* L., Calf, about 30 seen, mostly ♂♂, 15.vii.; between Calf Sound and The Chasms, several. *Eumenis semele* L., Point of Ayre; Spanish Head. *Maniola jurtina* L., Croietcaly; Langness; Port Erin; Garey; Lezayre; Calf; The Lhen; Old Laxey; Cregneish; Fleshwick. *Pamphilus pamphilus* L., Peel Castle; Injebreck; Snaefell; Cregneish.

GEOMETROIDEA

Thyatira batis L., Port Erin, one. *Idea biselata* Hufn., Ballaglass Glen. *I. aversata* L., Rushen Abbey. *Xanthorhoe montanata* Denis & Schiff., Croietcaly; Fleshwick Bay. *Scotopteryx luridata* Hufn.=*plumbaria* Fab., The Chasms, four amongst *Ulex gallii*; Bradda; Ballakilpheric. *Camptogramma bilineata* L., Bradda; Calf; Port Erin; Spanish Head; Fleshwick. *Entephria caesiata* Denis & Schiff., Rushen Plantation, plentiful, flying at dusk. *Cosmorhoe ocellata* L., Calf. *Ecliptopera citrata* L., Lezayre. *Perizoma alchemillata* L., Peel Road Station. *P. flavofasciata* Thunberg, Port Erin. *P. didymata* L., Ballaglass, flying in abundance by day in the Glen, and on the road towards Maughold; Ballakaighan. *Eupithecia simpliciatata* Haw.=*subnotata* Hübn., Langness, one disturbed from *A. hastata* on the saltmarsh, 12.vii. *E. lariciata* Freyer, Sky Hill, Lezayre. *Biston betularia* L., Port Erin, ♂, typical. *Peribatodes rhomboidaria* Denis & Schiff., Port Erin, a rather small greyish form. *Cabera pusaria* L., Lezayre.

NOCTUOIDEA

Spilosoma lubricipeda L.=*menthastri* Denis & Schiff., Port Erin. *S. lutea* Hufn.=*lubricipeda* sensu auctt., Port Erin. *Agrostis segetum* Denis & Schiff., Port Erin. *A. exclamationis* (L.), Port Erin. *Axylia putris* L., Port Erin. *Ochropleura plecta* (L.), Port Erin. *Noctua pronuba* L., Port Erin. *Lycophotia porphyria* Denis & Schiff.=*strigula* Thunberg, Rushen Plantation; Port Erin. *Diarsia mendica* Fab.=*festiva* Denis & Schiff., Port Erin, in m.v. trap, and

at veronica bloom. *Amathes c-nigrum* L., Port Erin. *Mamestra brassicae* L., Port Erin. *Lacanobia oleracea* L., Port Erin. *Ceramica pisi* L., Port Erin. *Hadena perplexa* (Denis & Schiff) ssp. *capsophila* (Dup.), Spanish Head, larvae on *Silene maritima*; Port Erin, a few in m.v. trap. *H. bicurris* Hufn.=*capsincola* Denis & Schiff., Port Erin. *H. caesia* Denis & Schiff. ssp. *mananii* Gregson, Fleshwick Bay, a few larvae on *S. maritima* growing in precipitous places. *Cerapteryx graminis* L., Port Erin. *Orthosia stabilis* Denis & Schiff., Glen Roy, a larva on oak. *Mithimna (Aletia) conigera* Denis & Schiff., Port Erin. *M. (A) ferrago* F.=*lythargyria* Esp., Port Erin. *M. (A) impura* Hübn., Port Erin. *M. (A) pallens* L., Port Erin. *M. (Leucania) comma* L., Port Erin. *Cucullia umbratica* L., Port Erin. *Cryphia (Bryoleuca) domestica* Hufn.=*perla* Denis & Schiff., Port Erin. *Euplexia lucipara* L., Port Erin. *Apamea monoglypha* Hufn., Port Erin. *A. lithoxylea* Denis & Schiff., Port Erin. *A. remissa* Hübn., Port Erin. *A. sordens* Hufn., Port Erin. *A. fasciuncula* Haw., Port Erin. *Mesoligea furuncula* Denis & Schiff., Port Erin. *Mesapamea secalis* L., Port Erin. *Caradrina morpheus* Hufn., Port Erin. *Chryspidia festucae* L., Port Erin. *Autographia gamma* L., Garey; Port Erin. *A. pulchrina* Haw., Port Erin. *A. jota* L., Port Erin. *Hypena proboscidalis* L., Port Erin. *Macrochilo nemoralis* F.=*grisealis* Denis & Schiff., Ballaglass Glen; Port Erin.

COLEOPTERA

Byrrhus pustulatus Forst., Old Laxey, one, 19.vii., among rocks at edge of Laxey River. *Lagria hirta* L., The Lhen, one on the dunes, 18.vii. *Rhagonycha fulva* Scop., The Lhen, on the dunes, 18.vii. *Corymbites cupreus* F., Snaefell, a pupa under a rock near the summit (2034 ft.) 19.vii., reared. *Dascillus cervinus* L., Glen Helen, 10.vii. *Helophorus brevipalpis* Bed., Glen Helen, 10.vii. *Otiorrhynchus singularis* L., Port Erin., 15.vii.

The above were determined by A. A. Allen, who writes (*in litt.*): "All are already recorded from I.o.M. in Britten (*The Coleoptera of the Isle of Man, North-West Naturalist*, 1943-45) . . . but the *Byrrus* only on one specimen, and the *Lagria* and *Dascillus* seem uncommon there".

HEMIPTERA-HETEROPTERA

Anthocoris sp. (det. A. A. Allen), nymphs, Glen Helen, 10.vii. *Calocoris sexguttatus* F. (det. A. A. Allen), Port Soderick, two, 14.vii

HEMIPTERA-HOMOPTERA

Aphrodes bifasciatus (L.) (det. W. J. Knight), Snaefell, ♂, near the summit, 19.vii. *Macrosteles* sp. (det. W. J. Knight), Snaefell, ♂, amongst bilberry, 19.vii.

TRICHOPTERA

Beraea marus Curtis, Port Erin, ♀, 15.vii. *Philopotamus montanus* Don., Port Soderick, on alder, ♂ "(speckled)", 14.vii. *Tinodes maclachlani* Kimmins, Port Soderick, ♂, ♀, 14.vii. All det. D. E. Kimmins.

PSOCHOPTERA

Caecilius flavidus Steph. (det. D. E. Kimmins), Glen Helen, 10.vii.

PLECOPTERA

Diura bicaudata (L.) (det. D. E. Kimmins), Tholt-y-Will, ♀, 18.vii.

ORTHOPTERA

I was naturally hoping to encounter the remarkable Manx Orthopteron, *Stenopothrus stigmaticus* (Rambur), so far only known in G.B. from the Langness Peninsula, but unfortunately failed to see it. It is possible, however, I was a month or so early, as I see the original specimens were taken on August 25th (cf. Ragge, *Entomologist*, 96: 211).

Myrmeleotettix maculatus (Thunberg), Point of Ayre, ♂, ♀, 18.vii.
Corthippus brunneus (Thunberg), Cregneish, ♂, 15.vii; Old Laxey, ♂, 19.vii. *Omocsetus viridulus* (L.), Spanish Head, ♂, 3 ♀ ♀, 20.vii.; Calf, ♂, 15.vii. All det. J. Huxley.

DIPTERA

RHAGIONIDAE

Chrysopilus cristatus F., Port St. Mary, ♂, 9.vii.

DOLICHOPODIDAE

Argyra leucocephala Mg, ♂, Port St. Mary, 9.vii. *Chrysotus gramineus* Fall., Port St. Mary, ♂, 9.vii. *Dolichopus trivialis* Hal., ♂, Glen Helen, 10.vii. *D. unguulatus* L., ♀, Port St. Mary, 9.vii.

SYRPHIDAE

Syrphus glaucius L (det. R. L. Coe), ♂, Glen Helen, 10.vii. *S. grossulariae* Mg., Glen Helen, ♂, 10.vii. *Volucella pellucens* L., ♀, Tholt-y-Will, 18.vii.

SCIOMYZIDAE

Pelidnoptera fuscipennis Zett., Glen Helen. ♂, ♀. 10.vii. *Trypetoptera punctulata* Scop., Bradda, ♀, 9.vii.

OPOMYZIADAE

Opomyza germinationis L., Glen Helen, ♀, 10.vii.

SPHAEROCERIDAE

Trichiaspis equina Fall., Port St. Mary, ♀, Port St. Mary, 9.vii.

SCATOPHAGIDAE

Scatophaga stercoraria L., Port Erin, ♂, 14.vii. This specimen had captured an example of the Tortricoid moth *Hedya pruniana* (Hübner), and was presumably eating it. The moth was still alive but in a moribund condition.

TIPULIDAE

Tipula fascipennis Meig (det. A. M. Hutson), Port St. Mary, ♂, 9.vii.

MUSCIDAE

Spilogaster denigrata Mg. (det. A. C. Pont), Glen Helen, ♂, 10.vii.
Phaonia basalis Zett., ♀, Tholt-y-Will, 18.vii.

TACHINIDAE

Actia pilipennis Fallen, Douglas, ♀, bred from a larva [of *Acleris variegana* Denis & Schiff.] taken on rose, 11.vii.

Except where stated, the Diptera were all determined by L. Parmenter.

HYMENOPTERA

Exothecus braconius Hal. (det. G. E. Nixon), Glen Helen, bred 17.vii., ex *Nepticula sorbi* Staint. mine collected 10.vii. *Eubadizon extensor* L. (det. G. E. Nixon), Douglas, bred from a larva [of *Acleris variegana* Denis & Schiff.] taken on rose, 11.vii.; Glen Helen, bred from a Tortricoid larva taken on sycamore, 10.vii. *Apanteles xanthostigma* Hal. (det. G. E. Nixon), Glen Helen, bred ex larva [of *Caloptilia* (*Caloptilla*) *elongella* (L.)] taken on alder, 10.vii. *A. lineipes* Wesm (det. G. E. Nixon), Laxey Glen, bred from a tortricoid larva taken on sycamore, 11.vii. *Apanteles* sp. (*ater*-group) (det. G. E. Nixon), Snaefell, bred from a larva [of *Ancylis* (*Anchylopera*) *myrtilana* (Treits.)], taken 19.vii. *Ongilus* sp. (det. G. E. Nixon), Langness, ♂, bred from case of *Coleophora discordella* Zell., collected 12.vii. *Angitia* sp. (det. J. F. Perkins), Glen Helen, bred from *Caloptilia* (*Caloptilla*) *betulicola* (Hering), taken 10.vii. *Chorinaeus* sp. (det. J. F. Perkins), Powick Bay, ♀, bred from larva of *Agonopterix rotundella* (Douglas), taken 9.vii. *Campoplex* sp. (det. J. F. Perkins), Peel Castle, bred from larvae of *Microsetia sexguttella* (Thunberg), taken 10.vii.; The Lhen, bred from larva [of *Agonapterix heracliana* (L.)=*applanata* Fab.], taken 18.vii.; Glen Helen, bred from larva [of *Epinotia* (*Evetria*) *immundana* (Fisch. v. Rossl.)], taken on alder, 10.vii. *Chrysocharis phryne* (Walker) (Eulophidae; Entedontinae) (det. R. R. Askew), Glen Helen, ♀, bred from a mine of *Phylonorycter sorbi* (Frey), taken 10.vii.

West Wickham, Kent, 8.xii.1967.

Some data overlooked by Dr. Ainley in his recent notes on the British species of Argynninae

By B. C. S. WARREN

Dr. Ainley's premises:—The British Argynninae were all included in one genus in his youth — recently placed in five — a modern "trend *ad absurdum*"—soon leading to a genus for each species—no ascertainable reason for these changes.

The facts:—Since about 1902, the British species of Argynninae have been classed in four genera; *Dryas*, *Argynnis*, *Issoria* and *Brenthis*. In 1903 all these names were used in Wheeler's "Butterflies of Switzerland," and in the *Entomologist's Record* from that date to 1930 or later. *Brenthis* and *Argynnis* were used by Kirby in 1903 in his "Butterflies of Europe," and all four by Tutt in his "British Lepidoptera," Vol. 9, Chapter 4, 1907-8. With the progress of research *Dryas* was found to be a synonym of *Argynnis* and had to be discarded. *Mesoacidalia* was brought in to fill the gap in 1926. *Brenthis* was found to be so highly specialized in

structure that the majority of species included in it were not true *Brenthis*, so *Clossiana* was brought in for them in 1920. No true *Brenthis* occur in England. Further in 1920 *Fabriciana* was introduced for a very distinct group, one species of which, *adippe* (Denis & Schiff.) occurs in England. In 1966 in Bretherton's new "List of the Butterflies of Western and Southern Europe" all these names are used.

The position therefore is that during the past 66 years two generic names have been removed from the British list; two new names replacing them and one new genus and name added. So much for the British List.

Turning to the Argynninae of the World, modern work places them in thirteen genera. One cannot say exactly how many species there are, the north American and east Asiatic species being far from fully known, but there must be well over 100. This situation is described as "genus-splitting" with more and more new names recently added (the most recent one dates from 1926), bringing us to the verge of a genus for each species. (We are apparently still about 100 genera short of Dr. Ainley's forecast).

Dr. Ainley supposes the genera are based on "sound reasons," but is unable to find out what these may be or where the details have been published. The following references will give the facts he has been searching for.

Trans. R. ent. Soc. Lond., **94**: 1-101, pls. 1-46, 1944. *Proc. R. ent. Soc. Lond.* (B) 15. Pts. 5-6; 71-73, 1946. *Trans. R. ent. Soc. Lond.*, **107**: 381-391, pls. 1-4, 1955.

In view of the doubts Dr. Ainley casts on the validity of all generic names, I may be excused quoting a few lines from the 1946 reference given above. This short note was the work of Dr. Cyril F. dos Passos, Dr. L. P. Grey and myself in collaboration:—

"In the years 1944 and 1945, two papers were published by the present authors, independently . . . Both papers had been completed before the authors became aware that a contemporaneous study of the classification of the Argynninae had been made . . . Warren's revision included an exposition of the researches made by Dr. Reuss on Argynninae (published during the past twenty years in isolated papers) together with the results of his own work . . . The two papers (1944 and 1945), therefore presented the results of three independent genitalic studies of Argynninae; the work of men of three different nationalities. That the classification adopted from these three standpoints coincided in all essentials is, we feel, not only a remarkable testimony to the taxonomic value of morphological data, but also a striking confirmation of the interpretation of such data by the individual authors."

The note was written to establish the structural characters of the Subfamily Argynninae and the great division of the species into the Tribes Boloridi and Argynnidi, without the recognition of which no classification of the Subfamily could accord with reality. The characters given are very definite, simple and unmistakable.

Finally a word on *Mesoacidalia*. This interesting genus is remarkable in being the link between the great American genus *Speyeria* and the Palaearctic species. Though *Mesoacidalia* no longer occurs in America there can be no doubt that it shows the line from which *Speyeria* has evolved. *Mesoacidalia* contains 8 or 9 species one of which occurs in

England.

We may not like the name but does that matter so long as we use it for the species it represents. Unfortunately some who dislike a new name will often use a name they like instead, even if they know it implies, and describes, some other species. This curious action they apparently consider a "contribution to science" as it avoids changing a name. But it also is the reason why systematic workers all over the world welcome the Rules, which whatever their shortcomings, remain the only protection against the flights of fancy of dissatisfied individuals.

Folkestone, Kent.

I am grateful to Mr. Warren for providing references to the work on the taxonomy of the *Argynninae*, and for his other observations on the genera in question, which I find very useful.

It is a pity that, in addition to this, he uses the old debating trick of attributing to me statements I have not made, then criticising me for them. For example: "In view of the doubts Dr. Ainley casts on the validity of *all generic names*" (my italics). I fail to see how anyone who has read what I actually wrote, could believe I hold all generic names to be invalid (whatever that may mean). I was merely enquiring whether any agreed criteria exist for determining generic status *in general*. Mr. Warren has not supplied an answer. If agreed criteria do not exist, then surely it cannot be denied that the choice of characters used for grouping species into genera is *to some extent* subjective and arbitrary. Therefore taxonomists will on occasion come to different conclusions. Therefore in the absence of any procedure by which the world's taxonomists can come together, sink their differences, and agree on a single compromise classification, there are bound to be different classifications in circulation. Suppose, for the sake of argument, that Messrs. Reuss, Warren, dos Passos and Grey, as a result of their researches, had each arrived at different conclusions as to the classification of the *Argynninae*. How would it then have been decided which classification was to be adopted internationally?

As we now know, the four authorities quoted above agree on the classification of the *Argynninae*, on the basis of their genitalic structure. What happens if, ten years hence, someone discovers that half the species at present included in *Brenthis* have, say, a major biochemical or chromosomal difference from the rest, and proposes to reclassify *Brenthis* into two more new genera on this basis? Who will then decide whether splitting the genus is justifiable? Which criteria are the more "valid"? And at what point will it be agreed that any further differences discovered between species are not to be regarded as grounds for introducing new genera?

Mr. Warren implies in his first paragraph that I think the placing of the British *Argynninae* in five genera instead of one is a "modern trend *ad absurdum*" and that we are *at present* "on the verge of a genus for each species." The sense of what I actually wrote is that *if* (repeat, *IF*) the genus-splitting tendency were to continue *unchecked*, the end-result would be that each species would come to be given a generic name peculiar to itself. I submit that the logic of this statement is undeniable.

Again, I merely ask, where do we draw the line between generic and specific differences?

Mr. Warren states as a fact that "since about 1902 the British species of *Argynnis* have been classed in four genera" (implying that I am about 66 years out of date). Then *Mesoacidalia*, *Fabriciana* and *Clossiana* were introduced in the nineteen-twenties. Why, then, did the Royal Entomological Society's authoritative Check List of 1934 retain the single genus *Argynnis* for our six species of *Argynnis*? Why did Sandars in 1939 follow suit, and likewise Heslop in 1947? Why did E. B. Ford in 1945 (p. 73 & 74), with the benefit of the advice of no less an authority than Mr. Francis Hemming, perpetuate the heresy? These, too, are facts. Perhaps Mr. Warren now sees the source of my confusion. He says "we may not like the name, but does that matter as long as we use it for the species it represents." But if *Mesoacidalia charlotta* Haw. so obviously represents the Dark Green Fritillary, how could all these authorities be so misguided as to think that *Argynnis aglaia* L. represented that species?

To avoid being misunderstood further, may I conclude by stating that I am entirely in favour of Latin names and binomial nomenclature. I think it a pity that there is apparently no authoritative international body to issue definitive and agreed revisions at intervals, to guide the world at large, both amateur and professional. Contrary to the implications of Mr. Warren's final paragraph, I am more than willing to adopt new names and revised classifications provided I can see good reasons for doing so—reasons related to the biology of the insects, not to unnecessary complications of the rules of nomenclature. (I hasten to add that I do not regard the work of Mr. Warren and his colleagues on the *Argynnis* as being in this last category). Obviously taxonomy cannot ossify; it must be revised as new facts come to light. I suspect we have not yet decided which facts are important in taxonomy and which are not. While I appreciate the need for rules to guide systematists and help to avoid chaos, I cannot help feeling that 87 rules occupying 91 pages of an octavo volume must be an equally potent source of confusion.

R. G. AINLEY.

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Any number can play — but no-one can win

By G. M. HAGGETT

The contributions by Professor Balfour-Browne and Dr. Ainley in recent numbers of this journal nicely sum up the feelings of field workers who have always been irritated by the name-changers and who despair at the present acceleration of their antics.

The nomenclature and classification of the Lepidoptera have become playthings far divorced from practical usage and good sense with each successive change bearing less and less relevance to the patterns of life these names should reflect. Any person with time at his disposal—pro-

fessional or amateur—can ransack the libraries of the world and after a deal of researching can proclaim further change due to a doubtful publication date or a dubious description or an erroneous figure reference; and so armed he may then swell the muddy flood of synonymy by throwing in more confusion, more names in brackets, more abbreviated authors and more chain reactions with incalculable consequences. Such a learned study will be utterly indifferent to the natural relationship of the insects themselves for the rules of the game are the rules of a word game and they are invented and invoked by persons whose preoccupation is with names and not living creatures.

I especially share Dr Ainley's concern for the genus, a concept that has become so abused that it is nowadays fast losing its purpose. I, too, thought that one of the wisdoms of binomial nomenclature was to indicate the natural affinities between living things, I, too, had always hoped that classification was a natural science that endeavoured to show relationships between individuals, and I, too, believed that names were of significance in achieving this. But I found that Checklists were issued with no indication of why species were placed in their genera, and textbooks were published with no real attempt at justifying how the genera and families were arranged.

The game is no new pastime of course, as reference to journals over the years will show. It just gets bursts of enthusiasm from time to time which appear to be due to whims and caprices of the player who has time to spare at any particular moment. We might have thought that researches over the past sixty years would have resolved most names by now and the violent upheavals that nomenclature and field workers have suffered could have been borne in quest of finality and perfection. But finality is a snare and perfection is a fancy, and the rules of the game ensure that no solution can be ever reached.

My answer to all this is simple. I have caught, reared or otherwise handled most of the larger British moths and I think I know something of them and their habits in the field, and a bit about their life histories and early stages; I have studied Seitz and Meyrick, Ford and Pierce, and I think I am aware of the principal structures that can be meaningfully employed in the classification of these insects. So I have produced my own classification and my own genera, and although I have tried to conform with accepted nomenclatural practice I have gone my own way where I have thought necessary, and I readily expect that my system may be full of pre-occupied names and obsolete genera. But this does not worry me. My collections, both of set moths and the Hammond-Haggett larval collection, are arranged and labelled according to the way I believe the species are related. And the genera I have used clearly indicate this relationship.

But when I submit a paper or note for publication I have to translate these names to a current list and even then I expect to see them mutilated and battered so that I can scarcely recognize what I have written, and at the present rate of change I shall not even know what insects I have written about. Perhaps that is why I am writing less.

A note on *Bittacus angulosus* Tjeder (Mecoptera, Bittacidae)

By J. S. TAYLOR

While collecting insects with my friend Mrs N. Gardiner on the grassy slopes immediately below Hilton, Natal (3,700 ft.) on 14th March 1966, we disturbed in the long grass what I at first thought to be a tipulid. When, just afterwards, another individual was seen to be carrying a small beetle, the matter was investigated further, and several of these curious-looking insects were obtained. They proved to belong to the Mecoptera, and later, on reference to Imms (1957) to a species of Bittacidae.

Anything more unlike the usual kind of scorpion-fly (*Panorpa* spp.) could scarcely be imagined. It is a reddish-brown insect, with long and elongate wings and particularly long and slender legs. Imms (*op. cit.*) refers to resemblance to the Tipulidae of this family of Mecoptera, as also does the Cambridge Natural History (1901) which figures a species, significantly named as *Bittacus tipularius*.

Material from Hilton was submitted to Dr. Bo Tjeder of the University of Lund, Sweden, who determined it as being *Bittacus angulosus*, a species which he had described (1956) from a female specimen collected at Krantz Kloof, Natal. According to Dr Tjeder (*op. cit.*), 2 genera and 18 species have been recorded in South Africa while "all species of the order hitherto known from Africa belong to this family which is easily distinguished from all other families by having one single claw on each tarsus and the legs modified to raptorial use, being very long and having the tarsi so constructed that they can be curled round a captured insect. All other Mecoptera have tarsi with two claws and legs of moderate length and usual shape".

As little seems to be known of the life-history and habits of these interesting insects, it is felt that the few notes we made on *B. angulosus* may be worthy of record.

The curious method of capturing passing insects with the third pair of legs and then by their means conveying the prey to the mouth, while hanging suspended by the other legs from a twig or grass stem, was recorded independently by Mrs Gardiner who had a caged pair under observation. This habit is mentioned by both Imms (*op. cit.*) and in the Cambridge Natural History (*op. cit.*) the latter having a figure of *B. tipularius* in the act of capturing an insect. The bittacids at Hilton were often seen perched at the tip of a twig or grass stem, presumably in wait for passing insect prey. The latter was varied, and included a chrysomelid beetle, a small lycaenid butterfly, a larval grasshopper about one inch in length, and the Hive Bee (*Apis mellifera*), this last being recorded on several occasions. It seemed surprising that such a stout and formidable insect as the Hive Bee should be subdued by such a frail-looking and slender creature as the bittacid.

During the heat of the day the bittacid seeks shade down in the grass or elsewhere, but in cooler weather and in the early morning it is usually to be seen perched upon grass stems and the like. When disturbed it generally flies a short distance before settling again.

At Hilton in 1966 it continued to be present until the advent of the cold weather at the beginning of May, and it was not noted again until 26th February 1967. Its late appearance may have been due to the cool and wet summer of that year. The individuals then seen were lethargic and were obviously freshly emerged. *B. angulosus* would appear to be single brooded. It was also recorded at Karkloof, Natal, by Mrs. Gardiner, and in this case again carrying a hive bee.

Little seems to have been noted of the early stages of the Bittacidae, but they are said to be similar to those of the more well-known Panorpidae.

I am much indebted to Mrs Nancy Gardiner, Hilton, Natal, for her kind assistance in the study of this interesting insect, as well as for the use of her observations, and to Dr. Bo Tjeder of the University of Lund, Sweden, for his kindness in determining the insect, and also for supplying literature.

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A new species of *Thestor* Hubner (Lepidoptera)

By D. A. SWANEPOEL

Thestor stepheni sp. nov.

This recently discovered "black" species would at first sight appear to be very similar to most of its congeners but when closely examined it is seen that it comes closest to *Thestor holmesi* van Son. from which it differs as follows:—The rather more uniform spread of the strikingly whitish-grey colouring over so much of the underside of the hindwings (but with some specimens of both species no different in this respect); the median spots in the hindwing on the upperside tend to be smaller (though not constantly so); the median spots in the forewing are usually smaller and discocellular mark of the hindwing underside is, on the whole wider (less linear than is often the case in *holmesi* and *penningtoni*).

Male holotype: blackish-brown on the upperside with chequered margins, sex-mark not as conspicuous as in *holmesi*. Median spots small and indistinct. Underside—slate grey. Median spots smaller than those of most *holmesi* specimens. Length of forewing: 16.25 mm. (or exp.: 31 mm.).

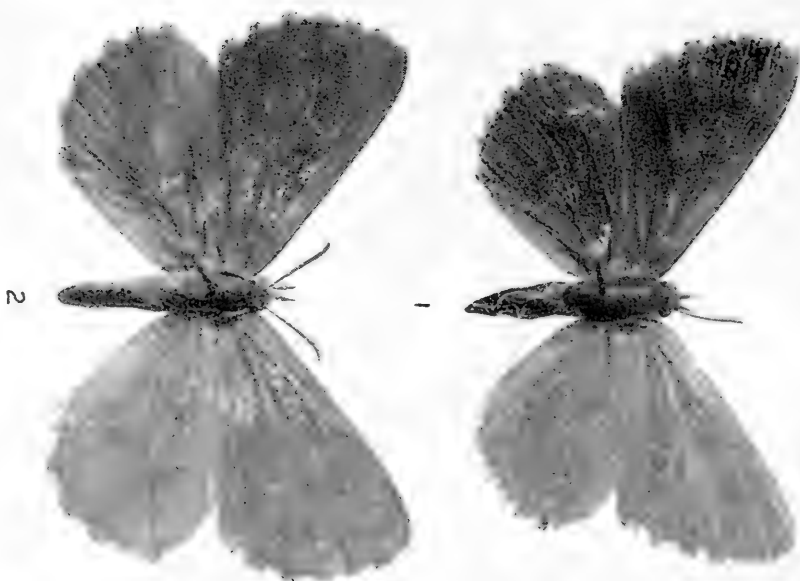
Female allotype: larger than the male, with rounder wings and the general colouring is not quite as blackish as in the male. The general tone of the forewing underside is not as grey as in the male, but rather suggests a dark brown colouring.

The median spots as well as the discocellular mark of the hindwing underside are well developed. The submarginal row is distinct. Length of forewing: 17 mm. (or exp.: 34 mm.).

In both sexes, small postdiscal markings of the forewing underside either not saggitate or less so than is nearly always the case in *holmesi* (more towards apex): this applying on the whole, also to the hindwing.

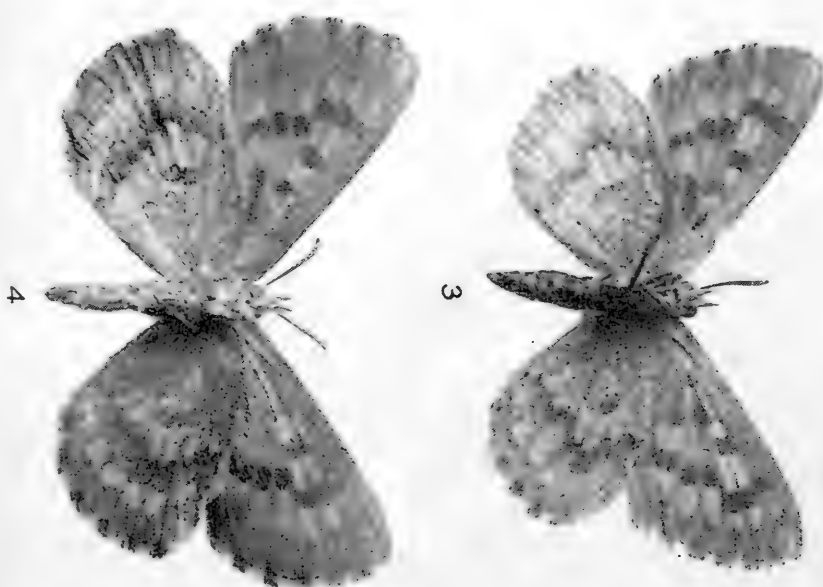
Material examined: Boesmanskloof Pass (Robertson dist., Cape) R.D. Stephen male holotype; idem, 19.xii.1965, R. D. Stephen female allotype; idem, 16.xii.1964, two paratypes one male idem, 19.xii.1965, one female idem, 16.xii.1964, in collection D. A. Swanepoel. The allo and holotype are in Mr. Stephen's collection.

I have much pleasure in naming this new species after its captor Mr. R. D. Stephen of Cape Town.



1. male upper side
2. male underside

Thestor stephemi Swanepeel



3. female upper side
4. female underside

Diptera, Tipulidae. Some Collecting and Setting Hints

P. N. CROW

At the Annual Exhibition of the South London Entomological and Natural History Society held on the 28th October last at the British Museum, I exhibited, amongst other insects, a drawer of Tipulidae which Mr. L. Parmenter kindly tells me were admired by many of the people there as they are very difficult insects to set as well as collect intact.

Now with regard to the collecting great care must be taken always when netting or tubing the creatures as the legs are so delicate. I think previous experience with collecting Lepidoptera helped me a lot to get good species as one seems to sense a good spot. Beech trunks and the surrounding foliage are splendid places in dull weather for good collecting, especially where there are some natural rotten ones. Big trunks seem to be very good and one gets very 'Tipulidae' tree conscious, just like in the old Lepidoptera days when I used to search each year for females of the Lobster Moth *Stauropus fagi* L. These I could always find a few specimens of, and occasionally a pair in 'cop,' but only on the small trees of about arm's thickness. To get back to Diptera, certain trees always seem to produce good species and, no doubt, the 'Tips' have bred there.

With regard to the killing of the Tipulidae, I use both Ethyl Acetate and Cyanide, and to this latter I am still much attached from Lepidopterous days as it has never let me down. The only trouble these days is to find a chemist who will make up a bottle to one's exact instructions! Ethyl Acetate is quite good as a Killing Agent, but the only drawback is that the bottle has to be charged with more of the liquid every time it is used daily. The great thing one must not do is to leave the insects in the bottle after they are dead as they can go greasy. Usually an hour or two is plenty of time for them to be 'bottled' and then although they may seem to be fairly relaxed it is best to transfer them to the *laurel* relaxing tin for a day or two. This process really softens the legs, which is essential for good setting. When I am satisfied the legs are supple I pin the insect, taking the greatest care as it is very easy to dislodge a leg. Then I spread the wings before I finally set the legs. Before I take an insect off the board I always run the setting needle under the legs to make sure one has not stuck to the board. The essential point of setting the creatures is to ensure that the *laurel* relaxing tin is in perfect working order. I make myself up two tins a year, each of which lasts me just over four months. For setting after killing with cyanide I leave the creatures in the cyanide just 30 hours before transferring them to the relaxing tin. But really the great thing about setting is the care taken. It always helps with the 'Tips' to coax the insects to die in a position from which it is possible to transfer them to the relaxing tin without any chance of damaging a leg.

I hope these little notes of mine will be of help to anyone interested.
c/o Reading Museum, Reading, Berks. 8.i.68.

OVER PAGE

Alan E. Stubbs: continued from Page 25.

(b) THE LARVA

It is unfortunate that the larva of *Symphoromyia immaculata* appears to be unknown.

Verrall says that the metamorphoses of *S. crassicornis* are known but gives no references to published work. He appears to refer to Beling's observations in Germany (1882, *Arch. naturgesch*, 44: 193-4) since he says that Beling found the larva of *S. crassicornis* in earth beneath turf on a cart road near a wood. Mr. R. Uffen suggests that a translation of the field observations should read:—

"A larva was found on 12th May, 1880, in the topsoil of a turfed carriageway at the edge of a beech wood. This was a pupa on the 22nd May, from which the imago hatched on the 4th June. Four further small larvae found up to 5th June attained no further development. On the 10th June the following year, I found at the same wooded spot three more fully grown larvae; with these, however, no attempt at rearing was arranged".

Mr Brindle informs me that, in Britain, he associates the adult of this species with marshy ground. The food of the larva is apparently unknown.

One must look to related genera and the following information is taken from a paper by Mr. A. Brindle (1965, *Entomologist*, 95: 311) for *Rhagio*, and he has also kindly given me further information on *Rhagio* and *Chrysopilus*. The larvae of *Rhagio* are known to live in the soil, often not far down, and also among decayed wood debris, in leaf mould and moss. Of the species, the nearest in habitat to *S. immaculata* would appear to be *Rhagio notata* Mg. whose larvae have been found in shallow limestone soils. Mr. Brindle has only taken this species on limestone in Lancashire and Yorkshire, but he does not know whether such a preference is true for the whole range of this species in Britain. The larvae of *Chrysopilus cristatus* also live in the soil, at the edges of streams and rivers, where the chief factor appears to be soil water content, since they occur in alkaline soils as well as peat. Mr. Brindle, in his paper, quotes Marchal's record of the larvae of *Rhagio tringaria* Linné feeding on earthworms in leaf mould and decaying wood. Mr. Brindle considers that it is reasonable to presume that all the *Rhagio* larvae are carnivorous, possibly all feeding on worms of some kind, and that a similar diet may be expected for the species of *Chrysopilus* and *Symphoromyia*. There are, however, many other soil-dwelling invertebrates on which *S. immaculata* could feed. This information leads to two possible controls of distribution, the soil water content and the food of the larva. Since soil temperature may be an important factor in distribution, it would be useful to know the timing of the larval and pupal stages and at what depth in the soil they occur. Chalk and limestone soils are often shallow.

Food is obviously one of the immediate factors affecting the life of the larva. At first sight a preference for calcareous districts could be related to prey living in calcareous soils. This may be the case, and the reason for its apparent absence from acid soils, but *S. crassicornis* appears to find food in acid and calcareous soils. A study of the mouthparts of the larvae may throw some light on the food of *Symphoromyia* and other Rhagionids, but it seems unlikely that the food of the two species within

one genus would be widely different, though these two species are not closely related but belong to different groups of a very large genus. One must remember that it is not proven that *Symphoromyia* larvae are carnivorous; the only Rhagionid larvae which are generally accepted as carnivorous are the members of the subfamily Xylophaginae which live in wood. Melin was able to show that many Asilid larvae are not primarily carnivorous as originally thought, but may be saprophagous, and the presence of masticating tablets suggests that the food consists of solid substances.

(c) THE PUPA

Nothing can be said of this stage, except that on the edge of the British range the date of last air frost is very close to the beginning of the emergence period and it may be that soil temperature is a critical factor.

(d) THE ADULT

As the only stage which has been observed, most of our ecological discussion must be based on the adult, yet this is only a brief phase in the life history. For instance, is the preference for long grasses a factor required by the adult or is there here a factor in the soil essential to the larva? Also it is far easier to collect small inconspicuous flies by sweeping long grasses than by looking at short turf, so one may be dealing with a collecting bias or perhaps the adults shelter from the wind in long grasses. As indicated above, ovipositing females are likely to be the key to solving much of the life history and ecological requirements of the species.

The habitat has important bearings on the life of the adult—its mating behaviour, feeding, shelter and susceptibility to enemies. Much can be discovered about the feeding habits by studying the mouthparts as Bletchly did for *Rhagio scolopacea* L. (1955, *Proc. zoo. Soc. Lond.* **125**: 779-794). This paper refers to continental workers who found that *Symphoromyia* has mandibles in the female as in Tabanids and the interesting observation that the females can be blood suckers, indeed Verrall mentions a case of a Californian species which bit painfully and drew blood. F. Knab and R. A. Colley (1912, *Proc. ent. Soc. Wash.*, **14**: 161-2) provide an interesting account of the blood sucking habits on man of a species believed to be *S. pachyceras* Williston in Montana, U.S.A., and drew attention to the considerable diversity of mouth parts of different species of the genus. H. H. Ross (1940, *Ann. ent. Soc. Amer.*, **33**: 254-256) illustrates the mouth parts of *S. atripes*, a species which he reports as biting man in southern British Columbia, and quotes Aldrich's observations of large numbers attacking horses. This is not the place to pursue discussion on this aspect of biology but absence of European records of biting and the diversity of mouth parts suggests that not all species bite man. It seems likely that both sexes of some *Symphoromyia* species are predatory on smaller insects, as suggested by E. Becher (1882, *Denkschr. Akad. Wiss. Wien.*, **45**: 123-162), but in 1955 Bletchly (*op. cit.*) was unable to cite any literature referring to this supposed habit in the family and C. N. Colyer (1951, *British Flies* London) was unable to record this habit from his field experience with British Rhagionids. Bletchly concluded that the mouth parts of *Rhagio scolopacea* are only suited to nectar feeding, but no field observations were made. H. Oldroyd (1964,

The Natural History of Flies, London) refers to a disputed French record of *R. scolopacea* biting and also draws attention to the non British sub-family *Vermileonidae* which specialises in flower feeding. The well-developed mouth parts of *S. immaculata* must have a function, and for the present it is perhaps simplest to subscribe to the popular, but unsubstantiated, view that as a Rhagionid, the species is probably predatory on small insects. A preference for long grasses could be related to the Rhagionid habit of standing at the ready on a perch, possibly waiting for a mate or prey or for fast escape at the approach of danger. Melin showed that in the predatory Asilidae selection of suitable prey was governed by its size, thickness of integument and behaviour. All stages in the life history are probably liable to predation and the earlier stages may well become hosts to parasites. There is a large field of unknown ecological factors here.

The main emergence period seems to run from the second week in June to mid-July, though the earliest date is the 11th May at Coulsdon and the latest is the 16th August at Ringwoud. It is of interest that the only August records cover the extreme limits of distribution—Yorkshire and Ringwoud (near Dover) so there appears to be no definite emergence pattern related to climate. This information is based on rather meagre evidence since relatively few recorders sent the dates of capture. There appears to be only one brood a year and the peak emergence period coincides with the time of year when long grasses are in good condition.

A very brief description of the adult may be welcomed by those not familiar with the species. *S. immaculata* is a dark grey fly about 4 mm. long and with smoky wings. Its overall build is narrow, yet stout, and the abdomen is gently tapering. Its Rhagionid stance and perky behaviour are the best clue to look for among a sweep net full of small black flies. It is readily identified from other small Rhagionids by its short segmented antennae, the third segment of which is kidney shaped, with the lower lobe extending well below the rest of the antennae. There is a fairly long antero-dorsal arista. *S. crassicornis* is about 7 mm. long and with a large hairy first antennal segment and the third antennal segment is less markedly kidney shaped. Since *S. immaculata* has been confused with *Ptiolina obscura*, it may be as well to mention that this genus has an oval third antennal segment with a short terminal arista.

As one of the immediate characters on which to identify the genus *Symphoromyia*, Verrall defines that the anal cell is open. In his discussion on *S. immaculata*, referring to its distinction from other European species, he states "no mistake should be made if attention be given to the reniform third antennal joint and the open anal cell." However, of the two specimens taken by Mr. Waller at the same spot at Temple Ewell, the female has an open anal cell whilst the male has the normal closed cell (the specimens were taken on different dates). Abnormal wing venation is known in other species of the family, thus care should be given when using a key for identification.

SUMMARY OF THE MAJOR ENVIRONMENTAL FACTORS CONTROLLING DISTRIBUTION

The factors probably controlling the distribution of *S. immaculata* can be considered under four headings.

- (a) **FOOD.** This species requires food at two stages in its life cycle and its requirements in each are quite different. One must for the present assume that the larva is carnivorous and preys on soil invertebrates. It is possible that these invertebrates are themselves directly dependent on components of a calcareous vegetation or require a calcareous soil. However, *S. crassicornis* is able to find suitable food in wet non-calcareous soils. An element or trace element requirement in the diet is an aspect which cannot be pursued. The food of the adult may be fairly specific though this is unlikely. If, in fact, it feeds on small flying insects, the adult may be suited to catching insects with a particular behaviour among long grasses. It is difficult to know how much emphasis to place on its apparent blood sucking abilities.
- (b) **SOIL.** The soil is the environment of the early stages of the life history which occupy the bulk of the life span. The texture of the soil must be a factor of importance to the larva moving through it and also for its prey. The texture of the soil will affect soil water content, drainage and interstitial air, and the underlying rocks, from which the soil has been derived, will play an important part in drainage and aspect.
- (c) **VEGETATION.** The roots of vegetation are an integral part of the soil environment and the whole plant contributes to the microclimate in the soil. The surface vegetation is essentially the environment of the adult where it must find food, shelter, mate and, in the female, presumably controls the sites suitable for laying her eggs. The vegetation, in species composition and growth character, is dependant on geographical distribution, climate, geology/soil, drainage, aspect, grazing and land use history. The vegetation is also the environment of the prey of the adult, whose early stages may depend on the vegetation and soil.
- (d) **CLIMATE.** This affects all stages of the life history, but in its control on distribution it may just be small factors which are critical, such as late frosts. Distribution in the drier part of the country on dry, well-drained soils, suggests that water balance is important. In a very local species on the edge of its European range occurring in a widespread habitat, it is probable that microclimate plays an important part.

(to be concluded)

Notes and Observations

SEMIOTHISA ALTERNARIA HUBN. (*ALTERNATA* SCHIFF.) AT WITHERSLACK.—It will interest Mr. Gaden S. Robinson to know that I took two specimens of *S. alternaria* Hübn. at Witherslack on 14th June 1952 (*Ent. Rec.* 79: 278). They were either caught at dusk, flying, or came to a paraffin pressure lamp.—R. FAIRCLOUGH, Blencathra, Deanoak Lane, Leigh, Surrey. 4.i.1968.

CRYPTOBLABES GNIDIELLA MILL.—Further to the note by the Rev. D. J. L. Agassiz (*Ent. Rec.* 79: 317), a larva found wandering about on a pomegranate box in Reigate, pupated at once in tissue, and produced a

Crytoblabe gnidiella Milliere in November 1967.—R. FAIRCLOUGH, Blencathra, Deanoak Lane, Leigh, Surrey. 4.i.1968.

CURIOUS BEHAVIOUR OF LARVA OF *ACHERONTIA ATROPOS* L.—Mr. O'Hefferan, in his note under the above heading 1967 (*Ent. Rec.* 79: 263) appears to have overlooked my comment (1967, *ibid.*, 79: 24) on his previous note (1966, *ibid.*, 78: 212). I would repeat that the behaviour he describes, viz:—nocturnal feeding and daytime concealment, is completely normal for the larva of *Acherontia atropos*, and that the same behaviour pattern is followed by the brown forms of the other Acherontinae that I have bred.—D. G. SEVASTOPULO, Mombasa. 2.i.1968.

FURTHER DECEMBER CATCHES. — When writing my earlier notes on December light trapping, I thought the catches were large for the time of year. However, a catch of over 200 moths on the night of December 22nd/23rd, 1967 was totally unexpected. Using a 6 watt ultra-violet lamp off a 12 volt battery in Cheddar Wood for a conservation project regularly since April, the only other month when catches have exceeded 200 is July: 6 nights out of 14 with an average number of 42 species. The large December catch comprised: 13 *Poecilicampa populi* Linn., 98 *Operophtera brumata* Linn., 2 *Erranis aurantiaria* Hb., 90 *E. defoliaria* Cl., and a single *Phigalia pedaria* Fab. There was a fresh S.W. wind with periods of rain and a minimum temperature of 8°C, but the site in the wood was well sheltered.—TREVOR B. SILCOCKS, 3 Kenmeade Close, Shipham, Winscombe, Somerset. 28.xii.67.

OCHROPLEURA PLECTA LINN.—In 1966 (*Ent. Rec.* 78: 182) I noted the occurrence of specimens of *O. plecta* in which the orbicular stigma was club-shaped. In that year I took a female of this form and bred the eggs she laid. The result was:—

	orbicular	club-shaped
Male	11	2
Female	5	3
	<hr/>	
Total	16	5

South says that the months occur in May and June and again in August and September, but I find that they also occur regularly throughout July. This brood came through in the same year. The proportion of the club-shaped form appears to be roughly constant throughout the season.

During 1967, I kept separate records of the two forms occurring in my m.v. trap. The result was:—orbicular 1,057, club-shaped 366.

The closer scrutiny of this common moth necessitated by this record has shown that there is a good deal of minor variation, but the clearly orbicular and the clearly club-shaped remain the principal forms. I have included the minor variations with the orbicular for the purposes of this count.

As a result of my earlier note, one entomologist has told me that he has taken the club-shaped form and I should be glad if other readers would look at their collection and let me know if they have any, so that an idea of its range may be arrived at.—L. W. SIGGS, Sungate, Football Green, Minstead, Lyndhurst, Hants.

Canary Is., in 1963.

line 7 down—after "article is" insert: by.

A. sublustris Esp.

p. 218—

Wrotham (div. 6), July 20, 1965 (2) (T. Peet).

A. zollikoferi Freyer

p. 220—

line 5 down—for "transversing" read: traversing.

A. crenata Hufn.

p. 223—

Bromley (div. 1), one, June 6, 1965, none in 1963-64, or 1966-67 (D. R. M. Long). Willesborough (div. 12), June 3-27, 1963 (3), June 8, 1964 (1) (W. L. Rudland).

A. unanimitis Hübn.

p. 224—

Willesborough (div. 12), May 25 (1), June 1 (1), 1964 (W. L. Rudland). Dover (div. 8), June 13 (1), 19 (2), 1956, June 14, 1960 (1), June 11 (1), 20 (1), 22 (3), 23 (1), 1962, June 12 (1), 15 (1), 1963, June 20, 1964 (1), June 19, 1965 (2), all in m.v. trap (G. H. Youden).

A. oblonga Haw.

p. 225—

Pinden (div. 6), one, August 22, 1963 (E. J. Hare, *fide* de Worms, *Lond. Nat.*, 1964: 2). Dungeness (div. 15), July 23, 1964 (1) (R. E. Scott); Greatstone, July 21, 1963 (1) (C.-H. & Wakely, *Ent. Rec.*, 76: 94).

A. furva Schiff.

p. 226—

Capel-le-Ferne (div. 8), at the edge of the Warren, one at m.v.l., July 20, 1965 (R. G. Chatelain).

A. scolopacina Esp.

p. 227—

West Wickham (div. 1), 1966 (C.-H.); Bromley, 1964 (14), with max. (3) on August 2; 1965 (3); 1966 (1) (D. R. M. Long); Orpington, 1964 (2), 1965 (3) (I. A. Watkinson). Westerham (div. 5), 1958 (R. C. Edwards, *teste* de Worms, *Lond. Nat.*, 1959: 106).

A. ophiogramma Esp.

p. 228—

Orpington (div. 1), July 21-August 1965 (2) (I. A. Watkinson). Bromley, July 29, 1967 (1) (D. R. M. Long). Lydd Town (div. 15), August 14, 1965 (1) (D. W. H. ffennell). Pinden (div. 6), 1956-57 (Hare, *teste* de Worms, *Lond. Nat.*, 1959: 105).

A. ypsilon Schiff.

p. 229—

Bromley (div. 1), July 15, 1965 (1), July 4, 1966 (1) (D. R. M. Long). Dover (div. 8), 1960 (1), 1962 (1), 1963 (2), 1964 (1) (G. H. Youden). Willesborough (div. 12), 1963 (2), 1964 (1) (W. L. Rudland). Pinden (div. 6), 1959 (1) (Hare, *teste* de Worms, *Lond. Nat.*, 1959: 106).

E. ochroleuca Schiff.

p. 230—

Dungeness (div. 15), August 6-29, 1964 (5) (R. E. Scott). Orpington (div. 1), one at light, August 18, 1966 (P. E. & D. Webb).

P. fasciuncula Haw.

p. 233—

Dungeness (div. 15), June 5-July 6, 1964 (192), with max. (144) on June 13, and max. not exceeding 11 (on June 29) on any other date (R. E. Scott).

P. minima Haw.

p. 239—

Bromley (div. 1), 1965 (1), 1966 (1) (D. R. M. Long). Boulderwell (div. 15), June 30, 1966 (1) (R. E. Scott).

C. leucostigma Hübn.

p. 240—

Lydd Town (div. 15), August 1965 (D. W. H. ffennell). Pinden (div. 6), July 19, 1957 (1) (Hare, *teste de Worms, Lond. Nat., 1959*: 107).

G. petasitis Doubl.

p. 243—

Westerham (div. 5), September 5, 1948 (1) (R. C. Edwards, *teste de Worms, Lond. Nat., 1959*: 107). Having seen this specimen, I can testify it is not *petasitis* but an exceptionally large *G. micacea* Esp. (C.H.).

G. flavago Schiff.

p. 243—

Syndale (div. 7), larva in stem of *Inula conyza* (H. C. Huggins, *Ent. Rec., 78*: 167).

C. pyralina Schiff.

p. 245—

Bromley (div. 1), 1960 (2), 1961 (1), 1962 (3), 1964 (1) (D. R. M. Long). Ashford (div. 12)*, 1903, seen for the first time in this district (Jeffrey, *Trans. E. Kent nat. Hist. Soc., 1903*: 25).

C. affinis L.

p. 247—

Lydd Town (div. 15), August 1965 (D. W. H. ffennell).

E. paleacea Esp.

p. 250—

Orlestone Woods, Ham Street (div. 12), one worn specimen, August 28, 1964 (de Worms, *Entomologist, 98*: 156).

Z. subtusa Schiff.

p. 251—

Dover (div. 8), 1947 (1), 1951 (1), 1954 (1), 1955 (1), 1962 (1), 1964 (1); all in light trap (G. H. Youden).

A. tragopoginis Clerck

p. 253—

The records suggest this may be native.
line 10 up—for "**tragopogonis**" read: **tragopoginis**.

C. muralis Forst.

p. 256—

Sheppey (div. 2), occurs "abundantly along the dockyard wall" [at Sheerness] (Walker, *Naturalist's Notebook, 1869*: 141).

line 6 up—for "Welker" read: Walker.

p. 257—

line 8 down—for "records" read: record.

p. 258—

First Record, 1864: Plumstead (Purnell, *teste Fenn, Diary, 11.i.1864*),

replaces that given.

A. alni L.

p. 262—

Dover (div. 8), one in m.v. trap, May 28, 1956 (G. H. Youden).
lines 9-10 down—delete the "Winchfield" record, which is Hants.

A. rumicis L.

p. 266—

Dover (div. 8), September 5, 1951 (1), May 12, 1952 (1), both in
m.v. trap (G. H. Youden). Dartford Heath (div. 1) larva on birch
and *Potentilla crecta*, October 6, 1967 (C.-H.).

S. venosa Borkh.

p. 268—

Lydd Town (div. 15), one, mid. August, 1965 (D. W. H. ffennell).

C. asteris Schiff.

p. 269—

Ashford, 1902 (Jeffrey, *Trans. E. Kent nat. Hist. Soc.*, 1902: 38).

C. chamonillae Schiff.

p. 270—

Ashford (div. 12), larvae on *Matricaria* and *Anthemis*, 1902; in
1901, a larva found feeding on carrot in a garden at Ashford
(Jeffrey, *Trans. E. Kent nat. Hist. Soc.*, 1902: 38).

C. gnaphalii Hübn.

p. 271—

Ashford, 1902, two larvae (Jeffrey, *Trans. E. Kent nat. Hist. Soc.*,
1902: 38).

line 1 down—for "out" read: cut.

C. absinthii L.

p. 272—

Dartford (div. 2), larvae on *A. absinthium*, 1967 (B. K. West). Dover
(div. 8), July 22 (1), 28 (1), 1963, July 26, 1965 (1), all in m.v. trap
(G. H. Youden).

C. verbasci L.

p. 273—

Ashford, larvae on *Verbascum lychnitis* (Jeffrey, *Trans. E. Kent
nat. Hist. Soc.*, 1902: 38).

L. semibrunnea Haw.

p. 275—

Orpington (div. 1), one, at light, April 11, 1962 (P. E. and D. Webb,
one, 1965 (I. A. Watkinson, Westerham (div. 5), one, May 11, 1958
(R. C. Edwards, *teste de Worms, Lond. nat.*, 1959: 112).

L. lamda F.

p. 277—

The 1875 specimen was recorded as *L. furcifera* Hufn. in error, but
this was corrected in *Entomologist*, 9: 191.

L. ornitopus Hufn.

p. 278—

line 6 down — for "ornithopus" read: **ornitopus**.

X. exsoleta L.

p. 279—

Pauls Cray (div. 1), in R. G. Sanderman coll. in B.M.N.H., one
labelled "Pauls Cray Sept., 1900." (C.-H.)

line 17 down—for "betusta" read: *vetusta*.

- X. vetusta* Hübn.
p. 280—
line 5 down—for “*vestuta*” read: *vetusta*.
- C. lunula* Hufn.
p. 282—
The Dipteron *Eumea hortulata* Mg. (det. A. C. Pont) emerged ex pupa, Dungeness, June 1966 (C.-H.). Dungeness (div. 15), imago on post, June 3, 1965 (R. G. Chatelain); imago at rest on yarrow bloom, August 5, 1967 (H. E. Chipperfield).
- A. australis* Boisd.
p. 287—
Dungeness (div. 15), larvae on “grass and sorrel” (Wakely, *Ent. Rec.*, **79**: 68). Haggett and Wightman (*Proc. S. Lond. ent. nat. Hist. Soc.*, **1964**: 17, pl. 1, fig. 6) exhibited an extreme melanic, taken Dungeness, 1964, which they considered apparently referable to “*ab.* (or ssp.) *orientalis* H.-S.”
- E. adusta* Esp.
p. 290—
line 20 up—for “(1963)” read: (1964).
- E. lichenea* Hübn.
p. 291—
Folkestone (div. 16), September 13, 1967 (A. M. Morley).
- P. suspecta* Hübn.
p. 292—
The records suggest this is native in Kent (C.-H.). Petts Wood (div. 1), 1953 (R. G. Chatelain).
- A. flavicincta* Schiff.
p. 293—
Abbey Wood (div. 1), 1951 (J. Green, *teste* Showler, *Ent. Rec.*, **63**: 166). Orpington, 1962 (1) (P. E. and D. Webb); October 2, 1965 (1) (I. A. Watkinson).
- A. lota* Clerck
p. 297—
line 18 down—for “**A.**” read: **Agrochola**.
- A. helvola* L.
p. 299—
Westwell (div. 7); Brook (div. 8)* (Scott, 1964).
- A. xerampelina* Esp.
p. 301—
The records suggest this is native in Kent (C.-H.).
- T. citrigo* L.
p. 302—
Sheppey (div. 2) (Walker, *Naturalist's Notebook*, **1869**: 141). Westwell (div. 7) (Scott, 1964).
- C. gilvago* Schiff.
p. 305—
The records suggest this is native in Kent (C.-H.). Sheppey (div. 2) (Walker, *Naturalist's Notebook*, **1869**: 141).
- C. palleago* Hübn.
p. 306—
A. J. Wightman (*in litt.*) points out the name *palleago* Hübn. should

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Edited by S. N. A. JACOBS, F.R.E.S.

with the assistance of

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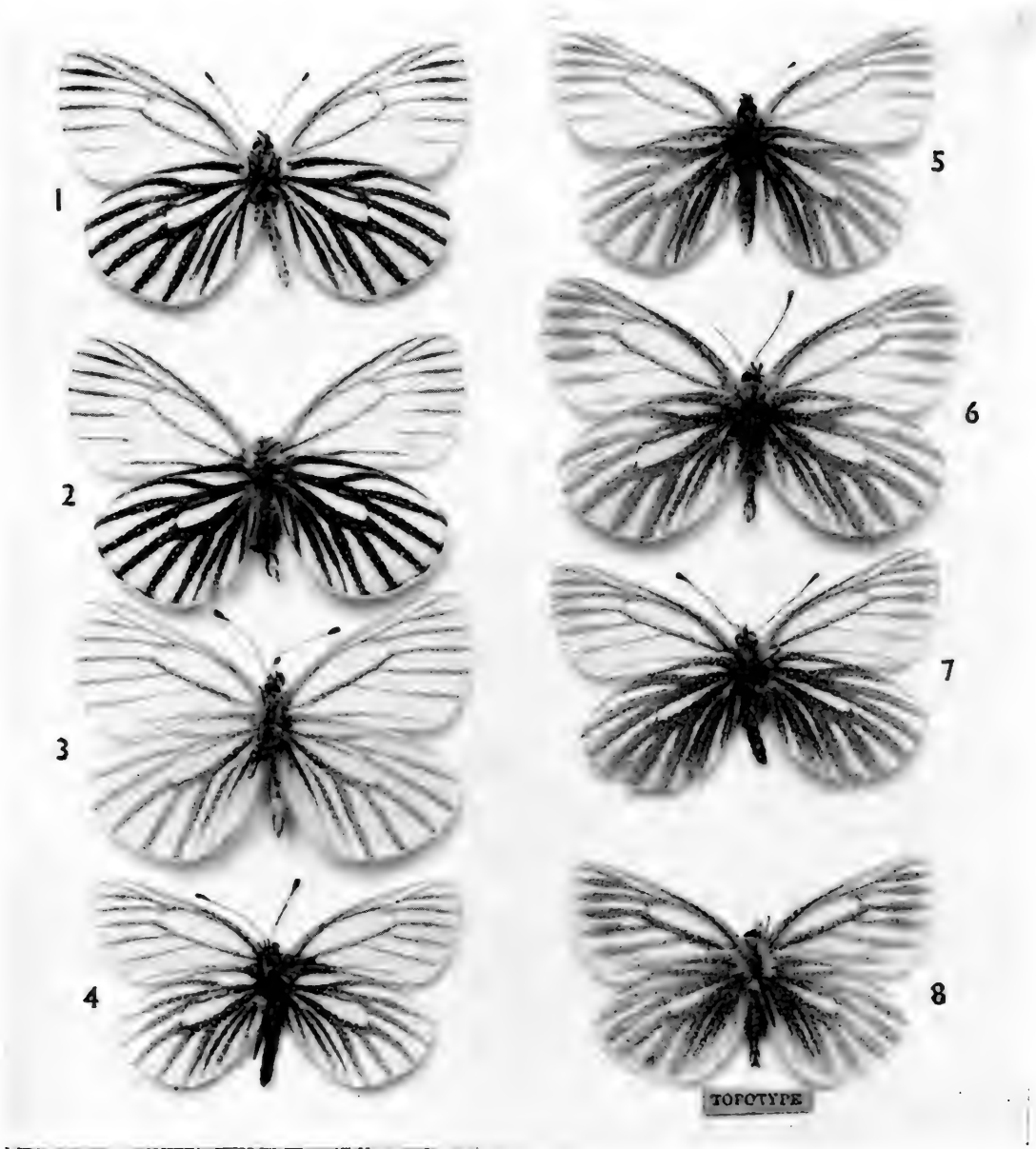
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Explanation of Plate on pp. 64-65

On the Nearctic Species of the *Bryoniae*- and *Oleracea*-Groups of the genus *Pieris*

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

It has been suggested to me that a more detailed systematic treatment of the Nearctic insects of the *bryoniae* and *oleracea* groups of *Pieris* than I gave in my last paper on the subject (Warren, 1967), would be of interest to collectors. But it is doubtful if this is possible, at present. The following list shows the relationship of these insects as exactly as our data permits. I have added an outline of the geographical distribution of each form, but the very general habit in the past of referring to all these insects as "*P. napi*" makes it impossible to obtain anything like an accurate idea as to how closely many of the forms approach one another. Several will be found to overlap.

In the *bryoniae*-group both forms of androconial scale of the subsp. *pseudobryoniae*, though smaller, correspond so exactly with those of typical *P. bryoniae* of the European Alps that no question can remain as to its being conspecific with the latter. The photographs I gave (Warren 1961, figs. 27, *bryoniae*, 32, *pseudobryoniae*) should convince the most sceptical of the fact. The only other member of the group, *P. hulda*, is rather an uncertain quantity. It is shown to be a member by the perfect, primitive-type *bryoniae*-scale, which so far as I know does not appear in the *oleracea*-group species. But the ordinary *hulda* scale is variable, and not exactly typical of *bryoniae*, though it suggests it.

All other Nearctic species so far known, belong to the *oleracea*-group.

(A) *Bryoniae*-group.

1. *P. bryoniae pseudobryoniae* Vty. North of 64.N. to shores of Arctic Ocean. Monogenerational. Alaska and N.W.T.
2. *P. hulda* Edwards. Kodiak Island and south Alaska to Yukon. Monogenerational.

(B) *Oleracea*-group. Hybrid species: *P. narina* Vty. × *P. dulcinea* Btlr.

1. *P. kamtschadalis* Röber. Kamchatka. (? Alaska).
2. *P. oleracea* Harris. South of 54.N. Bigenerational. Manitoba; Ontario; New Hampshire; New York; New Jersey. (2nd gen. *cruciferarum* Boisd.).
Monogenerational race. Between 58.50 N. and 62.N. Alaska; Mackenzie (Ft. Simpson; Gt. Slave Lake; Ft. Smith); Manitoba.
subsp. *frigida* Scudder (= *borealis* Grote). Island race between 46.50 N. and 52.N. Gt. Caribou Island, Labrador; Belle Island; Funk Island; Anticosti Island and Newfoundland. Bi- or monogenerational.
3. *P. venosa* Scudder. Bigenerational. California to British Columbia. (2nd gen. *castoria* Reakirt).
Monogenerational race. Lake Louise, 6000 feet, Alberta; Chatanika, Alaska, 64.59 N. and Slana and Suslota, south Alaska.
4. *P. marginalis* Scudder. Bigenerational. Oregon; Washington; recorded from British Columbia and California (Barnes and McDunnough). 2nd gen. *pallida* Scudder).

5. *P. pallidissima* Barnes and McDunnough (2nd gen.). Bigenerational. Rocky Mountains, Colorado; Utah. Monogenerational race. *Macdunnoughii* Remington. Silverton, Colorado, at 10,000 feet. ("Single brooded, last week of July", Barnes and McDunnough).
6. *P. mogollon* Burdick. Bigenerational. Arizona. (2nd gen. *warreni* dos Passos).
7. *P. virginiensis* Edwards. Monogenerational. Ontario south to New York. Recorded from north and south Colorado (Edwards).

(C) Inter group hybrid.

P. passosi Warren. Hybrid *P. oleracea* × *P. hulda*. Monogenerational. Palmer, south Alaska.

As noted, the *oleacea*-group insects are of hybrid origin, obviously of great age. According to the rules of nomenclature then, they are to be dealt with as "species". But of course this would not apply in cases where one could be shown to be a derivative of another. At the moment it seems that *frigida* is most probably a local race of *P. oleracea*, and possibly *venosa* also, for the seasonal dimorphism in both generations in the latter follows a similar line as in *oleracea*, which is suggestive of unity. Against this, however, must be set the fact that where *venosa* becomes monogenerational at high altitudes or latitudes, it tends to be reduced in size. This is not the case in *oleracea*, for in high latitudes where it produces but one generation it retains its full size.

In the case of *frigida* the first generation suggests a large, island race of *oleracea*, and there is some increase in size of the scales of the few specimens I have examined which points to some change between the two insects, for in *Pieris* as a rule the size of the scales seems independent of the size of the specimen. In some of the Nearctic hybrids, however, a reduction in size of scale appears in some small forms, which suggests that the size of the scales becomes a variable quantity in these hybrid forms. Then, the female of the second generation of *frigida* is said to be somewhat suffused with dark scaling on the upper side as in *P. bryoniae*, a phenomenon not known in any mainland *oleracea*. There are therefore some reasons for separating *frigida* and *oleracea*, but they are not decisive, and there is a lack of data concerning what forms of insect appear in New Brunswick and Nova Scotia which might throw some light on the question.

There are some who may question the likelihood of hybrids developing into so many distinctive forms as exist in the Nearctic Region, or the possibility of such forms spreading throughout great areas unimpeded by extreme alterations in climate and habitat. A recent discovery that illustrates how readily two very distinctive *Pieris* species can cross is therefore most welcome, especially as this case is obviously of fairly recent occurrence. It is a cross between *P. oleracea* (hybrid-group) and *P. hulda* (*bryoniae*-group).

My friend, Dr. Cyril F. dos Passos, obtained a series of "*P. napi*" from Palmer, south Alaska; 20 males and 9 females. With great kindness Dr. dos Passos sent me the entire series (together with other specimens). Had he only sent a few of them, I should most certainly have failed to recognise what they are, for the variation among them is so remarkable that several could not be connected with any known form. The mixture

of scale formation and characteristics was puzzling, ranging as it does from typical forms to a variety of atypical ones, and from symmetrical types to malformed ones. In some cases malformation is predominant. But the primitive-type scales led me to realise the meaning of the other fluctuating forms. In many specimens I failed to find any of the primitive-type scales. In others fully developed examples of the *bryoniae*-type existed; in yet others the primitive scale was of the *oleracea*-type, some of them much reduced in width, a feature known to occur in Palaearctic hybrids. The entire series are hybrids; a cross between *P. oleracea* and *P. hulda*. The most surprising fact is that one specimen in each of the parent species is present in typical form. As these two individuals are most striking and catch the eye at once, there is no reason to suspect they had been overlooked in collecting. It is therefore clear that the pure parent forms are now very rare: but they still exist. In view of the predominance of the hybrids it is unlikely they will continue to do so much longer.

Once the meaning of the confused state of scale development was recognised, comparison of the specimens themselves left me wondering how I failed to appreciate their true nature at once. In such cases illustrations convey the facts better than pages of descriptions would. The accompanying plate shows this. Fig. 1 is a typical *P. oleracea* from the east of the region, fig. 8 a toptypical *P. hulda*. Figs. 2 and 7, show these two species from Palmer, absolutely typical, not to be distinguished from figs. 1 and 8. Figs. 3, 4, 5 and 6 show some of the transitions which link the two extremes in Palmer. The colour changes are equally gradual; they are noted in the explanation of the plate. It must be remembered that the remaining 14 males of the series are all of the intermediate (i.e. hybrid) forms. The females are all closest to *P. hulda*, with a *bryoniae*-like, dark suffusion on the upper side and two dark, discoidal spots. Five somewhat resemble *P. oleracea* in that the markings on the under side are more sharply marked and narrower than in the other four which are more like *P. hulda*, with broader, paler and more suffused marking on the hind wings. There are not any quite typical of either parent species. The ground colour on the upper side is yellow in seven, paler, almost white in the other two, but still with a strong *bryoniae*-suffusion. This series was captured in 1965 and 1966.

In describing such a hybrid it is useless to designate a type specimen, no individual can be said to be "typical". I therefore include the Palmer series, with the exception of figs. 2 and 7, as Paratypes, that is 17 males and 9 females, and have much pleasure in naming this hybrid, *P. passosi* n. sp., to commemorate the fact that it was to the willingness of Dr. dos Passos to risk sending his entire series across the Atlantic we owe the recognition of this remarkable hybrid.

We know several long established hybrid species of *Pieris*, but *P. passosi* gives us one such hybrid in what must be a relatively early stage of development, for the parental species are still present. Some future collector will probably be able to record their disappearance. But when that time comes and *P. passosi* is represented by some particular form, or forms, between figs. 3 and 6 on our plate, it should be remembered that in spite of the superficial change, the mixed scale characteristics will still persist.

It is certain that there are localities in the great expanse of the

Nearctic Region where some of these *Pieris* species overlap, but they are known in their most remote areas in their typical forms. Possibly, here or there, a mixed race exists. This would account for difficulties in identification and divergent views. It also reminds us that the same phenomenon may appear in the Palaearctic Region. The central Balkans, for example, is one area where it is possible *P. napi* and the Palaearctic hybrid species *P. pseudorapae* or *P. dubiosa* may be in contact. (See Note at the end of this paper.)

Should such a zone of contact between *P. napi* and the hybrid species be found, the individuals would probably be in much the same condition as *P. passosi* is at the present time; i.e. hybrids mating with other hybrids of differing characters, on occasions back-crossed to one or other parent race only to be back-crossed again to some hybrid form. Under such conditions the establishment of any constant form could only follow on the elimination of many temporary vagaries and probably of the pure parent strains also. In the meantime the existing individuals will be lacking in any fundamental stability and if used for experimental breeding might well give wholly anomalous data.

I have previously described the hybrid characters of the scales which appear when *P. oleracea* is crossed with either *P. marginalis* or *P. virginiensis* (Warren, 1967). These characters prove the insects to be specifically distinct, for they are such as do not appear in crosses between races of one species. The *P. oleracea* × *P. hulda* cross gives the same characteristics seen in the other interspecific crosses. The discovery of *P. passosi* not only emphasises the likelihood of the hybrid nature of the *oleracea*-group species, but illustrates the facility with which long-established species can cross on occasions, but it should be noted by no means on every occasion when it might be possible, for if that were so the great geographical range of *P. oleracea*, and probably several other species also, could not have been achieved. One may call to mind that *P. oleracea* ranges from south Alaska to the islands off the Atlantic coast, a distance of at least 3500 miles, in the course of which it has spread over some 20 degrees of latitude. *P. hulda* occurs from Kodiak Island, south Alaska, to the borders of Yukon, perhaps even further, for it has been said to range into the western Alaskan islands also.

Such facts prove both species to have existed throughout extended periods of time, yet both are still able to cross and breed without loss of fertility, for *P. passosi* is said to be abundant in the Palmer district.

The under side of some *P. passosi* can resemble *P. bryoniae* subsp. *pseudobryoniae*. In the latter the colour on the veins is not so straight-edged as in *P. hulda* but appears more curving as seen in fig. 4, but on the whole the *pseudobryoniae* markings are somewhat broader than in that figure.

EXPLANATION OF PLATE

1. Typical *Pieris oleracea* from New Hampshire.
2. Typical *Pieris oleracea* from Palmer, Alaska. 61.48 N., 149.7 W.
3. Hybrid *Pieris passosi*, typical of *P. oleracea* in size and marking; colouring as in *P. hulda*; from Palmer, Alaska.
4. Hybrid *Pieris passosi*, markings as in *P. oleracea*; size and colouring as in *P. hulda*; from Palmer, Alaska.

5. Hybrid *Pieris passosi*, size, marking and colour all approaching *P. hulda*, but width of spaces of ground colour between the vein markings of the hind wings approaching *P. oleracea*; from Palmer, Alaska.
6. Hybrid *Pieris passosi*, markings very suggestive of *P. hulda*, note especially the expanding, dark bulges on the veins of fore wings; size and width of spaces of ground colour between the veins of hind wings as in *P. oleracea*; colouring also as *P. hulda*; from Palmer, Alaska.
7. Typical *Pieris hulda*, slightly worn specimen, note the extreme reduction in width of the spaces of ground colour between the veins of the hind wings; from Palmer Alaska.
8. Topotypical *Pieris hulda* from Kodiak Island, Alaska. 57.30 N., 153.30 W.

All specimens exactly natural size. Colour on the veins, dense, black-brown, sharply marked in *P. oleracea*. diffused, pale brown, not completely obscuring the ground colour in *P. hulda* and *P. passosi*.

Photograph E. J. M. WARREN.

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[Note on the Palaearctic hybrid species of *Pieris*:—

Since I first recognised the Palaearctic hybrid species in 1966 (*Ent. Record* pp. 57-65), I have always referred to them as *P. dubiosa* in the western area and *P. pseudorapae* in the eastern. With increase of our knowledge a change of these names, unfortunately, becomes unavoidable.

In 1895 Heyne gave the name "*P. napi meridionalis*" to the *napi*-like insect of "central Italy", in Rhül's "Die Palaearktischen Grossschmetterling" p. 714. In the summer of 1967 Col. W. B. L. Manley collected a series of this insect from Toscana and Lazio: the second generation. Examination of the scales showed them to be one of the hybrid species, but a difficulty at once became apparent: the locality was in the centre of the *dubiosa* zone, but the scales were not typical of that species; further, the size and under side markings suggested the eastern *P. pseudorapae*. My first impression was that these Italian insects must be some unrecognised race, but on considering the scales I had of some specimens from central Greece which I had referred to *dubiosa* I concluded they all would have to be attached to the latter. Mr. Bowden had earlier in the year captured some specimens in south Italy of the first generation, which I also accepted (doubtfully), as *dubiosa*. Later he bred hybrids between the south Italian race and Corsican *dubiosa*. These hybrids raised further doubts for the scales showed no increase in malformation beyond that normal to *dubiosa* and there was a distinct reduction in the size of the hybrids though they were of the second generation. This change in size was evidence that the races crossed

were constitutionally different. *P. dubiosa* on the average is smaller than *P. pseudorapae*, but the hybrids are a little smaller than normal *dubiosa*. Some check to normal development was active and this could not be attributed to treatment with such an expert breeder as Mr. Bowden. Indeed, at the same time, he bred an extensive series of the second generation of the Italian race from the same stock he had used in the cross and the resulting specimens were of full size and normal in every respect. The Italian race could therefore not be *dubiosa*. As an hybrid species, however, if not *dubiosa* it must be *pseudorapae*, in spite of the western locality. The superficial characters of *pseudorapae*, its great size, in both generations; the strong, dark markings of the underside hindwing in the first generation, practically unmarked in the second, all accord exactly with the Italian race. Occasional specimens of *dubiosa* can attain an equal size in the second generation, but it is much smaller in the first in which the underside markings more resemble those of *P. napi* while the first generation of *pseudorapae* on the underside is suggestive of *P. bryoniae neobryoniae*. The second generation of *dubiosa* tends to be more marked on the underside and the black spots on the upper side are larger even in the females, and the discoidal spot on the upper side forewing in the male *dubiosa* is more constant: it is frequently wanting in *pseudorapae*.

All these facts prove that the southern Greek and central and southern Italian insects can only be *P. pseudorapae*, in spite of the distance they have spread to the west, and of the presence of *dubiosa* in the central Balkans. My previous idea that the extreme malformation existing in the scales of *pseudorapae* of the Constantinople area resulted on a cross between *dubiosa* and *pseudorapae* seems impossible and must be connected with some local disturbance.

The first result of this discovery is that the name *meridionalis* will have to replace *pseudorapae* Vty. The name *dubiosa* will still apply to the Spanish, Portuguese and Corsican hybrid insects. But it must be noted that "*meridionalis*" cannot be applied to any form of *P. napi* as it has been (incorrectly), in the past.

The distribution of the Palaearctic, hybrid species, is of considerable interest. They are completely absent from some islands in the Mediterranean yet present in others at no great distance. I have some reason for thinking that a mixed race *meridionalis* × *dubiosa* may exist in Sicily, but have only seen a very few specimens. A considerable series will be needed before one can establish the nature of the indigenous race with certainty.]

EARLY APPEARANCES IN SOMERSET—On 20th January 1968, I was shown a specimen of *Eurrhynx hortulata* L. (small magpie moth) inside a bungalow near Weston-super-Mare. Possibly the larva had entered last autumn and its life cycle accelerated by the warmth indoors. One of the numerous house plants kept there may have aided this very early emergence.

Early dates at my light traps include 4 *Erannis marginaria* Fab. at Cheddar, 19.i.1968 and an *E. leucophaearia* Schiff. at Shipman, 21.i.1968.—TREVOR B. SILCOCKS, 3 Kenmeade Close, Shipham, near Winscombe, Somerset. 22.i.1968.

Quest for Exotic Rarities

By Dr. IAN HOWAT.

The rugged bush land of Jamaica is renowned for *Papilio homerus* F., that huge yellow and black creature, which ninety years ago used to be found along the backbone of the blue mountains. But how many are familiar with *Papilio marsellinus* Dbld. I suspect, very few, for this insect, although recorded for over one hundred years has rarely been caught in any numbers until recently, because it was never seen except for one or two days in the year, and then only in one place.

The opportunity to work at the University of the West Indies in Jamaica, also afforded the opportunity to search for these two Papilios.

Firstly, the famous *homerus*—featured on the Jamaican sixpenny stamp—was investigated by enquiring of the native residents if they had ever seen it near Bath—where ninety years ago it was common—well almost. No, no one had seen it for years. A similar reply came from those who went up into the mountains, and in fact, I found no local resident who had ever seen Jamaica's national butterfly. However a zoologist at the University had seen it one year ago—high up in the wildest mountain range in the island—about ten miles from Bath. There are only one or two trails leading up into these mountains, and these trails are precipitous—usually with a cliff on one side and a ravine on the other, the whole being overgrown with jungle—even vertical cliff faces. For the most part they allow only single file progress, which is impeded by crossing torrents, hacking away undergrowth, and climbing steeply for about four miles, to a pass lying at the crest of the range. Here it was that the only sighting of *homerus* was made for years, since its disappearance from the rest of the mountain range and the Cockpit Country, about twenty years ago. In fact many people believe it to have died out about ten years ago.

Armed with the necessary maps and equipment for ascending these trails, I went on weekend expeditions to this wild country many times, frequently to encounter torrential rain—these mountains have over 150 inches a year.

On one trip, I explored a small clearing for the first time, and found *homerus* flapping majestically in circles 15 feet above me, and there he remained for five circuits, quite unassailable, but none the less, a glorious sight. I encountered *homerus* on four occasions on subsequent trips; one of these encounters was at the end of a *homerus*less day, resting on the way down, in a glade. I watched one of the large tropical brimstones 100 yards away and it was there for three minutes before I realised that it was no brimstone, but *homerus*. As I ran to him, he flew to me, thus the only *homerus* of 1967 was caught. On another occasion, a friend of mine (that is he was), caught one ten yards ahead of me, and managed to let it get out. However, one *homerus* in the bag where none was expected was rather satisfying.

It is interesting to note that only one female was seen, and that the foodplant is not known with any certainty, and also that no records of larvae or pupae have come to light, although it used to be bred in Bath by a Chinese gentleman, ninety years ago, who sold them to passengers and crew of ships.

Papilio marsellinus presented greater difficulties still, for it is virtually unknown, even to zoologists. The five or six in the British Museum

collection are between 80 and 100 years old, and were probably the only ones in Europe until this year. Thus, probing had to start in reference libraries, which revealed that it was an attractive blue, white and red *Papilio*, only found in Jamaica, if one could find it at all. A local entomologist made a sighting of several of these coming over the beach from the direction of Venezuela four years ago, but no such creature has ever been seen in South America, although a similar *Papilio marcellus* Cramer is common there and in Cuba.

The first clue came after asking the natives all round the coasts and from one end of the island to the other if they had ever seen anything like the description and pictures of *marsellinus*. No one had ever seen such a creature, except near the same beach where they had been seen four years ago; several of the locals recognised it. Many days of questioning many locals began to reveal a pattern.

Firstly, the creature was unknown in any other area of the island (or of the world), and had only been seen in this one area of about two or three square miles.

Secondly, all the sightings, whichever year they were in, were all within the same two weeks of each year.

Thirdly, they were only seen for two to four days of each year.

Fourthly, some years they were not seen at all.

Thus, a connecting link had to be found to account for this quite extraordinary time sequence. Exhausting attempts were made to unearth some recurring factor at the specific time each year that sometimes would precipitate sightings, and sometimes would not. Tides, changes in seasonal influence from South America, or other Caribbean islands, and many other factors were excluded. However, it finally became apparent that it was the annual preceding heavy rains which was the link. Always the first sighting was ten to fifteen days after the rains had ceased, and if there were no rains that year, there were no sightings. If the rains were late in ending, *marsellinus* was apparently late in appearing. It seemed that these rains broke the diapause, allowing the insect to hatch out.

The next step was to explore the area fully for evidence of eaten food plant, larvae, pupae, etc. The area is about one or two miles from the coast, and very thick, high bush, almost impossible to work through. However, nothing of significance was found, so the final step was to monitor the area about ten days after the rains had ceased. This year, not only were the rains very late, but heavy showers continued for many days afterwards. Trips almost every day to the area were disappointing. During extensive exploration of the area after heavy overnight rain, one *marsellinus* was seen and caught. Next day, again after heavy rain, nine more were caught, and two days later, the insect was not seen again.

It is interesting to note that these creatures fly exceedingly fast, and only one was taken on the wing, and that by accident; furthermore, they were observed to fly through this difficult country down to the beach, there to take on moisture from seaweed and then fly back again to their locality. All specimens were absolutely fresh indicating very fresh emergence. Although the area was explored for a long time during and after their disappearance, no evidence of egg laying or of larvae was found.

At first it was thought that only males had been caught, but later, dissection revealed females in the ratio of 1 to 3.

Questions still to be answered about this extremely rare and attractive creature are: on what does it feed? why does it appear for such a short time? and why in such a restricted locality?

This year, time was not available to continue the investigations, for shortly after that, I went to South America, where, on one expedition to the Amazon jungle, several exotic rarities fell victim—but that is another story.

Notes on some South African Bees and Wasps

By J. S. TAYLOR

Since the publication of previous notes on the biology and behaviour of certain species of solitary bees at artificial nest sites at Port Elizabeth and Wilderness, C.P. (Taylor 1962, 1962, 1963, 1965), further work has been carried out at Hilton, Natal, and the following notes deal with the results obtained there. As far as the species of bee are concerned, the present notes are supplementary to those already published on the same species in the Eastern Cape Province. The nests used were exactly the same, i.e., blocks of wood containing three-inch lengths of plastic tubing, one quarter-of-an-inch in diameter.

While the three species of bee which occurred commonly at both Port Elizabeth and Wilderness were also found at Hilton, they were noted there much more sparingly and none could be described as common. Nesting operations were much more sporadic. This is thought to be at least partly due to the climatic conditions obtaining at Hilton. The altitude of the latter is some 3700 feet and it is situated in the mist belt. Damp mists occur frequently during the spring and summer months, while it is not unusual for the sun to be totally obscured by low cloud for several days at a time. As the bees are active only in sunny and warm weather, there were many days during which they remained inactive and did not venture outside their nests or tubes. Nest construction therefore frequently occupied lengthy periods, while many attempts were abortive or abandoned. This was especially the case in the summer of 1966/67 when the weather conditions were particularly wet and cool.

During the occasional warm spells the contrast was most marked; the rate of nest construction being accelerated considerably, and was more on a par with that noted in warmer parts of the country. It is also thought that the protracted nesting operations gave parasites a better opportunity to do their work; the percentage of parasitism being certainly higher at Hilton than in the Eastern Cape.

The three species of bee occurring at Hilton and the two Eastern Cape localities are dealt with below.

Heriades freygessneri Schletterer. (Megachilidae).

Very few nesting attempts by this species were observed at Hilton and of these only one such was successful. From a nest of two cells, sealed on 28th February 1965, an adult female bee emerged on 5th November of the same year, the period spent in the development stages therefore being 250 days, which is normal. From a nest of four cells, abandoned while under construction about 18th November 1966, an individual of *Anthrax*

triatomus Hesse (Bombyliidae) emerged on 16th April, 1967 and another on 28th April 1967. This parasite was also obtained from *Heriades freygessneri* at Port Elizabeth (Taylor 1962). Several individuals of the eulophid *Melittobia hawaiiensis* Perkins were later—July 1967—obtained from the same nest.

Megachile (Eutricharaea) gratiosa Gerstaecker.

Nesting by this species was first noted at Hilton on 22nd January 1966, it being even later than at Wilderness where in 1964 it commenced on 3rd January as compared with mid-August in Port Elizabeth (Taylor 1965). In 1967 this bee was not observed at the nest site until 27th January. The construction of a nest sometimes occupied up to 14 days if the weather was cool, damp and sunless. As in the case of *Heriades*, this often resulted in a nest being abandoned before completion. The duration of the immature stages at Hilton in summer varied from 79 to 110 days, being longer than at Wilderness and Port Elizabeth where 50 to 60 days were more usual.

It was noted that, as at the other localities, some individuals preferred the coloured petals of flowers to the more usual green leaves for nest construction. This leaf-cutting bee although more often noted at Hilton than *Heriades*, was by no means of common occurrence there and there were seldom more than two individuals using the nests at one time. In 1967 most of the nests, particularly those formed late in the summer, produced varying numbers of the eulophid *Melittobia hawaiiensis*. These nests were brought to the United Kingdom in June, and the parasite emerged from 15th July to 20th September (or from 119 to 165 days after the completion of the nest). This parasite was previously recorded from nests of the same bee at Port Elizabeth, but only during the summer (Taylor 1963). The percentage of parasitism by this eulophid was much higher at Hilton.

The species of *Coelioxys*, reared from nests of *M. gratiosa* at Port Elizabeth and previously referred to as *C. vumbula* Pasteels (Taylor 1965) has since been found to be *Coelioxys loricula* Smith. This parasite has hitherto been obtained from *M. gratiosa* only at Port Elizabeth.

From nests completed late in the summer of 1965 at Wilderness, C.P., adults emerged at Hilton from 31st December until 19th January 1966. When dismantling the nests at Wilderness in May 1965, preparatory to departure, the nest of a carder bee, hitherto unnoticed, was found in one of the tubes. Before this nest was unpacked at Hilton, late in the following October, ten male adults emerged from this particular nest and were found dead in the containing vial. In December two further individuals emerged, on the 24th and 31st respectively. This carder bee, the only species of its kind recorded at Wilderness, was subsequently determined as being *Pseudanthidium sjoestedti* (Fries) (Megachilidae). No carder bees were recorded at Hilton.

Nothylaeus heraldicus (Smith) (Colletidae).

This species, popularly known as the Membrane Bee, which occurred commonly at both Port Elizabeth and Wilderness, also frequented the nest sites at Hilton from time to time, but like the others was subject to weather conditions. The duration of the immature stages at Hilton occupied from 68 to 77 days in summer, somewhat longer than in the

Eastern Cape, and the maximum number of cells in a nest was five. The parasite *Gasteruption caffrarium* Schletterer, recorded at both the Cape localities, was likewise found at Hilton, and was seen at the nest site on several occasions. It was reared from one nest the adult parasite emerging 67 days after the nest was sealed. On 25th March 1966 a small species of chalcid emerged in large numbers from a nest of *N. heraldicus* at Hilton. This later proved to be a new species of *Coelopencystus*, and the first African one recorded from any host other than a xylocopid. Only one male was found among the specimens reared. On 1st August 1967. *Melittobia hawaiiensis* was obtained from a nest of *N. heraldicus*.

WASPS

While the incidence of bees at the nest sites at Hilton was disappointing, the occurrence of other occupants of the nests was more frequent and rewarding. The first indication of anything at the nests was on 1st December 1965 when a small black wasp was seen entering and leaving a beetle flight hole in one of the wooden blocks containing the tube or nests. Later on the same day the entrance to this hole was seen to be plugged or sealed with mud. On the following day a wasp was seen to be using a nest in an adjoining block, and by evening two complete cells were found towards the inner end of this particular tube, while the wasp was at rest in a curved position on the seal of the second cell. No further activity took place on the two following days, the weather being overcast, damp and cool, but when fine and warm weather returned on 6th December, activity was resumed, and the nest was sealed at the entrance on 9th December. This nest consisted of five occupied cells, each filled with small spiders, and one empty cell between the plugged entrance and the fifth occupied cell. The cells were separated by thin partitions of dry mud, with thicker plugs at the entrance and inner end. There appeared to be no other structure in the nests apart from the cell divisions and plugs. The spiders were for the most part immature individuals of the species of *Theridion*, a genus incompletely known in South Africa, and more common in the Northern Hemisphere. Up to 17 spiders have been found in one cell.

The wasp, or owner and builder of the nest, was determined as being *Pison transvaalensis* Cameron (Sphecidae). It is black and measures some 7 mm. in length. The egg is elongate, curved, opaque and cylindrical; it measures about 1 mm. in length, and is deposited on an immobilised spider, the curve of the egg fitting closely to the body of the spider. It hatches in 24 hours or less. The larval stage lasts some nine days, while the total duration of the developmental stages from the time of the sealing of the nest until the emergence of the progeny occupied from 51 to 68 days (October to March). Emergence may be spread over several days. The maximum number of cells per nest was five.

From several nests of this sphecid a species of Chrysiidae was obtained. This was determined as *Chrysis (Pentachrysis) inops* Gribodo. The developmental period of this parasitic wasp was sometimes considerably shorter than that of its host, in one case by as much as 26 days. Wasp nests brought to the United Kingdom in June 1967 produced many individuals of *Melittobia hawaiiensis*; these commenced to emerge in the middle of July and continued to do so until 20th September, or from 119 to 175 days from the time of the sealing of the nest. Apart from a few

chrysiids there were no other emergences from these nests. The eulophid would therefore appear to be a most effective controlling agent in this case. The sphecid was observed nesting at Hilton from October to March.

During winter another species of wasp with similar habits was recorded as occupying the nests at Hilton. This wasp behaved similarly to *Pison* and also preyed upon immature spiders: in this case two species of *Theridion* were involved. The wasp was indentified as *Auplopus* (*Conagenia*) *mazoensis* (Arnold), a member of the Pompilidae. It is a black and slender, somewhat ant-like wasp and measures about 8 mm. in length. From nests formed in autumn, adults emerged in September and October, while from those constructed in November, the resulting progeny emerged in the following February, developmental periods of 88 days being obtained. Up to four individuals have been obtained from one nest.

Nothing is known of the parasites of this species but it is thought that it is also affected by *Melittobia hawaiiensis*.

Climate again proved to be a factor in the lives of these wasps as in dull and damp weather there was little activity among them. However, they appeared to be quicker to avail themselves of dry and sunny intervals than were the bees, which may account for the fact that more of the nests were occupied by them.

SUMMARY

An account is given of certain species of bees and wasps in artificial nests at Hilton, Natal. In the case of the bees, these notes supplement previous ones concerning the same species at Port Elizabeth and Wilderness in the Eastern Cape Province. At Hilton, the climate as well as the parasite *Melittobia hawaiiensis* Perkins were controlling factors. Two species of wasp, *Pison transvaalensis* Cameron (Sphecidae) and *Auplopus* (*Conagenia*) *mazoensis* (Arnold) (Pompilidae), predatory upon small spiders *Theridion* spp., also occupied the nests at Hilton. Both species were affected by the climate, while *Pison* was heavily parasitised by the eulophid.

ACKNOWLEDGEMENTS

The writer is much indebted to Dr. K. V. Krombein, of the U.S. National Museum, for his continued and encouraging interest in these studies, as well as for determining, or arranging for the determination of much of the material; also to Prof. J. J. Pasteels, Drs. D. P. Annecke, H. E. Evans, and R. F. Lawrence for the determination of several of the species involved.

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Nomenclature and Common Sense

By A. A. ALLEN, B.Sc., A.R.C.S.

Our Editor calls for a readable article from some enlightened person entitled 'Nomenclature without Tears'. Far be it from me to attempt anything so difficult—or should I say impossible? Indeed, the subject becomes for many of us ever more lacrimose, whether the tears are of sheer bewilderment or mounting impatience and exasperation. But (though doubtless unenlightened) I am so much at one with the common-sense attitude both of Dr. Ainley (*antea*: 307) and of Mr. Jacobs in his appended note, as to be moved to defend it—at the same time venturing a few observations and personal reflections on points they have raised, with a suggestion or two as to the general line that might be adopted.

Dr. Ainley's title is a wryly apt comment on the state of affairs. As Mr. E. G. Bayford once remarked in a letter to me, it really is astonishing how easily an author (perhaps over-eager to see his name in print) can get a name-change adopted with little or no question, criticism or challenge. The fact seems to be that for a certain type of mind, nomenclature with all its ramifications and intricacies is liable to become an obsession and an end in itself, which of course can be disastrous. These enthusiasts rarely consider the hampering, distressing effect upon the progress of biological science that their policy, put into practice on an ever-growing scale, is bound to have; or when they do, they play it down to an extent verging on irresponsibility. Only thus is it possible to rate legalism above common sense in the naming of organisms. Now common sense demands a stable nomenclature, and that rules—useful and indeed indispensable as they are — must be so framed as not only to avoid interference with that stability but also to promote it actively; in fact, that is the whole point of having them. That they are only partly so framed (through a failure to grasp the essential requirements of a code) results in a great deal of needless confusion and difficulty, which in its turn tends to breed error; and the habit of upsetting and juggling with names has become a fashionable game amongst enthusiasts and often over-specialized professionals who have largely lost touch with the outlook and needs of ordinary entomologists.

The priority rule, whose uncritical application is at the root of so much of the trouble, is excellent as a *general* principle, *provided* however that it is subject to certain severe restrictions. Instead of that it has become, in many quarters, a sacred cow. It ought to have been foreseen that, if not so restricted, we should run into serious trouble through not having before us *at one and the same time* all the data necessary for arriving at the earliest name of many anciently founded species. The drafters of the International Code, however, seem to have been lawyers rather than working entomologists or zoologists, and to have taken it for granted (at least in the latest 1961 code) that it must be massive and complex and go into great detail—if so, a cardinal mistake. The artificial involutions of the law have little to do with the needs of a serviceable nomenclature. A consensus of rank-and-file entomologists is what we really want, not a ponderous bureaucratic set-up.

We who require above all that a name should be understood in one definite sense, and therefore fixed by usage rather than by edict, are often rebuked by the legalists as being selfish, lazy and reactionary, and as

putting short-term expediency and personal bias before ultimate scientific advancement; while they claim that their policy alone is conducive to stability in the long run. But is this quite fair? Readers may judge which position is the more realistic; and as for stability, facts speak for themselves! We are for ever promised 'jam to-morrow', but since the Commission was set up things have steadily become more chaotic. Even back in the '30s the controversy was raging in the *Record* and elsewhere—with, as it seems to me, the practical men winning easily on points. (For that matter, it has been with us for close on a century.) The telling facts and arguments brought forward by the late Professor Frank Balfour-Browne in numerous articles and notes are no doubt widely known, and I will not repeat them here, except just for his sensible proposal (rejected, of course, by 'officialdom') that "henceforth no change of a well-known name of a genus or species will be accepted if it is made solely by reason of the discovery of an earlier name" (1943(2)). In practice this would require slight extension, since simple priority is not the sole pretext on which names are needlessly altered, though it is the most common. In one point however I differ from Prof. Balfour-Browne and agree with the late Dr. G. W. Nicholson who wrote in 1932: "If Latin, however debased, is used at all in scientific language, it should, I submit, be used in accordance with the elementary and very simple rules of Latin grammar." This is also the view taken by the International Commission.

A suggestion I have seen made, that editors of journals should bring all names into conformity with the rules, is—apart from being distastefully authoritarian—quite impracticable because, even if they felt so disposed, few would have the necessary knowledge or time for the required checking. For the mere use of an up-to-date catalogue will not ensure even technical correctness. Compilers are very apt to follow blindly the latest authority; but different authorities (however eminent or learned) very often hold conflicting opinions, and who is to say which is right?

(Talking of conflicting opinions, our Editor tells us he has been taken to task by 'one of the authorities' for publishing an article on the present subject by Prof. Balfour-Browne. I am delighted that he is defiantly unrepentant! I hope most of our readers will agree that science is best served by the free expression, not the suppression, of differing views, and the discussion that flows therefrom. Unorthodox opinions may be shocking to some, but I would say: let those who disapprove, however exalted, demonstrate the superiority of their own if they can. It does no harm—indeed quite the reverse—to submit our most cherished assumptions to periodic examination in the light of reason.)

Many years ago the writer put forward a suggestion that a 'principle of longest use' might replace that of priority wherever an established name was threatened, so that the most-used or best-known name would be retained. The 'experts', naturally, poured scorn on the idea; but I have been gratified to see it gain ground steadily on the Continent—at least in the one Order, Coleoptera, where I can speak on this point. There many of the leading specialists and other prominent workers strongly support 'Kontinuitätsprinzip' (continuity principle), which amounts to the same thing. It seems to me that the best hope of sanity lies in this direction. In our country the movement has not been nearly so marked,

doubtless because Kloet and Hincks in their Check List, and other well-known authorities, have taken the opposite stand. This is doubly unfortunate in that there is consequent disharmony between the British and Continental catalogues as regards nomenclature. As Balfour-Browne has pointed out, many of the changes in the former are due to a stupid and arbitrary rule concerning homonyms, which our Continental colleagues for the most part wisely prefer to ignore; and it would be well if we were to come into line with them on these matters.

Things have now reached such a pass, with the rule-book swelling largely at each revision, that very many of us would favour cutting loose and starting afresh with a simple, clear and practical code of rules, free from lawyers' jargon, that could be put on a single page. At all costs we should avoid over-elaboration (making for cumbrousness) and not try to legislate for all contingencies, which is quite unnecessary. With the natural and inescapable complexity of his subject, and the output of literature increasing all the time, what working entomologist has the leisure to pore over 100 or more pages of tortuous legalistic phraseology, often so obscure that—like our law—it needs almost as much print again to make it intelligible to the average user? Meanwhile the non-expert will be well advised to adopt a cautiously conservative approach to name-changes and not to accept without question any that appear needless.

Before passing on to the distinct (though cognate) subject of generic splitting, I will just mention three further points. (1) A single change, insignificant perhaps in itself, may in turn set off a train of others if the rules are rigidly observed, thus generating a disproportionate upheaval. This fact should be quite sufficient justification for suppressing the original change. (2) The most obnoxious of all changes are transpositions or reversals, involving the switching over from one to another of two or more names of genera or species. Here it is not a matter of getting accustomed to unfamiliar names, but of the use of already familiar ones in reversed or new senses; with the strong probability of real error and confusion resulting. (3) The legalists are quite prepared to upset an established name if in the original publication it is preceded by another, held to refer to the same species, on an earlier page or even a few lines above. And that is not all. Suppose the prior of these relates not to the normal form of the species, but to a distinct variety: then this name, *even though properly that of a variety*, must yet be the valid name of the species itself. So we could have, say, a black insect named *niger*, and a yellow one *flavus* on the previous page which turns out to be a rare form of it. But the pundits will have it that the familiar name *niger* for the species must give way to *flavus*, notwithstanding that their 'new' *flavus* will then be a normally black insect! Such a *reductio ad absurdum*, perpetrated on the most trifling and flimsy of grounds, is by no means unknown and shows to what length fanaticism (or the want of a sense of proportion) will go. A very different matter from, say, 100 years' priority in one of the names! Pettifogging of this sort has helped to bring the Code into disrepute.

Both Dr. Ainley and Mr. Jacobs have made some good points about the creation of new genera out of long-established ones, and the rest of my remarks will mostly be devoted to that topic. 'New' genera in this sense, of course, result from the desire to give greater systematic

weight than hitherto to certain observed differences. No doubt some changes of this class reflect genuine advances in knowledge, and when it is seen that they are sound and necessary most of us learn to accept them with a good grace. Many more, however, are ill-conceived, thoughtlessly made, or quite unwanted; or at best highly questionable. There is certainly a very widespread present craze for indiscriminately multiplying genera by splitting up those long accepted in a given sense, and also (in some groups at least) for shifting species about from one genus (real or so-called) to another and sometimes back again. As Prof. Balfour-Browne remarks, "there seems to be a tendency in many of those who concentrate on smaller groups to raise the rank . . . the number of genera with one species tending to make classification ridiculous." The Rev. E. J. Pearce writes: "I am sure that we have to guard against what seems to be a common tendency—the considerable multiplication of the number of genera, especially when they contain but one species." A vigorous and cogent plea for restraint in this practice was made by Dr. T. T. Macan in 1955, and supported in a shorter but important article by G. H. Hardy in 1956. The late Dr. K. G. Blair, whose experience and breadth of outlook command attention, had taken a similar line in a most interesting and thought-provoking paper on the correct name for the Dark Green Fritillary, to which I shall return. "Excessive subdivision of genera," he wrote, "is to be deplored as leading, especially in a limited fauna, to almost every species being placed in a genus of its own, and having therefore two names to be remembered; and thus defeats the whole object of binomial nomenclature, which is to assist us to retain a mental picture of the classification of the group."

Dr. Ainley and Mr. Jacobs may, I think, rest assured that they have behind them here a growing body of distinguished professional entomologists (to say nothing of the mass of amateurs). As the above writers stress, the innovations in question are very largely matters of opinion, different specialists having different ideas of what constitutes a generic character. Some, for instance, automatically give a generic rank to divisions and characters that others consider to be at most subgeneric. Although (as Blair remarks) the amateur student of a limited fauna has no basis for judgment here, it is clear that such innovations cannot in any way be regarded as absolute or final, and we should not feel bound by them. Soundly-based changes ultimately win general acceptance—the only external criterion of their soundness. Meanwhile, many too hasty or ill-conceived ones will 'fall by the wayside' after varying times.

Specialists who study the world fauna in their particular group, whilst alone in possession of the facts required for a decision in any instance, may yet err for the very reason that their specialism tends to give them an exaggerated view of the importance of the characters they seek to evaluate; and the more so, the more narrowly they specialise and thus very likely lose touch with broader issues and interests. It is surely most necessary in these matters to keep a sense of balance and perspective¹ *over the whole field*—or as much of it as possible. It is just

¹It may be that the non-specialist alone can see when the balance gets badly upset. To take a concrete example, it surely is absurd that the two fritillaries *cydippe* and *aglaia* should be in separate 'genera' while at

here that discretion and caution are so often thrown to the winds in the first flush of classificatory zeal. Increasingly, characters are now widely used for founding genera, which 50 or 100 years ago would have been rated no higher than the specific level. Such a process cannot continue indefinitely if binomial nomenclature, with its great advantages, is not to break down—or (as Dr. Ainley says with much reason) become pointless.

So much for the existing situation; but what can be done about it? One might be tempted to begin by appealing to systematists everywhere never to make two or more genera where one exists already (above all if it has but few species) without having most earnestly asked themselves whether subgenera or species-groups would not do instead. The subgenus might well be made more use of, especially in the Lepidoptera where its availability seems to have been forgotten; but the same applies with even more force to the species-group, which is more elastic, more provisional, and very conveniently named from its most typical species. This in our state of near-ignorance offers immense advantages.

I fear, however, that such appeals would fall upon deaf ears; the hair-splitting habit has become too ingrained. As Mr. Hardy says, the taxonomist must first reform his own manner of thinking. Since there is no way of knowing whether a given innovation will stand the test of time, there appears to be only one sensible course for the amateur: instead of rushing to follow the nomenclature of the latest catalogue or up-to-date authority regardless of the policy adopted, let us hold our horses and stick to the names that everyone knows, at least until the neologisms have gained wide currency and there is no chance of their puzzling anyone. We shall then offend no one but the pundits, and shall merely be leaving the issues to more competent judges than ourselves.

This is the advice given in the three articles mentioned. Urging that some compromise must be sought, Dr. Macan writes: "Few wish to copy the antics of a kitten chasing its tail, which they will do if they try to keep right up to date by adopting every change the moment it comes out", and suggests ten years at least as a probationary period. He instances a species of *Corixa* that has had six different generic names within 25 years! This can only mean that the changes were premature and made more out of ignorance than knowledge, and the rest of us who want reasonable stability cannot be blamed for looking askance at the systematists' less responsible efforts. As Mr. Jacobs remarks, it is surely better to err on the side of too little splitting than too much, when there are obviously so many relevant factors still unknown.

Blair and Hardy both put forward the idea, which I strongly support, that during this protracted period of flux in nomenclature a 'double standard' should be permissible. Teachers, economic, agricultural, or medical entomologists, ecologists, general biologists, students of a limited fauna, popularisers and the great numbers of ordinary interested laymen, collectors, and naturalists—all alike have a vested interest in names which do not alter every few years, whether or not they are technically

the same time our *Papilio machaon* is made congeneric with the great 'bird-wings' of the Eastern tropics, which used to be in a genus *Ornithoptera* (seeming very natural) but now once more appear to be back in *Papilio*.

correct or officially sanctioned. These groups represent a broad spectrum, or a very considerable fringe on the periphery of the science, whose needs are by no means to be ignored; and those who affect to despise them lay themselves open to the charge of arrogance. The double standard (as Blair points out) is already employed to some extent by those who use subgenera. In a learned taxonomic paper, for instance, it is often more informative and convenient to use subgeneric names in place of generic where all students of the group will know what genus is under discussion, whereas in one of wider scope the generic names will naturally be used. In a similar way it should be legitimate in general contexts, and for all purposes that might be classed as exoteric rather than esoteric—and without any imputation of error or ignorance arising—to use certain generic names in a more extended and 'popular' sense than the strict purist or specialist might approve. They would at least then be intelligible to *all* concerned. Any doubts could be assuaged by the insertion of 's.l.' (for *sensu lato*, 'in a wide, or the wider, sense') in brackets after the name of the genus, thus in effect invoking against possible objectors the whole weight of traditional usage.

Dr. Ainley's reference to the Fritillaries affords a good example. By all means let us continue to call those he lists by the familiar and still much used generic name of *Argynnis* (except, perhaps, when we happen to be concerned with the larger fauna of Europe — in which the subdivisions have more point—or venture into the more difficult and disputed territory of the species' relationships, meeting the specialists on their own ground). For catalogue use and labelling the collection, I suggest inserting the newer 'generic' names (*Fabriciana*, *Clossiana*², etc.) as *sub-generic*, by way of compromise; and similarly in parallel cases. Very probably they rate no higher anyway, and in time even the systematists may revert to a wider conception of *Argynnis* as before (and as in Kloet & Hincks as late as 1945). The criteria for the separate 'genera' can hardly be other than slight; for one author, Francis Hemming, who used them all in 1942, was definitely of the opposite opinion in 1934.

I cannot, alas, tell Dr. Ainley what those criteria are. However, suspecting that some of them may be sexual, I would take the opportunity to urge caution in the erecting of genera on characters present in one sex only, as I think is increasingly done. (Their possible *confirmatory* use is, of course, another matter). There is surely something unsatisfactory about a criterion present in only half the members of a population. True, we cannot avoid it at the species level, and even there it is bad enough when one sex (usually female) is not determinable by inspection or even dissection. In any case, the sexual characters—both primary ('external' genitalia) and secondary—give in many groups an impression of being too recently acquired to indicate relationships more fundamental than those between species themselves, when we consider the remark-

²I wonder whether the substitution of this for the far more familiar *Brenthis*, which held the field for a very long time, was really necessary. I notice too that some recent lists have been using *Mellicta* instead of *Melitaea* for *athalia* Rott.; but is it worth more than a subgenus?

[I leave this note as originally written, though in fact Mr. Warren in the February *Record* clarifies the point as regards *Clossiana*, etc., besides certain others I have touched on.—A.A.A., 1.iii.1968.]

ably wide differences they can assume among species otherwise scarcely distinguishable.

And now a piece of good news for Dr. Ainley and Mr. Jacobs. Their bugbear, *Mesoacidalia charlotta*, can, I rejoice to say, be exorcized and forgotten at least by the butterfly-lover unconcerned with taxonomic niceties, and who is content with the excellent advice offered by Dr. Blair (himself, be it noted, a professional systematist). Incidentally, I should dearly like to know what possessed Herr Reuss in 1926 to light upon the monstrosity *Mesoacidalia* for a genus of fritillaries (of all things!). I trust that no enthusiast will come up with a name like *Protoargynnis* for some of the 'waves', but if he did it would be no more ridiculous. Blair questions whether this case of generic splitting will be widely accepted, and clearly favours for it a lower status, but either way I do not think we need worry. As for the specific name, he shows conclusively that Hemming, who had earlier accepted the Linnaean *aglaia* or *aglaja* (1758), misinterpreted the Rules in trying to establish in its place Haworth's *charlotta* (1803); and that in any case *charlotta* Haw. is neither the first described form nor the ordinary British one, but a well-known though scarce variety. (The rule that requires a species to take the name of its first-described *variety*, if no earlier name is valid, seems to have dubious consequences and should, I think, be scrapped).

I am not quite happy about Dr. Ainley's suggestion of an editorial strait-jacket for streamlining nomenclature in the Lepidoptera, even though made in an excellent cause. Regimentation of any kind is incompatible with the scientific spirit, and I feel that individual writers must still be free to choose, where so much remains a matter of opinion. As regards the butterflies, one might do far worse than follow Kloet & Hincks—a good list—as Dr. Ainley recommends; and I note that the new edition of the Lepidoptera part, on which great hopes are pinned, is due this year. (The moths, on whose systematics so much work has been done since the first edition in 1945 — and especially, of course, the 'Micros'—pose more of a problem). There will naturally be certain cases, when we are following the policy of the most-used name, where it will be hard to decide which that is; but then it will not greatly matter which is selected. Dr. Ainley mentions *Lysandra bellargus* and *Lycaena adonis*, to which one could add a third variant: *Agriades thetis*. The first now seems to have won the day, at least here.

Although the changes made by the priority-hunters and their kind are in a different class from those of the splitters, their cumulative effect is similar since they reinforce each other in undermining stability. As they involve names of species as well as genera and do not even pretend to any practical utility, or to reflect new knowledge, it follows that they are still more objectionable in the mass. I suggest that our attitude to them—or those of them which are not clearly and thoroughly justified—should be the same: a healthy scepticism, reserving the right to follow a more rational path. On one point even we non-experts may and should insist: that full and sufficient grounds be given for any change made or proposed, no matter how impressive the authority (cf. my footnote on *Augiades* versus *Ochlodes*, *Ent. Rec.* 79: 61). There must, I think, be some such curb upon abuses of the freedom to alter names once accepted. One consequence will be that changes made in catalogues or

lists, unless justified in print elsewhere, shall not be binding at least until their adoption is almost universal both here and abroad.

It is now evident that some of the alterations that have crept into our lists from time to time were needless from any point of view, being based on an over-zealous, excessively narrow, or downright faulty interpretation of the Code. It is only fair to add that the International Commission has increasingly of late years conceded the principle that changes liable to cause serious confusion should not be made. The pity is that this recognition has come so late (I had almost said *too* late), after so much harm has already been done through the spread of the habit of playing fast and loose with our nomenclature. The hopes must be for a change of heart—a larger vision, a less finicking and more generous attitude, with the resolve to profit from past mistakes and rebuild on a more realistic foundation. I see little chance, however, of that happening without collective and effective pressure by all interested parties; meanwhile, perhaps, rising discontent will force a crisis, which may bring the recovery of sanity nearer.

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GEOLOGY AS AN ECOLOGICAL FACTOR IN THE DISTRIBUTION OF INSECTS

By ALAN E. STUBBS

(concluded from p. 59)

DISCUSSION ON DISTRIBUTION

Now that the available information on the ecology and possible ecological requirements of *S. immaculata* have been considered some general discussion on distribution may be useful.

We find that grassland, often with associated scrub, is the preferred habitat—one of the most widespread vegetation types and occurring on a wide range of soils. Within this vegetation type, one must apparently narrow the most suitable terrain to those grassland localities occurring on chalk or limestone. However, the outcrops of chalk and limestone in southern and eastern Britain are widespread and extensive, even allowing for the large areas of these outcrops covered by non-calcareous superficial deposits. Yet, surprisingly, *S. immaculata* is a rare species, very local and often scarce when found, though locally plentiful.

The species used to be regarded as very rare, in fact the majority of dipterists would still consider it rare, yet there is a noticeably steady increase in records since the war, and especially for recent years. It is, of course impossible to get over the problem of bias caused by consulting

mainly the collectors still active to-day. However, if one for the moment allows that the species is genuinely less rare to-day than in the past, one reaches an interesting conclusion accounting for this in a change in land use history. The chalk and limestone downs used to be important sheep grazing areas with short turf. Nowadays these downland areas are often neglected. The rabbit took over as the chief grazing animal of these grasslands, but in the early 1950's myxomatosis almost wiped them out. As a result, large areas of formerly short, nibbled turf have, with the local reduction in grazing by loss of the sheep and finally almost total absence of grazing by loss of the rabbit, become areas of coarse, long grasses often with attendant invading scrub. As already observed, *S. immaculata* likes long grasses, assuming this is not a collecting bias (from sweeping), rather than short turf, so that large areas of formerly unsuitable terrain are now ideal. This may only be a short term advantage, however, since the rabbit is locally returning in numbers and scrubland areas are turning to woodland. Again, land use history will take its toll, for many grassland areas are now being put under the plough or restored as grazing areas.

The British range of the species has already been considered^{*} and various observations made on climatic conditions. The most difficult problem is its apparent absence from the extensive chalk areas of Wiltshire and East Anglia. The only immediate climatic reason against Wiltshire would appear to be its late spring frosts, though this will reflect wider climatic considerations. Mr. Collin has suggested that its absence from East Anglia is because it is too cold. The western parts of this region are somewhat similar to Wiltshire with regard to temperature, but East Suffolk and North Norfolk should be acceptable to the species. The Chalk outcrop of East Anglia is extensively covered in non-calcareous deposits and much of the available chalk soil is under intensive cultivation, so that good chalk grassland is relatively scarce. The floral composition of some of the chalk grassland of East Anglia shows differences from other calcareous districts, but the influence of this aspect cannot be discussed at present.

Most of the Cotswolds lie in the area of late frosts though there may be pockets of suitable climatic conditions. The Peak District and most of the calcareous districts in Northern England lie in areas of late frost and often low potential water deficit. The Doncaster district lies within a favourable climatic belt.

Considering geology and climatic range (selected factors of late frosts and potential water deficit) alone, there are surprisingly few areas favourable to the species. Climate being such a locally variable factor and with the source maps highly generalised, it is perhaps premature to draw conclusions on distribution, but only two records show more than a small deviation into climatically "unfavourable" areas (Sharpenhoe and Oxwich Bay). Applying these criteria strictly, the following areas should theoretically support the species, assuming the presence of rough grassland, with or without scrub (locality numbers in brackets):—

- (a) The North Downs, East and West Kent, Surrey, Chalk (6-22).
- (b) The South Downs, East and West Sussex, Chalk (5).
- (c) Littlehampton Inlier, West Sussex, Chalk.
- (d) Portsdown Anticline, South Hants and West Sussex, Chalk.
- (e) Narrow strip of Chalk from north of Havant to north of Romsey, South (and small piece of North) Hants., Chalk.

- (f) Ridge from Culver Cliff to Needles and parts of the high ground and landslips from north of Ventnor to near Chale, Isle of Wight, Chalk (possibly also Tertiary limestones to north).
- (g) Isle of Purbeck, Dorset, Chalk and Upper Jurassic limestones (1-3).
- (h) Isle of Portland, Dorset, Portland Limestone.
- (i) Small area near Cranborne, Dorset, Chalk.
- (j) Small area round East Bexington, Dorset, Chalk and Jurassic calcareous rocks (4).
- (k) Small area around Torquay, e.g., Hope's Nose, South Devon, Devonian limestone.
- (l) Small area South and East of Marston Magna, South Somerset, Jurassic calcareous rocks.
- (m) Area centred on Steeple Ashton, Oxon., Jurassic calcareous rocks (25-26).
- (n) Chilterns between Goring and Hemel Hempstead, Oxon. and Bucks., Chalk (23).
- (o) Area in triangle between Royston, Herts, Much Hadnam., Herts., and Great Yeldham, West Suffolk, Chalk. There is much chalk grassland at Royston, but the Chalk in much of this area is covered by drift; the fringe of Cambs, may be included.
- (p) A strip of Chalk largely in West Suffolk extending from about Framlingham to approximately Offton. Extensively covered by drift.
- (q) A belt of Chalk in the northern half of Norfolk, East and West Norfolk. Extensively drift covered. Barrett, Ringstead Down near Hunstanton may be a favourable locality.
- (r) The Jurassic limestone ridge from a little south of Sleaford to the Humber, North and South Lincs. (28, 29).
- (s) The Lincolnshire Wolds, North Lincs., Chalk, partly drift covered.
- (t) The southern part of the Yorkshire Wolds, South East Yorks, Chalk, partly drift covered.
- (u) The narrow strip of Magnesian Limestone from approximately Doncaster, South West Yorks., extending northwards possibly just entering Mid-West Yorks. (30, 31).

The species may well be distributed more widely than indicated from the climatic viewpoint and the species can occur on non-calcareous soils. If one considers possible localities connecting with the Oxwich Bay record and other possible gaps the following areas may be worth searching:—

- (v) Mendips, North Somerset. Carboniferous Limestone and other calcareous rocks.
- (w) Forest of Dean, Monmouth and Glos. Carboniferous Limestone.
- (x) The Jurassic Limestones and Chalk of South East Somerset and West Dorset. The Chalk in the coastal strip of South East Devon (Seaton—Lyme Regis).
- (y) The coast in South East Glamorgan, Lower Jurassic Limestone rocks and Carboniferous, seems unlikely but the Oxwich Bay record is a misfit.

SOME CONCLUDING REMARKS

Now that the habits of *S. immaculata* are a little better known it is to be hoped that more records will be forthcoming and its life cycle studied. One factor stands out very clearly concerning recording. County distribution is of little value since it obscures a great deal of valuable ecological information. Even the nearest town or village, as given on data labels, is

not accurate enough. To make any worthwhile assessment of geological distribution a grid reference is perhaps the only satisfactory location data, though not always suitable for publication in the case of a rarity. A few simple observations on the habitat, such as gross features of vegetation and aspect, make all the difference between a useful and meaningless record. Geology, climate and aspect can be determined, with care, from a map at home; vegetation and wetness of ground cannot.

I should be most grateful for any further records or information on the two species of *Symphoromyia* and also for records of the Asilid *Isopogon brevirostris* which may show a preference for calcareous districts in certain parts of the country only.

ACKNOWLEDGEMENTS

I should like to express my sincere thanks to all those who have given me records and information for this paper. Also Mr. F. W. Green for helpful discussion on climate, Mr. P. J. Chandler for passing on records and checking specimens in the course of compiling a Diptera of Kent, Mr. D. M. Ackland for the Hope Department records, the British Museum for allowing access to their Collection and to the South London Entomological and Natural History Society who house the H. W. Andrews Collection. In particular I must thank Mr. A. Brindle for much helpful information, Mr. L. Parmenter for advice and encouragement in preparing this paper and Dr. D. Frazer for reading the manuscript.

SUMMARY

Thirty-one locality records of this rare species have been assembled from very dispersed sources. This information, admittedly scanty, leads to some provisional conclusions on the ecology of the species. It appears to show a preference for calcareous districts, usually outcrops of limestone or Chalk, the exceptions being on neutral soils. The preferred habitat is calcareous grassland, with long grasses, often with associated scrub, and often on sloping ground of various aspect. The known distribution is eastern and southern with a western limit at Oxwich Bay, an eastern limit near Dover; and a northern limit near Doncaster. The highest concentration of records is for the Chalk downs of West Kent. The known distribution does not include all possible suitable areas, and its apparent absence in Wiltshire, much of the Cotswolds and western East Anglia may be due to climatic factors such as late frosts. Peak emergence period is mid-June to mid-July. The early stages of the life cycle are unknown but the larva is thought to live in the soil and to be carnivorous. The adult may be predatory on small flies and could also be a blood sucker.

91 Clitherow Avenue, Hanwell, W.7.

In search of *Autographa gracilis* Lempke

By C. G. BRUCE

Having obtained a copy of the notes by B. J. Lempke on the genus *Autographa* Hübner, sub genus *Chrysoaspidia* Hübner of 1st April 1966 (*Ent. Berichten* 26: 70) and having found in my collection an apparent *A. gracilis* taken in Norfolk, I thought it would be interesting to search for this moth and try to breed from any females taken.

The search commenced on 25th June 1967 and in two Norfolk areas on the fringes of marshes, both species *A. gracilis* and *festucae* in these areas

came to m.v. light the dates of their appearances are given below.

Autographa gracilis, 28th June to 17th July.

A. festucae, 3rd July to 29th August.

At two periods during the above dates Mr D. O'Keeffe joined me in the search with a further portable m.v. light and between us many *A. gracilis* were brought to the sheet, but all were males.

Treacling was tried on trees and on bunches of reeds and having read somewhere that flowers of *Silene* are attractive to *festucae*, bunches of some of the *Silene* species available were tied to reeds, some of these being also smeared with rum and treacle, but none of these methods produced a female of either species. A few years ago female *festucae* came to my m.v. light and I had high hopes, but it is now a case of waiting until 1968 for another try.

The numbers taken enabled me to make a thorough examination of the male genitalia of both species and there is a strong difference.

The examination by separating the valves (harpes) and even using a 10x hand lens readily provides a recognition, in *festucae* the ampulla arising from the centre of the valve is slender and of a pale amber colour and the length averages 0.45 mm., in no specimen did I find it exceeded 0.5 mm., whereas in *gracilis* the ampulla is robust and reddish brown in colour and the length average is 0.8 mm.

The investigation which entailed using about forty insects was made with a 30x binocular microscope, after having first separated the two species by their wing pattern, they were next checked for the genitalia form and in no instance was there any discrepancy, in my view the ampulla alone is a good check to verify a male of these two species.

I have mounted dried genitalia of the males of both of these species and added them to my reference set.

During the period of this search several other interesting moths came to m.v. light from the marshes including those detailed below:—

Acherontia atropos Linn., 1 male; *Nycterosea obstipata* Fab., 2 males; *Abraxas sylvata* Scop., 1 male on 25th August (in view of the date, I wonder if it was a migrant); *Apatele alni* Linn., *Harpyia bicuspis* Borkh., *Eustrotia uncula* Clerck., *Pelosia muscerda* Hufn., *Lophopteryx cucullina* Schiff, these appeared almost every night until 7th July, there being some maple in the hedges in the lanes leading to the marshes.

16 Harland Road, London, S.E.12. 5.xii.1967.

Notes and Observations

LITHOCOLLETIS EMBERIZAEPENNELLA BOUCHE (LEP. TINEINA MINING THE LEAVES OF SNOWBERRY (SYMPHORICARPOS RIVULARIS)—At Watermael (Belgium) on November 3, 1967, Mr. E. Janmouille drew my attention to some leaves of Snowberry growing in the grounds of his residence which contained the mines of *L. emberizipennella*, each mine occupying the greater part of a leaf in the manner characteristic of this species. So far as I am aware, *emberizaepennella* has only been found in Gt. Britain to mine the leaves of Honeysuckle (*Lonicera* sp.) and occasionally those of the closely allied cultivated shrub *Leycesteria formosa*. It would be interesting therefore to know whether it has even been found here on Snowberry.—
J. M. CHALMERS-HUNT. 10.ii.1968.

ARGYRESTHIA LAEVIGATELLA H.-S.=ATMORIELLA BANKES (LEP. TINEINA) IN KENT—Having casually disturbed a few imagines of *A. laevigatella* on June 18, 1966, from the edge of an old larch plantation at West Wickham. I revisited the spot on May 2, 1967, and after a brief search, located a number of twigs mined by the larvae. Many of these mines had been torn open, apparently by small birds, but several others were found to be tenanted, including a few in which the exit hole was furnished with the significant covering of silk formed by the larva preparatory to pupating. On May 8, the first imago emerged, to be followed by several others, the last of which appeared on June 6. To my knowledge, this is the first record of this species for Kent.—J. M. CHALMERS-HUNT. 10.ii.1968.

ABUNDANCE OF THE LARVAE OF BEDELLIA SOMNULENTELLA ZELL. (LEP. TINEINA) IN 1967—For some obscure reason that is not I think associated with migration, it is apparently normal for this curious little species to undergo periods of remarkable scarcity, followed by an occasional year of comparative abundance. Indeed, I had long looked in vain for *somnulentella*, until the autumn of 1967, when the “window-like” condition caused by the larva in the leaves of *Calystegia* and *Convolvulus* was very noticeable at several localities that I had occasion to visit. Thus, on some waste ground adjoining the saltmarshes at Stanford-le-Hope (Essex), during the S. London Field Meeting there on October 1, the larvae were numerous on *Calystegia sylvestris* and *Convolvulus arvensis*, the mines being especially conspicuous in the leaves of the former, and in one leaf of which I counted 5 larvae. Several of the odd-shaped pupae were also found suspended from the leaves of these foodplants. The “windows” were furthermore noticed on *C. arvensis* in roadside hedges, in the village of Fobbing (Essex), and on September 23 in the Isle of Thanet, between Minnis Bay and Birchington (Kent). Of the Stanford-le-Hope material, some 20 imagines emerged towards the end of October and no parasites.—J. M. CHALMERS-HUNT. 10.ii.1968.

FLIES OVER THE ATLANTIC—Professor D. F. Owen kindly sent me three flies taken by Dr. W. Sladen on 12th July 1949. They were caught flying round the “Johnny Briscoe” at 0900 hours G.M.T. when this Falkland Islands survey ship was 104 miles north-west of Spain. They proved to be two females of *Scaeva pyrastris* L. and a female of *Syrphus corollae* Fabr. Both species have been proved to migrate, and these flies may well have flown to the ship rather than have been stowaways.—L. PARMENTER.

MOMPHA CONTURBATELLA HUBN. (LEP. TINEINA) IN SUFFOLK—*M. conturbatella* does not appear to have been previously recorded from Suffolk. It may therefore be of interest to state that I collected several spun shoots of *Chamaenerion angustifolium* (Rose-bay Willow Herb) containing the larvae, on Aldringham Common, on May 27, 1967.—J. M. CHALMERS-HUNT. 10.ii.1968.

Current Notes

PROPOSED NATIONAL NATURE RESERVE, CORS FOCHNO, CARDIGANSHIRE.—The Natural Environment Research Council propose to establish a National Nature Reserve at Cors Fochno (Borth Bog) because of the national importance of its scientific interest.

Cors Fochno on the southern side of the Dovey Estuary, is a rare example of an extensive area of peat which is known technically as a raised bog. It has a convex surface and has developed from a former fen. The peat layers, deposited gradually over many thousands of years, contain evidence of vegetational changes in the surrounding countryside, thus forming an important source for prehistoric records.

Preserved remains show that, within the Dovey Estuary, salt marsh gave way to fresh-water fen which was replaced by fen-forest dominated successively by alder, birch and pine. This forest, the remains of which are exposed on the Ynyslas beach to the west, was eventually covered by the peat-bog that exists to-day.

Its surface supports a variety of mosses and other forms of wild life which attract scientific workers from many parts of Britain, as well as University and School Field parties.

A formal declaration of the Reserve will be made in due course.

Current Literature

Ants from close up, by **L. Hugh Newman**, xiv + 112 pp., Cassell, 35/-.

In this, as in his other books, Mr. Newman sets out to interest the ordinary person with a liking for nature, and in this, one must say, he is highly successful.

After a foreword by John Burton of the B.B.C. Bristol Natural History Unit, the author's introduction mentions the highlights of the study of ants, from Solomon's "Go to the ant, thou sluggard", and then making a great leap over the long period when no real study of ants was made to the day of Ferchault de Reaumur in the middle of the eighteenth century, Sir John Lubbock, and the more modern authors. He goes on to mention the difficulties which attend the close-up study of ants in their natural surroundings, and, one is pleased to see, he decries the anthropomorphism with which the subject is so often treated.

The chapters deal successively with their social systems, nesting habits, their diet and "logistics", their means of communication and understanding, their community life and nests. Further chapters deal with the slave ants and their masters, warfare and foraging parties, army ants, relations between neighbours, and finally, ants and man. Mr. Newman has gathered his facts from many parts of the globe, and has obviously given considerable thought to the sorting of these facts under the chapter headings quoted above, to make entertaining reading.

Before the index is a bibliography of some fifteen items for those who will wish to pursue the study further. The book is profusely illustrated by photographs, mostly considerably enlarged, by Stephen Dalton, Edward S. Ross, M. W. F. Tweedie, Graham Pizzey and Anthony Bannister. It is printed on good paper and bound in boards with a coloured wrapper. It should make a good item for the "not so scientific" side of a naturalist's library.—S.N.A.J.

Interesting separates which I have received include:

Poliana natalensis (Butl.) and P. o'heffernani sp. n., two hitherto confused hawk moths from South Africa, by **F. W. Gess**, published in part 54, Sept. 1967, of *Novos Taxa Entomologicos*, a supplement to *Revista de Entomologica de Moçambique*. This paper is in English and describes both species, giving photographic plates of the adult and larva of each species, and line drawings of the uncus and gnathos of both. The matter

arose from the capture of two females presumably of *Poliana natalensis* (Butl.) by Mr. o'Heffernan at George C.P., both of which laid eggs in the same cage, some 85 in all. A difference was noted in the colour of the eggs, but the larvae were similar until the final instar, when they showed marked differences in colour and form of the anal horn. They fell clearly into two groups and were accordingly separated before pupation, and produced moths of both sexes, differing from each other, but constant within the groups. A second generation confirmed the previous observation.

Förändringar i Sveriges storfjärilfauna senaste tiorarsperiod (Lep.) by **Ingvar Svensson**, *Opuscula Entomologica* 32, 1967, Lund. This paper, in the Swedish language with an English summary, lists 18 species which have been reported in Sweden between 1957 and 1966. It also lists 39 species which the author considers should be deleted from the Swedish list, and another 21 species which are more or less doubtful. It is interesting to note that *Plusia gracilis* Lempke is among the newcomers. The 18 additions are the subject of a black and white plate.

There are also photographic illustrations of genitalia preparations of some of these species. Particularly interesting are photographs of ♂ and ♀ genitalia of the four *Nycteola* species; *N. revayana* Sc., *N. degenerana* Hübn., *N. siculana* Fuchs. and *N. asiatica* Krul., and ♂ and ♀ genitalia of *P. festucae* and *P. gracilis*.—S.N.A.J.

Nature Trails: Nature Conservancy, distributed by Frederick Warne & Co., London and New York, 22 pp., 5/-. As its name implies, this booklet sets out the principles for establishing nature trails and also suggestions for their use by school-teachers during the periods set aside for open-air instruction of their classes. It is illustrated by means of photographs and line drawings. The booklet is divided into seven sections suitably headed: The Value of Nature Trails, Types of Trails, Design, Presentation, Management, Nature Trail Centres, and Nature Trails and School Work. There is an appendix giving a short account of the Alvecote Pools Nature Trail in Warwickshire, which is situated in the unpromising area around a mine waste tip, but which is shown to provide many interesting features of natural development. The interest is not confined to school classes, and members of the public will find it an interesting introduction to nature on a country ramble.—S.N.A.J.

Obituary

ORAZIO QUERCI, 1875-1967

Orazio Querci was born in Rome in 1875, and he graduated in chemistry in the University of Rome, after which he worked in the chemical field, doing research work on explosives for the Italian Government.

Querci had been interested in butterflies ever since he was fourteen years old, when he started collecting, and he continued collecting for the remainder of his active life. He married Clorinda di Nino who, from childhood, had also been attracted by butterflies, and she soon became an expert lepidopterist, exploring, with her husband, the mountains of central Italy. Much detail of their life together is given in the fine obituary notice written by Querci after her death (*Ent. Rec.*, 71: 215).

About 1923-24 he gave up other work in order to dedicate himself to the study and collecting of butterflies. By that time he was well known and had an international reputation as an expert on the butterflies of the Northern Hemisphere; his advice and collecting services were in demand by the British Museum (Natural History) and the Baron Rothschild in England, M. Oberthur in France, the museums of Madrid and Barcelona in Spain, and also in Portugal, North Africa and Morocco.. He was also a great friend of our sometime editor, Henry J. Turner, with whom he corresponded regularly.

In 1927-28, The Academy of Natural Sciences, of Philadelphia, U.S.A., charged him with the lepidopterological survey of the Island of Cuba, a task which took him a full year, and it took more than another year, back in Philadelphia, for him to classify and arrange the material which he had collected.

On his return to Europe, he spent another year at the University of Lisbon, and another three years in Madrid and Tangier. By that time, his son-in-law had been appointed to the Italian School in Salonika, and Querci and his wife joined their daughter in Greece, spending some considerable time collecting near Salonika and on Mount Olympus.

Back in Italy once more, in 1939, the war and its attendant difficulties put an end to his outdoor collecting, but he continued his studies on the effect of climate factors on the development and reproduction of butterflies. It was just after the end of the war that I first had correspondence with him, and at that time he was particularly interested in the effects of solar radiation and moisture on *Pieris rapae* L., on which insect he did considerable work. A strong point in his letters was his regret at the invasion of so much of his terrain by the Argentine ant, which seemed to multiply at a fantastic rate and which was fast destroying other insect populations.

About 1960, I was able to visit Rome, where my wife and I called on Querci and had dinner with him, his grand-daughter and her husband. It was unfortunately a very short visit as my wife and I had to hurry across Europe to be in time for our air passage back to England, but short as our visit was it was most pleasurable, mainly because of the spirit of family devotion which existed between our hosts. Unfortunately, his daughter, Erilda Romei Querci, was away at the time, but it was obvious that she, too, was an integral part of the family structure, and after the death of his wife, he lived in Rome at her flat.

My impression of him was of a kindly old man who had lived a very full life, and who was held in the highest esteem by all. He died in Rome on 20th August 1967, and I am indebted to his grand-daughter, Dr. Licena Romei Braconi for the foregoing details of his life, for, although this was known to me generally, I had little detail. The advice of his death only reached me early in February because, as Dr. Braconi explained, she and her grandfather were such close friends that she found it difficult to realize that he was not still with his devoted family, to all of whom we offer our sincerest sympathy in their loss.

Entomology has lost another famous name, but it is the richer for the work of the very full lives of Orazio Querci and his wife.—S.N.A.J.

refer to an ab. of *C. ocellaris* Borkh. A re-examination of the material referred to as *palleago* by Wood and South is therefore very desirable, though as yet I have unfortunately been unable positively to locate the present whereabouts of any of these specimens (C.-H.).

C. ocellaris Borkh.

p. 306—

Orpington (div. 1), October 1, 1961 (1), at light (I. A. Watkinson);
September 8, 1964 (1), at light (P. E. and D. Webb).

P. bicolorana Fuessl.

p. 310—

line 8 up—for "Daivs" read: Davis.

E. trabealis Scop.

p. 313—

First Record, 1782: "First week July 1782 . . . Taken, The Margate Beauty. Mr. Francillon" (*Diary of the Society of the Entomologists of London, 1780-82*, MS., 66), replaces that given.

L. fasciana L.

p. 315—

Bromley (div. 1), 1966 (1) (D. R. M. Long).

C. fraxini L.

p. 318—

According to Scott (1964), the moth was taken annually in the Ashford district [Ham Street] from 1957 to 1960 inclusive and was seen there in 1963. If correct, this means the species was observed there year after year for a total of 19 years until it was last seen in 1964 (C.-H.).

C. sponsa L.

p. 319—

P. Cue (*in litt.*) states he has never taken *sponsa* in Hoads Wood; thus, the record of this in Scott (1964) should be deleted. The statement in (Scott (1964) that in the Ashford district, it was "common in 1940 over a wide area", is unsupported by the records, and is I suspect erroneous (C.-H.).

M. lunaris Schiff.

p. 321—

There are strong indications that fallen oak leaves provide the normal diurnal resting place for this moth, the wing pattern and colouration of which is ideally suited for this purpose. R. P. Demuth (*in litt.*) referring to his diary, writes that at Ham Street, on June 15, 1948, he reckons he saw about 14 *lunaris*, some of which he noted by day in the manner described: "During the day they rest in dead oak leaves in ditches or on the ground and can be walked up". On May 29, 1949, "walked up 1 *lunaris* female during the day from a ditch filled with dead oak leaves . . ."

C. coryli L.

p. 324—

Loose (div. 11), May 5, 1956 (1), at light (E. Philp).

P. festucae L.

p. 329—

Bromley (div. 1), August 26, 1967 (1) (D. R. M. Long). East Kent [Reculver (div. 4)] (Battley, *Trans. E. Kent nat. Hist. Soc.*, 1904: 35).

Ashford district (div. 12)*, "emergence of a specimen reported in October 1959" (Scott, 1964).

U. triplasia L.

p. 336—

Sheppey (div. 2) (Walker, *Naturalist's Notebook*, 1869: 141).

U. tripartita Hufn.

p. 336—

Sheppey (div. 2) (Walker, *Naturalist's Notebook*, 1869: 141).

L. pastinum Treits.

p. 340—

Orpington (div. 1), 1961 (1), 1962 (1), 1966 (1), all at light (P. E. and D. Webb). Greatstone (div. 15), July 21, 1963 (1) (C.-H. and Wakely, *Ent. Rec.*, 76: 94).

C. salicalis Schiff.

p. 342—

Orlestone Woods (div. 12), a few, 1967, by B. K. West and D. W. H. fennell (C.-H.).

Z. nemoralis F.

p. 349—

Greatstone (div. 15), one in m.v. trap, July 21, 1963 (C.-H.).

L. flexula Schiff.

p. 352—

Greatstone (div. 15), one, July 21, 1963 (C.-H. and Wakely, *Ent. Rec.*, 76: 94).

FURTHER ADDITIONS TO VOL. 2

H. celerio L.

p. 11—

1868: Sheppey (div. 2), "taken in a room last year and probably attracted by the light" (Walker, *Naturalist's Notebook*, 1869: 141). 1963: East Malling (div. 11), October 25, in m.v. trap (Massee, *Proc. S. Lond. nat. Hist. Soc.*, 1963: 46)

H. bifida Brahm.

p. 18—

Dover (div. 8), ♂ in m.v. trap, June 28, 1958 (G. H. Youden).

C. ruficornis Hufn.

p. 25—

Summers (*Proc. S. London, ent. nat. Hist. Soc.*, 1966: 31, plt. 2, fig. 3) exhibited "an unusual male" ab., taken Bromley, May 11, 1965. It appears to conform to ab. *vivida* Zerny (C.-H.).

P. gnoma F.

p. 26—

Barham (div. 8), 1953 (1); Dover, 1951 (1), 1953 (1), 1964 (2), 1965 (1) (G. H. Youden). Greatstone (div. 15), July 16, 1963 (1) (C.-H.).

L. capucina L.

p. 32—

Orlestone Woods (div. 12), larva on hornbeam (C.-H., *Proc. S. Lond. ent. nat. Hist. Soc.*, 1967: 24).

O. carmelita Esp.

p. 33—

Bromley (div. 1), April 28, 1964 (1) (D. R. M. Long).

- C. curtula* L.
p. 36—
Dover (div. 8), May 25, 1952 (1), in m.v. trap (G. H. Youden).
- T. ocularis* L.
p. 42—
Dover (div. 8), 1962, 1964, 1965 (G. H. Youden). Dungeness (div. 15), 1966 (de Worms, *Entomologist* **100**: 97).
- T. fluctuosa* Hübn.
p. 46—
Dover (div. 8), ♂, July 27, 1967 (G. H. Youden). Ham Street (div. 12), 1966 (1) (de Worms, *Entomologist*, **100**: 97).
- O. antiqua* L.
p. 50—
Orlestone Woods (div. 12), larva on sallow (C.-H., *Proc. S. Lond. ent. nat. Hist. Soc.*, **1967**: 24).
- E. chrysorrhoea* L.
p. 53—
Bromley (div. 1), July 15 (1), 19 (1), 1967 (D. R. M. Long).
- M. neustria* L.
p. 61—
Tenterden (div. 14), larva on hop (C. G. Orpin).
- M. castrensis* L.
p. 62—
First Record, 1782: "First week August 1782 . . . Bred the Sea Wormwood Lackey. 20 of the Caterpillars were taken by Dr. Curtis at the Isle of Sheppey—they remained in chrysalis 30 days" (*Diary of the Society of the Entomologists of London, 1780-82*, MS., 67). This replaces that given.
- E. lanestrus* L.
p. 64—
The statement (in *Proc. S. Lond. ent. nat. Hist. Soc.*, **1963**: 15) that *lanestrus* was seen at Ashford in 1963 does not refer to the species in nature, but to non-Kentish examples being reared there in captivity.
- D. curvatula* Borkh.
p. 76—
This species should be enclosed within square brackets.
- N. albula* Schiff
p. 79—
Dover (div. 8), July 14-22, 1967 (3) (G. H. Youden). Dungeness (div. 15), July 21, 1967 (1) (D. O'Keeffe).
- S. irrorella* L.
p. 83—
First Record, 1782: "Last week July, taken the Irorella or Dew Moth, upon the Common opposite the 18 milestone, Erith" (div. 1) *Diary of the Society of the Entomologists of London, 1780-82*, MS., 67). This replaces that given.
- L. quadra* L.
p. 86—
1963: Dover (div. 8), July 16, 23; Brook, July 8; Dungeness (div. 15), July 18 (French, *Entomologist*, **93**: 76). 1966: Dover (div. 8), June 11 (♂) (Youden, *Ent. Rec.*, **79**: 60).

E. deplana Esp.

p. 86—

The record for Tenterden in Scott (1964) and attributed to me should be deleted. I have never noted it there (C.-H.).

E. caniola Hübn.

p. 91—

I have investigated all records for this species in Scott (1964) and find them to be erroneous (C.-H.).

A. rubricollis L.

pp. 93-94—

This species was misplaced. It should follow *Nudaria mundana* L. on p. 81.

C. trituberculana Bosc

pp. 94-95—

This species was misplaced. It should follow *Celama confusalis* H.-S. on p. 80. Dungeness (div. 15), one at m.v.l., July 21, 1967 (D. O'Keeffe).

A. pyramidae L.

p. 253—

I have examples in my coll. from West Wickham (div. 1); Broad Oak (div. 3); and Orlestone Woods (div. 12), that are referable to *pyramidea* as distinct from *A. berbera* Rungs (C.-H.).

A. berbera Rungs. Svensson's Copper Underwing.

Resident, perhaps native. Woods etc.

It is probable that a fair percentage of all so-called *A. pyramidea* from Kent are in fact referable to *A. berbera*. This was originally described (in 1949, *Soc. Sc. Nat. Maroc.* 25-27: 330, pl. 7, figs 3, 5) as a sub-species of *pyramidea*, but has since been recognised by I. Svensson as specifically distinct; the details of which are expected in a forth-coming paper.

The nymotypical race of *berbera* does not appear to occur in Britain, and a description of the British sub-species is at present in the press. The author, D. S. Fletcher, has been so good as to give me for publication here, the following characters by which our examples of *berbera* may be recognised from those of *pyramidea*:—"Duller brown colour of body and forewing; forewing orbicular spot usually larger and more broadly ringed with buffy-brown or light buff; median band, between vein A1 and inner margin, is usually narrower than in *pyramidea*; discal area between orbicular spot and postmedial fascia is less heavily shaded than in *pyramidea*, the shading not extending as far as the postmedial fascia." The genitalia are very distinct.

As yet, few series have been examined, and the following are the only records of identified Kentish *berbera* at present.

3. Broad Oak, one, July 19, 1946 (C.-H.).

7. Westwell (C. G. M. de Worms).

12. Orlestone Woods, three, July 29, 1946 (C.-H.). Ham Street (C. G. M. de Worms). Ashford, one (P. Cue teste C. G. M. de Worms).

15. Dungeness (C. G. M. de Worms).

EXCHANGES AND WANTS

Wanted.—Six male specimens of *M. furtina* from Scilly Isles and six from Hebrides, and also from W. Scotland of the form *splendida* B.-W. Condition not important but good specimens preferred. Exchange for European species can be arranged.—*L. Higgins, Fochlesbrook Farm, Chobham, Surrey.* Telephone No.: Chobham 8154.

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Urgent Request.—Would anyone running a light trap in January, February and March 1968, who would be willing to help in a survey of the dark forms of the moth *Phigalia pedaria* please contact *D. R. Lees* or *H. B. D. Kettlewell*, Dept. of Zoology, Oxford.

For Sale.—Rev. F. M. B. Carr's cabinets and collection.—*Carr, 93 Albany, Bournemouth.* Tel. No. Bournemouth 27419.

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Wanted.—Irish Lepidoptera. I am collecting material for a supplement to my "Revised catalogue of Irish Macrolepidoptera, 1964", and would be very grateful for any new county records, or other items of interest.—*E. S. A. Baynes, "Sandford", Adelaide Road, Glenagerry, Co. Dublin, Irish Republic.*

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M. Florent, now of 8 Allee, Fernan Leger, 95 Argenteuil, France.

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H. S. Robinson, now of P.O. Box 1166, Suva, Fiji.

L. J. D. Wakely, now of Long Meadow, Forest Road, East Horsley, near Leatherhead, Surrey.

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More than 50 years have elapsed since the publication of Porritt's list of the Lepidoptera of Yorkshire and the need for a revised list has long been felt. Work on this has been undertaken by Mr. C. T. Rutherford of Alderley Edge, Cheshire, and the new revised list is currently appearing in the *Naturalist*.

Details and copies available from the

Editor of the Naturalist, The University, Leeds, 2.

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(Founded by J. W. TUTT on 15th April 1890)

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All material for the TEXT of the magazine must be sent to the EDITOR at 54 Hayes Lane, Bromley, Kent.

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THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

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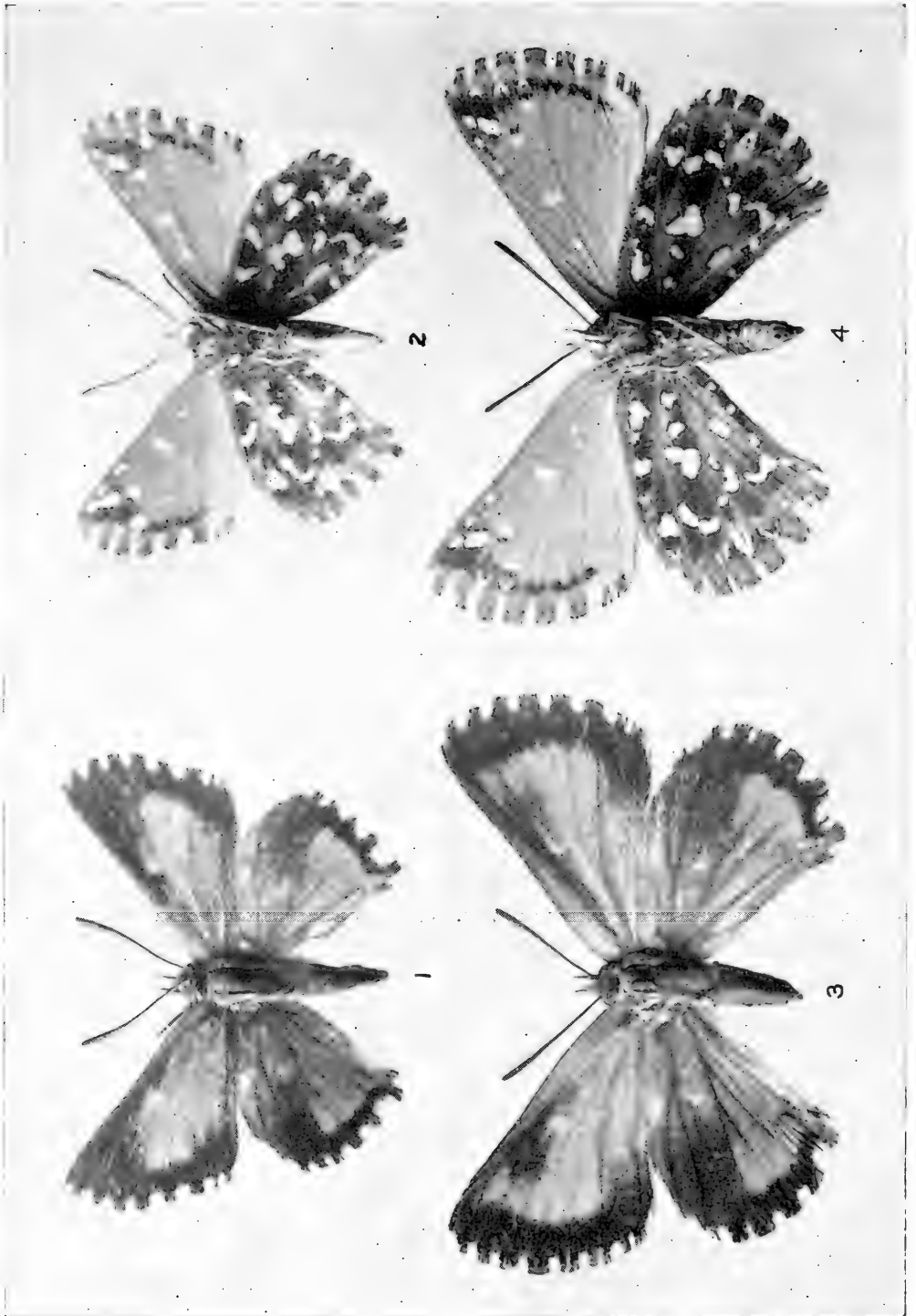
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Phasis macmasteri spec. nov.

Fig. 1.—♂ Holotype (upperside). Fig. 3.—♀ Allotype (upperside).
 Fig. 2.—♂ Holotype (underside). Fig. 4.—♀ Allotype (underside).

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Photo: H. N. Wykeham.

A Further New Species of the *Phasis wallengrenii* (Trimen) complex (Lepidoptera : Lycaenidae)

By C. G. C. DICKSON

When discussing the *Phasis wallengrenii* complex recently (Entomologist's Record, 79: 267-270, Nov., 1967) the present writer treated as a new species, under the name of *Phasis argyropлага*, the main Karroo member of the group and mentioned the possibility of this complex also containing other new taxa—a view which was shared by Mr G. E. Tite.

The butterfly which is now dealt with in this paper differs in wing-shape from both *Phasis wallengrenii* and *Ph. argyropлага* and although having the silvery markings of the hindwing underside thickened as in the latter species, it can be distinguished readily by certain differences in these markings. While there are one or two other taxa in this group which will require further investigation when more material is available, it is felt that the present insect clearly constitutes another new species and warrants description as such. This butterfly has a wide distribution, occurring as it does in the N.W. Cape as well as in the karroid or semi-karroid regions of the Eastern Cape—individual specimens from both regions sometimes matching one another closely. Furthermore, there is positive overlapping with *argyropлага* in some localities, with each insect retaining its identity completely and thus appearing to confirm fully the specific difference between the two taxa.

Phasis macmasteri spec. nov.

Male. Forewing with the distal margin not or at the most only slightly concave below vein 4; hindwing with the distal and hindmargins forming a wider angle on an average than in *argyropлага* and with the ana-angular projection much shorter. (N.B.: in the figure of the male holotype of *argyropлага* the length of the projection is not apparent owing to its partial loss in each hindwing of the specimen concerned).

Upperside.

Forewing. Relative proportion of the tawny-orange to black areas greater than in *argyropлага*, with the orange closer to costa and less restricted towards the hind margin and the tornus. (Specimens do, however, occur in which the greater part of area Ia is suffused with dark colouring).

Hindwing. Portion of wing between base and the large black apical area more obscured by dark scaling than in *argyropлага*, and the black apical patch itself extending further basad (and in some paratypes only slightly separated by some orange suffusion from the dark scaling at the wing base). No dark streak from or near lower inner edge of apical patch in holotype or other specimens from the type-locality which have been examined, but in some of these specimens an intervening scattering of dark scales represents, feebly, the streak which occurs in some examples of *argyropлага*.

Underside.

Forewing. Except to a slight extent near base and towards apex, virtually no scattered dark scaling is present near or at edge of costa. The silvery-white spots in and at cell-end without black edging or less distinctly edged with black than in *argyropлага*; those in areas 2 and 3 reduced in size and that in 2 often absent (as in the holotype). About

distal two-thirds of costal area narrowly dull salmon-pink and distal marginal area, down to vein 1, more broadly and distinctly so.

Hindwing. Background of less uniform tone than in *argyroplaga*—with dull salmon-pink streaks occurring above and below the cell and the same colour present submarginally below vein 3, down to the anal-angle and parallel with but separated from the inner margin; while most of the wing is edged with this colour, which broadens towards the upper angle of the wing as well as at the anal angle. In some paratypes this colouring is deeper and duller than in the holotype and in others more of a putty colour, this also applying to the correspondingly coloured parts of the forewing.

The silvery-white markings shaped differently, in the case of some of them, from the corresponding ones in *argyroplaga* and a few of them coalescing or showing more tendency to coalesce—the general impression being that of a rather less intricate pattern. The small more outwardly placed marking in the cell is usually so enlarged as to coalesce with the large irregularly shaped marking beyond the end of the cell, while the marking a little beyond and above the latter which forms a streak in area 5 in *argyroplaga*, more often occurs as a small thick marking in the present species and either coalesces with, or is not widely separated from a small marking below it—the combined effect being rather that of a figure J (with the “tail” reversed in one of the wings).

Length of forewing: 14.5–16.5 mm. (16 mm., in holotype). (One abnormally small male has a forewing length of under 12 mm.).

Female.

Hindwing with the anal-angular projection less produced than is usual in the female of *argyroplaga* (and generally but very slightly produced, with the effect partly due to the wing-margin between veins Ib and 2 being a little excavate).

Upperside.

Ground colour a little lighter and more ochreous than in the male, as is usual in members of this group.

Forewing. Dark patch about three-fifths along costa from base with its edges which adjoin orange area always more or less blurred (the edges better defined as a rule in the two allied species); the patch only consisting of a little diffuse dark scaling, in at least one of the paratypes.

Hindwing. No dark streak from the large apical patch (which, inferiorly, reaches vein 4) to near anal-angle, although generally as in the allotype, some intervening scattered dark scaling.

Underside.

Forewing. Essentially as in male, allowing for the differently shaped (evenly curved) termen, but the silvery-white markings reduced in size relative to the greater size of the female butterfly. Costal silvery-white from base far less developed than in the male and less so than in the female of *argyroplaga*.

Hindwing. As in the male generally but the silvery-white markings as a whole relatively reduced somewhat in size; the discal series more in the form of a sinuate chain, than in the male. The small more distally placed spot in the cell is normally not fused with the marking beyond the end of the cell. In this sex also the silvery-white marking is of less intricate formation than in the same sex of *wallengrenii* and *argyroplaga*.

Length of forewing: 16.5—20 mm. (19.5 mm., in allotype).

Body and ancillary parts in both sexes marked and coloured very similarly to the same parts in the allied species.

♂ Holotype, EASTERN CAPE PROVINCE: Vlekpoort, near Hofmeyr, 23.x.1967 (J. C. McMaster); British Museum Reg. No. Rh. 17023.

♀ Allotype, data as holotype; British Museum Reg. No. 17024.

Paratypes presented to British Museum (Natural History), data as holotype, 1♂, 1♀.

Paratypes in the author's collection, E. CAPE PROVINCE: between Port Elizabeth and Uitenhage, 4.i.1950 (C.G.C.D.), 1♂; data as holotype, 3♂♂, 1♀.

Paratypes in Coll. J. C. McMaster, E. CAPE PROVINCE: Eastpoort, nr. Cookhouse, 16.x.1966 (J. C. McM.), 1♂; data as holotype, 5♂♂, 4♀♀.

Paratype in Coll. N. A. Brauer, E. CAPE PROVINCE: Haasfonteinmond, Queenstown Dist., 24.xi.1965 (N.A.B.), 1♂.

Paratypes in Coll. Transvaal Museum, E. CAPE PROVINCE: Willowmore, 15.xi.1912 (Dr. Brauns), 3♂♂; Haasfonteinmond, Queenstown District, 13.xi.1965 (N. A. Brauer), 1♀; as holotype, 1♂, 1♀.

The comprehensive series of specimens from the type-locality is remarkably uniform in general appearance and varies only in unimportant detail. The Eastpoort male shows some slight increase in the dark areas of the upperside and this is apparent too in the Willowmore examples, with the increase quite marked in one of them—and in all three with the orange portions of the upperside more or less obscured in places by dark scaling. In the male from between Port Elizabeth and Uitenhage the orange area of the forewing is noticeably reduced and the hindwing is darkened over more than half the surface from the costa downwards, with the orange forming rays between the well darkened veins below this portion—but the darkest Willowmore example is nearly as darkly marked. Mr. Brauer's Queenstown male (the unusually small specimen which has been mentioned) has the dark portions of the upperside well developed, but part of the silvery-white marking of the underside incompletely developed. In all specimens the undersides are basically the same, with the degree of variation of a secondary nature only. In two of the female paratypes the pinkish colouring of the hindwing underside is very extensive and prominent.

Attention was drawn to this insect and the features which distinguish it so readily from *Ph. argyroplaga*, by Mr. McMaster after the capture of the Eastpoort specimen in 1966, and he was anxious that it should be described when he had obtained sufficient material for this purpose. Mr. N. A. Brauer found it in the previous year in the Queenstown district, and realised that it was quite distinct from other specimens of the group which were known to him; and he subsequently sent an example of it to the Transvaal Museum. The butterfly had been known to the late Mr. Gowan C. Clark for very many years and he appreciated the fact of there being two distinct insects of this group in the Eastern Cape. Mr. K. M. Pennington came across the species in Little Namaqualand in 1946 and he was particularly impressed by the difference which was apparent in the first female which he captured there. Specimens taken by Dr. Bernard Kettlewell at the Orange Mouth in 1952, and now in the British Museum (N.H.), appear to be the same as Mr. Pennington's 1946 examples.

The butterfly was found by the writer between Port Elizabeth and Uitenhage (on 4th January, 1950) on rough open ground adjoining the well developed and comparatively tall type of karroid vegetation which is so characteristic of that area*.

Mr. McMaster states in a letter that the butterfly seems to be fairly plentiful where it occurs, appearing here and there in the Karroo scrub, with a tendency to keep to flat open country. It settles on the ground, making short circular flights when disturbed, and can often be found on flowers.

Sincere thanks are due to Mr. G. E. Tite for his kindness in checking the manuscript before its publication; while Dr. L. Vári has been good enough to make available for study the specimens from the Transvaal Museum Collection.

*A female specimen which was captured to the west of Calvinia (Western Cape Province) on 15th December 1951, has also been found to answer to this species.

"Blencathra," Cambridge Avenue, St. Michael's Estate, Cape Town.

New Forest Mercury Vapour Light Records for 1967

By L. W. SIGGS

The numbers of specimens recorded in the Minstead M.V. trap were as follows:—

	Nights	Total	Average
March	30	1826	61
April	30	2084	69
May	30	915	30
June	28	3508	125
July	25	5650	226
August	31	5432	175
September	30	2710	90
October	31	1396	45
November	30	704	23
Total	265	24,225	91

This is the lowest daily average over the year since records began in 1962.

The following additions to the Minstead list are recorded:—

Heterogenea asella Schiff.
Shrankia taenialis Hübn.
Eupithecia indigata Hübn.
Operophtera jagata Scharf.

As a result of examination of genitalia, I can add—

Hydraecia paludis Tutt taken in 1963 and 1965
Oporinia christyi Prout taken in 1959.

The number of species of macrolepidoptera recorded in 1967 was 357, a more than average figure.

Species which put in an appearance this year but are not regular visitors were *Tethea duplaris* L., *Lasiocampus quercus* L., *Hepialus fusconebulosa* Deg., *Graphiphora augur* Fab., *Amathes agathina* Dup. (it

seems to have been a good year for this generally), *Anaplectoides prasana* Schiff., *Orthosia advena* Schiff., *Leucania obsoleta* Hübn., *Leucania vitellina* Hübn., *Nonagria sparganii* Esp., *Caradrina ambigua* Schiff., *Nycteola revayana* Scop., *Cosymbia pendularia* Clerck, *Plemyria rubiginata* Schiff., *Eupithecia succenturiata* L., *Apeira syringaria* L., *Ectropis consonaria* Hübn.

MIGRANTS. The number of species occurring was up to standard, but the number of specimens in most species was well down. The details are:—*Lithosia quadra* L. (9, including, for the first time in the trap, 2 females); *Agrotis ipsilon* Hufn. (322), *Peridroma porphyrea* Schiff. (67), *Leucania vitellina* Hübn. (2), *Laphygma exigua* Hübn. (1), *Plusia gamma* L. (291), *Rhodometra sacraria* L. (2), *Nycterosea obstipata* Fab. (10), *Diasemia ramburialis* Dup. (1), *Palpita unionalis* Hübn. (1), *Nomophila noctuella* Schiff. (86), *Udea ferrugalis* Hübn. (19), *Plutella maculipennis* Curt. (2).

A warm spell early in the year resulted in the unusually early appearance of several species, among which were—*Biston strataria* Hufn., 30.i.; *Nomophila noctuella* L., 30.i.; *Xylocampa areola* Esp., 1.ii., *Apocheima hispidaria* Fab., 3.ii.; *Orthosia gothica* L., 18.ii.; *Agrotis ipsilon* Hufn., 31.iii.; *Xanthorhoë fluctuata* L., 16.iv.; *Eupithecia nanata* Hübn., 17.iv.; *Spilosoma lubricipeda* L., 19.iv.; *Apatele rumicis* L., 22.iv.; *Thera firmata* Hübn., 22.iv. (this is the first time I have recorded this early brood, although the later one is quite common).

Some late records are also of interest—*Semiothisa alternaria* Hübn., 10.ix.; *Thyatira batis* L., 11.ix.; *Agrotis exclamationis* L., 15.x.; *Phlogophora meticulosa* L., 21.xii.

Phigalia pendaria Fab. was taken on 30.xi. and 21.xii.

POLYMORPHISM

<i>Biston betularia</i> L.	<i>Sterrrha aversata</i> L.
typical 115 (84%)	remutata 80 (71%)
carbonaria 7 (5%)	aversata 32 (29%)
insularia 15 (11%)	

Alcis repandata L. Typical 89, *conversaria* 8.

Apamea crenata Hufn. Typical 17, *alopecurus* 2.

Ectropis biundularia Borkh. (and *crepuscularia* Hübn.) Typical 16, melanic 1.

Eilema deplana Esp. Typical 6, *unicolor* 1.

Eilema griseola Hübn. Typical 4, *flava* 2.

REFERENCE

Siggs, L. W. New Forest Mercury Vapour Light Records for 1966. *Ent. Rec.*, 79: 144.

Sungate, Football Green, Minstead, Lyndhurst, Hants.

Insects at light: Hilton, Natal

By J. S. TAYLOR

During the summer of 1965/6, and again in the following year, observations on insects attracted by light were carried out at Hilton, Natal, similar to those at Wilderness, C.P., in 1964/5 (*Ent. Rec. & Jl. Var.*, 78: 73-75, 1966). At Hilton, the light was an ordinary 100 watt bulb

suspended in front of a sheet on the porch of our house. Hilton is situated in the mist belt at an altitude of some 3,700 feet and is eight miles from Pietermaritzburg. The climate is normally cool and damp on account of the mists which generally prevail throughout the spring and summer months. During this period the mist often comes over in the afternoon, and may persist for several days, while it is not unusual for the sun to be completely obscured for a number of days at a time. The country round about is mainly grassveld, much of which is now under Black Wattle (*acacia mollissima*). Very little of the indigenous bush has been left, while Hilton itself is an expanding residential area, with numerous houses and gardens.

During the summer of 1965/6 the light was operated from mid-December until May, and in the following season from January 7—which happened to be the first night in that summer on which conditions appeared to be suitable—until April 15th, just two weeks before my departure from Hilton. Conditions during the second summer (1966/7) were particularly cool and damp, with many nights unfavourable to insect activity. During this summer a collection of Microlepidoptera was made.

As at Wilderness, C.P., the insects at light at Hilton were both varied and numerous, with most orders represented. Among the Orthoptera, a large black species of Blattidae was often present, especially early in the season. Both field and tree crickets were also seen, but mole crickets, which were such a feature at Wilderness, were entirely absent. Several species of Mantidae were noted, also grasshoppers, an occasional katydid, and once a specimen of the Brown Locust (*Locusta pardalina* Wlk.). Although the pneumorid *Bulla longirostris* St., occurs in the area fairly commonly, several specimens being taken by neighbours at light during the same period, none was seen at my light. Neither were any Forficulidae, which had been such a noteworthy feature at Wilderness. Once, a species of Plecoptera was recorded at Hilton; Ephemoptera were noted at times, and included a large species, measuring some 50 mm. in length.

The Neuroptera were represented mainly by smallish Myrmelionidae, an ascalaphid and a few Chrysopidae. On one occasion—7.i.67—a very large species of lacewing was taken, much the largest I have ever seen. It was a particularly beautiful insect; the green body, measuring 15 mm. in length, had a series of dark spots on either side forming a lateral line. The wings, which had a bluish tinge, measured some 22 mm. in length. Only one specimen was seen. Dr. Bo Tjeder, of the University of Lund, Sweden, to whom it was subsequently submitted, reported it to be *Italochrysa gigantea* (McL.), "a very uncommon species"

Coleoptera were well represented, and among them several small species of Staphylinidae were particularly numerous. Small and moderate-sized Scarabaeidae were often present, while a large species of dynastid, last met with at Barberton, Transvaal, many years before, was sometimes recorded. Cerambycidae were not so abundant as at Wilderness, although several were noted, while one very small species was almost always present. Small Carabiidae were frequently seen.

Among the Diptera, Tipulidae were often noted, including several large species, one of which had a wing-span of at least 2½ inches. Various small flies and gnats were numerous at times, and a large male tabanid, similar to the one noted at Wilderness, occurred fairly often.

Hemiptera were well represented, especially by various species of

Reduviidae, as is usually the case at light in Africa Pentatomidae were also often seen, likewise Coreidae and Capsidae. Of the Homoptera, a small greenish yellow species of Jassidae was generally present; a large cercopid was noted from time to time, and a large cicada occasionally.

Lepidoptera were generally abundant, particularly the micros.

It was particularly interesting to note that during the late summer of 1965-66 when a widespread migration of *Catopsilia florella* (Fabr.) (Pieridae) was in progress in Natal and other parts of South Africa, migratory species of moths were much in evidence at light and elsewhere. Although some of these, such as *Heliothis armigera* Hbn., and *Nomophila noctuella* Schiff., are liable to appear almost anywhere and at any time in South Africa, they were more than normally in evidence during this migration, as were other migratory species including *Rhodometra sacraria* L., and *Utetheisa pulchella* L. Both these species were also observed in considerable numbers during daylight feeding at lucerne and *Senecio* flowers at Potgietersrus, Transvaal, during the latter half of April. *R. sacraria* was particularly abundant there, and never have I seen such a concentration of this species. It was interesting, too, to meet old acquaintances such as *Gynanisa maia* Klug., and *Heniocha appolonia* Cram., both of which came to light occasionally at Hilton. Another saturniid noted at Hilton was *Nudaurelia wahlbergi* Boisd. The larvae of these three species of Saturniidae have been recorded on wattle, but I was unsuccessful in finding any locally, although remains of the adult of *H. appolonia* were noted occasionally in the neighbouring plantations. Another old acquaintance was *Siccia caffra* Walk., which was often present at light. The larva of this species sometimes occurs in large numbers and causes a nuisance by invading porches and verandahs, crawling up the walls seeking pupation quarters. Hitherto all attempts to find the host have been unsuccessful. Similarly at Hilton, where the larva was also common. Another arctiid, of frequent occurrence at light at Hilton, was *Cyana pretoriae* Distant. The larva, too, was often seen, but the host-plant remains unknown. Among other species of Arctiidae were *Dionychopus amasis* Cram., and *D. similis* Mschl., also *Teracotona submacula* Walk. The male of *Metarctia meteus* Stoll. (*Syntomidae*) was also seen at light from time to time. Some years ago the larva was recorded on grass in the Eastern Cape. The female has vestigial wings. Among the Noctuidae were such well-known species as *Earias biplaga* Walk., *Grammodes stolidus* Fabr., and *Phytometra orichalcea* Fabr. Various species of Lymantriidae occurred commonly, including *Euproctis iridescens* Janse, the larva of which was frequently found on a variety of plants. Another lymantrid at light was *Psalis pennatula* (Fabr.), which was also reared from the larva found on grasses at Hilton. Of the Geometridae, one of the commonest species at light was *Semiothisa simplicita* Warr., which throughout the period it was present at light was often seen in the wattle plantations. The larva has been recorded on wattle foliage. Sphingidae occurred occasionally, and included *Macroglossum trochilus* Hbn. Although several species of Lasiocampidae were recorded from time to time, *Braura truncata* Walk., a well-known species on wattle and common in the area, was not noted at light at Hilton.

Microlepidoptera were numerous, and Mr. S. N. A. Jacobs has kindly provided a list of determinations of a collection sent to him. Crambids were particularly abundant, and included a species previously only

associated with rice. Rice, however, is not grown at or near Hilton. Pyralidae were likewise numerous, and included *Uresiphita gilvata* Fab.,—previously reared from cultivated Broom—*N. noctuella* and *Mesgrapha martialis* Guen. Several species of Adelidae with very long antennae occurred commonly. These included *Ceromitia amphichroa* Meyr., *C. flavicoma* Meyr., and *C. wahlbergi* Zeller. The last-mentioned species was also recorded at light at Wilderness, C. P. Tortricidae were likewise much in evidence; especially *Tortrix capensana* Walk., a common and widespread species, with numerous host-plants, including ivy growing on the wall of our house at Hilton.

The syntomid *Thyretes hippotes* Cram., which was the commonest species of moth at light at Wilderness, C.P., was not recorded at Hilton.

Hymenoptera were represented mainly by parasitic wasps and by various ants, including the ferocious-looking but innocuous male of the Driver Ant *Dorylus helvolus* L. Individuals of the Hive Bee *Apis mellifera* were also present at light from time to time.

I am much indebted to Mr. S. N. A. Jacobs, and to Drs. Bo Tjeder, E. C. G. Pinhey and L. Vari for their kind assistance in identifications.

3 Aird's Court, Westgate, Crail, Fife. 29.xii.67.

New Subspecies in the Genus *Zygaena* Fabricius* (Lep., Zygaenidae)

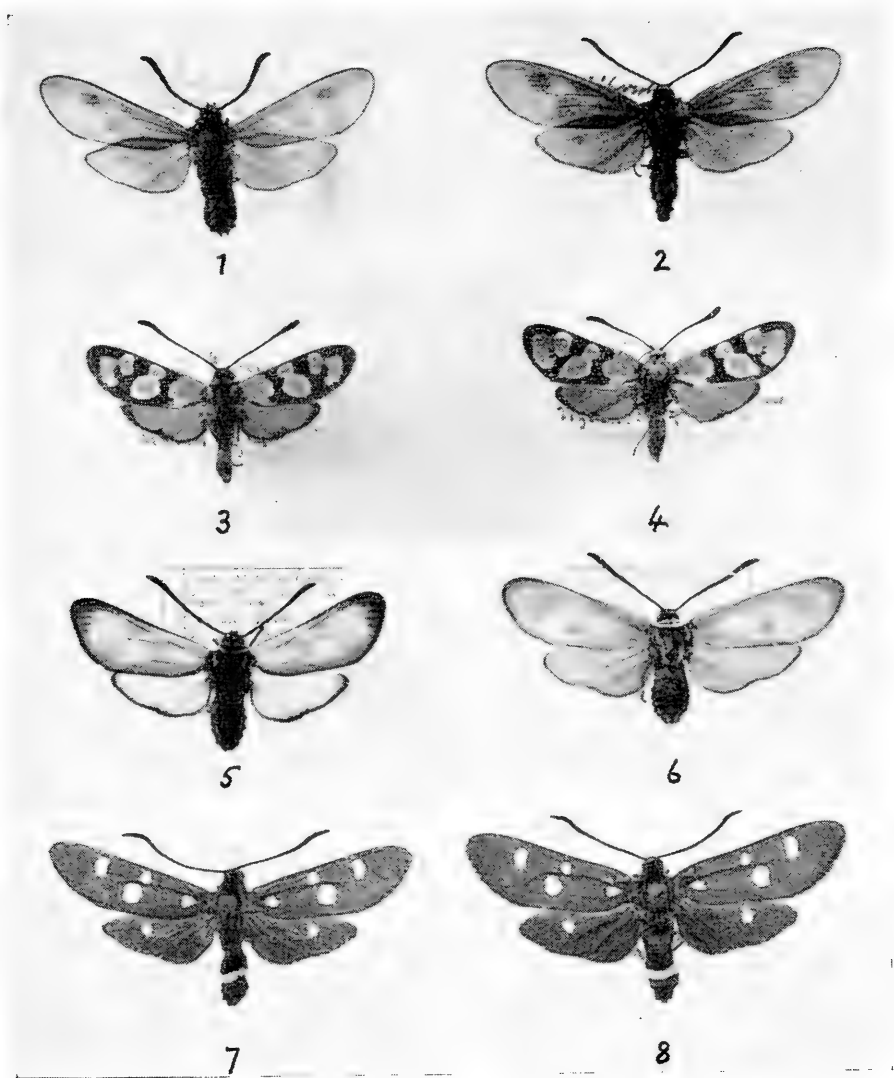
By HUGO REISS, Stuttgart

Zygaena (Mesembrynus) cynarae Esper ssp. **slovakica** n. subsp.

Zygaena cynarae Esper is one of the most interesting species. Its known localities are generally widely separated, consequently the various populations differ in their isolated biotopes. Such an example is shown in 45 ♂ and 7 ♀ that Mr. J. Smelhaus, Prague, sent my son. These specimens are ex coll. Dr. R. Schwarz and are labelled as follows: Slovakia occ. Laksarska—Nova Ves, from the Zahorska nizina (Zahorska Plain) ca 45 km north of Bratislava. The specimens were collected or were reared ex larva on the following dates: v.1947; v.1948; vi.1949; 9.vii.1950; v.1951; 27-30.vi.1951; 9.vii.1952; vi.1960; 26, 28.vi.1961. According to Dr. Schwarz the foodplant is *Peucedanum oreoselinum* Moench.

According to material in my collection, the Slovakian race differs from all known races of *cynarae*. The nominate race was described from Lemberg (Lwów), Galicia (Esper, 1789). Holik (1932: 115) has written on this subspecies and figured specimens from Janów, 20.vii.1931, leg. Swiatkiewicz. Of the nominate subspecies I possess material, labelled: Janów, Lwów, 15.vii.1932, leg. Swiatkiewicz, ex coll. Niesiolowski, with a wing span of 35 mm. in the ♂. Compared with the nominate race, the subspecies from Slovakia is smaller, with a wingspan of 28-33 mm. in the ♂ and 30-34 mm. in the ♀. The red of the forewing spots and the hindwings is lighter. The apex of the forewing is less rounded. Spots 3, 4 and 5 are larger, 3 and 4 are generally narrowly separated from each other. In addition, the dark border of the hindwing is narrower. The red abdominal ring is distinct, in the ♂ only sometimes dusted with

*The placing of the species into their respective subgenera *Mesembrynus* Hübner, *Agnumenia* Hübner and *Zygaena* Fabricius follows Reiss (1958).



- Fig. 1—*Zygaena cynarae slovakica* n. subsp. Holotype ♂, wingspan, 30 mm.
 Fig. 2—*Z. cynarae slovakica* n. supsp. Allotype ♀, wingspan, 32.5 mm.
 Fig. 3—*Z. kavrigini amankutana* n. subsp. Holotype, ♂, wingspan, 24.5 mm.
 Fig. 4—*Z. kavrigini amankutana* n. subsp. Holotype, ♀, wingspan, 24.5 mm.
 Fig. 5—*Z. loti isigensis* n. subsp. Holotype, ♂, wingspan, 29 mm.
 Fig. 6—*Z. loti isikensis* n. subsp. Allotype, ♀, wingspan, 31 mm.
 Fig. 7—*Z. ephialtes ines* n. subsp. Holotype ♂, wingspan, 33 mm.
 Fig. 8—*Z. ephialtes ines* n. subsp. Allotype ♀, wingspan, 35 mm

dark scaling. Only three ♂ of the Slovakian specimens have spots 1 and 3 and 2 and 4 confluent.

Compared with *cynarae austriaca* Schwingenschuss (1952: 136) of which I possess much material from the neighbourhood of Theyern near Herzogenburg, 350-400 m., Lower Austria, the Slovakian race is generally somewhat larger. Schwingenschuss gives 25-33 mm. wingspan for *austriaca*.

The red of the forewing spots and hindwings is somewhat lighter. Forewing spots 3, 4 and 5 are larger. The red abdominal ring does not appear to be essentially variable in either the ♂ or the ♀.

I name this Slovakian race: **slovakica** n. subsp. Holotype ♂, labelled: Slovakia occ., Laksarska Nova Ves, e.l. vi.1951; Allotype ♀, labelled: Zahorska nizina, e.l. v.1951, likewise 44 ♂, 6 ♀ Paratypes in coll. H. and G. Reiss. Further paratypes in coll. Dr. R. Schwarz and J. Smelhaus, Prague.

The types are illustrated on the accompanying plate (figs 1, 2). Wingspan, ♂, 30 mm., ♀ 32.5 mm. The figures show the length and form of the antennae, the wing shape and size and position of the forewing spots.

Zygaena (Argumentia) kavrigini Grum-Grschimailo ssp. **amankutana** n. subsp.

Grum-Grschimailo found the nominate *kavrigini* in the Dzhilian-Tau (Zeravshan) and near Baldzhuan (Karategin), Bucharra, 800-1200 m. Holik and Sheljuzhko (1956: 170-174) wrote at length on this species and quoted the original description of *kavrigini* Grum-Grschimailo (1887; 1890) and also the description of *rhodogastra* Staudinger (1889), which is placed as a synonym. From the Tring Museum I received 1 ♂ from coll. Grum-Grschimailo with the date of capture, 22.v.1885, handwritten in old style. Forewing length 12 mm., wingspan 25.5 mm. From the coll. Seiler, Montpellier, without details of the collector, I have 6 ♂, 2 ♀ labelled: mont. Zeravshan, Aman Kutan, 22.vi.1966, Uzbek S.S.R., that do not agree with the original description and the above mentioned specimen. On the whole, the specimens from Aman Kutan are quite uniform. They differ from the nominate subspecies, which in size has a wing length of 12-13 mm. in both sexes, while Staudinger, in describing *rhodogastra*, gave 25-30 mm. as wingspan. The wingspan of the specimens from Aman Kutan is 22-25 mm. in the ♂, 24.5 and 26.5 mm. in the two females. In shape the forewings are narrower and more pointed. The confluent, brick-red basal spots 1 and 2 of the forewings do not reach the inner margin, from which they are separated by the broad, yellow edging of these spots. This yellow edging more or less extends along the inner margin, especially in the ♀. The base of the wing is lightly dusted with dark scaling. Spots 3 and 4 are broadly surrounded with light yellow, spot 4 is larger with the point orientated towards the tornus. Spot 5 is likewise broadly surrounded with light yellow, spot 6 appears longer and is just connected to spot 5 anteriorly. In 1 ♂ spot 6 is separate, while in 1 ♀ the connection of spot 6 is broader. Spot 6 is distinctly edged with yellow around the posterior half, on the anterior half the edging is narrower. In 1 ♀ the lower part of spot 6 is almost yellow. The characteristic features of *kavrigini*, such as brick-red frons, patagia and tegulae, and the red abdomen (of both sexes, but stronger in the ♀) are all present in these specimens. Specimens with quite

narrow or absent yellow edging of the forewing spots, that often occur in typical *kavrigini* (= *rhodogastra*), are absent. On the underside, the yellow edging is clearly evident.

Holik and Sheljuzhko (1956: 173) state that the locality Dorf Aman Kutan is in the foothills of the Zeravshan Mountains.

I name this race **amankutana** n. subsp. Holotype, ♂, mont. Zeravshan, Aman Kutan, 22.vi.1966, Uzbek S.S.R.; Allotype ♀ with the same data. Paratypes, 5 ♂, 1 ♀ with the same data in coll. H. & G. Reiss.

The types are illustrated on the accompanying plate (figs 3, 4). Wingspan, ♂, 24.5 mm., ♀, 24.5 mm. The figures show the length and form of the antennae, the wingshape, the size of the forewing spots and the breadth of the hindwing border.

Zygaena (Agrumenia) loti Denis and Schiffermüller (*achilleae* auct.) ssp. **isikensis** n. subsp.

Mr. von Demelt sent my son 11 ♂, 16 ♀ labelled: Asia minor, Isik Dag, 1000-1200 m., 100 km. north of Ankara near Güvem, vi.1966, that differ from *loti anatolica* Burgeff (1926: 37) from Es-Schehir, southern Anatolia. These specimens also differ from specimens in my collection from Ak-Chehir, Anatolia, 1909, leg. Korb; Ak-Chehir, 21-30.vi.1928, leg. von Bartha; Aksehir, Sultan Dag, 1000-1500 m., 20-30.vi. and vii.1934, leg. Pfeiffer, München; Aksehir, Sultan Dag 15.vi.-13.vii.1963 leg. Leinfest and Bulghar Dag, Namrun, 1460-1600 m., 16.vi.1965, leg. von Demelt.

The specimens from Isik-Dag are on average larger, somewhat densely scaled and with large forewing spots. Wingspan, ♂ 27-31 mm., ♀ 28-31 mm. The red is somewhat warmer. The yellow scaling in the spot area is less in the ♂, but in the ♀, however, is well represented. The tendency to confluence of the forewing spots is less when compared with ssp. *anatolica*. Holik and Sheljuzhko (1955: 146) wrote at length on ssp. *anatolica* Burgeff. The series from Isik-Dag differs from the ssp. *pontica* Holik and Sheljuzhko (1955: 143) from Amasia by its size, the much broader wings and the dense scaling.

I name this race: **isikensis** n. subsp. Holotype, ♂, Asia minor, Isik Dag, 1000-1200 m., 100 km. north of Ankara near Güvem, vi.1966; Allotype, ♀ with the same data; Paratypes, 10 ♂, 15 ♀ with the same data, in coll. H. and G. Reiss.

The types are figured on the accompanying plate (figs 5, 6). These figures show the length and shape of the antennae, the wingshape, the size and position of the forewing spots and the breadth of the hindwing border.

Zygaena (Zygaena) ephialtes Linné ssp. **ines** n. subsp.

Mr. J. R. Caron and his wife, of Hilversum, found *Z. ephialtes* Linné near Jaca (Huesca), 800 m., North Spain on 9-17.vii.1966 and sent me 7 ♂, 7 ♀. Mr Caron wrote that he has retained 10 ♂, and 8 ♀ in his collection from Jaca and sent me a description of these specimens. Also Lt.-Col. W. B. L. Manley and his wife collected 11 ♂, 14 ♀ of this race near Jaca, 14-26.vii.1964 (Tremewan and Manley, 1965: 8, 9). This race differs from all known races of *ephialtes*. Wingspan, ♂, 31-33 mm., ♀, 35-36 mm., differing in size from ssp. *roussilloni* Koch (wingspan, ♂, 34 mm., ♀, 34-40.5 mm.), described from Vernet-les-Bains, Pyrénées-Orientales (French Pyrenees). I have in my collection specimens from the type

locality, 24.vii.1928, leg. Fischer, and from Gesse Uzzon (Aude), 7.vii.1931, leg. Aichele; Amboilas, 6.viii.1952, 15.vii.1955, leg. Lucas; Col de Joux, 10 and 12.vii.1952, leg. Lucas, all the localities being in the French Pyrenees. Specimens from Jaca are very uniform and without exception five spotted, red ephialtoid. While in ssp. *roussilloni* Koch the basal spots (1, 2) of the forewings have strong red scaling without the usual admixture of white scales, these spots are in the specimens from Jaca strongly reduced and in each example, spot 1 is so strongly dusted with dark scaling that in some specimens, especially the males, it is only just visible. Definite traces of white edging to spot 2 is present in the Jaca specimens, in spite of the dark scaling. On the underside, spots 1 and 2 are so reduced that they are only just discernible. The white spot 4 is in all specimens from Jaca, smaller than that in *roussilloni*, whilst the size of the forewing spots 3 and 5 are also smaller when compared with those of *roussilloni*. The admixture of red scaling in the white of the forewing spots is much less than in those in *roussilloni*.

Further localities for this subspecies, from specimens in coll. Caron: Ordesa, ca 1100-1200 m., 11 ♂, 13 ♀, 28-31.vii.1962, common but worn, and Panticosa, ca 1200 m., 3 ♂, 1 ♀, 14-27.vii.1962. According to Mr. Caron, these specimens from Ordesa and Panticosa agree exactly with those from Jaca. The biotope is according to Mr. Caron the same in all places, namely, not too dry, bushy places.

I name this race: *ines* n. subsp. Holotype, ♂, Hispania sept. (Huesca), Jaca 800 m., 9-17.vii.1966; Allotype, ♀, with the same data; Paratypes, 6 ♂, 6 ♀ with the same data in coll. H. and G. Reiss; 10 ♂, 8 ♀ with the same data, in coll. J. R. Caron and 11 ♂, 14 ♀ from Jaca (Huesca), 2700 ft., 14-26.vii.1964, in coll. W. B. L. Manley.

The types are figured on the accompanying plate (figs. 7, 8). Wingspan, ♂, 33 mm., ♀, 35 mm. These figures show the length and form of the antennae, the wingshape and the position and form of the spots.

ACKNOWLEDGEMENT

To my son, Dr. Günther Reiss, I am indebted for taking the original photographs reproduced on the plate.

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Inverness-shire in 1967

By Commander G. W. HARPER, R.N. Retd., F.R.E.S.

The fond hope for a recovery in entomological health in 1967, which I expressed as usual last year has been duly and dramatically destroyed! In order to be quite sure there was no obscure fault in the trap, I ran a second trap out of sight of the first for about three months of the six, and the results with it were broadly comparable as regards numbers and variations from night to night. The score for the same six months, April to September 1967, from the one main trap was only 2,500, no less than 1,000 fewer than the previous lowest record in 1966.

The sorry story begins with the onset of another early winter in November 1966, a stormy December with a perfect White Christmas in bright sunshine, followed by a heavy snowfall at Hogmanay. This was however the last real snow and the main winter was very open with very persistent but only moderate frost. A mild spell in the second half of January caused the first *Phigalia pedaria* Fab. to emerge and sit on one of my birches on 15th, equal to the earliest previous date I have recorded here; this was followed by a fair number later in the month and in early February, which month ended in a series of fierce blizzards of wet snow which never lasted long.

March came in like the proverbial lion with mild storm force gales (Beaufort Scale force 10) together with the worst floods for many years in the Spey valley, continuing most of the month. Plovers, thrushes and oyster-catchers arrived in the first week. During the brief intervals between gales I worked my m.v. trap in my birch spinney, the first *Achlya flavicornis* L. and *Orthosia incerta* Hufn. appearing in it on 21st. A visitor, Mr E. A. Sadler, reported *Brachyonica nubeculosa* Esp. and *Poecilopsis lapponaria* Bdv. on 25th, but I did not see the former at all and the latter not until the next month, a few elderly females which had laid all their eggs!

April was mostly very cold and stormy with Easterly blizzards of snow and hail. A few sunny days in the middle of the month tempted a single *Aglais urticae* L. out of hibernation and the sallows into blossom the next week; these were well patronised by the common *Orthosias* and hibernators, but *Lampropteryx suffumata* Schf. was unusually abundant at the catkins.

May was ushered in by the traditional "lambing" snowstorm and frosts for the first week. A few sunny days followed, but apart from one or two *Isturgia carbonaria* Cl. none of the usual sun-lovers was seen. However, the minute trap catches were graced by two male *Odontotia carmelita* Esp., the first appearing on the same day, 12th, as last year. The month ended with a little more sunshine and the emergence of a few *Pieris napi* L. and *Anthocaris cardamines* L. But *Callophrys rubi* L. was again very scarce this year.

June began with the continuation of very cold nights, so that light trap catches varied between nil and seven until 13th, when double figures were at last reached! However, gloriously sunny days began on 10th,

by which time *Argynnis euphrosyne* L. was well out and soon flew freely among the violets growing among the scree boulders of my local hillside. On 14th I had one of the most remarkable Hymenopterous experiences of my life. I had noticed during the previous three days, the beginning of the warm spell, that there were a good number of Queen wasps, *Vespa vulgaris*, busily at work paper-making on fence posts for their nests, and tried to reduce their numbers. In the early evening of 14th, whilst having a drink with a friend on his verandah, I noticed the queens swarming to the fresh buds of a Cotoneaster bush under the window, and I succeeded in netting no less than twenty-four in half an hour; I saw very few worker wasps later in the year. The sunny spell ended after only eight days on 18th, and our summer was virtually over. On this last hot day I visited the solitary and most northerly British colony of our rarest local Butterfly, *Cupido minimus* Fuess. to find it in very good heart, flying in very good numbers, in both sexes. Later in July, larvae were plentiful also and easy to find. This lovely little species was certainly one of the few bright spots in this depressingly poor season. A single immigrant *Vanessa atalanta* L. was also seen in an Aviemore garden on 18th June.

July was a very stormy, cold, wet month, so that the usual summer common butterflies appeared slowly and in small numbers. I did not see the first *Aricia artaxerxes* Fab. until 6th, and this species remained scarce again this year, nor was *Argynnis aglaia* L. at all abundant, appearing first as late as 22nd. One fairly mild night was that of 15th, when I sampled the high moorlands of Dalwhinnie with sugar and m.v. Moths were fairly numerous, both at sugar and light, no less than four *Apamea exulis* spp. *assimilis*, all damaged by the blustery weather, came to the latter. Light trap catches continued miserably small, with the year's record large total to date of 42 moths on the last night, 31st.

August produced a mixed bag of weather, with a fair amount of sun, especially in the third week. By 6th, *Erebia aethiops* Esp. was well out and particularly plentiful at Aviemore, where on this day in a grassy dell with many Ragwort plants I have never before seen such a beautiful concentration of this lovely butterfly, between ten and twenty individuals feeding avidly on each flower clump, the vivid females emerging all around, and many pairs in cop. The usual summer moths were about, but trap catches remained poor, though a maximum of fifty a night was reached occasionally! Finding myself in Elgin on 22nd I took my portable 20 watt m.v. tube to the cliff tops near Hopeman in fond hope of taking *Euschesis orbona* Hb. but was only rewarded by some fresh *E. comes* Hb., *Amathes agathina* Dup., and the local melanic form of *Caradrina blanda* Schf. Returning home, the month ended with a little more sunshine and one or two *Aglais urticae* in my garden but no migrants, not even one *Plusia gamma* L.!

September also produced some pleasant sunny days with rather less of the frustrating high winds which have been a pronounced feature of our weather recently. The normally common autumn species were seen in well below normal numbers, the Oporinias in particular were actually rare, especially *O. autumnata* Bork., and larvae too were very scarce and the few I found heavily parasitized.

October saw the virtual end of the season; it was the coldest, wettest and windiest for years. The hills were snow covered on 4th, and snow reached the low ground on 18th, which was followed by a mild, wet week

in which both *Operophtera brumata* L. and *O. fagata* Scharf. emerged with a fair number of *Erannis aurantiaria* Hb. So ended another disappointing year.

Nedaich, Newtonmore, Inverness-shire. 15.i.68.

Robert Dick Centenary Exhibition, Thurso, Saturday, 16th July 1966

By I. R. P. HESLOP

Robert Dick, 1810-1866, was an entomologist, and also my greatgrand-uncle. Some details are given below, but a very full biography was written by Samuel Smiles. This fact speaks in itself for the calibre of the subject, though unfortunately the book is now better known to the Scots than to the English.

Dick's collection of all orders of insects, taken exclusively in Caithness (the whole of which county he regularly covered on foot), is known to have included 240 species of Macrolepidoptera. Samuel Smiles saw his entomological collection, in a neglected state, about 1875; but it has since disappeared. It is chiefly as a pioneer geologist and botanist that Robert Dick is famous, but his influence on the study of entomology was undoubtedly very great; and I commend this aspect of his work to possible further research. Unfortunately his own name was not always credited with the prodigious amount of work that he did in all fields: and Samuel Smiles alludes to an instance of an extensive assembly of geological specimens being connected with the name of another geologist without any mention of the fact that every one of them had been collected by Robert Dick. He was almost quixotically generous with both specimens and information.

Robert Dick's house at Thurso is reverently preserved. His birth-place at Tullibody (January 1810), despite previous promises of preservation, has recently been pulled down.

Dick died on 24th December 1866, being accorded a public funeral and a splendid monument; and his centenary year was commemorated by means of an extensive exhibition during Thurso's gala week in the summer. This exhibition was the product of the devoted and protracted labours of a group of local geologists and botanists; and as a result thereof some additional information on and relics of Robert Dick came to light. One of these latter was an actual photograph of him, the only likeness previously known having been the pen and ink portrait which forms the frontispiece of Samuel Smiles's work. The exhibition attracted a good deal of attention; and visitors came to it from all parts of the world, even from England. Many exhibits, comprising some of Dick's original specimens, were lent from various sources including the Royal Scottish Museum. The exhibition was honoured by a visit from the Queen Mother.

As Robert Dick's great grand-nephew, I had the honour of being invited to perform the opening ceremony at Thurso on Saturday, 16th July 1966, for which purpose I made a rail journey of 800 miles from my school in Hampshire. On the afternoon of that day, accompanied by the local geologists, I visited the site on Holburn Head where Dick had obtained both geological and entomological specimens. Here, also, on the bleak and rugged headland overlooking the wild sea, I had the pleasure

of collecting two specimens of the large heath butterfly as a souvenir of the occasion.

The proceedings, including the visit to Holburn Head, were covered by the B.B.C. I reproduce hereunder the text of my inaugural speech, which has not previously appeared in print.

Speech by Mr Ian Robert Penicuik Heslop

My Lady Provost, Ladies and Gentlemen,

We are met here to commemorate, and to inaugurate a permanent tribute to the memory of, a great man, ROBERT DICK—pioneer Geologist and Naturalist—who was born at Tullibody in 1810 and who lived and worked here in Thurso for thirty-six years, dying here in 1866: one hundred years ago.

So many of the features, which we take for granted now, were a century ago matters of amazement and incredulity. Robert Dick lived in an age in which the doctrine of evolution, to which his studies and his specimens contributed so much, came as an alternative as much as nuclear fission does to ours. It was then still widely believed that the fossils which he so carefully and piously garnered were the work of demons; or even—by the anti-evolution school of religion—that they had been put there, by their own equivocal deity, just to confuse mankind: in other words, to their own supine belief, that Creation embodied one colossal lie.

Robert Dick furnished much of the material, literally did a great part of the spade-work, which others—more advantageously placed—used to make themselves famous and comfortable. And yet, though he had been besought by Peers and Princes and Philosophers, he himself died in want. But his work and his influence live on.

I do not know where any of the books he so treasured now are; and his collection of entomological specimens (which, according to family tradition, included a Satyrid butterfly new to Britain but unrecorded) has long since perished from neglect. In the field of botany he added several species of plants to the British list; and his herbarium, at that time unrivalled outside museums, has survived the neglect of former years. His geological specimens have been dispersed all over the world; but some, from Scottish locations, are re-assembled here again to-day.

I speak with feeling, since not only am I a naturalist (an entomologist in particular); but I am also the son of a geologist.

It is appropriate here to speak from a family viewpoint about one consideration. I observe that externally there has been some controversy as to whether Robert Dick was born in 1810 or in 1811. This is not the case within the family. My maternal grandfather (also a Robert Dick), who was his nephew, told me that it was definitely in 1810 that the Robert Dick was born.

I feel also a considerable additional bond with my great grand-uncle in that, as I note, he learned Latin exceptionally quickly; and that I myself, since my retirement from the Nigerian Administrative Service, have earned my living by teaching Classics.

Robert Dick was a poet and a visionary as well as a scientist. He was a profoundly religious man, though his views were not always acceptable to that brand of orthodoxy which precluded thought. Not the least of his achievements was the reconciliation, even identification, to

his own highly critical and original mind of the scientific and religious points of view. As a University Professor said of him: "In this man were combined singular powers of thought, the greatest devotion to natural science, and a truly devout and earnest spirit."

And now, since this is the only speech I shall be making; and more especially since presently I shall in silence be laying a wreath on the grave of my forbear, I conclude by quoting from Robert Dick's own profession of faith:—

"The whole universe is set to music! It is harmonious. There is, in truth, no jarring, no discord. And when man thinks that he discovers a want of harmony, the fault is in himself. It is he that is out of tune, and not Nature — not the Creator of the Universe."

I have the greatest pleasure and satisfaction in formally declaring open the Robert Dick Centenary Exhibition, an honour of which I am deeply sensitive.

Lepidoptera from the Stirling Area

By D. L. COATES

(Continued from p. 12)

- Thera obeliscata* Hübn. May/Oct. very common, appears to be continuously brooded.
- T. firmata* Hübn. Uncommon.
- Hydriomena furcata* Thunb. Common.
- H. coerulata* Fab. Uncommon.
- Chesias legatella* Schiff. Common.
- Odezia atrata* L. Cambusbarron, local but common where found.
- Anaitis plagiata* L. Uncommon.
- Epirrhoe alternata* Müll. Common, double-brooded.
- E. tristata* L. Easterton, widespread, fairly common, single-brooded.
- Eupithecia tenuiata* Hübn. Uncommon.
- E. linariata* Schiff. Fairly common.
- E. pulchellata* Steph. Common.
- E. exigua* Hübn. Fairly common.
- E. centaurata* Schiff. Occasional.
- E. satyrata* Hübn. Cambusbarron, uncommon.
- E. tripunctaria* H.-S. Fairly common.
- E. absinthiata* Clerck. Uncommon.
- E. assimilata* Doubld. Fairly common.
- E. vulgata* Haw. Very common.
- E. castigata* Hübn. Common, some melanic forms.
- E. icterata* de Vill. Uncommon.
- E. indigata* Hübn. Fairly common.
- E. nanata* s.sp. *angusta* Prout, widespread, fairly common.
- E. innotata* s.sp. *fraxinata* Crewe. Uncommon.
- E. abbreviata* Steph. Fairly common, some melanic forms.
- E. sobrinata* Hübn. Uncommon.
- E. lariceata* Freyer. Common.
- E. tantillaria* Boisd. Fairly common.

- Chloroclystis rectangulata* L. Fairly common, both green and black forms.
- Trichopteryx carpinata* Borkh. Bridge of Allan, fairly common.
- Oporinia autumnata* Borkh. Common.
- O. filigrammaria* H.-S. Uncommon.
- O. christyi* Prout. Bridge of Allan, uncommon.
- O. dilutata* Schiff. Very common.
- Operophtera fagata* Scharf. Uncommon.
- O. brumata* L. Very common.
- Abraxas grossulariata* L. Uncommon.
- Lomaspilis marginata* L. Widespread, common.
- Deileinea pusaria* L. Common.
- D. exanthemata* Scop. Cambusbarron, uncommon.
- Ellopia fasciaria* L. Uncommon.
- Campaea margaritata* L. Widespread, common.
- Ennomos quercinaria* Hufn. One at light in x.1962.
- Deuteronomos alniaria* L. Fairly common.
- Selenia bilunaria* Esp. Common.
- S. lunaria* Schiff. Fairly common.
- Gonodontis bidentata* Clerck. Common, including one ab. *nigra* Prout
- Colotois pennaria* L. Common, very variable.
- Crocallis elinguaris* L. Common.
- Ouropteryx sambucaria* L. Fairly common.
- Opisthograptis luteolata* L. Very common, however, not out until end of May.
- Pseudopanthera macularia* L. Cambusbarron, common in one area.
- Semiothisa liturata* Clerck. Widespread, fairly common.
- Theria rupicaparia* Schiff. Uncommon.
- Erannis leucophaeria* Schiff. Fairly common.
- E. aurantiaria* Hübn. Fairly common.
- E. marginaria* Fab. Fairly common.
- E. defoliaria* Clerck. Common.
- Phigalia pilosaria* Schiff. Very common.
- Biston strataria* Hufn. Bridge of Allan, uncommon.
- B. betularia* L. Common, approximately 3 typical to 1 ab. *carbonaria*, no ab. *insularia*.
- Cleora rhomboidaria* Schiff. Fairly common.
- Alcis repandata* L. Fairly common.
- Ematurga atomaria* L. Widespread, very common.
- Bupalus piniaria* L. Widespread, common.
- Itame wauaria* L. Uncommon.
- Lithina chlorosata* Scop. Widespread, very common.
- Chiasmia clathrata* L. Uncommon.

HEPIALIDAE

- Hepialus humuli* L. Common.
- H. sylvina* L. One only.
- H. fusconebulosa* Deg. Common.
- H. lupulina* L. Fairly common.

PYRALIDAE

- | | |
|-----------------------------------|--------------------------------------|
| <i>Aphomia sociella</i> L. | <i>C. pratellus</i> L. Cambusbarron. |
| <i>Crambus pascuellus</i> L. Bal- | <i>C. culmellus</i> L. |
| maha. | <i>C. hortuellus</i> Hübn. |

Crambus pinellus L.
C. tristellus Fab.
Eurrhyncha hortulata L.
Phlyctaenia lutealis Hübn.
P. ferrugalis Hübn. One at
 light on 29.x.1963.
P. prunalis Schiff.
P. fuscalis Schiff.
Pyrausta purpuralis L. Cam-
 busbarron.
P. cespitalis Schiff. Cambus-
 barron.
Scoparia murana Curt.
S. frequentella Staint.
S. cembrae Haw.
S. ambigualis Treits.
Mesographe forficalis L.

PTEROPHORIDAE

Platyptillia gonodactyla Schiff.
P. pallidactyla Haw.
Stenoptilia bipunctidactyla
 Haw.

PHALONIIDAE

Phalonia badiana Hübn.
Euxanthia straminea Haw.
E. hamana L. Cambusbarron.

TORTRICIDAE

Pandemis heparana Schiff.
P. ribeana Hübn.
Tortrix loeflingiana L.
T. viridana L.
T. paleana Hübn.
T. forsterana Fab.
T. costana Fab.
T. unifasciana Dup.
T. musculana Hübn. Cambus-
 barron.
Eulia ministrana L. Balmaha.
E. politana Haw. Sheriffmuir.
Expate congelatella Clerck.
 Males only at light.
Cnephasia virgaureana Treit.
C. incertana Treit.
Argyrotoxa bergmanniana L.
A. conwayana Fab.
Peronea caudana Fab.
P. contaminana Hübn.
P. latifasciana Haw.
P. variegana Schiff.
P. sparsana Schiff.

P. hyemana Haw.
P. literana L. One at light
 22.x.1963.
Gypsonoma dealbana Fröl.
Notocelia rosaecolana Doubl.
Eucosma diniana Guen.
E. ratzeburgiana Sax. One at
 light 26.viii.1965.
E. corticana Hübn.
E. scopoliana Haw.
E. pflugiana Haw.
E. cirsiana Zell.
E. tripunctana Fab.
E. ramella L.
E. nisella Clerck.
E. tetraquetra Haw. Easter-
 ton.
E. tedella Clerck. Cambus-
 barron.
E. semifuscana Steph.
Bactra lanceolana Hübn.
Endothenia antiquana Hübn.
Argyroproce betuletana Haw.
Laspeyresia ulicetana Haw.
 Easterton.
L. perlepidana Haw. Kippen.

COSMOPTERYGIDAE

Mompha conturbatella Hübn.

OECOPHORIDAE

Endrosis lactella Schiff.
Borkhausenia pseudosporetella
 Staint.
Chimbache fagella Fab.
Depressaria heracliiana L.
D. costella Haw.
D. umbellana Steph.
D. assimilella Treit.
D. arenella Schiff.
D. applana Fab.
D. ocellana Fab.

ORNEODIDAE

Orneodes hexadactyla L.

GLYPHIPTERYGIDAE

Glyphipterix thrasonella Scop.
 Balmaha.

HYPONOMEUTIDAE

Argyresthia laevigatella H.-S.
A. goedartella L.
Hyponomeuta evonymella L.

COLEOPHORIDAE

- Coleophora albicosta* Haw.
C. caespititiella Zell.

TINEIDAE

- Monopis rusticella* Hübn.
Tinea semifulvella Haw.

GRACILLARIIDAE

- Lithocolletis quercifoliella*
Zell. Sheriffmuir.
Gracillaria syringella Fab.

ADELIDAE

- Adela viridella* Scop. Easter-
ton.
Nemophora swammerdamella
L. Easterton.

PLUTELLIDAE

- Cerostoma xylostella* L.
Plutella maculipennis Curt.

ERIOCRANIIDAE

- Mnemonic* *subpurpurella*
Haw.

The following lists are not comprehensive and include only those species not mentioned above.

PERTHSHIRE

LASIOCAMPIDAE

- Trichiura crataegi* L. Aberfoyle.
Macrothylacia rubi L. Callander, larvae only, but bred through.

ARCTIIDAE

- Celama confusalis* H.-S. Brig O' Turk, fairly common.
Cybosia mesomella L. Brig O' Turk, uncommon.
Diacrisia sannio L. Brig O' Turk, one only.
Parasemia plantaginis L. Findo Gask, fairly common.

NOTODONTIDAE

- Drymonia dodonea* Schiff. Brig O' Turk, fairly common.

DREPANIDAE

- Drepana lacertinaria* L. Brig O' Turk, one only.

NOCTUIDAE

- Polia hepatica* Clerck. Brig O' Turk, uncommon.
P. nebulosa Hufn. Brig O' Turk, fairly common.
Hadena rivularis Fab. Brig O' Turk, uncommon.
Orthosia gracilis Schiff. Brig O' Turk, fairly common.
Xylena exsoleta L. Aberfoyle, one only.
Apamea exulis s.sp. *assimilis* Doubl. Brig O' Turk, one at light on
31.vii.1964.
Hydraecia crinanensis Burrows. Glendevon, fairly common.
Rivula sericealis Scop. Brig O' Turk, fairly common.

GEOMETRIDAE

- Scopula lactata* Haw. Brig O' Turk, fairly common.
Ortholitha plumbaria Fab. Findo Gask, fairly common.
Thera juniperata L. Callander, fairly common in one area.
Deuteronomos erosaria Schiff. Aberfoyle, common.
Plagodis dolabraria L. Brig O' Turk, fairly common.

Ectropis biundulata de Vill. Brig O' Turk, common.

Alcis jubata Thunb. Brig O' Turk, uncommon.

PYRALIDAE

Nomophila noctuella Schiff. Aberfoyle, one at light on 3.x.1965.

Scoparia truncicolella Staint. Aberfoyle.

TORTRICIDAE

Peronea abietana Hübn. Aberfoyle, one at light on 11.x.1965.

Lathronympha hypericana Hübn. Glen Farg.

Hemimene aeratana Pierce. Glen Farg, one on 2.vii.1965.

GELECHIIDAE

Chelaria conscriptella Hübn. Aberfoyle.

OECOPHORIDAE

Chimabacche phyrganella Hübn. Aberfoyle.

Depressaria scopariella H.-S. Aberfoyle, fairly common.

D. ciliella Staint. Brig O' Turk.

HYPONOMEUTIDAE

Argyresthia retinella Zell. Aberfoyle.

GRACILLARIIDAE

Lithocelletis cramerella Fab. Aberfoyle.

PLUTELLIDAE

Cerostoma costella Fab. Aberfoyle.

C. radiatella Don. Aberfoyle.

FIFESHIRE

GEOMETRIDAE

Rheumaptera undulata L. Kincardine, one on 21.vi.1965.

Perconia strigillaria Hübn. Kincardine, uncommon, in one area.

PTEROPHORIDAE

Platytilia acanthodoctyla Hübn. Kincardine.

PHALONIIDAE

Euxanthis angustana Hübn. Kincardine.

TORTRICIDAE

Argyroploce palustrana Zell. Kincardine.

A. urticana Hübn. Kincardine.

GELECHIIDAE

Gelechia ericetella Hübn. Kincardine.

OECOPHORIDAE

Pleurota bicostella Clerck. Kincardine.

LANARKSHIRE

NOCTUIDAE

Apamea furva s.sp. *scotica* Cockayne. Airdrie, one only.

Pyrrhia umbra Hufn. Airdrie, one at light on 28.vii.1963.

GEOMETRIDAE

Xanthorhoe munitata Hübn. Airdrie, uncommon.

Perizoma albulata Schiff. Airdrie, one only.

TORTRICIDAE

Evetria posticana Zett. Bishopbriggs.

Argyroproce sororculana Zett. Bishopbriggs.

“Daldryshaig”, Aberfoyle, Perthshire, 1967.

Any Number can Join ; — BUT !

By C. F. COWAN

Whether or not nomenclature can be called a game, of course any number can participate—but for Linnaeus' sake learn the rules, and play the game!

The first, unfortunate, highly misleading and inaccurate contribution to the debate, is best forgotten. But Dr. Ainley raised some constructive queries, most of which were ably answered by Mr. Warren, in the December and February numbers of the *Record*. To the plea for an article on “Nomenclature without Tears” there is only one reply: “read (and understand) the rules”, elementary homework obviously not yet attempted by some. The 87 Articles of the Code are printed in French and English on opposite pages (pp. 4-91), so really occupy only 44, not “91 pages of an octavo volume” (i.e. the same size as this page). And the last 12 Articles deal not with nomenclature but with the constitution and working of the referees committee for the game, the International Commission, whose very existence has been queried by some.

The present writer's very limited experience results mainly from having had to check a number of names of oriental species in the last few years, during which a few historical aspects have been noted. Perhaps the following *resumé*, tracing the evolution of nomenclature towards the establishment of stability, may help sufferers to read the rules with fuller sympathy and less frustration.

Linnaeus crystallised from chaos the early attempts at classification, and really founded binominal nomenclature. His *Systema Naturae*, 1758 edition, was the first work so to classify effectively the whole animal kingdom. It was completely revised and amplified in his final, 1767, edition. His work was acclaimed universally, as he had friends and correspondents in all active countries. On his death, the basis for all systematists naturally became his final work. The “year dot” was taken as 1767.

During the next half-century great quantities of fresh material were gathered by explorers world-wide, and written up in various countries. In this period, without Linnaeus' controlling hand, different procedures evolved. And then, as now, there were non-conformists who went their own individual ways. So were bequeathed untold worries for their successors.

One such, for instance, was “Dr. B” (no connection with our “Dr. A”). Active over 40 years, he became well known for several early works, some of which were unfinished. Then he began to distribute specimens with label names of his own, often inconsistently spelt, to different countries. These would frequently be described by other authors

in various publications. Finally, disregarding the works of others, he wrote several more books and papers publishing many of his old names, in one or other spelling, as new. He also had the habit of ignoring, or just disliking the sound of, established names, and publishing his own, to him more euphonious, substitutes. The literature became increasingly confusing, and the application of the "priority rule", indeed its very framing, posed formidable difficulties.

Another typical source of confusion at this time was the fact that the year 1775 had seen the publication in different countries of no less than four important works on butterflies. No relative priority was known, and later authors followed their own inclinations regarding the many names involved. This state of affairs lasted until 1958, when the International Commission, after careful research, ruled as to the relative precedence to be observed.

Then, towards the end of the 19th century, a long debate began regarding the "year dot". Eventually it was universally agreed that it should be 1758, not 1767. This was perfectly reasonable, as Linnaeus' work of that year, and several immediately following authors, had fully complied with the rules. But the result entailed considerable revision.

At last, in 1901, after a gestation of 11 years, the first comprehensive *International Rules* were drawn up, being published in 1905. So, world-wide control was provided for the first time since Linnaeus.

Finally, from experience of the operation of those Rules, they were revised and became the current *International Code* of 1958 (published 1961).

So much for the evolution of the Code, which includes provision for and is administered by the "referees board", the International Commission. This is a devoted and expert body, democratically constituted, and it is pointless to speak of "They." We are they. If we want to complain about "them" we should formulate our complaint and submit it to them. That is what "they" are for. As often as not, the very act of formulating it will show us the answer. Luckily for me, when I "had a go" and made a mistake it did not appear in print, as the Assistant Secretary of "them", Dr. W. E. China, C.B.E., gently pointed out my error.

One point must be emphasised here. The Commission does not step in and interfere on its own; "they" are the experts, arbiters, and referees in nomenclature, but not experts in every class of the animal kingdom. Thus, sensibly, it is up to the experts in every small branch—"us"—to initiate any desirable action to conserve stability in it by putting the necessary case to the Commission. And to be aware of what is going on lest a case go by default; the Commission might, through inadequate guidance or through misguidance, be led to give an undesirable ruling.

Editors of journals in branches of zoology would greatly help in this respect if they publicised for us briefly the titles of any cases before the Commission. Full details appear about every other month in the *Bulletin of zoological Nomenclature*, which surely should be accessible to at least one member of the editorial staff.

To quote, carefully, from Dr. Ainley's concluding remark about specific names; ". . . it matters not one jot whether we choose to call it *magnus*, *major*, or *maximus*, provided everyone agrees to call it by the

same name. If the last condition is not fulfilled, the function of the name as a means of communication breaks down, as so frequently happens under our present system thanks to those who"—*disregard the rules!* (my italics).

The four significant dates in the history of nomenclature may be given as;

- 1758 "The Year Dot." Linnaeus' *Systema Naturae* edition "10."
- 1767 "False Year Dot." Linnaeus' *Syst. Nat.* ed. "12."
- 1901 Adoption of the *International Rules*.
- 1961 Publication of the current 1958 *International Code*.

The adventures of the specific name *Papilio aglaja* may now be worth reviewing. It was Linnaeus himself who made the mistake of giving this name to two different species in his 1758 work; to the oriental Pierid which we now call *Delias aglaja* on his page 465, and to the Nymphalid species on his page 481. Even under his own rules or canons, this was invalid, and in 1767 he changed the *former* name, leaving the Nymphalid as *P. aglaja*. So, to the early users of the "false year dot", *Argynnis aglaja* (Linn., 1767) became familiar.

Then came 1901, with the International Rules, the adoption of 1758 as year dot, and the "page precedence" rule. This resulted in *Delias aglaja* (Linn., 1758: 465) being validated, with priority over the Argynnid. Hence *chariotta* Haw., the next prior name, became the valid one for the latter as from 1901. Of course it took some time for this to be realised — 34 years in fact. Then, of course, lots of people would not conform. Of course there were varied views, but no one put up a case for conservation and it went by default.

Meanwhile, the Pierid *aglaja* had undergone the reverse upheaval. Linnaeus had corrected this name in 1767 to *pasithoe*, and users of the "false year dot" were quite familiar with *Delias pasithoe* (Linn., 1767). Then, in 1901, its valid name became *Delias aglaja* (Linn., 1758). This change, in due course, was dutifully effected, and this famous migrant species thus smoothly underwent its unnatural transformation.

Finally, for various necessary reasons, the Rules were revised and the current Code adopted. One change was the insertion of the "First Reviser" rule in preference for that of "Page Precedence."

It was six years (i.e. only last year) before it was realised that Linnaeus, 1767 might be called the first reviser of Linnaeus, 1758 in this case, and that if so, *aglaja* could be revalidated for the Argynnid and invalidated for the Pierid. To save *Delias aglaja* from yet another metamorphosis, an application was submitted forthwith to the Commission for its stabilisation. A very sound case could also be made for stabilising *charlotta*. Anyway, in about another two years this 200-year-old problem should finally be settled.

All this may sound laborious and, as so often, it is easy to poke fun. But I firmly believe that we are gradually attaining stability in specific names, and that those who ridicule this view are misguided. It is essential, of course, first to stabilise the Code, and here one sad fact must be faced. One of its most enlightened and useful Articles (Art. 23b), which prevents the resurrection of long-forgotten names, is so couched that the Commission cannot interpret it and has put it in temporary abeyance. There is thus at present an unanswerable riposte to my "read and under-

stand (!) the rules." But it is hoped that this contretemps will be resolved this year.

As for generic names, they surely must always be a matter of degree and opinion. "God made the species, man the genus" (*verb. sap.*, frequently heard at Tring and perhaps there coined; I have even heard it as "The Lord . . ."). Genera are split to reflect our concepts of classification, affinities and evolution, when considering the world-wide population. If we take only a limited view, covering a small area or few species, they are lumped. If one sees all the Argynninae of the world together, one can at once see that *charlotta* (or *aglaja*) and its allies lack something which is possessed by the true *Argynnis*, typified by *paphia*. Hence, to the splitter, *Mesoacidalia* is good; to the lumper, *Argynnis* may be adequate. The few species collected in the nearby woods could as well all be lumped as *Papilio*.

To conclude, let us paraphrase our Ministry of Transport slogan:—
"STUDY AND FOLLOW THE INTERNATIONAL CODE."

Lepidoptera in North-East Derbyshire in 1967

By J. H. JOHNSON, F.R.E.S.

When I read in several magazines and journals last year that moths were becoming less abundant, and even in danger of disappearing altogether in some places, due to excessive use of pesticides and mercury vapour light traps, I felt that a journey into the hunting grounds to investigate was necessary. Accordingly on February 1st 1967 I set out at 8 p.m., carrying a large electric torch and headed for an ancient track called Old Lad's Lane by the local people and Egstow Lane by the Ordnance Survey cartographers. The Old Lad is, of course, the Devil himself,, and anyone who has walked down that lane in midwinter especially at night without a light of any kind will appreciate the inference. I walked slowly down the lane searching the hedgerows for signs of life. Within a very few yards I could have boxed as many Early Moths (*Erannis rupicapraria* L.) as I wanted. Scores of them could be seen resting on the hawthorn twigs, a few were in flight. Many street lamps were shining within easy flying distance of that spot and yet as far as I could tell not one moth made the effort to reach them. No moth was seen that night anywhere near a street light. I know that I was not there all night nor did I visit every light, but I visited enough to show me that light is not such a great attraction to at least one species of moth, and that the light trap has not made all other collecting methods obsolete. Certain species are safe from the blandishments of mercury vapour whatever they may be and will remain "locally abundant" so long as they can find the conditions which suit them, in the case of the Early Moth an undisturbed hedgerow of hawthorn, hazels, brambles, elms, maples, dog roses, blackthorn, wood sage and dog's mercury. I don't know if all these are necessary, but any hedgerow that has them is also likely to have the Early Moth.

On 23rd January an Angle Shades Moth (*Phlogophora meticulosa* L.) emerged from pupae reared *ab ovo* last year, by 10th February over thirty had appeared and been released in the garden. I kept a few of the

larger specimens to provide some viable eggs, but I was disappointed. Hundreds of eggs appeared in the boxes all infertile.

The first Small Tortoiseshell Butterfly (*Aglais urticae* L.) was seen at Tibshelf on 23rd March, the last one on 1st September. Throughout the summer this species was plentiful, not quite so abundant as in 1966 when all the nettle beds were smothered in the larvae.

On March 13th at 8.30 p.m. I searched the grassy banks of the Incline for grass feeding larvae. The Incline is a section of what was once part of a railway line from Alma Colliery to the Shunts (an old synonym for marshalling yard for coal wagons), but has not been used for at least fifty years, so it is overgrown with all kinds of weeds, and favoured by numerous insects. After half an hour's search I had found 32 larvae, the majority Cloud Bordered brindle (*Apamea crenata* Hufn.) (*rurea* F.), the rest Dusky Brocade (*Apamea remissa* Hubn. (*obscura* Haw.)) and one unidentified Geometer. This method of collecting is very useful for estimating the population of species with winter feeding larvae. In some years I have picked up scores of larvae in ten minutes on a mild evening in March, sometimes in April, although as the new grass grows the caterpillars are more difficult to find. If the number of larvae found in each hour, or whatever unit of time is most convenient, is recorded in a permanent form, there is a useful statistic for comparison with other places and years with which to build up some picture of population density. On March 20th there was a bright moon shining down at 8.30 p.m. and one hour's search resulted in no larvae anywhere. However, one very small toad was discovered squatting among the tussocks of grass, most likely also searching for insects. The ground temperature was 48° F. and I expected to see plenty of caterpillars on the grass. Perhaps the toads had felt the conditions were just right and had cleaned up before I arrived.

On March 23rd I searched the broom bushes on Clay Cross Gorse Hills for insects. Not one was seen feeding externally, but after I had noticed that some twigs were fastened together with silk webs below suspicious brown scars I looked more closely and found that tiny brown larvae were inside the webs. These were later identified as *Agonopterix assimilella* Treits. (Dusted Flat Body).

On March 24th I walked to Hardwick Woods in the afternoon. Colts-foot, lesser celandine and wood anemone were in full flower. From the oak and birch saplings *Tortricodes tortricella* Hubn. (*hyemana* Hubn.) (Clouded White Shade) was disturbed in large numbers. After a while I found that these moths were easy to find at rest on the twigs of the lower branches, and the best marked specimens could be selected at will.

Male and female sallow bushes were in full bloom and so were the cherry laurels, but no insects were seen feeding at either.

Wragg's Quarry on Darley Moors was visited in the evening. One Emperor Moth (*Saturnia pavonia* L.) cocoon was found on the heather, but contained a batch of parasites. Cotton grass seed-heads were next looked for, but only a few bedraggled scraps of white tufts loosely stuck together and attached to dead stalks were found. These were carefully gathered and guarded until on May 7th five good specimens of *Glyphipteryx haworthana* Steph. (Haworth's Fanner) emerged. The drawing of this species in Stainton's Manual is an excellent likeness.

On the evening of April 4th *Diurnea fagella* F. (*fagi* Haw.) (March

Day) appeared at the lighted kitchen window for the first time this year. The first Humble Bee was seen on April 14th, and the first swallow was seen on April 22nd flying over the waterlogged fields at Ankerbold.

A visit to Jack Flats, Baslow Edge, on May 21st was not very productive. About a score of male Common Heath Moths (*Ematurga atomaria* L.) were flying around a female at rest on a heather plant. One very dark specimen was taken. A few small moths were disturbed and good specimens of *Adela viridella* Scop. (Green Long-horn) and *Nemophora swammerdammella* L. (Swammerdam's Long-horn) were taken. Birch shrubs were searched for Coleophora. In two hours only eight cases were found, so they were not really abundant. The cases were brown and cylindrical, and proved to be *Coleophora fuscidinella* Zell. (Raven Feather Case). The English name was felt to be quite appropriate when the tiny imagines appeared on June 17th. While wandering among the birch shrubs I came across a few clumps of *Luzula pilosa*, and a large patch of *L. campestris*. No coleophora cases found on them. From a large sample of birch leaves showing signs of insect activity gathered from birch shrubs on the same day, several brown *Epinotia solandriana* L. (Solander's Bell) emerged on July 4th. Some very striking varieties of this species have been found among the bushes at this spot.

On May 25th the first pair of *Caloptila syringella* F. (Confluent-barred) were seen in the garden resting on privet leaves. Very few of the imagines were noticed during the summer, and yet almost every leaf on both privet and lilac bushes was disfigured by the blotches made by the larvae. This species has been extremely abundant in this area for the last ten years.

On May 27th a batch of Scalloped Hazel eggs (*Gonodontis bidentata* Clerck) was found on the seed heads of some *Juncus communis* growing in an old sink in the garden. I have found the eggs of this species in some very unsuitable places, but this seemed about the worst of the lot. Unless the larvae were content with a diet of *Juncus* they would have to swim to survive. I kept these ova but failed to rear them, the larvae died of disease when half grown. This species seems to be less frequently met with now.

A trip to Bumper Castle on Darley Moors produced a female *E. atomaria* which laid about 200 eggs. These were kept in a large plastic box and reared through to the pupal stage without the slightest trouble. They were fed on heather at first, but I soon found that they would eat sallow, and gradually they all turned exclusively to the latter, even the dried leaves and thin twigs were consumed, a very unusual diet for most caterpillars. Flying about among the heather at the same place on May 30th were many tiny brown moths. I succeeded in catching two eventually. They were *Neofaculta betulea* Haw. (*ericitella* Hubn.) Heather Groundling, very easy to disturb the first time but when they settled they slipped down among the heather debris and became invisible. The terminal leaves of many bilberry twigs showed signs of larval activity, but no larvae could be found.

(To be continued)

Diptera from Monks Wood National Nature Reserve

By H. J. WILLS, B.Sc., F.R.E.S.

Monks Wood is the largest remaining fragment of a great forest of Oak and Ash which at one time bordered the Huntingdonshire fenlands. It was acquired by the Nature Conservancy as a National Nature Reserve in 1953. Among lepidopterists it is famous as the original British locality for the Black Hairstreak Butterfly and the wood still supports a large number of interesting species including all the Hairstreaks, the White Admiral and the Comma Butterfly. The Lepidoptera and some other orders have been well worked in recent years but, except for the the Syrphidae recorded by Dr. B. N. K. Davis, (*Ent. Gazette*, **16**: 89-93, and **17**: 100). little has been done on the Diptera of the area.

During the summer of 1966 I was temporarily employed by the Nature Conservancy at Monks Wood Experimental Station and for a period of nine weeks, from 10th July to 9th September, I spent my spare time collecting Diptera within the reserve. Despite the poor weather conditions, and the fact that most of my collecting was done in the evenings, I was able to record a total of 248 species.

In order to give some indication of the distribution of species within the reserve I have summarised my observations by recording the presence or absence of each species in the following habitats. The names of rides and compartments of the reserve are as given in the Monks Wood Management Plan, 1964.

1. Boundary rides—Rides passing around the perimeter of the wood and bordered on one side by the wood itself, and on the other by a hedge, and then fields. (Southedge Ride, Top Ride, Eastedge Ride.)

2. Central rides—Those passing through the wood and bordered on each side by woodland. (Main Ride, Hotel Ride, Barrow Ride, Owl Ride, Halls Ride.)

3. Fields and glades within the wood—My collecting from these habitats was largely restricted to the two large fields (Compartments 5a and 6b), and two smaller glades (Compartments 4d and 17d).

4. Ewingswode Stream (Compartment 27b)—This stream has been dammed in three places to make small permanent ponds. Sweeping the vegetation around these ponds resulted in the capture of a number of species not taken elsewhere.

5. Windows of the Experimental Station buildings—On warm days when the outside doors of the laboratories were left open, large numbers of flies entered the buildings and became trapped on the windows. A total of 48 species were found in this situation and of these 16 were not found elsewhere.

In the following systematic list the name of each species is followed firstly by its occurrence in any of the habitats outlined above, secondly by the first and last dates on which I recorded its presence, and finally by any other remarks on the distribution, abundance, or behaviour.

I would like to thank a number of experts who have identified specimens for me. I am greatly indebted to Mr. E. M. C. d'Assis-Fonseca for naming all the Calypterae, and to Mr. L. Parmenter for naming the Dolichopodidae. My thanks also go to Dr. P. Freeman for allowing me to compare specimens with those in the British Museum (Natural History)

and to B. H. Cogan and A. C. Pont for naming the Ephydriidae and Sepsidae respectively. Dr. T. R. E. Southwood kindly identified the Heteroptera taken as prey by *Empis* (*Kritempis*) *livida* L. and finally I am very grateful to Dr. B. N. K. Davis for providing me with information regarding previous Diptera records and to the Nature Conservancy for allowing me the use of laboratory facilities during my stay at Monks Wood.

The nomenclature follows that of Kloet and Hinks, 1945, *A Check List of British Insects*, except where this has been superseded by publications in the Royal Entomological Society's "Handbooks" series, and by family monographs by J. E. Collin, E. M. C. d'Assis-Fonseca, and L. V. Knutson.

Abbreviations: B=Boundary rides, C=Central rides, F=Fields and glades, S=Ewingeswode Stream, W=Windows of the Experimental Station buildings.

*=previously recorded from Monks Wood by B. N. K. Davis.

†=recorded from other areas in Huntingdonshire but not Monks Wood by B. N. K. Davis or by A. J. Cole (*Huntingdonshire Fauna and Flora Society Annual Report 1966*).

All dates refer to the year 1966 so only the day and month have been given in the list.

NEMATOCERA

TIPULIDAE

†*Nephrotoma cornicina* L. W. 19th Aug. Attracted to lighted windows.

†*N. flavescens* L. B. 6th Aug.

†*Tipula oleracea* L. B. 11th Jul.

T. paludosa Meig. B. F. W. 19th Aug. to 8th Sept. Very common in glades.

†*T. fulvipennis* Meig. B. W. 15th to 19th Aug. Several individuals attracted to lighted windows.

†*T. fascipennis* Meig. C. 20th July.

†*T. lateralis* Meig. B. S. W. 6th to 28th Aug. Frequently attracted to lighted windows.

†*Cylindrotoma distinctissima* Meig. C. 8th Aug.

Metalimnobia bifasciata Schr. C. 14th July.

†*Limonia nubeculosa* Meig. S. 28th Aug. Common on tree bark.

Dicranomyia chorea Meig. C. 8th to 13th Aug. In swarms under trees.

ANISOPODIDAE

Anisopus punctatus F. C. W. 23rd Aug.

PTYCHOPTERIDAE

Ptychoptera contaminata L. S. W. 14th to 18th Aug.

P. albimana F. B. S. 15th Aug. to 3rd Sept.

CULICIDAE

Aedes annulipes Meig. C. F. 11th July to 14th Aug.

A. cantans Meig. C. 11th July to 14th Aug.

Theobaldia annulata Schr. W. 26th Aug.

BRACHYCERA

STRATIOMYIIDAE

Chorisops tibialis Meig. B. 17th to 21st July. In swarms under trees.

RHAGIONIDAE

Rhagio tringaria L. C. 11th to 17th July.

Chrysopilus cristatus F. C. 11th July.

TABANIDAE

- Chrysops caecutiens* L. B. C. F. 11th July to 6th Aug.
C. relictus Meig. C. 12th July.
Haematopota pluvialis L. C. F. 11th July.
Tabanus bromius L. W. 12th July. Common on windows.

ASILIDAE

- Machimus atricapillus* Fall. B. F. 15th Aug. to 8th Sept.

EMPIDIDAE

- Crossopalpus nigritella* Zett. B. 23rd Aug. On Oak bark.
 †*Sicodus arrogans* L. C. 16th Aug. On bark of tree.
 †*Tachydromia fasciata* Meig. B. 17th July.
 †*Hybos culiciformis* F. B. C. F. 16th July to 8th Sept.
 †*H. femoratus* Mull. B.C. 11th July to 26th Aug.
Bicellaria vana Collin B. C. F. S. 16th July to 14th Aug.
 †*Ocydromia glabricula* Fall. B. C. 22nd July to 15th Aug.
 †*Empis (Xanthempis) lutea* Meig. B.C. 17th July to 13th Aug.
 †*E. (Kritempis) livida* L. B. C. F. S. 11th July to 6th Aug. Very common throughout the wood. Specimens were taken with the following prey: Heteroptera—*Lophus decolor* Fall., *Phytocoris longipennis* Flor., Diptera—*Syrphus auricollis* Meig., *Melanostoma scalare* F., *Lonchaea flavidipennis* Zett., *Hydrotea cinerea* Deg., *Drosophila subobscura* Collin., *Leptohylemya coarctata* Fall. Also unidentified Homoptera, Neuroptera, Lepidoptera, and Ephemeroptera.
 †*E. (Pachymeria) tessellata* F. B. C. 15th July. to 9th Sept. The latter date is unusually late for this species. (See Wills, 1967, *Ent. Rec.*, **79**: 179).
Empis aestiva Loew. S. 17th July.
Hilara lurida Fall. S. 22nd July.
H. thoracica Macq. F. 11th July.

DOLICHOPODIDAE

- Dolichopus whalbergi* Zett. C. W. 14th July to 17th Aug.
D. festivus Hal. C. W. 11th July to 23rd July.
D. ungulatus L. S. 17th to 22nd July.
Hypophyllus obscurellus Fall. C. 14th July to 23rd Aug.
Poecilobothrus nobilitatus L. F. S. 16th July to 14th Aug.
Medeterus truncorum Meig. B. S. 23rd Aug. to 3rd Sept.
M. dendrobaenus Kowarz. C. 16th Aug.
Xiphandrium appendiculatum Zett. C. S. 14th July to 3rd Sept.
Syntormon pallipes F. F. S. 14th Aug. to 3rd Sept.
Eutarsus aulicus Meig. S. 14th to 28th Aug.
Bathycranium bicolorellum Zett. B. C. S. 14th July to 15th Aug.
Diaphorus oculatus Fall. C. 18th July.
Chrysotus cilipes Meig. S. 17th July.
C. blepharosceles Kowarz B. 8th July.
C. gramineus Fall. C. 14th July to 6th Aug.
Argyra diaphana F. S. 17th July to 14th Aug.
A. argentella Zett. S. 22nd July.
A. leucocephala Meig. B. C. S. 12th to 22nd July.
A. confinis Zett. S. 17th July.
Campsicnemus curvipes Fall. B. S. 17th July to 3rd September.
Sciopus platypterus F. C. 12th July.

CYCLORRHAPHA — ASCHIZA

LONCHOPTERIDAE

Lonchoptera luten Panz. B. S. 5th Aug. to 15th Aug.

PLATYPEZIDAE

Callomyia speciosa Meig. B. C. 17th July to 8th Aug.

SYRPHIDAE

Baccha elongata F. B. 17th July.

**B. obscuripennis* Meig. B. C. 21st Aug. to 9th Sept.

Pyrophaena rosarum F. B. C. 4th to 14th Aug.

**Platychirus manicatus* Meig. F. 4th Sept.

**P. peltatus* Meig. B. C. F. S. W. 14th Aug. to 8th Sept. Common throughout the reserve.

†*P. scutatus* Meig. B. C. F. 2nd Aug. to 4th Sept. Common.

**P. albimanus* F. B. C. F. W. 12th July to 4th Sept. Common.

P. immarginatus Zett. F. 27th Aug.

Xanthandrus comtus Harris B. F. 14th Aug. to 1st Sept.

**Melanostoma scalare* F. B. C. F. 17th July to 21st Aug. Large numbers of this species were found dead and attached to grasses, apparently victims of a parasitic fungus.

**M. mellinum* F. B. C. F. W. 17th July to 23rd Aug. Common on laboratory windows.

**Sphaerophoria scripta* L. F. 2nd Aug. to 8th Sept.

**S. menthastri* L. F. S. W. 23rd July to 8th Sept.

**Leucozona lucorum* L. C. 20th July.

**Scaeva pyrastris* L. B. F. 22nd to 29th July.

Syrphus torvus Osten-Sacken C. 24th July to 27th Aug.

**S. ribesii* L. C. F. 12th July to 27th Aug. Common.

**S. vitripennis* Meig. B. C. F. 17th July to 27th Aug. Common.

**S. albostriatus* F. B. C. F. 2nd Aug. to 3rd Sept. Frequent.

**S. grossulariae* Meig. C. 16th July.

**S. tricinctus* Fall. F. 6th Aug.

**S. corollae* F. C. F. 20th July to 1st Sept. Frequent.

**S. latifasciatus* Macq. B. C. 14th July to 9th Sept.

**S. luniger* Meig. B. F. 24th July to 8th Sept.

**S. balteatus* Deg. B. C. F. S. W. 11th July to 8th Sept. Very common throughout the wood.

†*S. auricollis* Meig. B. C. W. 11th July to 4th Sept. Very common.

**S. cinctellus* Zett. B. C. 21st Aug. to 27th Aug.

S. cinctus Fall. C. 2nd Aug.

**S. umbellatarum* F. B. 21st Aug.

Chrysotoxum bicinctum L. B. F. 31st July to 6th Aug.

**Rhingia campestris* Meig. B. C. F. S. W. 6th Aug. to 8th Sept. Common.

Ferdinandia cuprea Scop. B. 11th July to 27th Aug.

**Neoascia podagrica* F. C. S. W. 17th July to 8th Sept. Common around Ewingswode Stream.

†*Pipiza bimaculata* Meig. B. 23rd Aug.

Heringia heringii Zett. B. 31st July.

**Cheilisia intonsa* Loew F. 21st Aug.

**C. paganus* Meig. B. C. 31st July to 3rd Sept.

C. scutellata Fall. C. 6th to 21st Aug.

**C. bergenstammi* Becker C. F. 21st Aug. to 8th Sept.

- **C. proxima* Zett. B. 31st July.
 **Volucella bombylans* L. F. 24th July.
 **V. pellucens* L. B. C. F. S. 11th July to 2nd Sept. Frequent.
 **Eristalis sepulchralis* L. F. 4th to 8th Sept.
 **E. pertinax* Scop. B. C. F. S. 12th July to 3rd Sept. Common.
 **E. intricarius* L. B. F. 23rd Aug. to 9th Sept.
 **E. tenax* L. B. F. W. 31st Aug. to 8th Sept.
 **E. arbustorum* L. F. W. 21st July to 3rd Sept. Common in fields and glades.
 †*E. nemorem.* B. 22nd July.
 **Myiatropa florea* L. B. F. 21st July to 6th Aug.
 **Helophilus pendulus* L. C. F. S. 21st July to 8th Sept. Very common in fields within the wood.
 **H. hybridus* Loew. F. 14th Aug.
 **Xylota sylvarum* L. B. C. F. W. 23rd July to 21st Aug. Frequent.
 **X. segnis* L. B. C. F. S. W. 23rd July to 8th Sept. Common and widespread.
 **Syrirta pipiens* L. B. C. F. S. W. 17th July to 8th Sept. Common and widespread.
 **Eumerus strigatus* Fall. B. F. 8th to 21st Aug.
E. ornatus Meig. B. 31st July.

CYCLORRHAPHA—SCHIZOPHORA

ACALYPTERAE

CONOPIDAE

- Conops quadrifasciata* Deg. B. C. F. S. 5th to 23rd Aug. Very common during the middle of August.
Phyocephala rufipes F. F. 2nd to 21st Aug.

PIOPHILIDAE

- Piophila vulgaris* Fall. C. 8th Sept.

DRYOMYZIDAE

- Neuroctena anilis* Fall. C. F. W. 23rd July to 1st Sept. Several pairs "in cop" on and around a dead rabbit.

LONCHAEIDAE

- Lonchaea vaginalis* Fall. S. W. 17th to 23rd July.
L. flavidipennis Zett. B. C. F. W. 11th July to 8th Sept. Very common and widespread.

(To be continued)

Notes and Observations

RHAMPHOMYIA (AMYDROMEURA) HIRSUTIPES COLLIN (DIP. EMPIDIDAE) IN SHROPSHIRE—I took a single male of this interesting little Empid in Candy Woods, Oswestry, on 24th August 1967. Unfortunately I did not recognise it until I got home, and although I returned to the spot twice within the next few days in the hope of taking further specimens, I was unsuccessful.

The species was described by Mr. J. E. Collin in 1926 (*Ent. mon. Mag.* 62: 218) and is remarkable by reason of its clothing of extraordinarily

long hairs on the front tibiae and tarsi, almost reminding one of the shaggy long-haired fetlocks of a shire horse.

Apart from this it much resembles *R. erythrophthalma* Mg., and there is a strong suspicion (Collin (1961) *British Flies Vol. VI Empididae*: 439) that in the male sex these are dimorphic forms of the same species. The evidence for this is largely circumstantial. The female appears to be indistinguishable, though it has been stated that no female has yet been taken *in copula* with male *hirsutipes*. In addition, *hirsutipes* has apparently only been recorded from localities where *erythrophthalma* also occurs, and as corroboration of this I took a male of the latter species at the same time as the male of *hirsutipes* and within a few yards of the same spot.

Both species (or forms) occur in late summer and autumn in wooded localities, and are uncommon, or perhaps overlooked.—C. H. WALLACE PUGH, Derwent Dene, Oswestry. 10.ii.1968.

RHAMPHOMYIA (AMYDROMEURA) HIRSUTIPES COLLIN IN SUSSEX—Besides the localities mentioned by Mr. Collin in *British Flies VI Empididae* I can add Tilgate Forest, for I captured a male on 4th September 1949 when I also gathered the commoner and more widespread *R. (A.) erythrophthalma* Mg. there.—L. PARMENTER.

LEPIDOPTERA AT HEVERSHAM—Addenda et Corrigenda. Regrettably it is necessary to publish a few additions and changes to "Lepidoptera at Heversham" (*Ent. Record*, 79. 271-278 and 302-306). The corrections are as follows:

On p. 271 line 27 "16.iv.1965" to read "16.ix.1965."

Under Thyatiridae (p. 272) add "*Tethea duplaris* L., 1 specimen 16.vi.1967."

On p. 272 delete entries: "*H. trifolii* Hufn." etc., "*H. bombycina* Hufn." etc.

For "*P. blandiata* Schiff." (p. 274) read "*P. albulata* Schiff."

For total number of species trapped (pp. 275, 302 and 303) read 232.

These alterations have no appreciable effect on the statistical analysis of the total catch.

Below entry for *S. subsericeata* Haw. (p. 275) add "*Scopula lactata* Haw.—several at Meathop on 10.vi.1967".

Delete entry (vi) on p. 277 referring to *H. bombycina*.

Add to the list of microlepidoptera (p. 275-277):

- 1219 *Cochylichroa atricapitana* Steph.
- 1475 *Epinotia trimaculana* Don.
- 1518 *Bactra lanceolana* Hübn.
- 1571 *Metzneria metzneriella* Staint.
- 1636 *Bryotropha domestica* Haw.
- 1921 *Argyresthia brockeella* Hübn. (Meathop).
- 1923 *A. pygmaeella* Hübn.
- 1928 *A. retinella* Zell.
- 2263 *Nemapogon cloacella* Haw.
- 2312 *Micropterix aruncella* Scop.

THE
BUTTERFLIES
AND MOTHS
OF KENT

BY
J. M. CHALMERS-HUNT, F.R.E.S.

VOLUME II
HETEROCERA
(SPHINGIDAE - PLUSIIDAE)

ARBROATH
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P R E F A C E

THE present volume contains the Sphingidae, Notodontidae, Thyatiridae, Lymantriidae, Lasiocampidae, Bombycidae, Saturniidae, Drepanidae, Arctiidae, Noctuidae, Hylophilidae and Plusiidae. The total number of species in these Families pertaining to Kent is 438, of which 406 are accepted without reserve. Of these 406, 295 are natives or suspected natives, 52 are residents or residents reinforced by immigration, 52 are immigrants or suspected immigrants, and 6 are species that have become extinct. Of the remaining 31 species, 21 are placed within the reservation of square brackets as of somewhat doubtful status, and 11 are treated as inadmissible.

In the next volume there will be a departure from the system of nomenclature and classification hitherto adopted. Thus, Volume 3 will contain the Geometridae, for the classification of which, Mr. D. S. Fletcher (British Museum, Natural History), well-known as a leading specialist in this group, has kindly permitted me the use of his manuscript list of this portion of the new edition of Kloet and Hincks "Check List of British Insects".

Finally, I wish to express my deep appreciation and thanks to all those who have so liberally helped me in one way and another in this and the preceding volume. Owing to the nature of the work, however, and the fact that the number of its contributors is likely to increase, I propose awaiting its conclusion to give full acknowledgment of all help received, as I shall then know everyone whom I have to thank.

J. M. CHALMERS-HUNT.

West Wickham,
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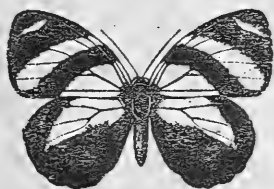
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All material for the TEXT of the magazine must be sent to the EDITOR at 54 Hayes Lane, Bromley, Kent.

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Entomological Notes for 1967

By S. WAKELY

The following notes have been written in the hope that they will encourage others to collect the smaller moths as well as the better-known larger species. It will be noted that most of the more interesting species were bred and many species can be reared successfully by using plastic "luncheon" boxes and "Kleenex" tissues. The foodplant can be wrapped in tissue and examined about a week later when it will be found that many species have become full fed and have spun up in the paper. These can then be placed in smaller plastic boxes to await emergence. Experience will enable one to cater for species which require growing foodplant. Care must be taken with tissue to see that tiny species are not thrown away when the material is renewed. Very small species have a habit of pupating between the thin paper and are not seen unless the paper is held up to the light.

Cambridgeshire.—On the 19th September, Col. A. M. Emmet invited me to accompany him to Wicken Fen to look for larvae of the rare *Cosmopteryx druryella* Zell. He said he had found some in the leaves of a reed-like plant and, knowing it was a species which I had never taken, thought I would like to see where they occurred. I was naturally delighted to have the opportunity to look for such a rarity and we arrived at Wicken soon after mid-day. Col. Emmet soon found a larva and showed it to me. The larvae were very difficult to find but we eventually found a few each. The particular foodplant at Wicken was a very reed-like grass growing round willow trees and is probably *Festuca arundinacea*, which is mentioned by a Continental writer. During our searches we noticed several spinings on another local foodplant—*Lathyrus palustris* (Marsh Pea). There were larvae present in some cases and from one of the pea seedpods I had a larva which spun up on the side of the container. It will be interesting to discover the identity of these larvae. While walking along one of the fen tracks my friend found a very fine larva resting on a reed stem. It was hairy and reminded me of a Drinker larva, but was grey in colour, and we came to the conclusion it could only be the larva of *Simyra venosa* Borks. Some larvae of *Acrocercops imperialella* Mann were pointed out to me and I was pleased to collect some mines in the leaves of *Symphytum officinalis* (Comfrey). Col. Emmet writes: "The larvae were more plentiful than in 1965 or 1966, and were to be found outside the very limited area which they appeared to be confined in the previous years".

Dorset (Portland).—On the 7th May I went to Portland with Col. Emmet, where we planned to meet Messrs E. Sadler and P. Rogers, who lived in the Alton district of Hampshire. The object of the trip was to look for Spring larvae of some of the special local moths occurring at Portland. Thirty years previously I had taken a similar trip with the late L. T. Ford, and I was anxious to see if many of the species found then were still to be taken. We arrived at Ope Cove about 1 p.m., and as we intended to stay the night we looked round for a place to stay. Luckily, we quickly found accommodation nearby and were joined about 2 o'clock by Sadler and Rogers. They had already stopped at Chesil Beach on the approach to Portland and done some collecting as they were going to return home later that night.

One of the first species taken was some larvae spun up in the flower-heads of *Euphorbia amygdaloides* (Wood Spurge). They turned out to be *Cacoecimorpha pronubana* Hübn., much to our surprise as Spurge is not one of the many foodplants usually associated with this polyphagous species. They were very common, but local, and I took over a score. At the time we did not know their identity and were hoping for something that might prove to be a rarity. However, both my Alton friends were glad to get *pronubana*.

We then tried the cliff edges where we found larvae of *Epischnia banksiella* Rich. spun up among the leaves of *Inula crithmoides*. These were not very common but they were present in some of the clumps of foodplant examined. Our next find was the larvae (and pupae) of *Agdistis staticis* Mill. on the small-leaved cliff-loving *Limonium binervosum*. The plants were far from common but, when found, larvae (and an occasional pupa) were nearly always present. Odd moths netted were *Phalonia williana* Brahm (*zephyrana* Treits.) and *Acroclita subsequana* H.-S. In the evening we visited the large quarries by the roadside on the hill leading up to Ope Cove and on the plants of *Artemisia absinthium* found larvae of *Euzophera cinerosella* Zell. feeding in the stems. One or two *Eucosma pupillana* Curt. were also bred out later from the stems collected.

As soon as it began to get dark Sadler and Rogers switched on the m.v. light, having brought a generator with them, but the weather was chilly and results were very poor. We retired about 11 p.m. and they left for home in the early hours.

The next day we tried the quarries again, and found plenty of larvae of *Aspilapteryx tringipennella* Zell. in blisters on leaves of *Plantago lanceolata*. Pupae of *Adaina microdactylus* Hübn. were plentiful in the dead flowering stems of *Eupatorium cannabinum*. Also growing in these quarries were a great many plants of *Rubia peregrina* (Madder). By pulling up some of the trailing branches we were able to find several larvae of *Mecyna asinalis* Hübn., which were spun up tightly in dead leaves at base of stems. Another local species was *Teichobia verhuellella* Staint., the larvae and cocoons of which were in plenty on the leaves of *Phyllitis scolopendrium* (Hartstongue Fern), a very common plant among the rocks at Portland.

Our next port of call was Chesil Beach, which was on our way home. We collected some very local species which are common here on some of the plants growing on the shingle. They included larvae of *Scrobipalpa suaedella* Rich. on *Suaeda fruticosa* (Shrubbery Seablite) and *S. ocellatella* Boyd on *Beta maritima* (Sea Beet). Also taken were a few larvae of *Caryocolum inflatellum* Chretien on *Silene maritima* (Sea Champion) and *Aproaerema anthyllidella* Hübn. on *Anthyllis vulneraria* (Kidney Vetch).

Feeding some of the larvae was going to be a problem, so we had to take a few roots of some of the plants. When digging up a root of *Inula crithmoides* a large Noctuid larva was found, and from this a fine *Agrotis trux* Hübn. was bred on the 28th July. Other species found at Ope Cove were larvae of *Scrobipalpa plantiginella* Staint. (on *Plantago coronopus*) and *Nudaria mundana* L. The latter were quite common under the larger slabs of limestone, but the species we were hoping to find was *Meesia richardsoni* Wals., the larval cases of which were fairly common thirty

years ago. On this occasion a single old case was all our combined efforts produced.

Essex.—On the 17th June I went to Benfleet accompanied by Mr. N. Heal. The larval cases of *Coleophora conspiculella* Zell. were particularly common on the leaves of *Centaurea nigra* and so were the larvae of *C. trochiella* Dup. on *Achillea millefolium* (Yarrow). A few larvae of the rare *Eucnemidophorus rhododactyla* Schiff. were also found on wild rose.

On 1st October the South London Entomological and Natural History Society held a field meeting at Stanford-le-Hope. A number of larval cases of various saltern *Coleophoridae* were collected, including some undetermined species from *Beta maritima*, *Atriplex littoralis*, *A. portulacoides*, *Suaeda maritima*, *Juncus maritimus* and various species of *Salicornia* (Glasswort). Larvae of *Bedellia somnulentella* Zell. were literally swarming on *Calystegia sylvestris*.

Hampshire.—Browdown, Gosport, was visited on 11th June, on the occasion of a field meeting there of the "South London". On the shingle a number of imagines of *Coleophora gryphipennella* Bouch. were smoked out of a bush of *Rosa pimpinellifolia* (Burnet Rose), and a specimen of *Heliothobus albicolon* Hübn. was found at rest under a railway sleeper. In a reed-bed a specimen of *Nascia ciliaris* Hübn. was netted, a fenland species only recently found to be breeding in the area. I was anxious to try and find larvae of *Acleris lorquiniana* Dup., a few worn specimens of which I had taken on previous visits. The foodplant, *Lythrum salicaria* (Purple Loosestrife), was not common and difficult to detect among the tall reeds, but about a dozen moths were bred a few weeks later from larvae found. All the specimens bred had a bold jet black spot in the centre of the forewings and two had a brownish streak running from the central base of the fore wings diagonally to the apex. None of those taken in the autumn had the black central spot. Luckily I had a plant established in my garden and so was able to supply the larvae with fresh food. For fuller report of this meeting see *Proc. S. Lond. ent. Nat. Hist. Soc.*, 1967: 92.

Isle of Wight.—On 2nd August I was staying with friends in the Island and managed to have a trip to Lucombe Chine, near Shanklin. Descending the many scores of steps to the shore, I walked along the sands about a hundred yards to where the broken ground enabled me to climb a little way above high tide-mark to some clumps of *Lathyrus sylvestris* where I was hoping to find larvae of one of the most local micros in Britain, namely *Grapholita gemmiferana* Treits. Owing to the frequent cliff falls hereabouts this species is in danger of extermination. However, it was soon seen by the spun-together terminal leaves of the *Lathyrus* that larvae had been, and in many instances still were, present. On the same plant the larvae of *Leucoptera lathyrifoliella* Staint. were more common, and every plant showed leaves with the characteristic larval mines of this tiny moth. Owing to the treacherous nature of the ground, with its "blue slipper" mud, collecting here is most unpleasant. However, it is gratifying to know both these species are still to be found in their old habitat.

Kent.—The first trips of the season were with Mr. Heal who had recently come to live at Detling. We met on the 25th February, 4th, 11th,

and 18th March, and also on the 1st April, and on each occasion went to Trottiscliffe where we looked for various specimens of the *Elachistidae* feeding on grasses. The larvae were not easy to rear, and I think Mr. Heal was more fortunate than I. In July 1965, Col. Emmet had taken *Coleophora niveicostella* Zell. there and we spent a long time searching for the larval cases on *Thymus drucei* (Wild Thyme). We had to admit they were most difficult to find, and the only one found by me was taken by combing the thyme on the side of an anthill with a piece of cloth stretched under it to catch what fell off. However, I was given another by a friend and eventually succeeded in breeding one moth.

On the 6th April I accompanied Messrs E. Sadler and P. Rogers on a long excursion to various localities, starting off with Blean where it was hoped to find larvae of one of the local fritillaries that occurs there. We were unsuccessful in our search and had to be content with a few larvae of *Aegeria vespiformis* L. which we dug out from the bark of some large sawn-off oak trees. The weather was not at all kind for this trip, rain showers being frequent all day. Leaving Blean, we made another stop at Hothfield Bog, near Ashford. Here we wanted to find the larvae of *Aegeria formicaeformis* Esp., as some years previously I had found a damaged pupa in a large burrow in the trunk of a willow tree. In pouring rain we searched for likely willow trees and eventually found a full-fed larva of *Sphecia bembeciformis* Hübn. but nothing else. I persuaded my friends to go on to St. Margaret at Cliffe to try for the larvae of *Grapholita caecana* Schlag. which I had read could be obtained by collecting the stems of *Onobrychis sativa* (Sainfoin) in March. Knowing the place where I had seen a few moths, I was very hopeful of breeding a nice series. However, although we all three collected a good bag of stems, nothing eventually emerged and I am still wondering if the information was correct. We expected to see signs of larval workings but could see none. Returning from there, we next stopped at Folkestone Warren where we hoped to catch some imagines of *Trichopteryx polycommata* at dusk. We descended into the Warren by the cliff path at Capel le Ferne and waited until it was dark. The chalk paths were very slippery with the wet and I shall not forget for a long time our return to the top in the dark. We had lights, of course, or I don't think we should have found the way. To add to our difficulties the path had been obliterated near the bottom by recent cliff falls. When we were near the top there was some excitement as we saw a geometer on the wing, but when netted it proved to be only *Colostygia multistrigaria* Haw., another of which was taken a little later. Certainly this was one of our bad days.

Further visits to Trottiscliffe were made on the 19th, with Col. Emmet and Mr. Raymond Uffen, and again on the 29th April with more members of the "South London" and Kent Field Club. The grand total of *Coleophora niveicostella* Zell. larvae taken on all these occasions by those present was 14. (See *Proc. S. Lond. ent. nat. Hist. Soc.*, 1967: 87-88.) Other species taken at Trottiscliffe were larvae of *Oidamematophorus carphodactylus* Hübn. and *Coleophora conyzae* Zell. on *Inula conyza* and *Agonopterix nanatella* Staint. on *Carlina vulgaris* (Carlina Thistle) Imagines taken on the wing included *Elachista biatomella* Staint., *E. subnigrella* Dougl. and a single *Acrolepia granitella* Treits. Mr. Bradford dug up a plant of *Inula conyza* to feed the larvae he had taken, and from this bred a specimen of the rare and local *Acrolepia perlepidella* Staint., a

species none of the rest of us had ever taken. The larva of this species lives in a mine in the lower leaves of *I. conyzae*, and the specimen was probably spun up on the plant taken by Mr. Bradford.

On 1st July the "South London" met at Faversham. I joined the party which first of all started collecting on the waste ground by the harbour. Imagines of *Laspeyresia nigricana* F. were flying freely at one spot. In a previous report I mentioned that larvae were found in the seeds of the local *Peucedanum officinale* (Hog's Fennel) which grows so commonly here. This year, in July, I managed to breed several of these, which proved to be *Laspeyresia gallicana* Guen., and I was pleased to be able to establish their identity. Moving down the creek we were soon collecting on the salterns. Flying freely among *Juncus gerardi* was a small moth which was identified later as *Coleophora alticolella* Zell. A pair of *Scopula emutaria* Hübn. were netted on the salterns and from ova obtained a few moths were reared in the autumn.

On the 10th July I was taken to Dartford Marshes by Mr. Heal, where we collected some seeds of *Malva sylvestris* (Common Mallow). When examined later I found two larvae of *Platyedra vilella* Zell. present, a species I was expecting to find. From here we went on to Great Culand Pit, near Maidstone, where we found a few larvae of *Salebria obductella* Zell. on *Origanum vulgare* (Marjoram). On the Whitethorn bushes larvae were found of *Eurhodope suavella* Zinck., but most of the larval spinnings were empty. To finish the day we visited the path by the River Medway at Alresford to have a look at some of the large beds of *Tanacetum vulgare* (Tansy) growing there. We were hoping to find larvae of the Plume attached to this plant but all we found were imagines of *Dichrorampha sequana* Hübn. and *D. saturnana* Guen.

Folkestone Warren was visited on the 6th August with Col. Emmet. For many years I had hoped to take some nice specimens of that fine large tortrix *Stenodes alternana* Steph. and on this occasion my wish was gratified. We found them comparatively common along the Crete Road at the top of the Warren. The larva feeds in the flower-head of *Centaurea scabiosa* and seeing several heads where the empty pupae cases were extruded, I collected a plastic bag full of the seed-heads which produced half-a-dozen fine moths during the following week. On the same ground a pretty micro was netted showing bright metallic markings which I recognised as *Stephensia brunnichiella* L. Its foodplant, *Clinopodium vulgare*, was common so we started looking for the larvae which we knew fed in mines in the leaves. Lots of the leaves of the Wild Basil showed a brown spot at the apex which was caused by the larval mine, and on pulling up a plant for a closer look we noticed that the extreme edges of some leaves were turned downwards and the white of a cocoon could be seen. By collecting some of the cocoons, which are easiest to detect when the leaf is turned with underside upwards, we were able to breed fresh specimens at home later. We then decided to go into the Warren and descended the steps by the Royal Oak Inn. Here we collected some larvae of *Lobesia euphorbiana* Freyer in the rosette tops of *Euphorbia amygdaloides* (Wood Spurge), one of the many good micros to be found at Folkestone. We actually saw this moth on the wing and found pupae and larvae all on the same day. Other species taken on the wing were *Cochylis hybridella* Hübn., *C. roseana* Haw., *Cnephasia genitalana* Pierce and, in addition, several larvae of *Agonopterix umbellana* Steph. were found in webs on *Ulex* (Gorse). A

few years previously Col. Emmet took a specimen of *Caloptilia cuculipennella* Hübn. in the Warren so we looked on the privet bushes for the characteristic leaf cones of this species. These spinnings were quite common, so much so that we had doubt as to whether they were not those of the common *C. syringella* F. Then it was noticed that some privet leaves had the extreme edge turned upwards, forming a thin tube which appeared to be the early feeding place of the larva of *cuculipennella* and distinct from the mined leaf of a young *syringella* larva. It was also noticed that the larva of *cuculipennella* made an emergence "window" in the side of the cone by the end of its cocoon which is always spun inside the cone. The full-fed larva of *syringella* pupates under a semi-transparent web away from the feeding place. It will be interesting to see if *cuculipennella* is always common hereabout or if in some years only they are so common.

This excursion was so productive that I visited the same area twice more, on the 8th with Mr. R. Fairclough and on the 20th August with Mr. Heal. The same species were present on each occasion and on the 20th I found a large clump of *Lathyrus sylvestris* present. I was particularly interested in this as only a few weeks previously I had taken larvae of *Grapholita gemmiferana* Treits. on this local plant in the Isle of Wight, but there was no sign of the larval spinnings in the Warren (see under sub-heading "Isle of Wight").

On the 2nd September I visited Lydd with Mr. Chipperfield on our return from Playden (see under sub-heading "Sussex"). We noticed a good growth of *Senecio viscosus* (Sticky Groundsel) by the roadside just before reaching Lydd Town and a quick glance showed there were plenty of larvae present of *Heliothis peltigera* Schiff. We both collected a few of the larger larvae and one of mine emerged on the 22nd of October. We also collected a number of seed heads of Yarrow hoping to find larvae of *Eupithecia millefoliata* Rossl. present later. Our next stop was at Lydd Town Station where we found several unidentified species of *Eupithecia* present. A number of plants of *Echium vulgare* (Viper's Bugloss) were examined here and we were rewarded by finding several larvae of *Ethmia bipunctella* F. On our way home we made a short stop at Ham Street where seed-heads of *Solidago virgaurea* were collected.

On the 17th September Col. Emmet and I went to Higham where we found a few larvae of *Coleophora squamosella* Staint. (*erigella* Ford) in seedheads of *Erigeron acer* (Blue Fleabane). We then moved on to Stoke salterns where a number of larvae of *Cochylis hybridella* Hübn. were found in the seedheads of *Picris echiodes* (Bristly Ox-tongue). We first found a few of the pinkish larvae by splitting the seedheads but could not see which heads contained a larva by examination. By collecting a number of the fatter seedheads and placing them in a container with tissue paper it was found that the larvae could be seen after a few days in the tissue paper when they had spun up. I had never succeeded in breeding any moths of this species so far and it is reputed to be difficult. On the banks of the sea wall numerous *Coleophorida* larvae were collected from the *Atriplex littoralis* and we shall have to breed the moths to find out which species they are. I also found one larva of *Eucosma heringiana* Jackh in a spinning on *Aster tripolium*. Larval cases of *Coleophora artemisiella* Scott were plentiful on *Artemisia maritima*.

On the 6th October I joined Col. Emmet and Messrs Chalmers-Hunt and R. Uffen for a morning trip to Dartford Heath. The main purpose of

the trip was to find larvae of *Coleophora milvipennis* Zell. Col. Emmet had taken some here on birch the previous year. We all succeeded in finding specimens but they were not common. Other larvae found were *Coleophora artemisicolella* Braund on *Artemisia vulgaris* (Mugwort) and *C. potentillae* Staint. on *Potentilla erecta*, the latter being a new food-plant record to all of us.

On the 29th October I went to East Blean with Col. Emmet. The main purpose of the trip was to look for larvae of *Coleophora wockeella* Zell. but we could not even find its foodplant, namely the Wood Betony. Larval cases of *C. olivaceella* Staint. were found on *Stellaria holostea*. Some seedheads of *Solidago virgaurea* which we collected produced larvae of *Eupithecia expallidata* Doubl., *Oidaematophorus bowesi* Whalley, as well as some unidentified *Phalonid* larvae. On the hazel bushes we found larvae of *Coleophora fuscocuprella* H.-S., but they were very local on a few bushes only. We were particularly interested in small larvae found living in silk tubes covered in frass on the hazel leaves. These were fairly common and some were found on leaves of *Castanea sativa* (Spanish Chestnut). The silk frass-covered tubes were on the undersides of the leaves and perhaps some reader can tell me what species is responsible.

(To be continued)

A New Aberration of *Pieris brassicae* (Linn.) Lepidoptera, Pieridae

By L. McLEOD

(Chesterford Park Research Station)

INTRODUCTION

In May 1967 two males of a new aberration appeared in a laboratory culture of *Pieris brassicae* Linn. maintained at Chesterford Park Research Station, Saffron Walden, Essex. Attempts at breeding from the two individuals were unsuccessful.

The culture mained at Chesterford Park was derived from that of the A.R.C. Unit of Insect Physiology, Department of Zoology, Cambridge, in 1953, the original stock having been collected in the Cambridge area in 1950. It has since been maintained continuously under laboratory conditions, being supplemented from time to time with further quantities from the Unit of Insect Physiology.

DESCRIPTIVE

Pieris brassicae Linn. ab. *marginavenata* (ab. nov.)

Characterised by the veins on the underside of the hindwing being stressed by borders of black and grey scales. The area where the veins converge at the wing base is densely suffused with black scales. The borders taper towards the wing margin. When examined under magnification, the veins are seen to be clad with yellow scales which stand out from dark borders, as in *Pieris napi* Linn.

The discal spots on the underside of the forewing are pale brown instead of the black of type specimens, and the lower spot is greatly reduced.

The upperside is normal except for a slight increase in black scaling at the basal areas of all four wings, i.e., a tendency towards ab. *basinigrescens* (Graham Smith and Graham Smith).

Wing span 54 mm. Normal wingspan for the laboratory colony males is 58.5 mm.

Holotype ♂. Bred from a continuous brooded culture kept under laboratory conditions for 17 years since 1950. The specimen is figured on the accompanying plate and is in the author's collection.

Paratype. One other specimen from the same brood. This specimen was damaged during attempts at breeding and is also in the author's collection.

Type Locality. The original stock from which this aberration arose was collected in the Cambridge area in 1950.

COMPARATIVE

1. ab. *anthrax*. Graham Smith and Graham Smith (1930) described and figured a male ab. *anthrax*: "In a male of this series the undersides of the hindwings are so densely suffused with black scales that they have a very dark appearance".

2. ab. *venata*. Verity (1908) described and illustrated ab. *venata*. He stated "Les nervures du revers chez le male et des deux surfaces chez la female sont vaguement teintée d'un gris-violet" i.e. the veins themselves are tinted with grey-violet scales.

The author has compared the present aberration with specimens of ab. *anthrax* (Graham Smith and Graham Smith) and ab. *venata* (Verity) in the British Museum collection at Tring, and it does not resemble either of them.

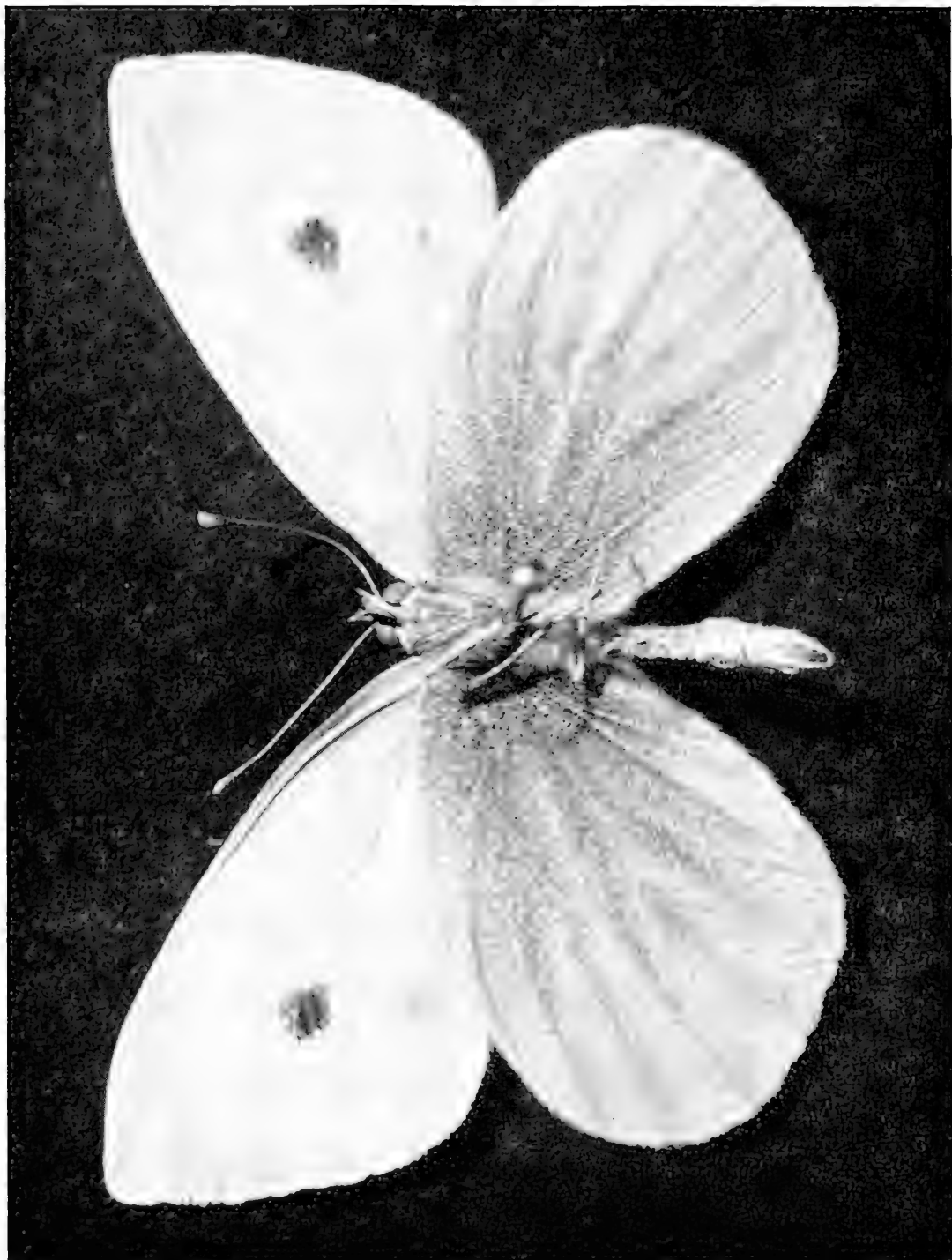
3. ab. *plasschaerti* Dufrane (1912).

"Les ailes postérieurs, en dessous, sont fortement saupoudrées d'atomes noirs, surtout les nervures qui paraissent presque noirs". i.e. the underside of the hindwings are strongly powdered with black atoms especially along the veins which appear almost black.

Graham Smith and Graham Smith (1930) wrongly quoted ab. *plasschaerti* as a synonym for ab. *venata* Verity. Dufrane (1930) quickly re-asserted again that ab. *plasschaerti* is a separate aberration. He accompanied further description with a photograph but unfortunately it depicted the upperside only and failed to show the main character.

Dufrane's further description translates as follows: "In *plasschaerti*, on the contrary, the forewings are very curious; they are excessively pointed at the apex which is largely black. The apical patch extends strongly along the outside edge almost reaching vein 2 while that of the type scarcely reaches vein 3. The edge is bordered with black along its length from base to apex, while underneath the apex is lightly tinted with a very pale yellow. There is also the size of the two black (discal) spots underneath, in which the upper is almost as big as in a type, while the lower is small".

Dufrane continues: "The form *venata* Verity and the form *plasschaerti* are of the spring generation. My aberration should therefore have the characteristics of *chariclea* Stephens: apical patch light grey with slight indentations, underneath the hindwings powdered with blackish, fringes yellowish. In *plasschaerti*, the character of the underside of the hindwings is very marked, as I said in my description (1912),



Pieris brassicae L. ab. *marginavenata* ab. nov.

but I do not find the other characteristics of *chariclea* to be present. The apical patch is very black carrying simply a few grey atoms, and the fringes are white”.

The British Museum does not possess a specimen of ab. *plasschaerti* and I have been unable to compare the present aberration with any other specimens of ab. *plasschaerti*. However, having considered Dufrane's descriptions, I consider the present aberration to differ in that the black and grey scales on the underside of the hindwings are definitely in the form of a border to the veins which are themselves clad almost entirely with yellow scales.

NOTE

Variation in *Pieris brassicae* L. is uncommon and it is interesting to note that as well as the present aberration, three others appeared after ten or more years of inbreeding in the Cambridge stock.

- ab. *albinensis* Gardiner (1962)
- ab. *coerulea* Gardiner (1963)
- ab. *fuscospinata* Lempke (1953)

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Luperina nickerlii in the Dingle Peninsula, August 1967

By R. FAIRCLOUGH

When Mr. Stuart Coxey and I decided to join forces on a holiday in Kerry to try to catch *Luperina nickerlii* Freyer ssp. *knilli* Boursin we took Mr. Wightman's advice, booking our accommodation at the Anchor Guest House in Anascaul. This we found entirely satisfactory, while Anascaul was a good centre for the area.

On the 18th I travelled from Lancaster to Bolton in pouring rain to collect S. C. with his gear. This we managed to fit in with mine in the Morris Traveller which we had decided to use for the trip. On then we went to Liverpool where, having delivered the car for loading, we filled in the gap by dining, wondering if Ireland would be as wet as reputed, or as Lancashire was that day.

Saturday morning in Dublin was fair but the sky looked very threatening as we made our way out of the city. At one point, being uncertain of our position after following a series of one-way streets, we asked a policeman how to find the Limerick road. After some description of the ensuing streets he broke off and said, "Well now, you just keep to the mainest road and you'll be all right."

After that delightful start to the day we drove west into the good weather we were lucky enough to experience during our stay. We made a few stops, seeing at one point *Argynnis paphia* L. flying round the brambles in the corner of a field, woodland apparently not being necessary for this butterfly in Ireland.

At Castlemayne we turned down the Dingle Peninsula, enjoying magnificent views of Macgillycuddy's Reeks across the bay, particularly when seen behind the Inch sandhills with long waves breaking on the beach in the foreground.

By 9.45 p.m. we had an m.v. light going on the shore at the mouth of the River Caul, and before ten the first *nickerlii* had arrived followed by five others at intervals up to 11.30 p.m. The small numbers of other species, none interesting, reflected the clear sky, northerly breeze, and full moon over the mountains, but we retired delighted with having caught our moth on the first night.

We had been visited in the course of the evening by Herr Brandt who owns a holiday bungalow on the opposite cliff, and who kindly allowed us to plug in a trap thereafter.

On the Sunday morning we visited the Inch sandhills but were not impressed enough to return at any time, a decision that we felt afterwards to have been a mistake. Despite having brought with us everything we thought we might need, we had failed to add to the list Baynes' "Revised List of Irish Macrolepidoptera." Therefore when we saw on the sandhills one worn small skipper which we noted mentally as a *Thymelicus sylvestris* Poda, we disregarded the insect as something common. Back in England we found that had we caught it and confirmed its identity we could have added another species to the Irish list.

That afternoon was spent round Ventry Bay in one of our unsuccessful attempts to find the food plant of *Hadena caesia* Schiff., sea campion, which appears to be fairly uncommon in Dingle.

At dusk we put out both engines in adjacent cliff top quarries on the Inch road. A fault in my choke put my light out of action, and with a nasty wind at that height, we retired to the river mouth, using the one light till 1 a.m. when the sky cleared and the moths ceased to fly. We recorded thirty species, the best number of the holiday, but apart from five *nickerlii*, the last at 12.15 p.m., there were no other coastal species. Indeed the usual catch consisted of moths common anywhere in Britain, apart from the *Luperina*. Its relative *L. testacea* Schiff., was either not present, or in small numbers, while *Eilema complana* L. was a regular attendant as was *Aphomia sociella* L.

On the 21st we went straight to Tralee where the choke was repaired by a radio mechanic. On our way back we stopped on the flat part of the north coast of the peninsula between Tralee and Camp. In the hot sunshine the only butterflies on the wing were *Nymphalis io* L., *Aglais urtica* L. and *Pieris napi* L., a few of the whites being rather dusky, but none extreme. While I searched the bog myrtle for microlepidoptera larvae without success, S. C. was carefully testing the repaired choke in readiness for the night.

At the river later that night it was warm (61 deg. F. at midnight), but few moths came to the sheet. We had our quota of *nickerlii*, and one *Actebia praecox* L. S. C. tried out his small actinic light trap which we were to find surprisingly successful.

On the next day which was dry and warm we went sight-seeing to Killarney, going as far as Sneem and Kenmare. The scenery lived up to its reputation, but such rock sitting moths as *Dysstroma citrata* L. were scarce, and there were no larvae on the *Myrica* and *Salix*, a great difference from Scotland in August. We were pleased to see the very local Irish plant Blue-eyed Grass which S. C. found by the roadside. In our usual place at night the weather was warm and windy. With the *nickerlii* came one *Agrotis trux* Hubn.

Leaving behind the sunshine on the 23rd we drove into a muggy mist at Slea Head. Large numbers of *Ammogrotis lucerneae* L. were careering up and down the cliff face. This species does not come well to m.v. light. Some *Cochylis pallidana* Zell. larvae were found in Sheepsbit seedheads while a few *Schrobipalpa plantaginella* Staint. and one *Agonopterix subpropingnella* Staint were netted. Mr. R. Haynes was discovered digging up the few campion plants in a vain search for *caesia* larvae. He reported having found a few in Co. Claire earlier.

We decided to try a large reed bed east of Dingle as a change from the coast that night. The small Irish *Celaena leucostigma* Hübn. turned out to be the most interesting visitor there, more of them going to the little tube set in the reeds than to the m.v. light at the edge of the bed. A fresh *Spilosoma lubricipeda* L. was a surprise at this date, but the rest of the moths did not reflect the marshy area.

After a wet morning on the 24th we explored some of the small lanes leading to the coast between Anascaul and Dingle. A return to the coast at night produced a success for the actinic trap with twice as many *nickerlii* to its credit as the m.v., plus a fresh *lucernea*, a *trux*, and some *Gnophos obscurata* Schiff, which ventured little from the rocks. At the big light we recorded the only prominents seen, *Notodontia ziczac* L. and *N. dromedaris* L.

We went to the north coast at Brandon Point on the next day, finding no campion there but seeing a swarm of *Colostygia didymata* L. flying over the heather on the cliff top. This was the only time we saw this common moth. We went on over a cloudy Connor Pass complete with a pair of Ravens.

By now we wondered how far *nickerlii* was spread beyond the small Inch—Anascaul piece of coast, so we went to Trabeg Bay about two miles east of Dingle. As the wind was high we used only the actinic trap at the base of the cliff, being pleased to find two of the moth had arrived in an hour. We did not know at that time that it had been taken in Dingle town by Mr. H. C. Huggins.

Brandon Creek, on the western side of the great block of cliffs at Brandon Head below the 2,500 ft. Masatiompan, was a delightful spot on the warm afternoon of the 26th. We saw a curragh carried down and launched for the lobster fishing, while we had good views of a pair of Choughs, and noticed large patches another Irish speciality, the Saxifrage, St. Patrick's Cabbage. We collected some *Clostera pigra* Hufn. larvae, with a few parasitised *Acleris hastiana* L., the only ones found on the holiday and some *Caloptilia stigmatella* F. *Eupithecia jasionata* Crewe larvae which were common in the Sheepsbit heads pupated well without producing a lot of parasites as pug larvae so often do. In contrast to the day before we were able to see Mount Brandon clear of cloud, not too frequent an occurrence one would think.

We tried Acres Bay that night, a beautiful spot with large boulders for a beach, and the remains of a castle. This turned out to be a rare cold night with the temperature falling below 50 deg. F., so that few moths stirred. However, *nickerlii* was there, and *Stilbia anomola* Haw. showed itself to be the hardiest species, coming when all others had ceased to fly.

A long journey to Glengarriff on the morrow produced nothing except a very late *Bomolocha fontis* Thumb. which was knocked out whilst I was trying an area for *Acleris cristana* Schiff. The night in Acres Bay again was very poor.

On the 28th we did more exploration of the coast, finding Mynard Bay unsuitable for our purpose, so we returned for the third time to Acres Bay where we had an audience for a while, but few moths despite a temperature of 60 deg. F. again. A reminder of the Burren was the only example seen of the large forms of *Pempelia dilutella* Hubn.

For the next day we planned to explore the Lake Caragh area, dine in Killarney and use our lights somewhere in the woods. This we did, going by Glenbeigh where we looked at the sandy spit which juts out roughly opposite the Inch sandhills, almost cutting off Castlemayne Harbour, the upper end of Dingle Bay. Near Blackstone Bridge we found some old blackthorns growing among hollies on mossy rocks, and though *cristana* could not be found, there would almost certainly have been *Perizoma taeniata* Steph. at the right date.

After dinner at the Muckcross Hotel where we talked much of that legendary moth *Leucodonta bicoloria* Schiff., wondering if any flew at all on June nights in the remaining birch woods, we pitched our sheets in Torc Woods where a cold clear night did not give us much idea of the local Lepidoptera. We had seventeen species the only two of interest being one *Atethmia xerampelina* Esp. and a number of a large yellow *Eilema deplana* Esp.

The 30th was our last "working" day. In the morning we went to the Strand Hotel to see whose was the trap we had noticed on our return from Killarney. There we found Mr. Huggins from whom we learned much. He showed us his insects, and kindly invited us to collect any *Hydraecia crinanensis* Burr from his trap on the morrow as we had seen only two, whereas at Inch they were fairly common (see his article 79/283). We should have had a night on the sandhills, but we had concentrated on the rocky coasts as we were so interested in *nickerlii*.

Many last nights are washed or blown away but on this occasion we had a fine finish at Slea Head. Despite heavy cloud and threats of rain, all went well. We were able to go part way down into a bay with the car, using an m.v. light there, while S.C. took his actinic trap near the beach at the bottom. Between 9.20 and 12.15, twenty-six *nickerlii* arrived, far more than we had seen on any other night. The other species were *complana*, *Amethes xanthographa* Schiff., *Euschesis comes* Hübn., *Noctua pronuba* L., *lucerneae* (actinic light), *Hadena capsophila* Dup., *praecox*, *Ochropleura plecta* L., *Caradrina alsines* Brahm, *Apamea monoglypha* Hufn., *Procus literosa* Haw, *Thalpophila matura* Hufn., *Tholera popularis* F., *Plusia chrysitis* L., *Cerapteryx graminis* L., *Xanthrohoe ferrugata* Clerck, *X fluctuata* L., *Epirrhoe alternata* Mull., *E. galiata* Schiff, *Eupithecia centaureata* Schiff. These were in general the species we had seen every night. Between 12.30 and 1.00 the insects ceased to arrive,

and with the wind rising off the Atlantic we retired, feeling sure that our experiences pointed to *nickerlii* being found all round the rocky parts of the coast of Dingle, and the probability of its being found on suitable stretches of the opposite coast as far as Valencia Island; possibly beyond. It is a moth, which, as Mr. Huggins pointed out in the article mentioned above, needs to be worked for at the cliff bases. Thanks to Mr. Wightman's advice we had concentrated on the beaches where we had found it the third commonest species, being exceeded in numbers only by *monoglyphu* and *xanthographa*. It is interesting to note that the trap, located only a hundred yards above the cliff, produced less than two *nickerlii* per night.

The 31st was rather wet but we were busy setting insects and preparing for an early start to Dublin on the morrow. Late in the afternoon, the sky, having cleared, we went to Acres Bay for a last look at that delightful coast with its narrow lanes like Devon but where never once did we meet another vehicle. Some Fulmars soaring round a cliff were seen, and we put up two worn *Euphybia bilineata* L., not of the brown form. A very pale *Cnephasia conspersana* Dougl. was our last Dingle moth.

We had rain all the way back to Dublin which was as crowded as the Irish countryside was empty. S.C., never giving up, managed to spot specimens of *fluctuata* and *Orgyia antiqua* L. on the walls of the capital before our boat sailed.

There had been a few puzzling features about the collecting. No dusk flight of geometers occurred on any of the nights, most of which were warm. Nightly numbers of species and totals were always low, the average species per night being only twenty-two. It is true that we did not stay out very late, retiring when the flight ceased, but the trap produced the same sort of numbers as confirmation. In the first week we noted an extraordinary high number of crippled moths coming to the sheet, many species being affected. Although we had good conditions we recorded only just over one hundred species of macrolepidoptera, including larvae found. However we felt that we had made a thorough acquaintance with *nickerlii* with its flashing hind wings as it came to the sheet, and at the same time we had enjoyed the peace and beauty of the area with its fuschia hedges and great drifts of montbretia by the streams.

Blencathra, Deanoak Lane, Leigh, Surrey. ii.1968.

The Butterfly Sale of the Century

By BRIAN O. C. GARDINER

The largest accumulation of butterflies ever to come under the hammer was sold at the Hotel Drouot in Paris on the 5th, 6th and 7th February 1968, the sale lasting each day from two o'clock in the afternoon until almost midnight, with a short break for an evening meal.

This was the stock of the late Eugène Le Moulton, and comprised some half a million insects—the majority butterflies, but with some moths. It was not only a collection of Lepidoptera; it was also a dealer's stock and had been gathered together throughout most of the eighty-two years of Mons. Le Moulton's life. It all began when Mons. Le Moulton, as a boy, was able to collect in Cayenne—the French "Devil's Island" penal settlement—

where his father was one of the officials. Le Moutt it was who organised some of the trusty prisoners to earn pocket-money by going out and collecting the rare and beautiful butterflies which were to be found in the vicinity, a practice that continued until the final disbandment of the penal settlement. Subsequently, he established contact with collectors all over the world and butterflies in their tens of thousands flowed in for redistribution, a trade latterly carried on in the Rue Dumeril in Paris.

Over 1200 lots were sold, ranging from individual specimens to twenty or so boxes containing thousands of unset and often frightfully damaged butterflies packed in tightly.

The specimens were on display the Saturday prior to the sale and occupied three large rooms in the Hotel Drouot. Thousands of people came to view although only some 250-300 attended the actual auction. The quantity on view, combined with the crush of people, made it quite impossible to view in detail any but a selected quota of the lots. It may well be that some of the high prices realised subsequently were due to the lot in question containing some choice rarity, not apparent to any but the two or three specialists bidding for it. Although some individual prices were not so high as that of the Rousseau Decelle sale, only fifteen months ago (see *Ent. Rec.*, 79, pp. 88-91), the general trend of high prices was continued. About ten per cent of the specimens to the value of about one quarter of the total realised, were bought by one buyer from the United States. Perhaps one of the most striking things about this auction was the consistently good prices paid throughout for a very large quantity of material indeed, much of it often not in first-class condition.

The sale commenced with 123 lots of exotic *Papilio*. Nearly 8,000 specimens realised an average of 8/- each. The outstanding prices were £90 for a male of *P. phidias*; two pairs of *P. hahneli* went for £150, and three specimens for £125. A pair of *P. homerus* fetched £120—some £35 more than a similar lot 15 months ago.

There were only 23 lots of Ornithoptera. The 465 specimens sold, all of the more common species, made an average of £2 2/- each. Perhaps the most puzzling thing was the £36 paid for 19 specimens of mixed *O. brookiana* and *urvilleana* in very poor condition. Good quality specimens of these species are readily available at less than the price this poor material went for.

From boyhood, Mons. Le Moutt was especially interested in the *Morphidae* and only a few years ago published in collaboration with Mons. Real the results of his lifelong study, "Les Morpho d'Amerique du Sud". The Morphos sold comprised hundreds of types, mainly of forms and subspecies. While these were mainly in fine condition, many of the thousands of common Morphos sold were only in fair, or even poor condition.

Over £5,000 was realised for the Morphos, an average of over £32 per lot. Each lot comprised from 4-80 specimens and while most of the commoner species were only fetching a few shillings each, as soon as any types came up, or the rare species, there was a sharp rise in price. For instance one lot containing one pair each of *M. achillaena* and *violacea* together with the very common *didius* and *eugenia* fetched £60. A lot containing the blue female form *cyanites* of *M. cypris* rose to £105 and it was noticeable that there was strong bidding whenever *M. diana augustinae* appeared in a lot.

Another of Mons. Le Moutt's specialities was the Erycinidae, in particular the genus *Helicopsis* of which he had amassed over 1,300 types of

one sort or another. These were in beautiful condition and fetched an average price of about £1 each, which was really very reasonable for these rare and difficult-to-obtain in good condition species. The remaining Erycinidae, also in very good condition, and numbering over 2,000 specimens, fetched about a third of the price of the *Helicopsis*.

The next lots to be sold comprised the Heliconidae. There were many forms and species of these and they were in very good condition. The price averaged around 3/- each, which, while it is certainly two or three times the price at which they can be bought on the open market, probably included a number of unusual and hard to obtain species in each lot.

The Tuesday session of the sale opened with the large number of *Prepona*. These comprised not only common species in considerable numbers which fetched around 4/- — 5/- each, but also a considerable number of types of exceedingly rare species and it was some of these which fetched the highest prices of the sale, as they were, on the whole, in absolutely superb condition. The highest price for an individual species reached in this sale was £150 paid for *P. garleppiana*. Other specimens which fetched over £100 were *P. praeneste* f ♀ *fournierae* L.M., the holotype from Rio Bamba which is, as is well known named after Madame Fournier, who herself had a remarkable collection of South American butterflies. £120 was paid for *P. weneri* ♂ from Colombia, and £110 for *P. deiphile* also in superb condition, while a very tatty specimen of the same species went for £35. The total realised by the 53 lots of *Prepona* averaged £51 per lot. After the *Prepona* came a few *Agrias* and these were really quite reasonably priced at only £1—£2 each, although it was really rather remarkable that no less than £52 was paid for 100 assorted specimens in such poor condition that this author would have consigned them to his dust bin.

Next were sold the exotic Nymphalidae and the South American species in particular realised very good prices indeed. £100 was paid for 26 specimens male and female of *Catagramma albofasciata* and other *Catagramma* together with *Callithea* and *Anaea* were fetching £30 to £90 for lots of a few dozen.

The Charaxes also produced a few high prices for the rarer species, these being £110 for nine males of *C. acraeoides*, £100 for 21 specimens of *C. monteiri*, £100 for 13 specimens of *C. thomasius* and £130 was paid for 100 assorted species containing a few *C. laodice* and *bohemanni*.

The exotic Lycaenidae and Pieridae fetched exceedingly good prices. For instance, £55 was paid for 58 specimens from Trinidad and Brazil, which included the magnificent *Thecla coronata*, while £25—£50 was paid for lots of common Indo-Australian Pieridae which can be bought direct from the dealers at far less than this price.

A number of the *Delias* types of Joicey, Noakes and Talbot fetched £130.

There were about 200 lots of Palearctic butterflies and while the average price per lot remained around the £20—£40 mark, the number of specimens in each lot, often several hundred, was considerably more than in many of the Exotic lots of material so that the resultant price often worked out at only a shilling or two per specimen. Particularly noticeable with these Palearctic specimens was the very sharp price increase on any lots containing material from Tibet, China or U.S.S.R.,

areas from which it is to-day almost impossible to collect or obtain any specimens. As an example, 140 specimens of *Parnassius apollo* from French localities fetched £8 whilst 133 specimens in a similar lot but containing 26 examples from U.S.S.R. localities fetched £45. The sum of £85 was paid for a pair of *Thais rumina honnoratii*, and several of the rarer species of *Parnassius* and *Colias* ran up to £60 for a couple of dozen examples. The highest price paid for any one lot in this auction was the £210 fetched by four gynandrous examples of *Gonopteryx cleopatra* which were in quite mint condition.

The Palearctic butterflies were followed by the 200 lots of various moths, starting with 20 lots of the larger and more colourful Exotics mostly in excellent condition. Nine examples of *Leto venus* fetched £120, and seven specimens of *Charagia mirabilis* £80. Cheap when compared to the £62 paid at the Rousseau Decelle sale for one of each. The £32 paid for 47 specimens of *Alcidis* was also very reasonable. Eleven *Thysania agrippina*, sold as one lot, went for just under £3 each, but a few minutes later a single specimen was sold for £8. Some 200 examples of *Castnia*, comprising examples of 24 species, were very reasonable at £195 in view of the difficulty in obtaining good examples of these powerful fliers.

The Saturniidae were not on the whole in good condition and prices varied from 2/- each for *Samia cynthia* to the £3 each for the lovely Spanish *Graellsia isabellae*. In spite of their condition the 2,390 specimens fetched an average price of 11/6 each.

The Sphingidae, Arctiidae, and Zygaenidae did not contain anything spectacular, rare, or unusual. Sold in lots often of several hundred specimens they fetched an average price of over £17 per lot.

These were followed by several large lots which, per specimen, undoubtedly represented the cheapest buy of the sale, the price paid being in some cases worth it for the storeboxes alone. These lots were part of the collection of the late Mons. Berthet, which were acquired after his death by Le Moulton and had been kept since more or less intact. A collection of French moths in 25 boxes fetched £40; the Hesperidae in 16 boxes were quite expensive at £90; the Microlepidoptera in 50 boxes at £25 were absurdly cheap and reflects the little interest and attention that is given to this half of the Lepidoptera world; the 53 boxes of Noctuidae fetched £40, a similar number of Geometridae £65; while 55 boxes of pinned but unset material from Jaulnac went for £42.

Following these large accumulations were Palearctic moths sold in lots of four boxes at an average price of £5-£9 per lot, although the lots containing *Catocala* rose to £20 and £30. These prices were distinctly high as this sort of material has often been sold in London for as many shillings as it here fetched pounds, even allowing for the price of the containing boxes. The bidders were keen to the last and the sale ended with a sudden upsurge in prices, £28 being paid for an odd lot of colourful Geometridae and £40 for some rather doubtful 'types' of Cossidae.

Interspersed between the lots of set specimens there were sold upwards of 2,500 boxes containing a small proportion of properly papered material, but mainly perhaps a quarter-of-a-million butterflies loose, or packed in so tight in some cases it would be a job to get them back again once the lid was removed. The quality of this material was variable and in most cases not possible to assess accurately. There were undoubtedly some bargains had here, but also some unlucky buyers will have found a

load of rubbish on their hands. While some material in these boxes—which had glass lids—could be seen to be good, at any rate on the top layers, others could be seen to be mouldy, or to consist entirely of bodies, or loose wings, or specimens torn, tatty and crushed to a degree making them useless for any collection. It is quite possible that some of the high prices paid was due to the possibility that the wings could be used for some decorative purpose, or that they were required for the chemical extraction of some pigment: a purpose for which there is a rising demand. Perhaps more likely, however, was the hope of some buyers that amongst such a quantity there must be something worth having—a bargain to be had. Perhaps, too, some expert had managed to spot some valuable specimens in good condition. To give some examples, five boxes containing not very many damaged Ornithoptera fetched from £55 to £100 the lot. A lot of eight boxes of *Morpho rhetenor*, *diana augustinae* and other Morphos perhaps to the number of 2,000 and in fair condition fetched £130. Another lot of *Morpho*, however, which the author had been able to examine carefully and which contained mainly fragmented wings and a great deal of loose powder, etc., seemed a very expensive buy at £100. In view of the prices realised for set *Charaxes*, the lots of 10 boxes at £25-£40 per lot were probably a bargain. Not such a bargain were the assorted Lepidoptera frankly catalogued as “poor condition” which fetched £45-£65 for lots of a dozen to eighteen boxes. The Saturniid material looked very damaged, but even so realised an average of £7 per box, the real bargain here being the *Rothschildia zacateca*.

Perhaps the best bargains in this material were the thousand odd boxes, not catalogued nor viewed, which were sold in the late afternoon of Wednesday in batches of from one to two dozen. It was only possible in the crush to get a fleeting glimpse of part of the material and an immediate assessment had to be made. The prices at £20-£70 per lot may or may not have been worth it; attending this sale certainly was.

Diptera from Monks Wood National Nature Reserve

By H. J. WILLS, B.Sc., F.R.E.S.

(Concluded from p. 119)

LAUXANIIDAE

- Lyciella rorida* Fall. B. C. S. 11th to 22nd July. Common.
L. pallidiventris Fall. B. C. 16th Aug. to 8th Sept.
Tricholauxania praeusta Fall. C. S. 11th to 18th July.
Calliopum aneum Fall. B. F. 17th to 21st July.

PSILIDAE

- Loxocera albiseta* Schrank C. F. 16th July to 8th Sept.

SEPSIDAE

- Nemopoda nitidula* Fall. B. C. F. W. 17th July to 8th Sept.
Sepsis fulgens Meig. B. C. 22nd July to 28th Aug. A large swarm of this species on the vegetation bordering Southedge Ride remained in the same position for the whole of August.
S. punctum F. B. 3rd Sept.
S. violacea Meig. B. C. 26th July to 8th Sept.
S. flavimana Meig. C. 27th Aug.

S. orthocnemis Frey, R. C. 6th Sept.

S. cynipsea L. B. 26th July.

SCIOMYZIDAE

Pherbellia albocostata Fall. S. 22nd July.

P. dubia Fall. S. 17th July.

Euthycera fumigata Scop. B. C. 13th Aug. to 8th Sept.

Knutsonia albiseta Scop. C. 9th Sept.

Tetanocera elata F. B. C. F. S. 14th July to 21st Aug. Common and widespread.

T. hyalipennis von Roser. B. C. F. S. 11th July to 8th Sept. Common and widespread.

Trypetoptera punctulata Scop. B. C. 11th July to 3rd Sept. Frequent.

CHAMAEMYIIDAE

Chamaemyia elegans Panz. C. F. 8th to 23rd Aug.

HELOMYZIDAE

Helomyza variegata Loew B. S. 17th July to 15th Aug.

H. affinis Meig. B. 15th Aug.

Neoleria inscripta Meig. C. F. 10th Aug. to 8th Sept. On carrion.

ANTHOMYZIDAE

Anthomyza sordidella Zett. C. 23rd Aug.

Paranthomyza nitida Meig. C. 18th July.

OPOMYZIDAE

Opomyza germinationis L. B. C. F. S. 14th July to 8th Sept.

O. florum F. B. C. 8th to 28th Aug.

Geomyza combinata L. B. F. 26th July to 8th Sept.

EPHYDRIDAE

Setacera micans Hal. W. 18th Aug.

Hydrellia griseola Fall. C. 16th Aug.

H. modesta Loew B. C. S. 18th July to 8th Sept. Common.

Scatella stagnalis Fall. W. 22nd July.

S. (Stictoscatella) quadrata Fall. B. 15th Aug.

Parydra coarctata Fall. S. 17th July to 28th Aug. Very common on emergent pondside vegetation.

BORBORIDAE

Copromyza suillorum Hal. C. 27th Aug.

DROSOPHILIDAE

Parascaptomyza pallida Zett. C. 23rd Aug.

Drosophila funebris F. W. 10th July.

D. subobscura Collin C. 20th July. Prey of *Empis (Kritempis) livida* L.

DIASTATIDAE

Campichaeta basalis Meig. S. 28th Aug.

CHLOROPIDAE

Elachiptera brevipennis Meig. C. 6th Aug.

CALYPTERAE

TACHINIDAE

Trixa oestroidea R.-D. F. 6th Aug.

Phyllomyia volvulus F. B. 14th July.

- Wagneria lentis* Meig. W. 18th Aug.
Eriothrix rufomaculata Wain. B. F. 21st July to 8th Sept.
Linnaemyia vulpina Fall. F. 3rd Sept.
Echinomyia fera L. B. C. F. 21st Aug. to 1st Sept. Common.
Siphona geniculata Deg. B. F. 23rd Aug. to 4th Sept.
Voria ruralis Fall. C. F. W. 14th to 27th Aug.
Paraphorocera stabulans Meig. C. F. 11th July to 23rd August. Common.

CALLIPHORIDAE

- Morinia nana* Meig. C. F. S. 17th July to 8th Sept.
Nyctia halterata Panz. B. S. 17th July to 14th Aug.
Sarcophaga haemorrhoea Meig. B. 21st Aug.
S. dissimilis Meig. B. 17th July.
S. subvicina Rohdendorf C. S. W. 17th July to 18th Aug.
Pollenia varia Meig. W. 18th Aug.
P. rudis F. B. C. F. S. 12th July to 3rd Sept.
Lucilia sericata Meig. B. 29th July.
L. silvarum Meig. F. 16th July.
L. caesar L. W. 18th Aug.
L. illustris Meig. B. W. 10th to 18th Aug.
Calliphora erythrocephala Meig. B. C. W. 13th July to 8th Sept.
C. vomitoria Meig. C. F. S. 21st July to 28th Aug.
Cynomyia mortuorum L. W. 23rd July.

MUSCIDAE

- Muscina assimilis* Fall. F. 24th July.
Graphomyia maculata Scop. B. C. F. S. 14th Aug. to 27th Aug. Common and widespread.
Orthellia caesarion Meig. F. 3rd Sept.
Musca domestica L. W. 17th to 24th Aug.
M. autumnalis Deg. B. C. F. S. 31st July to 28th Aug. Common and widespread.
Dasyphora cyanella Meig. W. 23rd July.
Morellia hortorum Fall. B. 21st Aug.
M. simplex Loew B. C. 11th July to 6th Aug.
Polietes lardaria F. B. 22nd July.
Lasiops semicinereus Wied. B. C. W. 11th July to 11th Aug.
Pogonomyia (Trichopticoides) decolor Fall. C. 8th Sept.
Hydrotaea irritans Fall. B. C. F. W. 11th July to 18th Aug. Widespread and very common.
H. similis Meade C. 6th to 27th Aug.
H. dentipes F. B. 21st July.
H. cinerea R.-D. C. 20th July. Prey of *Empis (Kritempis) livida* L.
Phaonia variegata Meig. W. 23rd July.
P. pallida F. B. C. 11th to 17th July.
P. trimaculata Bouche. F. 24th July.
P. rufipalpis Macq. B. 22nd July.
P. perdita Meig. F. 8th Aug.
P. basalis Zett. C. F. 14th Aug. to 3rd Sept.
P. signata Meig. B. 28th Aug.
Lophosceles cinereiventris Zett. C. 27th Aug.
Fannia difficilis Stein B. 2nd Aug.

- F. umbrosa* Stein C. 11th July.
F. armata Meig. W. 23rd July.
F. polychaeta Stein B. 17th to 21st July.
F. serena Fall. B. S. 17th July to 15th Aug.
F. similis Stein C. 12th July.
F. subsimilis Ringdahl S. 14th Aug.
F. coracina Loew. C. 12th July.
F. gotlandica Ringdahl C. 11th July.
Hebecema umbratica Meig. C. 11th July to 8th Sept.
H. affinis Malloch B. S. 14th to 28th Aug.
Helina laetifica Desvoidy (= *lucorum* Fall.) C. 11th July.
H. lasiophthalma Macq. W. 18th Aug.
H. concolor Czerny C. 2nd Aug.
H. depuncta Fall. C. 18th July.
Coenosia mollicula Fall. W. 18th Aug.
C. infantula Rondani C. S. 14th Aug. to 8th Sept.
C. lineatipes Zett. B. C. S. 12th Aug. to 8th Sept. Frequent in damp places.
C. alleni Fonseca C. 27th Aug.

ANTHOMYIIDAE

- Anthomyia procellaris* Rondani B. 21st Aug. to 8th Sept.
Hydrophoria conica Wied. C. 11th July.
Pegoplata virginea Meig. C. 14th July.
Hylemyia strigosa F. C. 14th July.
Pegomyia winthemi Meig. B. 30th July.
P. rufina Fall. F. 8th Aug.
P. fulgens Meig. C. 23rd Aug.
Leptohylemyia coarctata Fall. F. 16th to 21st July.
Paregle aestiva Meig. F. 8th Sept.
Nupedia infirma Meig. (= *dissecta* Meig.) C. 16th Aug.
Erioeschia brassicae Bouche F. 27th Aug.
Lasiomma eriophthalma Zett. C. 13th Aug.
L. meadei Kowarz B. 18th July.
Delia cilicrura Rondani F. 21st July.
D. trichodactyla Rondani C. F. 11th July to 8th Sept.

CORDYLURIDAE

- Parallelomma albipes* Fall. B. 13th Aug.
Norellisoma spinimanum Fall. C. S. W. 2nd Aug. to 8th Sept.
Scatophaga lutaria F. C. 24th July.
S. stercoraria L. B. C. F. S. W. 14th July to 3rd Sept. Common and widespread.
S. squalida Meig. C. 18th July to 2nd Aug.

"Greylands", Furse Hill Road, Ilfracombe, Devon.

 SPECIAL INDEX

The continuance of the Special Index is now under consideration and the views of readers would be appreciated. It is thought that while it is of use to research workers, little use is made of it by ordinary subscribers. The resultant saving would enable us to print an equivalent amount of additional material during the year.—ED.

Lepidoptera in North-East Derbyshire in 1967

By J. H. JOHNSON, F.R.E.S.

(Concluded from p. 114)

A short walk along the Incline on June 2nd after tea gave me the chance to take a few *Ancylis badiana* Schiff. (*lundana* F.) Lund's Roller. A very tiny moth was noticed flying in large numbers in and around and settling on hawthorn bushes. They were finally identified as *Argyresthia nitidella* F. (*purpurascens* Staint.) (Cream Coloured Argent), and they certainly fitted Stainton's description. When examined closely they are a very pretty lilac shade.

On June 4th the flowers of germander speedwell, *Veronica chamaedrys* L. were attracting scores of tiny black moths which were not identified. A larger species present on the same flowers was captured and proved to be *Adela fibulella* Schiff. (Frisch's Gold Long-horn). This was in Ashover near Butts Pastures.

A newly emerged Poplar Hawk female (*Laothoe populi* L.) was seen on a poplar trunk in the garden at 9 a.m. and left undisturbed. It remained there all through the day unseen by the sparrows and did not move until about 10.30 p.m.

All through May, magpie moth (*Abraxas grossulariata* L.) larvae were brought to me from all parts of the district. It was obvious that this was a Magpie moth year, but I did not expect to see quite so much havoc caused to a hedgerow as I saw at Locko Lane, Pilsley, where, near a pair of old cottages, the well-known black and white caterpillars had attacked every species of plant in the hedge. They were eating hazel, bramble, hawthorn as well as the blackthorn and gooseberry. I collected 75 larvae in a few minutes to rear through to the perfect insect. I always hope to find a new variety emerging in the breeding cage, but, as usual, I was disappointed.

After a careful search of a few plants of knapweed (*Centaurea nigra* L.) growing near No. 4 Tip I found three cases of *Coleophora alcyonipennella* Koll. (Knapweed Green Case). There were several other small larvae feeding inside the stems but I failed to rear any of them. *Platyptilia gonodactyla* Schiff. (Triangle-marked Plume) was common among the sorrel plants, and a tortrix, *Cephasia interjectana* Haw. (Lesser Grey Shade) was caught in abundance among birch scrub.

Butterflies were quite plentiful during June and July at Tibshelf. On June 14th, down Locust Lane, I saw seven Wall Browns *Pararge aegeria* L., sixteen Small Heaths (*Coenonympha pamphilus* L.), four Large Skippers (*Ochlodes venata* Br. and Grey (*sylvanus* Esp.)) and scores of Cabbage Whites.

The Silver Ground Carpet (*Xanthorhoe montanata* Schiff.) has been seen in every part of the district, nearly as frequently as the Garden Carpet (*X. fluctuata* L.). The latter seems to be becoming darker while the former is becoming lighter, or, at least more conspicuous. Even the youngest collector among us now scorns the ubiquitous *montanata*!

An expedition to Lathkil Dale on Sunday morning, June 18th, was upset by scores of hikers tramping up and down. The Grizzled Skipper (*Pyrgus malvae* L.) was common and not too difficult to capture in spite of the very steep and rugged slope that it always kept to. Male Orange Tips (*Anthocaris cardamines* L.) were seen near the border of the wooded part of the dale. One Mother Shipton (*Euclidimera mi* Clerck) and

several Cinnabars (*Callimorpha jacobaeae* L.) were netted on the same steep slopes, which are a real sun trap and become extremely hot on a fine day. A few Speckled Yellows (*Pseudopanthera macularia* L.) were disturbed. They were pale and worn, and past their best. One Flame Shoulder (*Ochropleura plecta* L.) was taken feeding at bedstraw flowers.

On the way back from Lathkil, a short search of the heather on Beeley Moor revealed several *Ancyliis myrtillana* Treits. (Lyell's Roller), and one Beautiful Yellow Underwing (*Anarta myrtilli* L.). Two male Emperor Moths were seen in flight, but unfortunately they did not lead to a female.

Agapeta hamana L. (Hook-marked Conch) was disturbed in odd ones from its resting place near thistles on the waste land near the Incline at 8 p.m. on June 27th. At the same time *Olethreutes lacunana* Schiff. (*herbana* Guen.) (Indefinite Marble) was flying about everywhere. This moth was also reared from larvae found feeding on both knapweed and birch this year.

A female Puss Moth (*Cerura vinula* L.) was found in the light trap on July 2nd, so badly damaged that I thought a cat had been playing with it. For three days it lay in a cardboard box motionless, then suddenly began ovipositing. Over a hundred eggs appeared, mostly stuck together in clumps of five or six, but they were fertile and produced a good percentage of pupae in the proper season.

The Meadow Brown Butterfly (*Maniola jurtina* L. (*janira* L.)) was seen for the first time this season at Tibshelf on July 5th, when, in several fields, the Chimney Sweep Moth (*Odezia atrata* L. (*chaerophyllata* L.)) was incredibly abundant.

During a visit to Slagmill Plantation, Beeley Moors, on July 23rd a few specimens of *Apotomis saucinana* Frol. (Dark Long-cloaked Marble) were captured. This, a common species wherever bilberry grows, has been recorded in most parts of Derbyshire.

Several members of the Derbyshire Entomological Society decided to make an evening trip to Ashover Butts on July 27th, and since it was the first Field Meeting of the Society since 1961 we agreed in advance not to be put off by anything, least of all the weather. And so, in spite of a steady drizzle, which covered everything with a film of moisture, we left the car and proceeded through soaking wet grass and dripping bushes. We beat shrubs and trees, making drops of water fly if not moths. At first no insects were seen, and then as darkness closed in several small pale geometers came out of hiding, and we were rewarded for our pains by the capture of four Blue-bordered Carpet Moths (*Plemyria rubiginata* Schiff. (*bicolorata* Hufn.)) and three Dwarf Cream Waves (*Sterrrha interjectana* Boisd. (*fuscovenosa* auct.)). The former species has been recorded in most areas of Derbyshire, but this is the first county record for the latter. The weather improved next day so we made another trip to the same locality in the evening about 8.30. We took a few more *interjectana*, several Treble Lines (*Anaitis plagiata* L.) and Local Chalk Carpets (*Ortholitha bipunctaria* Schiff.). Just as we were beginning to warm to our task of searching the ragwort flowers our only torch failed, and we were unable to continue. However, we were happy to have discovered an addition to the county list. A few Brimstone Moths, now called the Sulphur Thorn (*Opisthograptis luteolata* L. *crataegata* L.), and Barred Yellow Moths (*Cidaria fulvata* Forst.) flew

out of rose bushes as soon as the beating stick was used. The tiny yellow *Acleris rhombana* Schiff. (*contaminana* Hubn.) flew out of almost every hawthorn bush before the beating stick was applied.

I tried an evening's "sugaring" at Bath Lane, Ashover, on August 1st. The total catch of nine moths was hardly worth the trouble, and I was not encouraged to repeat the performance on any other occasion.

On August 1st I saw hundreds of *Udea lutealis* Hubn. (Pale Straw Pearl) everywhere I walked through grass. This species must now be the commonest of all the moths in this area. On every patch of waste ground it seems to be building up a large population. Fortunately it seems to feed only on weeds, otherwise it might develop into a serious pest.

At 5 p.m. on August 11th I was examining a small clump of tansy plants growing on the "Shunts" near Clay Cross Station, when I saw a perfect example of *Dichrorampha petiverella* L. (Petiver's Drill) at rest on one of the leaves. As I watched, another one flew around the plant for a second or two and then joined the first, and almost before I had realised it was there, they were *in cop*. This is the first record of this species in area 6.

On August 12th I saw two Wall Brown Butterflies (*Pararge megera* L.) settled on Clay Cross Pit Tip, and after searching the ragwort for an hour I was able to find 56 Cinnabar (*jacabaeae*) larvae of all sizes from almost newly hatched ones to fully grown ones. More than half were parasitised and failed to pupate. A perfect Grey Chi (*Antitype chi* L.) was seen at rest on a wooden fence rail. This species is very common on the heather moors where it usually rests all day on the stone walls, and may be taken in large numbers in most years in August.

I paid another visit to Ashover Butts on the afternoon of August 15th and saw hundreds of Small Tortoiseshell Butterflies (*Aglais urticae* L.) feeding on the scabious flowers, and a couple of Small Copper Butterflies (*Lycaena phlaeas* L.) in the same position. Three pale specimens of *Crambus perlellus* Scop. (Yellow Satin Grass Veneer) were caught on a tussock of cock's-foot grass, together with two *Ochsenheimeria mediopectinella* Haw. (Middle Feather Field). The antennae of the latter species are unusually thick, and are noticed immediately, even before a magnifying glass is used. The locality where these insects were found was very rough pasture on limestone sheltered by a strong hedge of a very tall rosebay willowherb.

The first Red Admiral (*Vanessa atalanta* L.) was seen feeding on the buddleia blooms in the garden on September 1st. Others were seen later at Pilsley and Tibshelf, but in no great quantity, in fact they were uncommon this year.

One Dark Dagger larva (*Apatele tridens* Schiff.) was found feeding on blackthorn in the hedgerow near Tibshelf School at 9.0 a.m. on September 6th. It was nearly fully grown and pupated a few days later. This species has been found in the same place in other years, but, although I have searched carefully, I have found it in no other locality. Two Grey Dagger (*A. psi* L.) larvae were found feeding on birch in the garden on September 9th.

I searched the rosebay willowherb plants growing on the banks of the Incline and Alma Pit Tip for larvae for two whole hours on September 9th. Between 4.0 p.m. and 6.0 p.m., I found only two Elephant Hawk

(*Deilephila elpenor* L.), both brown and both fully grown and feeding in full view. On a willow bush near the railway line I found one Coxcomb Prominent larva (*Lophopteryx capucina* L., *camelina* L.) also feeding in full view.

An evening visit to Slagmill Plantation, Beeley Moors, produced wet feet and a few specimens of *Epinotia stroemiana* F. (*bimaculana* Don.) (Stroem's Bell), which was flying about freely in spite of heavy drizzle. This medium sized tortrix is very easy to differentiate from other species. It has two dorsal white marks and flies in September, and yet the authors have caused confusion by giving it several quite different names. Heslop (1964) and Bradley (1959) agree on the name given above, Meyrick (1897) named it *Epiblema similana* Hb. (*bimaculana* Don.), Ford (1949) called it *Eucosma similana* Hbn., Morris (1872) *Ephippiphora bimaculana*, and Stainton (1857) *Halonota bimaculana*.

A keen amateur entomologist had reported the discovery of a few larvae of the Fox Moth (*Macrothylacia rubi* L.) near Slagmill but none was seen on this occasion. The following evening was much milder and the sun was shining, so another journey was made to the same spot. A very short walk among the heather was enough to prove the presence of *rubi*, and a close search of the vegetation of just thirty minutes produced 53 healthy larvae, and by 7.0 p.m. when it was too dark to see any more I had 72 in my boxes and jars. They were feeding indiscriminately on grass, heather, bilberry, bramble and birch, but usually they were found in a sheltered spot facing the sun or where the sun's rays fell on them.

On September 15th I made another trip to Slagmill Plantation and searched another part of the moor. In ten minutes I had 13 *rubi* larvae. I moved to several places within a radius of half a mile and everywhere I found *rubi* larvae in the same abundance, searching for half an hour was enough to find 50. Near Wragg's Quarry, about a mile from Slagmill I picked up 50 larvae in seven minutes on September 20th. This abundance continued until October 10th, but on this date I noticed that a few of the caterpillars failed to roll up tightly when touched, and even felt limp, while an occasional one was carrying small fly maggots on the long hairs. When handled, some larvae exuded an offensive yellow fluid which stained the fingers. The last time that I saw *rubi* larvae as numerous as this was in 1952, since which time they have been quite uncommon. Next year they will, no doubt, be uncommon again. Whatever happens to these little population explosions?

Eddlestowe Wood is an interesting strip of woodland which encloses the first few miles of the River Amber above the hamlet of Kelstedge. The dipper finds suitable nesting sites in the overhanging river banks, and a tawny owl nests in the same hollow tree every year. There is a small clearing where heather, bilberry and field scabious grow undisturbed. On September 16th I put up several small brown plume moths as I moved about among the grass. They were found to be *Stenoptilia bipunctidactyla* Scop. (*arida* Zell.) (Grey Wood Plume), which is the only plume moth so far recorded from Area 5. Feeding on the scabious leaves were several inch long yellow and green sawfly larvae which have not been named yet.

Ruby Tiger (*Phragmatobia fuliginosa* L.) larvae were found feeding on ragwort plants when I searched the flowers for moths, others were found

on rosebay willowherb when I was looking for *elpenor* larvae, and yet others were found on wormwood when I was searching for Wormwood Shark (*Cucullia absinthii* L.) larvae. Wormwood leaves seem acceptable as food to a large number of larvae. Besides *absinthii* and *fuliginosa* I obtained two small Garden Tiger (*Arctia caja* L.), five Broom (*Ceramica pisi* L.) and six Wormwood Pug (*Eupithecia absinthiata* Clerck). On other occasions I have found both Peppered (*Biston betularia* L.) and Scalloped Hazel (*Gonodontis bidentata* (Clerck)) apparently thriving on a diet of wormwood. One fully grown *betularia* larvae was observed feeding on broom in the garden on September 28th. It pupated a few days later.

On November 10th an Angle Shades Moth (*Phlogophora meticulosa* L.) in Tibshelf School yard. The last record of the season, which has not been such an empty one after all, was a male Winter Moth (*Operophtera brumata* L.) which appeared at a lighted window on the evening of November 28th. There are still plenty of moths to be found—in the right place at the right time!

The mercury vapour light trap which was operated in my garden every night between April and October inclusive captured 182 species of macrolepidoptera and a total of 15,996 specimens, which is well above the average catch for the last thirteen years. I have operated the same light trap in the same place since 1953, with the exception of 1956 and 1964, every night between April and October inclusive, and have recorded every moth found in the box. The mean annual catch is 11,663, so the present year 1967 can be classed as a good year. A few species have declined in numbers, at least in my trap, the most notable one being the Hedge Rustic (*Tholera cespitis* Schiff.), which is now missing from the list completely, although quite common in 1953. Perhaps this explains the absence of this species from the list of macrolepidoptera of the county produced by H. C. Hayward (1926); it has been only a temporary resident.

One species new to the county was taken in the trap this year. On September 18th a perfect specimen of the Black Rustic (*Aporophyla lunula* Stroem. *nigra* Haw.) appeared among a few common species. New records in the Noctuidae are very uncommon now. I sometimes wonder where these lone travellers have come from, and why they have not called before. New records among the Pyralidae are commoner but still gratifying to make. On the night of July 12th a large specimen of *Chilo phragmitellus* Hübn. (Wainscot Grass-veneer) was captured, the only one recorded in Derbyshire, although I am confident that if the reed beds in the South of the county were searched closely at the right time a few more examples would be found. A single Oak Hook-tip (*Drepana binaria* Hufn.) was taken on August 8th: the fourth county record, the first in Area 6. It laid a few eggs, but all the larvae died in the second or third instar. When I saw a pretty little Yellow Waved Carpet (*Hydrelia flammeolaria* Hufn., *luteata* Schiff.), I thought I had another new record, but when I looked it up I found that it has been seen in Areas 1, 2, 3, 5 and 6. The larvae feed on field maple which is common enough in some parts of the county, so it is surprising that it has not turned up sooner. Thus in 1967 four comparative rarities were met with in the trap; not a bad score for any year now. Of the common species 17 were more abundant in this season than in any other since 1953, judging by the results of the trapping. The following table gives the total number of the species named in 1967 and the second figure gives the average annual catch.

<i>Gortyna micacea</i> Esp. (Rosy Rustic)	412	262.7
<i>Amathes baja</i> Schiff. (Dotted Clay)	391	168.0
<i>Graphiphora augur</i> F. (Double Dart)	125	59.0
<i>Xanthorhoe montanata</i> Schiff. (Silver Ground Carpet)	151	51.5
<i>Apatele psi</i> L. (Grey Dagger)	167	43.5
<i>Euplexia lucipara</i> L. (Small Angle Shades)	137	39.9
<i>Alcis repandata</i> L. (Mottled Beauty)	70	32.9
<i>Eupithecia succenturiata</i> L. (Bordered Pug)	67	27.0
<i>Abraxas grossulariata</i> L. (Magpie)	87	19.9
<i>Unca triplasia</i> L. (Spectacle)	53	15.9
<i>Sterrha dimidiata</i> Hufn. (Single Dotted Wave)	37	11.9
<i>Lophopteryx capucina</i> L. (Coxcomb Prominent)	27	11.6
<i>Ourapteryx sambucaria</i> L. (Swallowtail)	38	10.2
<i>Nola cucullatella</i> L. (Short Cloaked)	38	9.5
<i>Sterrha seriata</i> Schrank (Small Dusty Wave)	10	3.8
<i>Chiasma clathrata</i> L. (Latticed Heath)	11	2.8
<i>Habrosyne pyritoides</i> Hufn. (Buff Arches)	13	2.7

To try to explain these increases in the population of any or all of these species is to attempt the impossible. There is no obvious pattern, no common factor, which can easily be picked out. The sudden great increase in the population of the Grey Dagger may have been caused by the destruction of the trees in Tupton Park to make way for a new school. The lack of suitable trees might have forced the females to travel further in search of places to oviposit. This is only a wild guess. For the most part, these increases merely illustrate the instability of the so-called "Balance of Nature". Normally the populations of most wild creatures rise and fall periodically, and while one species is having a recession, another is having a boom. As certain habitats are modified the creatures favoured by the changes may increase in numbers, while others, less fortunate, may disappear altogether, an observation which has been made many times previously.

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POST-GRADUATE STUDENTSHIPS IN NATURAL RESOURCES OFFERED BY THE MINISTRY OF OVERSEAS DEVELOPMENT.—In order to increase the numbers of qualified men and women available for work overseas the Ministry of Overseas Development are making a novel offer of post-graduate studentships in *agriculture, agricultural engineering, forestry, geology, mining, veterinary science, botany, plant pathology, and allied subjects in the natural resources spectrum*, to graduates willing to work in the developing countries after completing their courses. Students may be offered courses at home or overseas depending upon the nature of their qualifications and their subsequent posts overseas.

Applications are invited from those who have or are about to obtain their first degrees or other qualifications in these subjects.

The Ministry is to-day issuing a booklet about the scheme, which is available through University Appointments Boards, as are application forms. People interested in the scheme may also obtain copies of this booklet and application forms direct from the Ministry, Eland House, Stag Place, London, S.W.1. Room E.301.

Notes and Observations

I was interested to see the note of *Amphipyra berbera* Rungs in the supplement to "The Butterflies and Moths of Kent" (antea (380)). I am particularly interested in the dates of capture. I have examined my series, and the dates of capture of six *A. berbera* range from July 23rd to August 15th. The dates of capture of eight *A. pyramidea* range from August 22nd to September 13th. This suggests that the emergence of *A. berbera* is rather earlier than that of *A. pyramidea*. The two dates quoted on p. 380 seem to fit in, as they are July 19th and 29th.

Of course, this is a very small sample, but perhaps others would examine the dates of capture of their *pyramidea* and *berbera*, and see whether this is generally borne out.—Air Marshal Sir ROBERT SAUNDBY, K.C.B., Oxleas, Burghclere, near Newbury, Berkshire. 26.iii.1968.

HERSE CONVOLVULI L.—Mr. Bunn's article, *Number of Instars of the Larva of Herse convolvuli L.*, (1968, *Entomologist's Record*, 80: 13) has prompted me to look up some details of my own breeding experience of this species in India and East Africa.

All my larvae have had five instars, actual dates recorded are as under:—

	Calcutta	Kampala
Ovum laid	4th October	5th April
Ovum hatched	7th October	8th April
1st moult	10th October	10th April
2nd moult	12th October	13th April
3rd moult	15th October	16th April
4th moult	17th October	20th April
Larva buried	23rd October	30th April
Imago emerged	3rd November	19th May

The green form of larva is fairly constant with the head green with a darker green inverted Y and black marginal stripe. Body green with the usual lateral stripes white edged above with darker green. The spiracles black rimmed with orange and set in small black spots. Horn curved, orange tipped with black. Legs black. Prolegs, clasper and venter green. Occasionally a green larva lacks all the above black markings.

The brown form is very variable, the ground colour ranging from almost black to an ochreous buff. The horn is always black. The spiracles vary from black in the darker forms to a dark red brown with a black central slit in the paler, always set in black spots.

The horn in the first instar has the extreme tip bifid.

The first and second instars do not appear to vary, it is only in the third that the various forms begin to manifest themselves.

Bell and Scott, *Fauna of British India*, Moths. V (Sphingidae), give a very complete description of the various forms and figure a number of

them. Hampson, *Fauna of British India*, Moths, I, states that the European form of larva has a black spot above each lateral stripe, which is the only distinction between it and the Indian (and presumably African) form *orientalis* Btlr.—D. G. SEVASTOPULO, F.R.E.S., Mombasa. 2.iv.68.

Current Literature

Flies of the British Isles. By C. N. Colyer in collaboration with C. O. Hammond. London & New York. Frederick Warne & Co. Ltd. Price 55s.

This is the second edition but in a larger format 8½ inches × 6 inches with 24 plates in colour, 28 half-tone plates and 50 text figures and diagrams depicting 286 species carefully chosen representatives of the 5600 or so species known in Britain.

The appearance of the book in 1951 filled a void and was enthusiastically welcomed in this country and abroad. The coloured illustrations were considered to be the best in the Wayside and Woodland series and of books on diptera. For the first time non-entomologists could recognise a fly from good pictures and Colyer's account of the varied habits made many pay attention to flies. Coinciding with the interest aroused by the 1949 Check List of Kloet and Hincks and the start of the Royal Entomological Society's Identification Handbooks covering the Diptera, the book commenced a further burst of study of flies.

Many species have been discovered for the first time in Britain since 1951, many new to science. These additions, with the changes in classification, have caused some alterations in the text and this edition has benefited by the help of Mr. K. G. V. Smith of the British Museum (Natural History) and his colleagues. The amendments have been cleverly made so that despite an increase from 268 to 445 items of literature cited and an addition of 26 items in the index, the pages have been increased by only one from the 1951 edition to a total of 384.

The beautiful coloured and half-tone illustrations by C. O. Hammond that are large enough to enable each species to be correctly identified now appear side by side on the larger pages of this edition making comparison easier.

Although reference is made to the value of consulting museum collections perhaps in the next edition it would be useful to inform readers of the benefit to be obtained by joining local natural history societies (details obtainable from County and Municipal libraries) for guidance in the field and of the national societies who have the specialised libraries needed by amateur dipterists as they progress.

The publishers and authors are to be congratulated in producing this improved edition within a few months of the first edition disappearing from the bookstalls. The work remains the world's best introduction to the diptera with an excellent reference list for further reading to enable a beginner to extend his studies

It is hoped that this work will encourage the study of flies of whose life histories so much is still to be discovered and to inspire many to gain sufficient experience to enable them to assist local Nature Trusts to ascertain the fly inhabitants of reserves and their ecology.—L. P.

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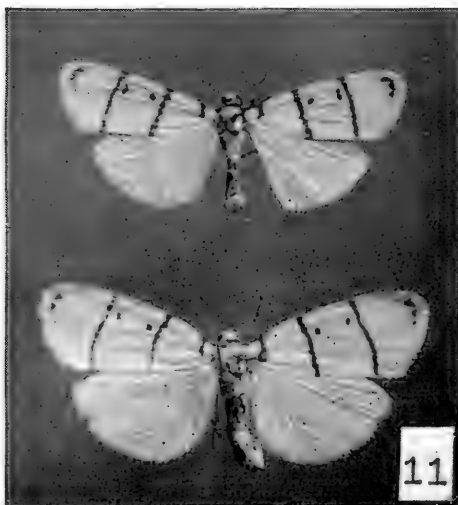
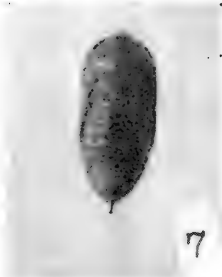
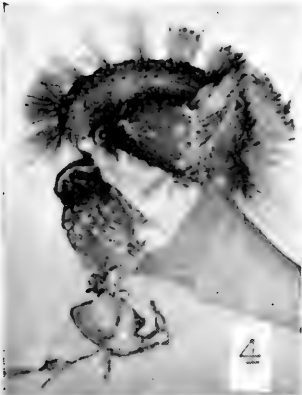
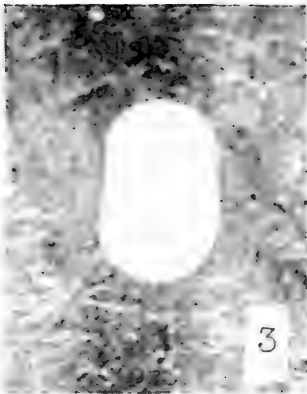
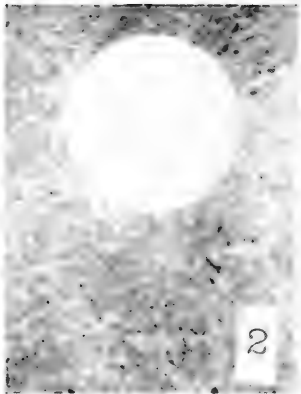
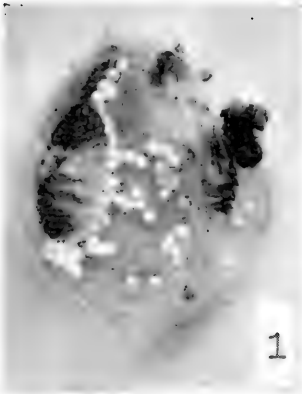
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Notes on Some South African Lepidoptera

By J. S. TAYLOR

For a number of years the writer has recorded observations on South African Lepidoptera with particular reference to the Eastern Cape Province (Taylor, 1949, 1951, 1954, 1957, 1965). While in some cases the following notes are supplementary to those published earlier, they are largely the result of observations carried in Natal since he left the Eastern Cape in 1965.

The writer's thanks are due to Drs. E. C. G. Pinhey and L. Vari for naming Lepidoptera; to Miss G. V. Britten and Dr. O. M. Hilliard for naming plant material; to Mr. C. G. C. Dickson for his constant interest and encouragement, as well as supplying insect material and data; and to Mr. A. N. Wykemam for the photographic illustrations.

SYNTOMIDAE

Metarctia metus Stoll.

Adult males were noted at light at Hilton, Natal, during January; the female is incapable of flight, having vestigial wings. In the Eastern Cape this species was found commonly, and the gregarious larva was a grass-feeder (Taylor, 1949); Platt (1921) recorded the larva on *Trema bracteolata* Blume. At Hilton, larvae were found singly and fed on *Senecio pterophorus* D.C. Larvae found in May did not pupate until the following January.

The full-grown larva measures some 70 mm. in length. It has a greasy appearance and is covered with long black and highly irritant hairs which emanate from black verrucae on a reddish-brown integument. Low down laterally the reddish-brown colour is more intensified, while ventrally the integument has a greenish tinge. The larva is very active.

The cocoon, which is constructed under debris, etc., or in holes in the ground, is flimsy and consists of larval hairs woven together with brown silk. It is oval in shape.

ARCTIIDAE

Siccia caffra Walk.

Taylor (1965) gave an account of this species in the Eastern Cape where the larva sometimes causes a nuisance, swarms over the walls of porches and verandahs seeking pupation quarters. No host plant was then known. This arctiid was of common occurrence at Hilton, and although the larva was often seen on walls no host-plant was found. The adult was frequently noted at light during the summer.

Dionychopus similis Mschl.

The larva of this species was found feeding on the leaves of cultivated dahlias and also on *Senecio pterophorus* at Hilton. The full-grown larva measures some 45 mm. in length. It is black with transverse rows of light-coloured verrucae. These have black spots or specks from which emanate outward-spreading chestnut hairs. The head is dark brown and the legs, prolegs and stigmata are red. The winter is spent in the pupal stage, and the adult was seen at light during the summer. In 1953,

observations were made on a pair of *D. similis* at Fort Beaufort in the Eastern Cape Province. Both male and female emerged on September 18, and were found in copula early on September 19, but separated immediately on being touched. On September 20, a batch of 360 eggs was found. The pair was in copula again on the morning of the Sept. 21 and remained thus for most of the day. By the morning of Sept. 22 the pair had separated, and four batches of eggs, totalling in all 462, were found. Egg-laying continued until Sept. 25, the total number deposited being 932. The male died on Sept. 26, the female on Sept. 29, the duration of the adult period being 8 and 11 days respectively. The egg is round, creamy white, with a finely reticulated surface, and measures slightly less than 1 mm. in diameter. It is deposited in rows in clusters of varying number, up to 200 or more. The incubation period occupied 10 days in September-October. These notes on the egg and adult were not published at the time, further attempts at rearing being unsuccessful.

Spilosoma lutescens Walk.

This species was of common occurrence at Hilton. The adult was often present at light during the summer, while the larva, which would seem to be a general feeder, was found on a variety of plants including *Vigna* sp. It readily accepted and thrived on the foliage of wattle *Acacia molissima* Willd., and Hepburn (1967) records it as an occasional pest of this tree. Platt (*op. cit.*) recorded it on *Solanum seaforthianum* Andr. and *Cassia tomentosa* L.

The larva is hairy, the hairs being mainly black, but with longer grey hairs intermingled. The hairs emanate from black verrucae arranged in transverse rows or ridges. The white integument is blotched or streaked with a faint bluish tinge laterally, while dorsally these markings show as streaks between the segments. The length of the larva is some 45 mm. Pupal periods of 25 to 27 days were obtained in January-February.

Cyana pretoriae Dist.

The larva of this species was found in clusters on the roof of a road tunnel under the railway at Hilton during the period December-February and also walking about in gardens. Despite constant search in the vicinity of the tunnel and elsewhere, the host-plant was never found. Although many of the larvae clustering in the tunnel were full-grown and ready for pupation, numerous individuals of younger instars occurred among them, and all attempts at rearing these younger larvae failed, in spite of a great variety of plants offered to them.

Pupation took place on the walls of the tunnel, the clusters of cocoons resembling those of the larvae. The larva is some 26 mm. in length, and is greyish to blackish-brown. It is densely covered with long grey hairs which curve over the body. The ventral surface is hairless and is tinged with olive. The fragile silken cocoon is coated with larval hairs, these projecting forwards and upwards, thus causing the cocoon to resemble the larva. The pupa is light brown and shiny. The duration of the pupal period is 20 to 21 days in mid-summer and emergence continued until March. An earlier generation emerges in the

spring. The adult was often noted at light during the summer. Both male and female are figured on Plate VIII, Fig. 11.

THYATIRIDAE

Aethiopsesestis austrina nebulosa Watson.

This recently described species was reared from the larva found feeding on the foliage of *Royena pubescens* Willd. and *Euclea undulata* Thb., at Highlands, near Grahamstown, C.P., in June 1947 (Taylor, 1965, 2).

NOCTUIDAE

Heliothis scutigera Guen.

The larva of this species was recorded at Hilton feeding on the buds and flowers of *Helichrysum cooperi* Harv.

Polia speyeri Feld.

The larva was found during December and January feeding on the flowering-heads of *Hypochoeris radicata* L., a very common plant, at Hilton. Platt (*op. cit.*) records it on *Rhoicissus cirrniflora* G. & B., *Vigna* sp., and *Gerbera jamesoni* Bolus.

The larva is yellowish-green, and is liberally sprinkled with white and black spots. A median dorsal line consists of small white spots, while there is a subdorsal line of larger and enamel-like black and white spots. The stigmata are enamel white and are surrounded by red which in its turn is surrounded or margined by white. These red patches occur also on the thorax, but are darker there, almost black in fact. The integument is smooth, but there is much subdued speckling, mainly white but with some black as well. The ventral surface is also faintly speckled with white. The head and legs are pale green. The length is some 48 mm. Pupation takes place in a fragile earthen cocoon in the soil. The pupa is of the typical noctuid form. The pupal period has varied from 34 to 65 days (December-March).

LYMANTRIIDAE

Psalis pennatula (Fabr.).

The larva, which is hairy and black and yellow in appearance, is of common occurrence at Hilton, and feeds on veld grasses. It has a broad and black median dorsal line with lateral and downward extensions as fine lines between the segments to a darker, streaked and broad lateral area. There is a pair of long and forward-projecting tufts of dark hairs on the first thoracic segment and a fused pair of backward-projecting tufts on the last abdominal segment. There are also dense but not long tufts on the third thoracic and first abdominal segments. The osmeteria are yellow, and the length of the larva is 35 mm.

The elongate silken cocoon is also often found on grass stems and the adult has been recorded at light.

Lymantria modesta Walk.

Host-plant: *Rhus pyroides* Burch. Hilton Platt (*op. cit.*) records it on *Rhus villosa* L.f. and on *Sclerocarya caffra* Sond.

The larva was beaten from the host bushes during the winter. It has a greyish-brown appearance and is lightly clad with hairs. The pinkish

surface is finely streaked or stippled with fine black lines. There are paired whiteish tubercles on the first four abdominal segments and whiteish markings laterally but above the lateral line area which is darker than the remainder of the body. There is a prominent and forward-projecting tuft of black hairs on the first thoracic segment immediately behind the head which is large, pink, and with thick black fascia on either side. The legs and prolegs are pink, the latter being particularly prominent and with large black patches between them. The osmeteria are whiteish, and the ventral surface is hairless. The length is 35 mm.

The pupa, which is formed in a loose cocoon among leaves of the host-plant, is light greyish-brown, with darker speckling, and has tufts of hairs on the anterior of the thorax and on the abdomen. There is a long cremaster, and the total length of the pupa is some 18 mm. The pupal period varied from 23 to 65 days (June to September).

Euproctis iridescens Janse.

Host-plants: *Acacia molissima* (Wattle) *Plantanus* sp. (Plane), a general feeder being found on almost any plant. Hilton.

A very common species; the larva is densely covered with black hairs which completely hide the integument, and there are also tufts of grey to white hairs. The first two thoracic segments bear tufts of dense whitehairs situated dorsally, and the third segment has a dense tuft of black hairs. The abdominal segments have tufts of grey hairs but on the last the hairs are black. There are also lateral tufts, white on the thorax, grey on the abdomen. The forward-projecting tufts on the first thoracic segment are mainly black. The thoracic legs, antennae and mouth-parts are yellow, the prolegs deep pink. The length is some 26 mm. Pupation takes place in a loose cocoon under debris, etc., and the pupal period occupies some 32 days (December-January).

Cymaroa leptopepla Hmps. (Plate VIII, Figs. 1-10).

Host-plant: *mesembryanthemum* (Ficoideae); Cape Town.

The larva is greyish-black in appearance. There are dorsal transverse rows of verrucae bearing tufts of black and grey hairs, and a dorsal line of shorter grey hairs. The tufts on the thorax are less dense and more black, and a whiteish dorsal line shows on the abdomen, while the osmeteria are pale yellow. There is a broad, wavy and irregular lateral line, pale orange in colour. The head is black. The ventral surface is hairless and has a greenish tinge. The length is some 25 mm.

The adult female is apterous and the eggs are deposited in the flimsy silken cocoon constructed on or near the host-plant. Emergence takes place in two to three weeks. Mr. C. G. C. Dickson has kindly contributed the following notes on the species which are quoted in full. "Larvae of this moth were first noticed on mesembryanthemum plants in my garden in Cape Town in the summer of 1965-66. They had never been seen here before and, considering that the female moths are wingless and do not leave their cocoon, one cannot account for the sudden appearance of the species in this way, in a spot which is nowhere near any breeding ground of this moth.

"The larvae matured fairly rapidly and cocoons were constructed on

or near the plants, in some cases in the angles formed by bricks which projected slightly from the wall of the house and close to which the plants were growing. Male moths were observed flying in the garden from about April onwards. They were on the wing during the daytime, but no more than two or three specimens were ever seen on the one occasion. They were active when the sun was shining, and were only found at rest if really dull weather prevailed. Specimens were seen in the same way during the following summer but they were not noticed in greater numbers than when they were seen on sunny days during the winter or spring. The flight was erratic but sustained and individual specimens remained as a rule in the same part of the garden for a considerable time. The moths were rather conspicuous for their size when on the wing, with the yellowish colouring accentuated by the sunshine.

"It was found subsequently that the larvae increased and decreased in numbers spasmodically. They had become extremely numerous rather more than a year after they were first observed in the garden but by the spring of 1967 (about August to October) their numbers had diminished greatly, probably due to parasitic attack—especially, it is believed, during the first half of the summer of 1967-1968 and at the time of writing (January 1968), the mesembrianthemum plants seem to be entirely free of them. When the infestation was at its height some of the plants, even the large ones, were virtually destroyed through defoliation by these larvae.

"This moth has been noticed at times in flight on the mountain slopes of the Cape Peninsula. One specimen in my collection was taken on Table Mountain on 27 January 1933. Even in its usual habitat it has never been observed in numbers, in the adult state."

From larval material received from Cape Town, a species of Tachinidae was obtained. The larva appeared to be very susceptible to some form of wilt.

SPHINGIDAE

Macroglossum trochilus Hbn. (Humming Bird Hawkmoth)

Host-plant: *Rubia cordifolia* L. Hilton Platt (*op. cit.*) likewise records it on this plant, also Pinhey (1962) and on *Galium*.

The larva is light yellowish-green, the surface being finely speckled with yellow. There is a double median dorsal line, and a narrow lateral line, both yellow in colour. The long and slender anal horn has a blackish tinge, due to dark and pimple-like incrustations. The larva measures 52 mm. in length. The pupal period occupies some three weeks in summer. The adult is to be seen at flowers during the day, and at light at night.

GEOMETRIDAE

Rhodometra sacraria L. (The Vestal)

Although this well-known immigrant species in Britain is of common occurrence in South Africa, at flowers during the day as well as at light, especially during seasons of activity by other migratory species of Lepidoptera, nothing appears to have been recorded of its larval habits or host-plants there. South (1908) mentions knotgrass and dock as hosts in Europe. At Wilderness, C.P., in the autumn of 1965, the writer confined some adults in a jar with the leaves of *Rumex* sp. Larvae were

subsequently obtained and readily accepted the leaves of the species of dock provided. They appeared to thrive, but unfortunately all died before reaching the pupal stage. They were then 25 mm. in length. The larva is light-grey and twig-like (younger specimens are brown), the surface is lined and streaked, also ridged; there is a prominent lateral ridge. Ventrally it is lighter in colour, and the body tapers towards the head which is tinged with pink. If disturbed, the larva drops readily and lies in a curled or twisted position, resembling a twisted stalk or twig. It does not appear to have been recorded in the field in South Africa.

Boarmia complacita Prout.

Host-plant: cultivated *Gardenia*: Hilton.

Semiothisa simplicita Warr.

Host-plant: *Acacia molissima*: Hilton.

The adult was often seen in wattle plantations, and also at light. The species has been recorded as a minor pest of wattle. (Hepburn, 1967).

SATURNIIDAE

Nudaurelia walhbergi Boisd.

Host-plants: *Styraciflua* or "Liquid Amber": Hilton. Platt (*op cit.*) records it on *Trema bracteolata* Blume., *Ricinus communis* L., *Psidium* sp. (guava) and *Magnifera indica* L., (Mango). Hepburn (*op. cit.*) records it on *Acacia molissima* (wattle).

The full-grown larva is some 85 mm. in length. It is black with transverse rows of scarlet scoli bearing short white hairs. There are yellow markings situated subdorsally on the abdominal segments. The white stigmata are prominent, and the head and legs are black. When young the larvae live gregariously in clusters. Pupation takes place in a fragile earthen cell in the soil and within the larval skin.

The adult has been recorded at light at Hilton in January.

Urota sinope Westwood

Host-plant: *Erythrina lysistemon* Hutch. Charter's Creek, Zululand; Umhlanga Rocks, Natal.

On 20 August 1966, 18 larvae were found on or near a small tree 10 to 12 feet in height. The tree had been completely defoliated, and the larvae were searching for food, some being on the ground, or on low-growing plants, grasses, etc. The tree concerned was one of a row of the same species, planted some 20 to 30 feet apart alongside a road. None of the other trees was affected. The larvae were collected and supplied with leaves of *Erythrina*. They commenced to seek pupation on August 23 and all had entered the soil by August 28. Emergence commenced on October 27 and was completed by November 3. The pupal period varied from 64 to 70 days. When the soil was later examined, little sign of a cocoon was found; if a cocoon exists, it must be a very flimsy earthen cell. Larvae were later obtained from Umhlanga Rocks, Natal North Coast, by Mrs. N. Gardiner. These entered the soil on 12 November.

The larva is greenish-yellow; the segments are humped or ridged, the second and third thoracic segments more so than the others. All these ridges have yellow tubercles bearing short white hairs. The inter-

segmental divisions are prominently marked with double lines of jet black. The ventral surface is greener with black markings or patches situated laterally on the third thoracic and first abdominal segments. The head and thoracic legs are black. The length of the larva is 55 mm.

Some infertile eggs were obtained from a female moth. They were rectangular, rounded at the ends, some 2 mm. in length, white with brown blotching, resulting in a pinkish tinge.

LASIOCAMPIDAE

Philotherma rosa Druce.

The larvae of this species was found at Hilton during late summer and autumn, and adults emerged in spring and early summer. The larva is a general feeder (Taylor, 1951, 1957), and it readily accepts the foliage of wattle. Hepburn (1967) records it as an occasional pest of wattle. At Hilton it was parasitized by a species of Tachinidae, as many as 36 puparia being obtained from one host larva.

Bombycopsis indecora (Walk.)

Host-plants: *Maesa lanceolata* Forsk., *Acacia molissima*, citrus: Hilton.

The larva is of the typical "lappet" type. It is brown to grey and bark-like, with the integument finely streaked. There are transverse ridges of dense brown hairs on the thorax, as well as the usual forward-projecting and lateral tufts. The full-grown larva measures some 50 mm. in length.

Some recently hatched larvae found on citrus in early February were reared on wattle foliage which they preferred. Cocoon formation commenced on March 24 and the subsequent adults emerged between April 16 and 22. Another larva, found in May, formed its cocoon on June 9, and the adult emerged on August 6.

The thin brown and silken cocoon is found among debris, etc., on the ground. The pupa is light greyish-brown and has a finely speckled surface, with rows of hairs dorsally and laterally. The stigmata are prominent.

The egg is light grey, oval, and is heavily marked and speckled with dark brown. It measures 1.5×1 mm.

ZYGAENIDAE

Neurosymploca lateralis Jordan.

Host-plant: *Maytenus heterophylla* (E. and Z.) Hilton.

The larva is green and slug-like; the surface is faintly lined longitudinally and is also speckled. There is a faint median dorsal line which is more darkly defined towards the anterior end of the body, which is blunted. Situated on the median dorsal line is a raised white marking or proturbance with red on its lateral margins. Other similar markings or proturbances, also on the median dorsal line, are situated towards the posterior end of the larva. These proturbances are pear-shaped, the narrow end pointing posteriorly. The white of these proturbances appears to be ridged and to be superimposed on dark red, which shows only at the margins. The length of the larva is 15 mm.

Larvae were plentiful on the host-plant in May. Cocoons were formed on the muslin covering the containing jar from early July to early August, and emergence took place in September.

PYRALIDAE

Botyodes phyllophila Butler.

The gregarious and web-forming larvae was found in the terminal shoots of *Rapanea melanophleos* (L.) Mez., at Hilton. The adult emerged in June.

Sylepta attenualis Hmps.

The larva of this species—a typical leaf-roller—was found commonly on the leaves of stinging nettle at Hilton. Adults emerged in March-April from larvae obtained in January-February.

TORTRICIDAE

Tortrix capensana Walk.

The larva (Taylor, 1957 and 1965) was particularly common on cultivated ivy at Hilton, rolling and feeding on the leaves. The adult was almost invariably present at light throughout the summer.

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EXPLANATION OF PLATE. Figs. 1-10, *Cymaroa leptopepla* Hmps. Fig. 1, Cocoon opened to show female and eggs, $\times 15$; 2, Egg, dorsal view, $\times 18$; 3, Egg, lateral view, $\times 18$; 4, Larva feeding on seed-capsule of mesembrianthemum, $\times 1.5$; 5, Larva, final instar, feeding, $\times 2$; 6, Cocoon on host-plant, $\times 1.5$; 7, Pupa, dorsal view, $\times 2$; 8, Pupa, lateral view, $\times 2$; 9, Adult male, $\times 1.5$; 10, Adult male, $\times 3$; 11, *Cyana pretoria* Distant. Adult male and female. Natural size.

Photo: H. N. Wykeham.

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A New Aberration of *Eupithecia venosata* Fabr. (Fabr.)

By H. C. HUGGINS, F.R.E.S.

In 1961 Mr. E. S. A. Baynes and myself visited Inishvickilaun in the Blaskets, and from seed vessels of *Silene maritima* bred in 1962, three specimens between us of the dark leaden form of *Eupithecia venosata* Fabr. which I described as s.sp. *plumbea* (*Ent. Record* **74**: 171). In 1962 I again visited the island with an especial intent to take *venosata* larvae, and was successful in breeding in 1963 half a dozen more *plumbea*.

In 1963, Mr. Baynes joined me for the second time at Dingle, and we determined to make a search for *venosata* on the mainland. *S. maritima* is by no means common in the district, as it is usually hard grazed by sheep and cows, but we managed to find a patch near Slea Head from which, in 1964, we each bred a number of s.sp. *plumbea*. In addition, however, Mr. Baynes bred a most remarkable insect, which he has kindly given to me. It appears to be quite undescribed, so I am now doing so, and naming it:

***Eupithecia venosata* Fabr. ab. *sepiata* (ab. nov.)**

Markings as in the type, but the whole insect is of a very dark sepia colour; the netted markings are brownish black, not black as in s.sp. *plumbea*.

Type ♂, Dingle, bred 24.v.1964 by Mr. E. S. A. Baynes, in coll. H. C. Huggins.

It may be of interest to record that all the *venosata* Mr. Baynes and I have bred from Dingle and the Blaskets are s.sp. *plumbea* excepting the above insect. As we have now bred about forty between us, it appears to be a rare aberration.

E. venosata is not found everywhere on the peninsula where *S. maritima* grows, I found nothing but *Hadena lepida* s.sp. *capsophila* Dup. at either Sybil Head or Brandon Creek. *S. maritima* is highly localised now, not common as in Donovan's time, as it is much more heavily grazed down than in the past.

Pyralid and Plume Moths of Derbyshire

By D. C. HULME

Since leaving Derby in October 1963 to start a minicoach service in the Highlands of Scotland, the compiler has had even less spare time than hitherto for work on the new *Derbyshire Lepidoptera*. He, therefore, proposes to deal with at least one major group each winter. This instalment covers the Pyralid and Plume Moths and its purpose is three-fold: to gather together all H. C. Hayward's important observations; to give actual dates and the periods these insects are on the wing in this truly Midland county and expand the inadequate summaries quoted in *The Victoria County History of Derby* (1905) and *Lepidoptera of Derbyshire* (1926.)

Sources of the majority of the records and information on many of the contributors are given in the writer's survey of "The History and Bibliography of Lepidopterous Entomology in Derbyshire" (*in press.*). The National Grid 10 km. square, parish and area number of all the place-names mentioned may be determined by consulting *The Index of Derbyshire Localities* (published privately — copies available in the Derbyshire County Reference Library).

The writer is aware that the nomenclature is undergoing considerable change in these families but until the new Check List of British Lepidoptera is available, Heslop's *Revised Indexed Check-list* (1964) order is retained.

B. P. Beirne's map, figure 3, in his *British Pyralid and Plume Moths* (1954) gives a figure of 73 species for the county. The total now stands at 83 species. The twelve recent additions to *Lepidoptera of Derbyshire* (1926), which listed 71 representatives of these groups, are numbers 976, 1045, 1066, 1086, 1088, 1137, 1142, 1166, 1178, 1180, 1186 and 1189.

- 970 *Schoenobius gigantellus* Schiff. Found near Repton by Dr. Philip B. Mason (not Dr. William Garneys as given in the 1926 list), prior to 1881. The VCH of Derby Burton, Staffordshire, record should be deleted.
- 971 *Donacaula forficellus* Thunb. Recorded at Willington by Edwin Brown, prior to 1863, and at the same place, in railway cuttings before 1866, by the Rev. F. M. Spilsbury. The VCH Burton record should be deleted.
- 973 *Acentropus niveus* Ol. E. Brown took many ♂♂ over the River Trent, below the weir, at Drakelow, in the summers of 1855 and 1856. In August 1857 he found several pupae in the axils of *Potamogeton pectinatus* L. and *P. perfoliatus* L. from which a ♂ was bred. The following July he found larvae and pupae and bred an apterous ♀. F. M. Spilsbury found it a little further east at Willington a few years later.
- 976 *Eudorea angustea* Steph. Harold C. Hayward took the first in Repton village on 28th August, 1926, and a further specimen in September 1927 or 1928. H. N. Michaelis has taken the species occasionally, from walls at Fernilee, in the Dale of Goyt, since 1948.
- 978 *E. murana* Curt. John Hill reported the species as rare, prior to 1905, at Little Eaton. H. N. Michaelis found it common on walls in Millers Dale in July 1938, emerging at 08.00. The same observer recorded it at Combs in July 1951. The VCH Burton record should be deleted.
- 979 *E. mercurea* Haw. E. Brown's early Burton record may not refer to Derbyshire but F. M. Spilsbury recorded it at Repton, prior to 1866, and Thomas Gibbs at Bretby, prior to 1889. J. Hill recorded it as common at Little Eaton, prior to 1905. H. C. Hayward found it abundantly on old walls and trunks of fruit trees in Repton gardens between 1916 and 1926 and dated specimens are given as 22nd June 1920 and 3rd August 1924. In more recent years, H. N. Michaelis has found it common at Millers Dale, Great Hucklow and Whaley Bridge. Three were taken at J. Harold Johnson's Ault Hucknall m.v.l. trap between 26th July and 18th August 1966.

- 980 *Dipleurina crataegella* Hübn. One taken by Hayward at Willington (not Repton as given in his 1932 list) on 11th August 1916. Harold William Daltry also took a single specimen in Dovedale on 12th July 1931. N. H. Michaelis records it as occasional in Millers Dale since 1948.
- 982 *Witlesia pallida* Steph. Recorded in railway cuttings at Willington, before 1866, by F. M. Spilsbury (not Repton by W. Garneys as given in the 1926 list).
- 983 *Scoparia cembra* Haw. The VCH record "once near Burton" refers to George Baker's pre-1885 record on the Ashby Road in Staffordshire. It was common at Bretby, prior to 1885, according to John T. Harris and Thomas Gibbs but H. C. Hayward took only one specimen, and this was in his own garden, in the neighbouring parish of Repton in July, 1916. L. Wyre (or Wyer) recorded it at Stavely in 1900. H. N. Michaelis writes that it is occasional in Millers Dale. The writer found a specimen in a batch of micros taken in J. H. Johnson's Hepthorne Lane m.v.l. trap on 9th August 1958 and four were taken at Ault Hucknall between 9th July and 18th August 1966.
- 984 *S. dubitalis* Hübn. The majority of records refer to the limestone dales. The Rev. Thomas W. Daltry found it common in Dovedale, prior to 1905, and R. G. Warren confirmed this on 20th June, 1939. The writer found two specimens here on 15th June 1961, one on Thorpe Cloud and the other in the dale. L. Wyre (or Wyer) observed the species at Stony Middleton on 10th June 1915. Via Gellia is another good locality with records on 9th June 1917 (H. C. Hayward); 10th June 1922 (G. Hanson Sale); 6th June 1926, a few, and 7th and 14th June 1931, common on the latter date (Hayward). In Millers Dale, R. G. Warren noted it as common on 28th May 1933 and H. N. Michaelis as abundant since 1948, having bred imagines from dead roots of *Senecio jacobaea* L. gathered in April. Away from the dales, the only records from the southern areas are at Repton, prior to 1866 (Spilsbury); Bretby Park, prior to 1889 (T. Gibbs); Derby, one on 25th July 1962 (A. B. Wassell, D. C. Hulme).
- 986 *S. ambigualis* Treits. An abundant and widespread insect. It has been recorded at Repton since the mid-19th century (E. Brown and F. M. Spilsbury). H. C. Hayward found it abundant here and in Repton Shrubs between 1916 and 1926; with dated specimens 31st May 1918 and 18th July 1926. Prior to 1905, the Rev. Francis C. R. Jourdain recorded it at Ashbourne and J. Hill at Little Eaton. Since 1948 H. N. Michaelis has recorded it as common at Millers Dale, Buxton, Dale of Goyt, Whaley Bridge and Hayfield and noted a fuscous form almost devoid of markings and smaller than those found on lower ground (see *Ent. Gaz.*, **14**, plate 5). Arthur H. Turner recorded this species at Edale on 9th August 1956 (latest date for the county). The writer has found or confirmed specimens at Littleover on 24th June 1958, 29th June of 1959 and 1961; Hepthorne Lane between 15th and 30th July 1958 (three at Mr. Johnson's m.v.l.); Alderwasley on 14th June 1959 and Stanton Moor on 13th July 1959.

- 987 *S. ulmella* Knaggs. Many fresh specimens were taken by John Sang in early August 1883, at a locality given as "near Burton" and "a wood near Uttoxter" but probably in Derbyshire (see *Entomologist's mon. Mag.*, **20**: 167). G. Baker found this species in Repton Shrubs prior to 1885 and in 1886 and ca. 1890 (see *Ent. Gaz.*, **14**: 91 & 97). H. C. Hayward found one in Repton village in 1916 or 1917 (identification confirmed by W. G. Sheldon) and 1919. The following year he took over 50 within a space of fifty yards on the trunks of three wych elms and some adjacent oaks in a remote part of Repton Shrubs. Edward Meyrick had treated *ulmella* as a form of *ambigualis* in his *Handbok of British Lepidoptera* of 1895 (as had Staudinger in his catalogue). Hayward sent fourteen specimens to Meyrick who, in 1921, wrote ". . . it appears in July after *ambigualis* is over. This excellent material has enabled me to ascertain that *ulmella* is without doubt a good species." For characters of these insects see *Entomologist*, **54**: 52. On 9th July 1921 Hayward found it on its three "pet" tree trunks but it was rare in 1925 and only a few were taken on 18th July 1926. Away from the South of the Trent area, J. Hill recorded it twice, prior to 1905, at Little Eaton.
- 988 *S. trunciolella* Staint. G. Baker's pre-1885 VCH record from Burton should be deleted. Hayward took the first definite Derbyshire specimen on 10th August 1916, in Repton Shrubs, and recorded it as fairly common there in the years 1917 to 1926, usually beating specimens from firs.
- 989 *Cataclysta lemnata* L. Spilsbury noted this china-mark at Repton, prior to 1866, but it was not recorded here again until A. H. Turner took one at light on 28th August 1920. J. Hill or G. Pullen found it at Little Eaton prior to 1905. On 10th August 1916 Hayward took several very richly marked ♂♂ at a Willington pond (the brown pencilling was almost as pronounced as in the typical ♀) and took one at the same place on 9th July 1917. Since 1948, H. N. Michaelis found it common sometimes along the canal from Whaley Bridge to New Mills.
- 990 *Nymphula stagnata* Don. The VCH states that it is "very common" but gives no localities. Dr. W. St. John recorded it at Little Eaton in July 1913. Hayward found it common by the River Trent at Repton between July 1914 and 1919 and remarked that the pale form was fairly common among swarms of the type. As no other actual dates are known, it is worth noting his Repton specimen taken on 6th August 1916. One of his last Derbyshire records was for this species at Willington in June 1933. J. H. Johnson found it abundant in the Hephthorne Lane, Clay Cross and Hardwick Wood district in 1958. The writer also found one in a tin of dead micros from the Hephthorne Lane m.v.l. trap in July 1959.
- 991 *N. nympheata* L. Spilsbury listed this species at Repton prior to 1866 and Hayward gave two dates only for this locality: 31st July and 11th August 1916. At neighbouring Willington he recorded it as abundant about ponds between 1916 and 1919 and gives an additional date of 12th July 1922. James Douglas noted it at Milford on 27th July 1912 and W. St. John, at Little Eaton in the following July. There are no records for the limestone and central

grit areas. In 1935 Alfred W. Richards found it to be fairly common at Eckington and in Hardwick Park. Since 1948 H. N. Michaelis has found it common sometimes along the canal from Whaley Bridge to New Mills. W. Bilbie netted one in Hardwick Wood (in a different region of Derbyshire to Hardwick Park) on 19th August 1956 and the writer found six specimens in a box of micros from J. H. Johnson's Hephthorne Lane m.v.l. trap in July 1959.

- 992 *Parapoynx stratiotata* L. We have no recent records and when the VCH records from Burton are deleted, we are left with three records only: Repton, prior to 1866, at the Waters-meet meadows (F. M. Spilsbury); Derby, prior to 1885 (G. Baker); Little Eaton, prior to 1905, common (J. Hill or G. Pullen).
- 996 *Eurrhynx hortulata* L. This familiar moth was abundant in Edwin Brown's day at Drakelow and its status is unchanged to this day. We have records from all areas except the central grit though one only from the neglected Permian area (2nd July 1966 at Johnson's Ault Hucknall m.v.l.) and few from the Peak Grit where H. N. Michaelis records it as rare. Hayward found it fairly common, especially in Repton gardens. Between 2nd June and 21st July 1956 W. K. Henson took 148 at the Repton School m.v.l., with a maximum of 52 on the 14th July. From the many dated records we can ascertain its main flight as between 1st June and 21st July, with the earliest recorded appearance on 4th May at Youlgrave in 1957 (G. W. Wheeldon, D. C. Hulme) and an exceptionally late date of 22nd September at Clay Cross m.v.l. in 1960 (W. Bilbie).
- 1001 *Nomophila noctuella* Schiff. Spilsbury found this migrant in Repton pastures late in pre-1866 summers and this observation was confirmed, prior to 1885, by J. T. Harris in Newton Solney clover fields and T. Gibbs in Brethby Park. J. Hill deposited two pre-1905 specimens from Little Eaton in the Derby Museum collection. Hayward noted two specimens at Repton, on 1st September 1911 and 2nd June 1923, the latter a particularly early date. H. N. Michaelis found it common on Goyt's Moss in the myriad year of 1949. The writer came across specimens in J. H. Johnson's Hephthorne Lane m.v.l. captures (one on 9th August 1958 and three in July 1959) and two were taken at the Ault Hucknall trap on 17th October 1966.
- 1002 *Pyrausta cingulata* L. Confined to the Peak District with four named localities and J. Hill's vague pre-1905 record "rare in the Peak District." It was found in Dovedale by E. Brown before 1863 and E. W. H. Blagg in 1889. The Rev. C. F. Thornewill recorded it as common in Lathkil Dale, prior to 1905, and J. Douglas found a specimen there on 15th June 1918. Via Gellia proved to be a good locality by Hayward on 9th June 1917; his colleague, G. H. Sale found it common on 10th June 1922 and Hayward took further specimens on 6th June 1926, 7th and 14th June 1931. H. N. Michaelis noted the species occasionally between June 1938 and 1940 and on 13th June 1958 in Millers Dale.
- 1003 *P. nigrata* Scop. The reliable John Hill was said to have taken a single specimen in the Peak District before 1905. H. N. Michaelis (*in litt.*) doubts if this species occurs in Derbyshire.

- 1005 *P. purpuralis* L. The Rev. R. H. Fuller took a specimen in Lathkil Dale on 5th June 1897. E. W. H. Blagg found it in Dovedale and J. Hill noted both the type and ab. *ostrinalis* Hübn. common, prior to 1905. H. N. Michaelis observed it occasionally in Millers Dale in the period 1948 to 1956. A single specimen of the second generation was attracted to J. H. Johnson's Hephthorne Lane m.v.l. on 13th August 1953.
- 1007 *P. aurata* Scop. Confined to the limestone dales apart from Hill's Little Eaton record of it as a rare insect. In Dovedale, G. Baker recorded it before 1885, R. G. Warren found it common on 18th July 1948 and A. H. Turner noted it on 24th July 1953. R. H. Fuller found it in Lathkil Dale on 5th June 1897. L. Wyre (or Wyer) recorded it at Stony Middleton on 10th June 1915. Via *Gellia* has four records: 9th June 1917, abundant (Hayward); 10th June 1922 (G. H. Sale); 7th and 14th June 1931, common on the latter date (Hayward). In Millers Dale, R. G. Warren found it commonly on 28th May 1933 and H. N. Michaelis records it as locally common since 1948.
- 1008 *P. cespitalis* Schiff. To add to the VCH records—namely Repton Park, prior to 1866 (Spilsbury); Dovedale (E. W. H. Blagg); Hassop, once (C. F. Thornewill); Peak District, common (J. Hill)—we have Hayward's observation that it was fairly common at Repton between May 1915 and 1926 and he took a specimen at Willington on 26th July 1919.
- 1012 *Opsibotys fuscalis* Schiff. The VCH records can be filled out a little as follows: Drakelow, prior to 1863 (E. Brown); rare among mowing grass in damp places at Repton, prior to 1866 (F. M. Spilsbury); common at Derby, prior to 1885 (G. Baker); rare at Little Eaton, prior to 1905 (J. Hill). H. C. Hayward took a single specimen at Repton on 19th June 1920.
- 1014 *Udea lutealis* Hübn. Abundant on lower ground throughout the county and commonly attracted to all forms of artificial light. Listed without comment by Spilsbury but E. Brown and J. Hill noted it as common at Drakelow and Little Eaton respectively. The numerous dated observations give a flight period of 2nd July (1913 and 1959) to 10th September (at Littleover in 1956) with the main emergence in mid-August. J. H. Johnson caught a total of 146 between 23rd July and 31st August 1966 at his Ault Hucknall m.v.l. trap.
- 1015 *U. ferrugalis* Hübn. F. M. Spilsbury recorded a specimen near an osier bed at Willington in October 1865. There were no further records until W. Bilbie took three night-flying specimens in the Coal Measures. The first was netted in Britton Wood on 5th August 1951; the second was taken at Ramcroft Colliery electric light on 3rd August 1955 and the third netted at rocket flowers, Clay Cross on 10th August 1958. These specimens are in his collection and were shown to the writer.
- 1016 *U. nivealis* F. E. Brown noted it as common at Drakelow and Spilsbury included it in his 1866 Repton list. J. Hill or G. Pullen found it abundant at Little Eaton before 1905. Hayward also recorded it as an abundant insect at Repton between 17th July

1916 and 1st July 1926. Mr Michaelis found the species at Millers Dale in 1937, 1938 and between 1951 and 1955. He also noted it on 27th July 1953 at Whaley Bridge. The writer took one at electric light on 6th July 1961 at Littleover and J. H. Johnson took three at the Ault Hucknall m.v.l. between 17th July and 14th August 1966.

- 1019 *U. olivalis* Schiff. The first two sentences under *nivealis* apply, word for word, for this species. Hayward noted it as common amongst elder in hedgegrows at Repton between July 1913 and 29th June 1926. W. K. Henson supplied a later Repton record dated June 1954. R. G. Warren noted single specimens in Wye Dale, below Topley Pike, on 31st July 1932 and in Dovedale on 5th July 1953. Mr. Michaelis has recorded it occasionally on the roadside between Whaley Bridge and Chapel-en-le-Frith since 1948 and found the larvae fairly common on *Mercurialis perennis* L. in Millers Dale in 1956. J. H. Johnson took eight specimens at his Ault Hucknall m.v.l. between 9th July and 20th August 1966.
- 1022 *Haritala ruralis* Scop. Recorded, surprisingly, as rare by Spilbury at Willington in the mid-19th century, though he remarked that it was abundant just over the county boundary at Burton. J. Hill also said that this species was rare at Little Eaton, prior to 1905. A. H. Turner recorded it as abundant at Repton in the period 1910-1919 and Hayward observed that it was common in nettle beds between 3rd August 1916 and 1919. A. W. Richards found it common at Tibshelf between 1921 and 1923. A. H. Turner noted it on holiday at Findern in 1950 and in Dovedale on 24th July 1953. H. N. Michaelis writes that it has always been common in Millers Dale, at Whaley Bridge and in the Longdendale Valley, Both J. H. Johnson and W. Bilbie have taken it, some at m.v.l., since 1953, more commonly in the Hephthorne Lane, Clay Cross and Heath districts; their dates ranging from 13th July to 7th September. The writer recorded only seven specimens at Littleover in the years 1956-1961, between 8th July and 29th August. W. K. Henson took four at the Repton School m.v.l. between 13th and 20th July 1957.
- 1023 *Perinephela coronata* Hufn. F. C. R. Jourdain gave its status as fairly common in the southern half of the county though the only 19th-century list it appears on is Spilbury's. Hayward remarked that it was fairly common in hedgerows and gardens at Repton between July 1913 and 1926 and his county type specimen is dated 26th June 1917. His only other record is for Willington in July 1918. There were no further records until the writer caught a specimen at Littleover on 20th July 1951 at electric light. Another appeared there on 11th July 1958. The species is decidedly commoner in the Coal Measures around Hephthorne Lane, Clay Cross and Heath. J. H. Johnson and W. Bilbie have taken many at m.v.l. since 1953: e.g., the former collected 36 between 15th and 30th July 1958 and 59 in July 1959, with an early date of 26th May in 1953, and the latter observer took 27 between 25th July and 22nd August, and a late specimen on 22nd September, in 1960.

(to be continued)

Entomological Notes for 1967

By S. WAKELY

(Concluded from P. 127)

London (Camberwell).—Before mentioning the moths taken in 1967 I would like to mention that a specimen of *Rhizedra lutosa* Hübn. was taken by a neighbour in his garden on the 10th September 1966. In spite of it being given to me in a match-box it was in good condition and still alive. It struck me as being a very unusual visitor to a London garden. As already recorded (*Ent. Record*, **79** (1967): 230), on the night of 12th-13th July, a specimen of *Diasemia ramburialis* Dup. was found in my m.v. trap. The trap was used from mid-June to end of July nightly and the more unusual species taken, considering the locality, were as follows: *Tethea ocularis* L., *Leucoma salicis* L. (two males at end of July), *Zeuzera pyrina* L. (three at rest on cement outside trap), *Caradrina ambigua* Schiff., *Pseudopsis bicolorana* Fuessl., *Polychrisia moneta* Fabr. (several), *Plusia pulchrina* Haw., *Scopula promutata* Guen., *Nycterosea obstipata* F. (one on same night as the *D. ramburialis* Dup.), *Euphyia unangulata* Haw., *Homoeosoma binaevella* Hübn., *Euzophera pinguis* Haw., *Lozotaeniodes formosana* Frol., *Croesia forskaleana* L., *Epiblema foenella* L., *Aristotelia lucidella* Steph., *Oegoconia deauratella* H.-S., *Mompha raschkiella* Zell., *Blastobasis decolorella* Wollaston, *Batia lunaris* Haw., and *Borkhausenia tinctella* Hübn. Several imagines of *Chrysoclista linneella* Clerck were taken from the trunk of a lime tree in Ruskin Park at the end of June.

Norfolk and Suffolk.—As both these counties were usually visited on the same day it will be easier for the writer to combine the two.

The "South London" met at Tetford, Norfolk, on the 16th April. At East Wretham a number of shoots of *Larix decidua* (European Larch) were collected and from these some *Blastotere laevigatella* H.-S. were bred. At Elveden in Suffolk more *laevigatella* were taken and some old galls of what we thought was the work of the larvae of *Laspeyresia zebeana* Ratz. were noted on the Larch. By sweeping the heather, larval cases of *Coleophora juncicolella* Staint. were obtained. Imagines taken on the wing included *Argyrotaenia pulchellana* Haw., *Acleris hyemana* Haw., and *Epinotia pygmaeana* Hübn. Barton Mills was next visited and some time was spent here collecting poplar catkins from the roadside under large *Populus nigra* trees. This locality is noted for the numbers of *Cirrhia ocellaris* Borkh. larvae which can be procured by this method. From about two handfuls of catkins I extracted seven minute larvae on examination at home during the next few days. The material was checked each evening as the larvae hide during the daytime and are active at night and more easily detected when moving. My seven larvae all fed up quickly on fresh catkins and young poplar shoots and produced moths during September. Two small micro larvae which I found and which were nursed carefully by feeding them on the catkins eventually emerged and proved to be a common but unexpected species, namely *Batodes angustiorana* Haw.

From 19th May until 2nd June my wife and I had a holiday at Thorpe-ness, Suffolk. Although I had been to the same place several times in previous years, it was the earliest date we had tried, and the number of species taken at light was not as great as on our holidays at later dates.

However, we took some species not seen on previous visits, particularly among larvae. Mr. H. E. Chipperfield visited us soon after our arrival, and Col. A. M. Emmet arrived in the evening with the moth-trap.

The fen was just a few yards from our bungalow and we soon paid it a visit. One of our first observations was the large number of spinnings in the tips of the willow shoots. We collected some to sample them and others were collected on several other occasions during our stay. Species eventually bred from the willow spinnings were *Acleris hastiana* L., *Epinotia caprana* F., *Gelechia sororculella* Hübn., *Agonopteryx conterminella* Zell., and *Argyresthia pygmaeella* Hübn. The larger trees of willow on the fen had trunks four to six inches in diameter, and it was seen that nearly all of these larger trees had holes exuding frass, and we were able to get a few larvae of *Sphacia bembeciformis* Hübn. towards the end of our stay after hard work with chisels, etc.

In a ditch mid-way between Thorpeness and Aldeburgh we found some plants of *Alisma plantago* (Water Plantain) and took some larvae of *Phalonidia alismana* Rag. in the old dead flowering stems. We collected the stems and saw little signs of larvae being present, but about a dozen moths were eventually bred between us. Other larvae taken nearby were *Euzophera cinerosella* Zell. (on *Artemisia absinthium*) and *Eurhodope marmorea* Haw. and *Coleophora anatipennella* Hübn. (on blackthorn). Very small larvae of *Agonopterix cinicella* Treits. were found spun up in the centre shoots of *Eryngium maritimum* (Sea Holly). There were numerous old larval mines of *Stigmella suberivora* Staint. in the leaves of some large Holm Oaks (*Quercus ilex*) growing in the village at Thorpeness. The moth is on the wing in May and larvae should be looked for in March. This species is a new county record for Suffolk.

On the beach at Thorpeness we spotted numerous spinnings on a species of Chickweed which puzzled us. I came to the conclusion it was *Cerastium diffusum* Pers. The few moths we bred were determined by Mr. J. Bradley as *Caryocolum alsinellum* Zell. (*semidecandrella* Threlf.).

Mr. J. M. Chalmers-Hunt joined us for the second week of our stay, and we all had numerous trips together, and were often joined by Mr. Chipperfield, who lives a few miles to the north, at Walberswick. The date was just right for the larvae of *Leioptilus lienigianus* Zell., and we made several excursions to Orford where we found the larvae fairly common in lanes and round the edges of fields. They were feeding on *Artemisia vulgaris* and the feeding places could be found by careful searching. The leaf is folded downwards and the larvae eat the inside layer of the leaf, forming windows which are semi-transparent if fresh and brownish if old.

Several trips were made to Walberswick where we visited the salterns by the Bailey Bridge over the River Blythe. Larvae of *Agdistis bennettii* Curt. were our chief objective on these occasions, and a few were taken on the leaves of *Statice limonium* on most visits, but they were quite difficult to find. Crossing the bridge to the Southwold side we found *Phalonidia griseana* Haw. flying freely among its foodplant—*Triglochin maritima*.

Another locality we visited frequently was Aldringham Heath which is situated about a mile or more from Thorpeness. During our second week we were lucky to find *Grapholita internana* Guen. flying among the

gorse. This is a single-brooded species that occurs, usually in numbers, during the last week in May. If one misses the few days it is on the wing twelve months will elapse before it can be seen again. Seeing some black fungi (*Daldinia concentrica*) growing on scorched and dead birch trees, we removed some and found several larvae and pupae of *Apomyelois neophanes* Durr. in webs, a most interesting find confirming a previous record for the district. On the plants of *Epilobium angustifolium* many spinnings were seen and larvae of *Mompha conturbatella* Hübn. were found in some. The moths subsequently bred proved to be a new addition to the Suffolk List.

On the 23rd Mr. Chipperfield took my wife and me to Redgrave Fen. Part of this is in Norfolk and part in Suffolk. The part we explored was in Norfolk, I understood. The few hours we were there was too short a time to do much entomologically, but we did examine the *Genista anglica* and found larval cases of *Coleophora genistae* Staint. I was pleased to see the very pretty violet-like flowers of the Common Butterwort (*Pinguicula vulgaris*) for the first time.

On the 25th a visit was paid to the salterns at Aldeburgh where we managed to find one larva of *Agdistis bennetii*, but later went on to Walberswick to find a few more.

On Saturday (27th) Capt. J. Ellerton visited us and was able to stay the night. We were pleased to be able to introduce him to many of our most prolific hunting grounds at Aldringham Heath, Walberswick, and the local Thorpeness Fen. The only specimen of *Epischnia boisduvaliella* Guen. seen during this holiday appeared in the trap the night he was with us and he was pleased to have it. A fortnight later it would have been more common.

On Monday (29th) we visited Dunwich Cliffs and walked along the shore path by the Minsmere Bird Sanctuary. On the way we passed a lot of square concrete blocks, a relic of the shore defences, and a number of larvae of *Cryphio perla* Schiff. were found under patches of lichen. It was a lovely bright day and several bird-watching "hides" were full of enthusiastic bird-watchers who were only too pleased to point out to us some of the more interesting birds to be seen.

Of particular interest to us were the Avocets which none of us had ever seen in the wild previously. On a visit to Dunwich in 1966 we found larvae of *Paltodora cytisella* Curt. in stems of bracken. This year (1967) we were about a fortnight earlier so the larvae were smaller but once more quite common. Knowing the difficulty that arose when trying to rear small larvae owing to the rapid putrefying of the stems, I did not take any, but Col. Emmet solved the problem by cutting the stems into four-inch lengths and putting them into a nylon stocking with a ball of old nylon above the stems. The resulting "sausage" was hung outside in the shade and sprayed occasionally. The larvae pupated in the ball of nylon and he had 100 per cent. success by his ingenious method.

On Tuesday (30th) we had made plans to go to the King's Lynn district, firstly to search the Bog Myrtle for a rare Tortrix larva and then to try to find the long-lost *Nothris verbascella* Hübn. We failed in our first quest and the larvae found in spun shoots of *Myrica gale* proved to be *Spilonota ocellana* Schiff. and *Epinotia caprana* F., both common moths. A species we were all pleased to take was *Eucosmomorpha albersana* Hübn, which we disturbed in numbers from the honeysuckle.

How successful we were with the second quest can be gathered from the fine article by Mr. Chalmers-Hunt published last year (*Ent. Rec.* **79**, 1967: 216-219). C.-H. had done a lot of "spade-work" finding out where the foodplant—*Verbascum pulverulentum* Vill.—could be found, but even when the plant was found there was no certainty that the moth would be there as well. It was pouring with rain during a thunderstorm when we eventually reached a place answering the description given. We had come about 100 miles so it was decided to brave the elements and proceed up a muddy path. Actually I stayed in the car until C.-H. came back after a few minutes and showed me a piece of the foodplant upon which was a fat larva, with the result that of course I quickly had my raincoat on and joined the others. I brought back one small plant which is still growing in the garden at home. I bred nine specimens myself and gave away two pupae to friends. A never-to-be-forgotten expedition and if it had not been for the enthusiasm of C.-H. it would not have been successful.

Lepidoptera coming to the light increased from three species only on the first night to over twenty on our last night. *Callimorpha jacobaeae* L. and *Aspitates ochrearia* Rossi were the most frequent visitors. The best species taken in the trap were *Pheosia gnoma* F., *Meliana flammea* Curt., *Simyra venosa* Borkh., *Scopula emutaria* Hübn., *Phtheochroa rugosana* Hübn. and *Aristotelia palustrella* Dougl.

On the 20th September, after a trip to Wicken Fen the previous day, I was taken to Icklingham, Suffolk, by Col. Emmet. The object of our journey was to try and find larvae of *Coleophora laripennella* Zett. Some years ago (1963) I was with Mr. R. Fairclough in this locality and saw several small moths when walking round the edge of a cultivated field. I netted two which were determined later as *Coleophora laripennella* Zett. The larva of this local species feeds on the seeds of *Atriplex* and *Chenopodium*. Meyrick states that the species is common, but according to our experience it is not often taken, and old records cannot be depended on for accuracy in determination as there have been so many new discoveries among the *Atriplex* Coleophorids in recent years. My specimens were taken on the 6th July, which is about a month earlier than most of its allies occur. We found fields where the foodplant grew in abundance and spent some hours searching for the larval cases. We eventually found one case each, and we hoped to breed the moths to find out if they are really *laripennella*. While in the district we visited a clump of elm trees where we looked for the larvae of *Ancylis upupana* Treits. We had taken imagines at the spot a year or two previously, and were pleased on this occasion to find several larvae each. Birch is the more usual foodplant of this species and when on elm the feeding place is rather similar to that of *Acleris boscana* F.

Surrey.—On the 7th April I went to Riddlesdown with Col. Emmet, where we found mined leaves of Juniper containing larvae of *Argyresthia aurulentella* Staint. Col. Emmet was successful in breeding half-a-dozen moths. We both visited Betchworth Down on the 7th May where we worked the Junipers again. Apart from larvae of *Dichomeris marginellus* F. nothing else of note was found.

On the 22nd April the "South London" had a field meeting at the Sheep Leas, Horsley, which I attended. Larval cases of *Coleophora viminetella* Zett. on sallow and *C. gryphipennella* Bouch. on rose were collected, also

C. hemerobiella Scop. in an orchard of young apple trees. Seeing a number of small spinings on these apple trees we collected a plastic bag of spun shoots and Mr Heal, who had come all the way from Detling in Kent to see me, was fortunate enough to breed half-a-dozen specimens of *Argyresthia quadriella* Haw. (*andereggiella* Dup.) later from this material. Most of my spinings produced larvae of *Operophtera brumata* L. Leaving the party early, Mr. Heal and I went to Ockham Common where we managed to collect a few larvae of *Laspeyresia coniferana* Sax. in the bark of an old Scots Pine which I had visited before. From here we went on to Horsell Common and collected a bag of fir cones which later produced a few *Laspeyresia conicolana* Heylaerts.

On Saturday, 5th August, I went to Boxhill with Col. Emmet. We collected some seed-heads of *Lactuca muralis* in the hope of getting larvae of *Brevisociaria gilvicomana* Zell., but none were seen in the material taken by me and we were probably late for this rarity. Some time was spent later looking for the larvae of *Caloptilia semifascia* on maple. Although numerous cones were collected, once again we seemed to be late, but Col. Emmet did manage to breed one moth. The cone made by the larva of this species is a most interesting object and the way the leaf is spun into a cone with the terminal end of the leaf neatly closing the end is very skilful.

On 26th August the "South London" had a meeting to Ashted Common. Larval cases of *Coleophora hornigi* Toll. (*albicornuella* Bradley) were common on sloe and bramble. Another species we found commonly was the larvae of *Leucoptera lotella* Staint. in the leaves of *Lotus corniculatus*. A few larvae of *Epermenia testaceella* Hübn. were found on leaves of *Peucedanum sativum*.

On the 8th and 21st October I went to Featherbed Lane, Addington, and found the portable larval cases of *Thiotricha subocellea* Steph. fairly common on the flower-heads of *Origanum vulgare*. The case is made of the florets, several being used in the process. This can be found by looking for portions of the case standing a little higher than the rest of the flower-head. The most interesting find was the larval cases of *Coleophora deauratella* Zell. on the seed-heads of clover. The cases are partly buried in the seed-head but the extremity is extruded and the extreme edges at end of the trifid lobes are white-tipped, which betrays the presence of the case.

On the 3rd November I went to Mickleham Down with Col. Emmet. After a fruitless search for the mines of a species of *Nepticula* which are to be found on *Spiraea filipendula*, we switched our search to the mines of an allied species which was first discovered in this locality namely *Fedalmia headleyella* Staint. The foodplant is *Prunella vulgaris* (Selfheal). We found a few seed-heads of the plant and eventually a mine was found which was probably made by that species, but no larva emerged. An earlier search another year was indicated.

Sussex.—On June 16th I visited Ditchling Common with Col. Emmet. Our objective was to look for larvae on *Genista tinctoria* (Dyer's Greenweed). We hoped to get larval cases of *Coleophora vibicella* Hübn., but none were found on this occasion. We did collect several small bags of spinings and from these were bred nice series of *Agonopterix atomella* Schiff. a few weeks later. A few *Iwaruna vinella* Bankes were also bred. Larvae found in spinings on *Genista anglica* (Petty Whin) proved to be

Stomopteryx albipalpella H.-S. Col. Emmet tells me he also bred a specimen of *Grapholita lathyrana* Hübn. in February 1968, from some of the *Genista tinctoria* by forcing in a warm room. Some of the spinnings on *G. tinctoria* produced larvae of *Orthosia gracilis* Schiff. Six larval cases of *Coleophora saturatella* Staint. from the latter plant produced parasites.

Another trip to Ditchling was paid on the 17th July with Mr. Heal. A few larvae of *Agonopterix atomella* were still to be found on the *Genista*. In spite of a long search only one larval case of *Coleophora vibicella* was found, but it produced a fine moth a few weeks later. Some larval cases of *Coleophora genistae* Staint. found on Petty Whin produced only parasites and we were obviously too late to find healthy larvae.

On the 1st September Mr. Chipperfield came along from Suffolk and we planned to try for *Gortyna hucherardi* Mab. Mr. M. W. F. Tweedie offered to give us any help he could and we arrived at his house near Rye late in the evening. Not content with offering his help he and Mrs. Tweedie hospitably asked us to join them in a sumptuous meal before showing us where to try for this very local moth. The weather was fine and mild and we were taken to a place where there were great beds of *Althaea officinalis* (Marsh Mallow). Mr Chipperfield had brought along his generator and the m.v. light was soon working. In spite of what appeared to be a perfect night very few moths were attracted to the light, one of the commonest species being *Tholera popularis* F. which were in very fresh condition. There was quite a breeze blowing which might have accounted for the dearth of insects. We both wandered among the plants of Marsh Mallow in the hope of finding *hucherardi* settled on them and at last Mr. Chipperfield tried beating the plant over a net and was rewarded by a fine specimen—the only one we saw. In the early hours we returned to Mr. Tweedie's house and had a nap in the car until breakfast time. Before moving off in the morning Mr. Tweedie showed us the contents of his trap and we helped ourselves to some of the captures.

26 Finsen Road, London, S.E.5. 16.iii.1968.

A Second British Record of *Agathomyia falleni* (Zett.), with some Biological Notes on the Platypezidae (Dipt.)

By P. J. CHANDLER

On 9th October 1966, I visited Knole Park, Sevenoaks, Kent. The park contains large quantities of old, dying and dead beech trees, and fallen trunks and stumps are frequent. It is therefore extremely suitable for the growth of lignicolous fungi, i.e., growing on wood, and as a habitat for the insects which feed on them. This locality has, however, been rarely visited by dipterists and hardly, if at all, before 1963.

While sweeping around a stump thickly covered with fungi, three Platypezids appeared in the net; one was recognised as a female of a small *Agathomyia* species which I had previously taken elsewhere in Kent, while the others were obviously of a related species but distinctly larger and more brightly coloured. The stump was more closely

examined and others were seen at rest beneath projecting brackets of the fungus *Coriolus (Polystictus) versicolor* (L. ex Fr.) Quél. and on the surface of the stump which was covered with a growth of *Phlebia merismoides* (Fr.) Fr., and possibly some other resupinate, i.e., fruiting body prostrate on wood, fungi, bearing numerous brownish droplets of moisture. After I had remained motionless by the stump for a few minutes, others were seen arriving, which I had, no doubt, disturbed previously. They hovered two-three feet above the stump for a few seconds before landing, and while in flight their beautiful colours made them quite conspicuous in the shafts of sunlight coming through the foliage high above. The red eyes sharply contrasted with the grey thorax and orange abdomen—the colours are somewhat dulled after death. Later in the day these flies were seen around many other stumps and trunks bearing fungal growth in various parts of the park, and seven individuals were taken. All these seen were females, the date presumably being too late for the male. On subsequent examination these were found to be *A. falleni*, and this was kindly confirmed by Mr. K. G. V. Smith of the British Museum (Nat. Hist.).

Agathomyia falleni was first recorded as a British species by Mr. L. Parmenter (1953) on the capture of a single male, resting "on the upper surface of a hazel leaf", in the oakwoods at the top of Box-Hill, Surrey, on 21st September 1952. Nothing further has been published concerning this species in Britain, but examination of Mr. Parmenter's collection of the family has disclosed a further capture of a single female, which he made at Mickleham, Surrey, not far from Box Hill on 7th October 1956.

A week later, on 16th October, the Kent Field Club held their Fungus Foray in Knole Park and the opportunity to search for further specimens was taken. The previous date was, however, obviously near the end of the flight-period of the species as indicated by the absence of males, and only one more female was found, this being on the original stump referred to above. Of the eight specimens taken three have been presented to the British Museum, which had no previous representation of the species, either British or Foreign; one has been given to Mr. L. Parmenter, one to Mr. A. E. Stubbs, and the remaining three (including that taken on the second date) are in my own collection.

A. falleni is very distinct from the other species of *Agathomyia* occurring in Britain, both by its colour and its larger size (my specimens range from 4 to 6 mm. in body length, reduced on drying, while the wing is approximately 5 mm. long). The sexual dimorphism characteristic of the Platypezidae is found here but is much less marked than in most species, where the male is normally predominantly black, while here the male is also brightly coloured and is, in fact, more striking than the female. Mr. Parmenter gave a description of the male in his paper and I have emphasised the sexual differences in the following description of the female from my own specimens:—

Head grey; frons broad, narrowing anteriorly, as eyes are widely separated (touching in the male); eyes and the three ocelli, borne in a triangle on the raised ocellar protuberance, are bright red, while antennae, palpi, and proboscis are yellow with darkened tip to pointed third antennal joint and black terminal arista, as in male. A pair of long outwardly-curving fronto-orbital bristles anterior to front ocellus and below these a second pair of much shorter (about two-fifths length) frontal bristles, the distance between latter bristles being equal

to their distance from the eye-margins. Also a much longer pair of outwardly curving bristles midway between posterior ocelli and upper eye-margin and a complete row of short occipital bristles placed some distance behind eyes. Antennae lack long bristle present above second joint in male, although distinct bristles are present on this joint.

Thorax and scutellum all grey dorsally in contrast to extensively brown thorax of male, but humeri, some parts of pleura and wing-roots are dull yellowish. Dorsocentrals, acrostichals, and scutellars as in male. Praescutellars, which are the strongest of the dorsocentral row, are as widely separated from the main row of dorsocentrals as from scutellum and more laterally placed. Only three dorsocentrals beyond the last of the single median acrostichal row.

Elongate cylindrical abdomen, coloured much as in male, with orange yellow ground colour obscured by brownish rectangular bands interrupted by a narrow dorsal mid-line and not reaching either anterior or posterior margins of segments. Dark abdominal hairs mainly short, but markedly longer near base; a group of short but strong black bristles ventrally on 6th segment and a similar tuft of thinner paler hairs on following sternite.

Legs entirely pale yellow like male; but hind legs, especially metatarsi, much less dilated than in male. Strong leg-bristles of male absent except for dorsal bristle and apical spur of middle tibiae; knob at ventral tip of mid femora is, however, present. Hind femora similarly fringed but ventral fringe sparse and incomplete. Hind tibiae have a short black anterodorsal fringe on the apical half to two-thirds. Halteres yellow with partly darkened knob, wings tinged yellowish, but less so than in male.

Mr. Parmenter stated, following Lundbeck, that the development of the genus *Agathomyia* is unknown; however, Hennig (1952) described and illustrated the anal segment of the larva of an undetermined species of *Agathomyia* (how genus and not species was known not stated) found in an unnamed fungus, without mention of locality or situation (though presumably somewhere in Europe). In the short description, he said that the larva resembled that of *Platypeza* (*Clythia* in text) but the anal segment did not bear the characteristic pair of hooks of *Platypeza*, instead possessing four pairs of feathery appendages at the base, resembling those of *Callomyia*. The respiratory appendages are distinctly longer than in *Platypeza* and the parts of the cephalo-pharyngeal skeleton are less closely associated—they are united in *Platypeza* and *Callomyia*. More recently Kessel (1957), in a paper on the distribution and variation of the nearctic species *A. notata* (Loew) records the rearing of this fly by Mr. A. Ross. He obtained two hundred flies from a single specimen of the fleshy bracket-fungus *Polyporus albellus* Peck, growing on a standing dead alder in California, on 23rd December 1956, adults emerging from 2.i.-10.i.1957.

No description of the larva was given. A very full account (Weidner & Schremmer, 1962) has now been given, however, of the development of a fly of this genus—the large orange-yellow Central European species *A. wankowiczi* (Schnabl.), which was previously very little known. The formation of small peg-shaped galls, in numbers together, on the under-surface of the tough Polypore *Ganoderma applanatum* (Pers. ex Wallr.) Pat., is apparently caused by this fly; the gall had been known for some time from Germany to Yugoslavia, but these authors were the first to establish the causative insect. The formation of galls, rare in fungi, is otherwise unknown in the Platypezidae. The larva and the gall were fully described and illustrated in this paper; the appendages characteristic of the Platypezidae are reduced but spiny warts are present on the tergites, which assist in holding on to the inside wall of the gall, from

which food-material is rasped by the strong mouth-parts. These also serve to open an aperture at the tip of the gall, through which the larva leaves to seek a pupation site. The gall (although not the fly) has now been recorded by Anderson (1967) on the same fungus from two localities in Sweden, and the photograph illustrating this paper shows galls apparently the same as the German ones. The fungus which forms colonies of large brackets on beech trunks is not uncommon in Southern England but the gall has never been recorded from Britain. I have personally examined numerous specimens of this fungus, on the underside of which small groups of *Drosophila confusa* Staeg. (*vibrissina* Duda) are usually to be seen, and although I was, of course, unaware of the existence of the gall I do not recall having ever seen any evidence of it. What little is known of the development of the related genus *Callomyia* suggests that these genera are confined to fungi of the order Aphyllophorales. The fungi present on the original stump on which *A. falleni* was numerous, included in addition to those mentioned above quantities of the partly resupinate brackets of *Bjerkandera adusta* (Willd. ex Fr.) Karst., several large brackets of *Pseudotremetes gibbosa* Fr. and when visited in 1967 it also bore a rather small example of *Polyporus varius* Fr.; *C. versicolor*, *B. adusta* and *P. gibbosa* are frequent in Knole Park and all could be suitable foodplants for *Agathomyia* larvae. It is hoped that these flies will soon be reared now that there is some indication of their foodplants.

The only published observation of a species of *Agathomyia* visiting a fungus in Britain, of which I am aware, is that by J. Edwards (1952). He made observations on Dipterous visitors to *Coriolus* (as *Polystictus*) *versicolor* in Autumn 1951 at Dimmingsdale, N. Staffs. A colony of the fungus on an oak stump was visited by Platypezids only in contrast to one on a beech stump, whose visitors included thirteen species of Mycetophilidae, two Sciarids and one Chironomid but no Platypezidae. Edwards offered the explanation for the discrepancy between these results that the Platypezids preferred the drier and warmer conditions provided by the position of the oak stump. Between 19.ix. and 19.x. one male of *Callomyia amoena* Mg., and seventeen females of five species were seen, including three females of *Agathomyia antennata* (Zett.).

GENERAL FEATURES OF PLATYPEZIDAE

My finding of *Agathomyia falleni* was responsible for awakening my interest in this remarkable family of flies, which stand apart from other Diptera in many respects. Owing to their development in fungi they are typically woodland insects, which are usually found running about rapidly on broad leaves in a characteristic erratic manner. They are on the whole infrequent, occurring chiefly as odd individuals, but occasionally are found in larger numbers, usually when having recently emerged, while males congregate in swarms prior to copulation and females may gather in numbers for oviposition.

The comparative rarity of Platypezids among Diptera is recognized to be so in both Europe and North America; they are poorly known from other continents. This probably accounts for the neglect which their study has hitherto generally received from Dipterists. Their foodplants are often ephemeral and of irregular occurrence, although this hardly applies to the Polypores and *Agathomyia* species are particularly rare, but other factors must also be involved as Platypezid populations are

small compared with those of other fungivorous Diptera, e.g., Mycetophilidae and Helomyzidae, the latter being a good comparison as the number of fungivorous species is about the same in Britain. As with many insects their apparent rarity is reduced when they are sought in the most suitable places at the right time, but this does not appear to be the full explanation. No parasitism of Platypezidae has ever been recorded.

Some species occur throughout the summer, but the majority are found only in the autumn, when the greatest number of fungi are available for oviposition. Some authors, e.g., Verrall (1901) and Lundbeck (1927) have considered that all species have two broods, with the second autumnal one more numerous but Kessel has shown that there is only one brood in several American species and this is probably so in many European species also; some are, however, clearly double-brooded, e.g., *Platypeza infumata* Hal., which occurs equally in the spring. Emergence of a single brood may occur over a period of several months and in general males emerge first; females, emerging later are found alone for the latter part of the flight-period for a given species (as suggested above). Sexual dimorphism is very marked in many species—the males usually predominantly black while the females usually have a paler ground-colour, often with grey, silver, yellow or red markings, a contrast to the condition usually prevailing in the Diptera when sexual dimorphism occurs. Both sexes have the expanded and flattened hind tarsi, which give the family its name, but these may be differently developed in the male and female in some species.

(to be continued)

Nomenclature and Taxonomy

By Dr. R. G. AINLEY

Presumably the more we discuss the problems of nomenclature, the more likely it is that someone will produce a bright idea to solve them. I, for one, have learnt much from the correspondence following the late Professor Balfour-Browne's article.

Though I admire Mr. Haggett's individuality, his approach would not appear to solve any problems for anyone other than himself—though, on reflection, I suppose he is only doing what most taxonomists are doing all the time. I imagine that if any two authorities on a particular group were to reach conflicting conclusions about its classification they would pursue precisely the course outlined by Mr. Haggett.

A "world view" is, of course, essential, and I regret apparently having given the impression of thinking that the World's Lepidoptera could be classified on the basis of the British species alone. (In fact, I deplore the illogicality of collectors who have "British" species in one cabinet and "foreign" species—if any—in another).

Monospecific genera are probably inevitable in some cases. It is reassuring that some professionals dislike them, as shown by the Editor's quotation from Dr. Klots. (Incidentally, if the latter's taxonomic studies are as superb as his photographs of insects we should treat his views with great respect!).

While I agree with nearly all of Mr. Allen's article, I wonder whether the use of the "subgenus" is really of any value? A good case can be made for trinomial nomenclature (genus, species, subspecies, e.g. *Agapetes galatea procida*, which is useful), but need we add the subgenus, which would probably provide even more scope for disagreement than does the genus itself? Similarly, his notion of a "two-tier" system of nomenclature seems unwise, since it would perpetuate the usage of multiple names for the same genus, providing two sets of names to disagree about, whereas our aim should surely be to reach a single, internationally-agreed nomenclature acceptable to professional and amateur alike, even if not everyone agrees about every part of it. Mr. Cowan has paraphrased a Ministry of Transport slogan for us (*antea* p. 112). I will paraphrase Parkinson's First Law:—"Names multiply to fill the number of categories available for their occupation."

Mr. Cowan's excellent historical résumé threw much light on the subject for me. I readily plead guilty to his suggestion that some of us have not done our homework, *i.e.* have not read and understood the Rules. I have read them, but do not understand them all—a failing apparently shared by the Commission. Though most amateurs could, in theory, keep delving into the literature to be up to date with the latest views on nomenclature, in practice life is too short to allow this as well as field work. In short, we need a certain amount of spoon-feeding in these matters, and I suggest that *The Record* and similar journals could fulfil a very useful function in this respect, serving as a means of communication between the professional and the amateur. Of course, they do this already, but perhaps news and views about nomenclature could be put on a more systematic basis. (*e.g.* an annual "News on Nomenclature," if someone could be persuaded to undertake the tedious task).

I conclude with another suggestion, I hope a constructive one. I agree with Mr Cowan that in an ideal world everyone would have the time and energy to "study and follow the international code." But most amateurs, and professional zoologists who have no direct interest in taxonomy (the latter often being those who make the most fundamental contributions to Science), take their nomenclature from publications — text-books, periodicals and check-lists. Therefore there is a heavy responsibility on all editors and publishers for the names in circulation. Hence, stability would be promoted if all editors or publishers of *any* work, from schoolboy manuals to research journals, which involved the use of scientific nomenclature were to obtain guidance from an approved list. An international body could perhaps be devised to compile and publish such a list, which could be revised at intervals, say every five years, as taxonomic ideas changed in the light of new facts. Editorial agreement to publish only names on the list might be reached by means of an international Convention; such a move would at least facilitate international communication at all levels, and writers would soon toe the line, whatever their private objections might be to some parts of the list.

As many readers of this journal will know, an exactly analogous system is already in use, and works well, in respect of the abbreviations of titles of journals used in the lists of references quoted in scientific papers. Any authority submitting an original paper or thesis for publication in

most scientific journals, is required by the editor to put his list of quoted references in the abbreviated form prescribed by the World List of Scientific Periodicals (the 1960 edition of which contains nearly 60,000 entries!). This system at least ensures that any reader in the world will know that, for example, *Ann. Surg.* means Annals of Surgery, and not Annals of the Royal College of Surgeons.

Mr. Allen would perhaps object to this system as constituting an "editorial straightjacket", where free expression would be preferable. I have some sympathy with this view, but after all we are not dealing here with publication of facts, only of names. Names are only for convenience, and are not of any fundamental biological importance except in so far as they help communication, for which purpose they must be reasonably stable. The system outlined would still allow the experts, in the light of their researches, to influence the names in use, by presenting arguments to the Commission; but it would ensure that the arguments were good ones before a name could be changed and become accepted. Editors would not have a great burden thrust upon them provided they had ready access to the agreed list.

In practice, I believe Mr. Cowan may be justified in his belief that we are attaining stability in *specific* names, and apart from the much-quoted *charlotta-aglaia*, and *Dira petropolitana* Fab. (which I had always thought of as *Pararge hiera* Hbn.) I personally have not been unduly confused by name changes of species. But generic names are a different matter entirely, perhaps reflecting the fact that biological material will not easily fit into tidy pigeon-holes which can be objectively determined by observation and measurement.

Notes and Observations

DIPTERA COLLECTING IN SCOTLAND—In a recent letter from Mr. E. C. Pelham Clinton of the Dept. of Natural History, Royal Scottish Museum, Edinburgh, he gave a comment on the regions of Scotland most worth working which other readers would like to see. He says:—

The east—central highlands, particularly Strathspey (Aviemore and Nethy Bridge, chiefly) have had more attention than anywhere else, but are also worth more attention. There are more boreal species of insects in this area than elsewhere in Scotland. Messrs. E. C. M. d'A. Fonseca and D. M. Ackland have done a lot of collecting there recently, the former concentrating on Muscidae, the latter on Anthomiidae and Mycetophilidae, and though they have not discovered much not formerly collected by Mr. J. E. Collin they have found many species in numbers that were hardly known before. So anyone specialising particularly in Acalyptrates or Nematocera, could still do a lot of good work in Strathspey. The other areas with a somewhat similar climate and good vegetation, Braemar, Rannoch, Glen Affric and Loch Maree are wetter and less sunny and would now be the most profitable areas for dipterists in Scotland. Other parts of Scotland need working rather more for working out distributions than for the possibility of discoveries, but of course this work is badly needed.

DIPTERA: TIPULIDAE. SOME FURTHER NOTES ON PRESERVATION. Referring to my previous article (antea p. 55) I think the great pleasure to a newcomer to the collecting of Diptera is the interest created by seeing these handsome creatures on the wing now that the Lepidoptera have become so scarce, except in their specialised haunts. Previous to last year I had not been nearly so aware of the presence of the Diptera, and it really is a fine sight to see, for example, the Syrphid fly *Volucella pellucens* L. hovering in the sunshine in a woodland glade, probably several quite close together.

I would very much like to see more entomologists, particularly the young take up the study of the Diptera in the British Isles. Collecting the Lepidoptera abroad is no doubt very pleasant, but one does not really learn anything about them until one has resided in a foreign land for several years. Hence my interest in the Diptera in these Islands, as there is so much field work to be done, and many areas have received no attention from collectors of this order. Remember too that there are over 5000 Diptera to study, which are resident in the British Isles.

A propos to my recent hints on setting Tipulidae, do not be discouraged if, at first, when taking a specimen off the board a leg or two breaks. The specimen can be well repaired by sticking the leg on where it broke off, provided great care is taken, but naturally, practice is essential for this delicate operation.

In conclusion I would like to say that previous experience with setting lepidoptera is of great benefit. With the Tipulidae, always deal with one insect at a time. By this I mean that it is wise to put each "Tip." in the cabinet or storebox as soon as it is safely off the board, or has been repaired, as it is so easy to damage a nice specimen when left lying about.—P. N. CROW, 154 Thorpe Road, Peterborough. 28.iv.1968.

NEPTICULA SUBERIVORA STANTON (LEP. TINEINA) IN KENT—On April 29, 1968, I examined some old Holm Oaks (*Quercus ilex*) growing in a garden at Kingsdown near Deal, and by the roadside at Worth near Sandwich, and at both localities found the mines of *N. suberivora* in some numbers in the leaves. So far as I am aware, there is no previous record of *suberivora* for Kent.—J. M. CHALMERS-HUNT. 30.iv.1968.

FIRST APPEARANCES, 1968—The following dates of first appearances of butterflies in Sussex may be of interest. March 9, *V. io*; March 28, *G. rhamani*; March 29, *V. urticae*; April 6, *P. rapae*; May 4, *C. croceus*; *E. cardamines*; *P. brassicae*. With regard to *C. croceus* on May 4, this was a single specimen which I observed in St. Leonards-on-Sea.—WILLIAM E. BUSBRIDGE, 9 Warrior Square, St. Leonards-on-Sea, Sussex.

NOMENCLATURE.—I would like to express complete agreement with the remarks of Messrs Ainley and Haggett in your issue of February of this year. When I started to collect Lepidoptera on the Isle of Barra in 1936, I was given a copy of Meyrick's *Revised Handbook* by a professional naturalist, a member of the staff of a well-known museum. Here, said he, is the final and definite list of British Lepidoptera; if you arrange and name your collection according to it, you cannot be wrong. How many of the names in the *Revised Handbook* now stand? (I notice Meyrick called the Dark Green Fritillary *Argynnis aglaia*).

The situation is absurd when the only stable names of our common butterflies are the vernacular ones. Confusion has now reached a point where future editors of South's *British Butterflies* and *British Moths* will have to follow the practice employed by Ralph W. Macy and Harold H. Shepard in their *Butterflies: A Handbook of the Butterflies of the United States complete for the Region North of the Potomac and Ohio Rivers and East of the Dakotas* (University of Minnesota Press, 1941), of giving all the Latin names that all the species they describe have ever been known by.

Future editors of such works as South's might also tell us what these names mean; whoever thinks some of them up must possess astonishing classical education, a thing which is becoming increasingly rare nowadays. But best of all, for goodness sake let us have a moratorium on all this chopping and changing, and put an end to the word game of hunting for earlier but hitherto unrecognised descriptions in obscure eighteenth and nineteenth century publications which seem to have become such an obsession with some of our naturalists.—J. L. CAMPBELL, Isle of Canna, Scotland.

Current Literature

Scopula aequicerata Träff not a separate species (Lep.), also by Ingvar Svensson (Ibid) is in the English language, and points out that it is now realized that the unequal lengths of the carata results from differences in mounting the slides. Two illustrations give first nine examples of the male genitalia and secondly, photographs of the nine relative moths.—S.N.A.J.

From **Dr. L. A. Gozmany** of Budapest. I have received a parcel of interesting separates setting out much of the work recently undertaken by this very energetic micro-lepidopterist.

The Tineid Moths of the Royal Museum of Central Africa, Tervuren Belgium covers his work at that museum during a recent visit, in pursuance of his research work on the Tineidae, and of 31 genera and 91 species mentioned, 4 genera and 48 species are described as new. Much is added to the knowledge of the family, but the size of his task can hardly be imagined, and in his conclusions, he mentions that a small consignment received from the British Museum (Nat. Hist.) for identification revealed 23 species of which 17 were new, and only 3 of which he had found also in the Tervuren Museum.

The Family Holopogonidae Fam. nov. (Lep.) and its constituent Taxa, *Acta Zoologica Academiae scientiarum Hungaricae* XIII, 3-4: 271-278, describes a new genus and three new species of Gelechiidae.

Some Tineid Moths (Lep.) from the National Museum (Rhodesia), *Arnoldia (Rhodesia)* 3, No. 25, gives the result of his identification of some Tineid moths from the Bulawayo Museum, giving two new species with ♂ and ♀ genitalia of *Episcardia rhodesica* sp. nov. illustrated by line drawings.

Some Tineid Moths of the Ethiopian Region in the Collection of the British Museum (Natural History). *Acta Zoologica Academiae Scientiarum*, XIV, 1-2: 117-138. This paper deals with the determination

of several hundred unidentified Tineid specimens in the B.M. general, and Walsingham collections; 1 *Ceratophaga*, 7 *Perissomastix*, 1 *Hyperbola* and 13 *Episcardia* species new to science are described with several figures of genitalia dissections.

***Perissomastix varii* sp. nov. (Lep. Tineidae).** *Novos Taxa Entomologicos (Mocambique)*, 53, Aug. 1967, gives a description of this new species with a photographic plate of the ♂ paratype $\times 3\frac{1}{2}$ and text figure of the ♂ genitalia.

New *Symmoca* Moths (Lep.) In the Collection of the British Museum. *Annales Historico-Naturales Musei Nationalis Hungarici*, 59: 353-357. Four new species and one new genus are described, with text figures of wing neuration and ♂ and ♀ genitalia.—S.N.A.J.

From the United States I have a separate of **A Remarkable Aberrant ♀ of *Speyeria nokomis nokomis* (Edwards) by T. W. Davies and P. H. Arnaud Jr.** from *The Pan Pacific Entomologist*, 43: 177-181. This paper describes a melanic female of this species from Vernal, Utah, with a fine coloured plate figuring the upper and underside of this specimen and of a normal specimen for comparison. Variation in this species is uncommon, and the present specimen is said to be only the third variety noted.

The Complete British Butterflies in Colour, by L. Hugh Newman, illustrated by **E. Mansell**, Ebury Press and Michael Joseph; 15 pp. and 62 coloured plates, 35/-. This book is produced for the interested public rather than the specialist, and as such I think that it should be generally successful.

After a foreword giving a general picture of butterfly ecology in non-technical language, the book follows the customary design of this series; the text consists of plates on the right-hand side with a descriptive text on the left set out in a uniform way with headings: Haunts and Habits, On the Wing, Localities, Foodplants, Aberrations and Variations, and Continental Distribution. The author has supplied these details in language well suited to his chosen circle of readers. A page giving the classification of British Butterflies and another giving an index to the scientific names finish the book.

Generally speaking, Mr. Mansell has done well with his figures, especially with the foodplants, but there seem to have been times when he has tired of the task and some of the smaller species tend to be a little crude. Larvae are usually shown well up on their toes, and some would have profited by other treatment, for instance, the small tortoise-shell or peacock would have benefited by the inclusion of a colony of larvae, and the brimstone larva could better have been shown in its customary pose of lying on the upper surface of the leaf along the midrib, as mentioned in the text. Then again, in the case of the small blue, although the text states that the larva only feeds on kidney vetch, it is illustrated, complete with larva, on a red clover. Here, one must say that the larva's habit of feeding concealed in the flower head sets a problem for the artist, but the correct foodplant might have been shown.

This book could well stimulate the wish for a closer knowledge of the subject and should provide new members for the existing entomological societies.—S. N. A. J.

Common Insects of India by **N. P. Kalyanam**, Asia Publishing House, 25/- (Feb. 1967) 136 + xv pp. 8vo. The author, who is head of the department of Zoology, Pachaiyappa's College, Madras, was trained in the University of Tennessee, and has produced this book to fill the gap left by the fact that so much of the Indian entomological literature is now out of print. It is designed to give a basic idea of insect orders so that determination to that level should present no great difficulty to the student, and order by order, insects likely to come under notice are illustrated with short descriptions both as to form and habits so that they may be named fairly accurately after a little practice. The author has explained in his foreword, that ignorance of animal life is surprising, and he had heard a cockroach described as a little red bird.

There is a bibliography of works of general interest and a short list of those suggested for general study, followed by an index of the species mentioned.

Although paper covered, the paper and printing are good, and the illustrations show a very great improvement over those in the last book of this series which we reviewed; nearly all are good representations, and sufficient, in most cases, for specific determination. One or two are a little crude, but still convey their meaning. The proof-reading seems to have also improved, and although not thoroughly examined by me, only one error was noted.

Interest in this book should go far beyond the college student, and should be of considerable use to the school teacher and to the general public, inspiring a wish to know more of the insects with which they are in almost daily contact, and so many of which are of real economic importance.—S. N. A. J.

Prevention of Rh-Haemolytic Disease, by **C. A. Clarke, M.D., Sc.D., F.R.C.P.** *Brit. Med. Journal*, 4: 7-12. This paper is really only of medical interest, but it is interesting to note that the main idea came to the author as a result of observations made in pursuance of his hobby of breeding hybrids of certain swallowtail butterflies. There is a good coloured plate illustrating these hybrids.—S. N. A. J.

Warne's Picture Reference Books, 46 pp. with 28 coloured illustrations, 3½ in. × 6½ in., Frederick Warne, 5/-. The four booklets now before me represent the first four subjects of a new series produced by these popular natural history publishers. The series is edited by John Clegg and the coloured photographs by George E. Hyde. The make-up is similar, consisting of a frontispiece, Contents, More Books to Read, an Introduction of 3 pp. followed by spreads of four coloured subjects treated on the following spread. There are usually 28 such pictures, after which two pages deal with other related species, not illustrated, a glossary, index, a page for notes; the back cover paper is illustrated with instructive sketches in black and white.

No. 1 is *Butterflies and Moths and their Caterpillars*, No. 2 *Berries and Fruits*, No. 3 *Insects (other orders)* and No. 4 *Wild Flowers of the Spring*. Further subjects in preparation are No. 5 *Wild Flowers of the Summer*, No. 6 *Wild Flowers of the Autumn*, No. 7 *Pond Life* and No. 8 *Trees*, I.

The series should be popular with young enthusiasts and with parents and relatives wishing to inspire young people to become enthusiasts. The colour work is good and the notes on species concise. We wish the series well.—S. N. A. J.

Proceedings and Transactions of The South London Entomological and Natural History Society, Part 3, August 1967. Published by the Society, 10/-.

This part contains the Council's, Curator's, Librarian's and Treasurer's reports, and an account of the 1966 Annual Exhibition with one coloured and two half tone plates. This is followed by an account of the Lepidoptera Distribution Scheme by J. Heath. The Proceedings section gives accounts of indoor meetings from 9th February until 22nd June 1967. Field meetings of 1967 are covered up to 11th June 1967. An obituary notice for Robin Mere concludes the issue.

Part 4, December 1967, 9/-. Carries an account of the Future of Field-Meeting Localities in Surrey, by Alan E. Stubbs. Comments on the Limacodidae of East and West Africa, in respect of Dr. MacNulty's paper on the subject (ibid Pt. 1, 12) by D. G. Sevastopulo. P. Calderara contributes an article on Butterflies at Collobieres, Var. Alpes Maures, and Provence in July and August 1967. The Proceedings cover indoor meetings from 13th July until 9th November 1967. There is also an account of the 1967 Annual Exhibition with four half-tone plates. Field Meetings range from 14th May to 1st October 1967. C. Carter contributes an account of the change in the Lepidoptera of Hampstead after four decades. The part closes with an obituary notice for Arthur Morel Masee, O.B.E., D.Sc., F.R.E.S.—S.N.A.J.

Field and Meadow Life in Colour by Leif Lyneborg, translated from the Danish by Kirsten Campbell Fergusson and edited in the English edition by Arnold Darlington. Blandford Press. 164 pp. 80 coloured plates. 21/-.

This excellent little book represents a further extension of the praiseworthy practice of making the maximum use of existing coloured plates. It must be understood that the plates represent some species not yet on the British list, but then, insects are not subject to passport regulations, and it is as well that interested people should have some idea of the species to be found on the other side of the North Sea. The Editor has done a very good job in this respect, and the only striking mistake is the labelling of *Lycaena virgaureae* as our *L. phlaeas*.

The book covers all invertibrate orders to be found in meadowland and the eighty plates occupy pages 5-84. The figures are numbered consecutively throughout and these numbers refer to pages 85-159, where short accounts of the species may be found under that number.

The quality of the plates is very good indeed and the range of subjects, from Nematodes and earthworms, woodlice, centipedes and millipedes, through the insects from Collembola to Diptera and then on to spiders, mites and ticks, and on to Mollusca. The last 12 plates are devoted to good illustrations of many forms of plant galls and insect mines. In all 543 animal and 78 vegetable subjects are illustrated. The book is bound in a small octavo size suitable for the pocket, and would be an excellent companion in the field and also an excellent addition to the bookshelf.—S.N.A.J.

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REVISED LIST OF YORKSHIRE LEPIDOPTERA

More than 50 years have elapsed since the publication of Porritt's list of The Lepidoptera of Yorkshire, and the need for a revised list has long been felt. Work on this has been undertaken by The Lepidoptera Committee of The Yorkshire Naturalists' Union, and the new revised list is currently appearing in "The Naturalist". Details and copies available from The Editor of "The Naturalist", The University, Leeds 2.

SPECIAL NOTICE

BACK ISSUES OF THE ENTOMOLOGIST'S RECORD

THE RESPONSE to previous announcements regarding above has been so exceptional that the stock of most numbers has been reduced to the required level and the offer of "sale prices" has now been withdrawn.

However some issues are still in good supply, and the Editor will be pleased to quote prices in reply to enquiries.

LEPIDOPTERA OF KENT, VOL. II

This comprehensive work will be completed with the instalment in our May issue and a limited number of separates, unbound, with stiff paper cover, is available for sale at 45/- per copy from The Editor, 54 Hayes Lane, Bromley BR2 9EE, Kent. (Postage extra)

A BUTTERFLY COURSE will be held at Pendley Residential Centre of adult Education Ltd., Pendley Manor, Tring, Hertfordshire, on 26th-28th July, under the auspices of well-known experts. For full details please write to The Warden.

EXCHANGES AND WANTS

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- For Sale.*—Rev. F. M. B. Carr's cabinets and collection.—*Carr, 93 Albany, Bournemouth*. Tel. No. Bournemouth 27419.
- For Sale.*—Butterflies and Motns—Worldwide selection, especially Africa and Madagascar, many *Papilio's* Charaxes, Cymothoe, Salamis, Sphingidae, Saturnidae, etc. Sometimes livestock. Lists on request by sending 1/- stamps.—*Robert Keiser, Frederik Van Eeden Plein 3, Antwerp 1, Belgium*.
- Wanted.*—Irish Lepidoptera. I am collecting material for a supplement to my "Revised catalogue of Irish Macrolepidoptera, 1964", and would be very grateful for any new county records, or other items of interest.—*E. S. A. Baynes, "Sandford", Adelaide Road, Glenageary, Co. Dublin, Irish Republic*.
- Wanted.*—Entomological Literature of all sorts. Books, Periodicals, Monographs, Museum Reports, Proceedings of learned Societies, collections of papers.—Apply *Julian J. Nadolny, Scientific Books and Periodicals, 35 Varmor Drive, New Britain, Connecticut 06053, U.S.A.*
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TO OUR CONTRIBUTORS

All material for the TEXT of the magazine must be sent to the EDITOR at 54 Hayes Lane, Bromley, Kent.

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Edited by S. N. A. JACOBS, F.R.E.S.

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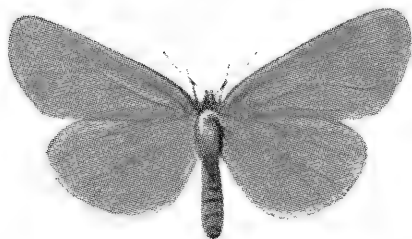
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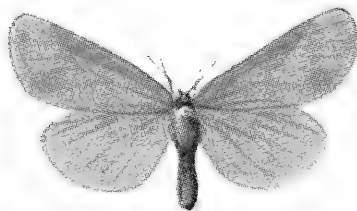
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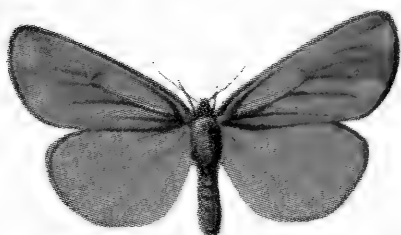
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New aberrations of *Callimorpha jacobæ* Linn. 1967.

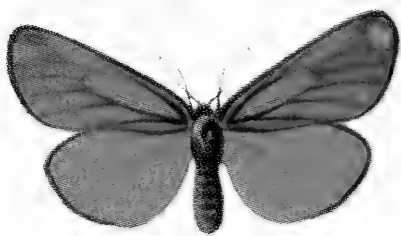
- | | | | | | |
|----|------------------------------|---|----|-------|------------------|
| 1. | ab. <i>flavarosea</i> Watson | ♂ | 3. | ditto | ♀ |
| 2. | ditto | ♀ | 4. | ditto | ♂ (extreme form) |



1



2



3



4

From the original watercolour drawing by A. D. A. Russwurm.

New aberrations of *Callimorpha jacobæ* Linn. 1967.

1. ab. *rubrasuffusa* Watson ♂
2. ab. *nigrociliata* Watson ♂

3. ab. *nigrociliata* Watson ♀
4. ab. *pallida* Watson ♂

New Aberrations of *Callimorpha jacobaeae* Linn. (Lep. Arctidae)

By R. W. WATSON, F.B.A.A., F.A., F.C.C.S., F.Comm.A., F.R.E.S.

Description:

***Callimorpha jachbaeae* ab. *flavarosea* ab. nov.**

Forewings buff yellow suffused with pale vermilion with the usual costal streak and spots of vermilion.

Hindwings buff yellow suffused with a rosy tint which follows the veins in many specimens.

Fringes buff yellow with variable amount of black scaling. Thorax and abdomen vermilion suffused with black. This is a very beautiful form, some of them resembling rose petals.

Type, Male bred 10th June 1967, Watson Collection.

***Callimorpha jacobaeae* ab. *nigrociliata* ab. nov.**

Fore and hindwings crimson with the usual costal streak and spots of a darker shade. Fringes mainly black. Thorax and abdomen crimson, heavily suffused with black.

Type, Female bred 16th June 1967, Watson Collection.

***Callimorpha jacobaeae* ab. *pallida* ab. nov.**

Forewings very pale vermilion with the costal streak and spots only just visible. Hindwings pale rose pink. Fringes buff with a little grey scaling. Thorax and abdomen pale vermilion suffused with greyish buff.

Type, Male bred 18th June 1967, Watson Collection.

***Callimorpha jacobaeae* ab. *rubrasuffusa* ab. nov.**

Fore and hindwings as typical forms suffused with rusty vermilion so that although all typical markings remain, this form has the appearance of being overlaid with additional scaling.

Fringes greyish black. Thorax and abdomen dull vermilion suffused with greyish black.

Type, Female, June 7th, 1967, Watson Collection.

BREEDING RESULTS

The pupae from 1966 were divided as follows

Brood Numbers

	Brood 1	Brood 2	Brood 3	Brood 4	Brood 5	Brood 6	Total
Watson	75	—	240	83	79	62	
Coney	—	—	—	—	52	46	
Kettlewell	6	5	6	—	6	6	
Totals from pupae 1966	81	5	246	83	137	114	666

ANALYSIS OF EMERGENCES

	Typical forms	<i>coneyi intermedia</i>	<i>flavarozea nigro-nigrociliata pallida</i>	<i>rubra-suffusa rubrasuffusa</i>	Trans. to	Failed	Total				
Brood 1											
<i>intermedia</i> ♂	22	25	—	—	—	14	81				
×											
<i>coneyi</i> ♀											
Brood 2											
Type ♂	2	—	—	—	—	3	5				
×											
Type ♀											
Brood 3											
Wild type ♂											
ex Boldre	107	25	60	—	—	29	246				
×											
<i>intermedia</i> ♀											
Brood 4											
Type ♂	48	—	—	—	—	35	83				
×											
Type ♀											
Brood 5											
<i>coneyi</i> ♂	54	4	20	—	1	19	137				
×											
Type ♀											
Brood 6											
<i>intermedia</i> ♂	54	8	—	1	10	41	114				
×											
Wild type ♀											
ex Milborne											
Port											
	287	49	78	60	1	10	1	5	19	156	666

GENETICS:

I considered the original female *coneyi* taken in 1965 must be a dominant as if it had been a recessive the chances of a pairing in the wild to produce the results shown below in the first brood were too remote.

Red	Type	Total	Percentage of red to total
14	16	30	46·7%

On the assumption that the red form was a dominant the expected and actual results are shown in the following table:

Percentage of "red" *jacobæae* to total emergences

Brood No.		Expected	Actual
1	<i>intermedia</i> ♂ × <i>coneyi</i> ♀	75%	67·2%
2	Typical ♂ × typical ♀	nil	nil
3	Wild typical ♂ × <i>intermedia</i> ♀	50%	50·7%
4	Typical ♂ × typical ♀	nil	nil
5	<i>coneyi</i> ♂ × typical ♀	50%	47·6%
6	<i>intermedia</i> ♂ × wild typical ♀	50%	26%

This proves that "red" *jacobæae* is a dominant, the variation in ground colour, fringes, etc., being doubtless the effect of modifying genes.

On June 30, 1967, a male ab. *intermedia* was taken within 400 yards of the place of capture in 1965 of the original ab. *coneyi* female. This male was paired by A. W. Coney with an ab. *coneyi* female.

In the case of ab. *rubrasuffusa*, however, further results are necessary as these forms only occurred in brood 5. This is probably a recessive which may only be able to express itself in the presence of the "red" gene.

At the time of writing, some 1200 pupae are due to emerge shortly. It is hoped eventually to obtain pairings with the yellow recessive form.

Acknowledgments

Once again the author expresses his appreciation to the following:

A. D. A. Russwurm who has again excelled himself on this difficult subject.
 A. W. Coney for continuing the breeding in an exemplary manner.
 Bernard Kettlewell for his assistance in breeding from a limited number of pupae so that a sufficient stock is available, thereby spreading the risk.

All the helpers with the mundane tasks of collecting ragwort, cleaning out cages, etc., under the supervision of Mrs. M. B. Watson, F.R.E.S.

"Porcorum", Sandy Down, Boldre, nr. Lymington, Hants,
 May 1968.

Notes on Breeding *Callimorpha jacobæae* Linn. (Lep. Arctidae)

By R. W. WATSON, F.B.A.A., F.A., F.C.C.S., F.Comm.A., F.R.E.S.

This species is one which although easy to breed has not in the past been given to much variation except for occasional broods of the yellow recessive form. I have bred small numbers in the past without difficulty, the larvae being healthy and not in my experience much affected by virus diseases.

With the advent of "red" *jacobaeae* it was obvious that some large-scale arrangements were necessary.

As I believe in breeding in as near natural conditions as possible, tins and plastic containers were avoided.

In June 1966 when A. W. Coney and myself obtained the first pairings it was found by A. W. Coney that females would only lay on growing plants of groundsel or ragwort.

The moths emerge between 6.30 a.m. and 8.30 a.m. B.S.T. On one occasion when the laboratory lights had been left on for some hours a few emerged at midnight.

The selected pairings are placed in cardboard shoe boxes from which the centre of the lid had been removed and replaced by nylon netting. Pairing occurs the following morning between 6.00 a.m. and 7.30 a.m. B.S.T., and after separation the males are removed and are still fit for setting if required.

The laying cages are prepared in the following way: Selected plants of ragwort about 24" in height and with a single stem are planted in flower pots. Before planting a rolled nylon stocking is placed round the stem, care being taken to see there are no holes and that the mesh is not too large. After planting, the nylon is tied round the stem at the bottom and rolled up over the plant. This ensures that the leaves are not damaged. A cane is then inserted in the pot to act as support. One female is placed in each container, the top then being tied and also tied to the cane. Apart from reasonable watering of the plant no further care is required.

The eggs are deposited mainly on the underside of the leaves, although some females choose flower heads and stems. Oviposition occurs from 12 hrs.-72 hrs. after pairing.

The young larvae require no attention until all the foodplant is exhausted. This time varies as there is considerable variation in the number of ova per female. Usually the larvae are in the third instar before they require transferring to cages.

The cages used for this purpose are of wood construction, 30"×18"×12" with a copper gauze back and a glass door which lifts out. The bottom of each cage is covered with $\frac{1}{2}$ " of peat. The ragwort plants are pulled, not cut, as in this way they keep fresh for 48 hours, by which time they are usually consumed. The plants selected are longer than the cages so they tend to jam in a horizontal position.

The larvae show a preference for the flower petals and feed up rapidly, no cleaning out is necessary as the frass remains dry. Pupation takes place in the peat, many pupae lying close together and often touching.

In September the pupae are removed from the cages and placed in small tins, care being taken to remove all those damaged or deformed. The small tins are then placed in a biscuit tin and left in a cold position for the winter. The pupae are examined at regular intervals and any doubtful ones removed. Under these conditions the correct humidity is maintained without mould arising and so far 80% to 85% have emerged.

Porcorum, Sandy Down, Boldre, nr. Lymington, Hants. May 1968.

Collecting Notes 1967

By T. W. HARMAN

May I first apologise to readers of this magazine for the late emergence of these notes. Perhaps many will already have forgotten 1967, or tried to, so perhaps these notes may add a little optimism to some rather gloomy results which others seem to have had. This was my first complete season in N. Derbyshire and consequently it began rather later than in previous years 150 miles further south. Apart from the colder climate the season commenced with a physical setback to myself. While working in a gymnasium on 25th January, I had the misfortune to tear both achilles tendons simultaneously. Besides being very painful it meant I couldn't walk. After literally crawling about for a fortnight, I made gradual progress and returned gingerly to work on 15th May. At one stage it looked as though I would have to hang up my net for at least a season, but after ten weeks of daily physiotherapy and seeing insects on the wing, recovery was faster than expected.

Lepidoptera in their early stages was the feature of early spring. Ova of *Antitype chi* L. began hatching on the 19th March and resulted in a splendid series of extremely varied moths in July. On the 18th April, ova of *Enargia paleacea* Esp. and *Amphipyra tragopoginis* Clerk. began hatching from Clumber Park females. The *E. paleacea* Esp. gave a great deal of trouble, the vast majority wandering around without feeding until they died. Only one managed to reach maturity, but even this died before pupating. The *tragopoginis* gave no trouble on hawthorn. Mercury-vapour light was used for the first time on 24th April with the expected *Orthosia gothica* L. and *O. stabilis* Schiff. the only result. However, April ended well. The first of half a dozen *Cucullia chamomillae* Schiff. from local larvae hatched on the 28th. The generator was taken up to the edge of the moors near here on the 29th, but failed to start because of a stuck exhaust valve. This was one occasion I didn't mind as I then decided to hunt for larvae with the aid of a pressure lamp. This proved very profitable although rather risky for my legs. The bilberry was rather far advanced to be able to see larvae easily, but the grasses and heather yielded dozens, several species being present. Another visit on the 6th May added more to the breeding cage and the results were nice series of *Diarsia brunnea* Schiff., *Amathes castanea* Esp., *Euschesis comes* Hubn., and, a welcome surprise, one specimen of *Ammogrotis lucerneae* L.

During the second week of May summer seemed to be coming in and *Callophrys rubi* L. was fairly common flying around bilberry and settling on small Scots Pines on Beeley Moor on 11th May. Before resuming work after my injury, I spent a long weekend at my parents' farm in the Chilterns from the 12th to 14th May. The weather was good and, on advice from Mr Theodore Homer we tried local beechwoods for *Ectropis consonaria* Hubn. He had taken several recently and I was very pleased to get eight good specimens, a new species. It had possibly been overlooked previously. On the morning of 13th May we visited Bix Bottom near Henley-on-Thames, a delightful spot which is now a nature reserve. It was a good morning for insects and although we saw several species, *C. rubi* L. was not present. At Turville Heath that night the summer

species were well out and included *Stauropus fagi* L., *Hadena w-latinum* Hufn. and *Drepana cultraria* F.

Work then took precedence over collecting for a fortnight until the Whitsun holiday, not that I really deserved a holiday at the time! I took my two small boys as helpers to beat larvae of *Chesias legatella* Schiff. in Warsop Wood, Notts., not very far east of here. There had been a heath fire among the broom, but even so, larvae were very common on the remaining broom bushes around the edge of the area. Broom appears to deteriorate rapidly as a foodplant and I think it advisable to only take full-grown larvae and change their foodplant at least every other day. Mr Homer came up on 29th May and stayed at the Peacock Hotel, Rowsley, a very central position to Peak District operations. He struck a bad patch of weather and we relied a great deal on larvae hunting at night. We visited Lathkill Dale on 30th May in showery conditions, but were lucky enough to see a number of *C. rubi* L. which seemed to like settling on grasses when the sun was not shining. The night temperature dropped to 40°F., but we found a number of larvae on Beeley Moor. *Lasiocampa quercus callunae* L. were common on heather and bilberry and among identifiable species taken were six *Enterphria caesiata* Schiff. and many *castanea*. On the following night we were back on the moors with m.v. lights. Despite a temp. of 47°F., overcast sky and a rare, almost windless night, only four moths turned up, three *Hadena bombycina* Hufn. and one *Eumichtis adusta* Esp. On the 1st June we visited Clumber Park where we beat a number of larvae and heard a nightingale singing. In the evening we were again on Beeley Moor, but in a rather lower, more sheltered site. Again, conditions looked good but we only took eight *H. bombycina* Hufn. and no other moorland species. So ended a rather poor first Derbyshire visit for Mr Homer.

Messrs. Alan Hepworth, Brian Elliot and I went to Lathkill Dale on the third June to beat wych elm for larvae of *Strymonidia w-album* Knoch. without luck, but we may have been too late. We did see *Abraxas sylvata* Scop. and a single *Perizoma affinitata* Steph. which I suspected might be there among the Red Champion. I also saw for the first time Meadow Saxifrage and Wild Columbine growing commonly, the latter very attractive to some small micros.

The next day of note was 14th June, when I went straight from work to Lathkill Dale to tackle the problem of catching *Parasemia plantaginis* L. By walking among the long grass on the slopes I got two specimens, but then a thunderstorm forced a hasty retreat to the shelter of some limestone rocks. As luck would have it I found a pair of *plantaginis* in cop sitting on a tuft of grass on a rock ledge, so decided to wait for the rain to stop. This it did fairly quickly so I went to an adjoining slope to try again. Here males were flying freely, but on the steep slope and limestone scree netting them by chasing was impossible. They appeared to fly along definite paths below some rock outcrops so I decided on guerilla warfare and set an ambush. The female was placed in an open box on a ledge and I took up a crouched position with net at the ready nearby. Whether the female had any effect I couldn't decide, but this method of waiting was easily the best answer to the problem, especially if one can get the slope on the skyline which makes a better background than long grass. In all, about two dozen were netted, although not all were perfect. The female laid over 100 ova and they hatched well. †

decided to force them, so airing-cupboard treatment on myosotis, dock and foxglove was tried. They fed up well to about half-grown, but then gradually died off. Half a dozen came through successfully by October. Two days later, 16th June, saw me on my first visit to the Breck District. Barton Mills was the centre of operations and I based myself near a wood about a mile from Tuddenham. All around were excellent areas of typical Breck flora and I had great hopes for the evening, especially after a very warm day. I planned to run the generator attached to the trap all night so slept in the back of my Reliant van a short distance away from the light. It was indeed quite a good night and pleasant to see species I normally associate with Kent, such as *Arctia villica* L., *Heliophobus albicolon* Hubn. and *Agrotis vestigialis* Hufn. Another welcome visitor was *Heliophobus reticulata* Hubn. which was quite common. However, none of the Breck specialities turned up. I awoke at 3.45 a.m. and had finished breakfast by 5.00 a.m., an egg boiled dry on a spoon over a primus, as there was no water available! Hardly a square meal to begin the day, but I then shared daybreak with a multitude of wild life and no sound of human inhabitants, very refreshing. I then joined Mr Brian Elliot at Woodwalton Fen. We walked around during the day in hot sunshine, but nothing seemed to be flying at all, despite plenty of attractive-looking flowers. Even micros seemed absent. Mr Bernard Skinner and his wife arrived later in the evening and we had a most disappointing, cold evening with twelve moths to four m.v. lights. Three of these were *Arenostola extrema* Hubn., but even though the sky was clear and temperature low, one would expect to see more than we did. Not having much experience of this Fen my conclusions are that the combined effect of its low-flying nature, moist conditions and low night temperatures in early summer tend to make it rather unfavourable to lepidoptera, particularly early in the season. Some long term trapping records taken actually in the Fen would be most interesting, if it hasn't already been done. The day we returned to Chesterfield my family asked to go out for a picnic so we went to Coal Aston, Derbys., very near the Yorkshire boundary and the City of Sheffield. Even so, this is an attractive wooded valley with a stream running through it and plenty of glades on the slopes. Many insects were flying including *A. sylvata* Scop. *Odezia atrata* L. and some *Procris statices* L., very nice to see this last species in such an unlikely situation. The next field trip was to Clumber Park on 24th June. *Hadena contigua* Schiff. was the object of the visit, but in apparently perfect weather conditions we only got one specimen. The trap at home had drawn in a lot of moths plus a sparrow which had caused havoc. The Breck was revisited on the 30th June, Brian Elliot and I camping in my previous spot near Tuddenham. We took a nice variety of species, 68 in all, including two good specimens of *Euschesis orbona* Hufn., and one *Hyloicus pinastri* L. *Heliophobus reticulata* Hübn. and *H. albicolon* Hübn. were fairly common.

The following night we moved to Chippenham Fen and found it much more interesting than Wood Walton, with insects in plenty. In the evening we kicked up *Eustrotia bankiana* F. and *Sterrha muricata* Hufn. in the same area. They were distinctly localised, but fairly common. We had the unusual experience of a hot, sunny day followed by an evening which clouded over just at dusk, providing near perfect conditions. The m.v. light yielded 68 species, among the most interesting being *Meliana flammea* Curt. and *Phragmataecia castanaea* Hubn. in fair numbers,

Craniophora ligustri Schiff., *Leucania straminea* Treits., *Chilodes maritima* Tausch., *Zanclognatha cribrumalis* Hubn., *Lygephila pastinum* Treits. Altogether a very rewarding first visit and one I hope to repeat.

At Chesterfield on 5th July I took the first of two *Plusia bractea* Schiff. which came to light at home during the season. This was an excellent night, one of those which made up a remarkable week, a week which brought forth so many *Trisateles emortualis* Schiff., 50 on two nights in the Chilterns, that 1967 must go down as the 'emortualis year.' I may add, for those who were not present at the S. London Ent. and Nat. Hist. Society's Annual Exhibition at the Natural History Museum, S. Kensington, that Mr Brian Baker has at last achieved the difficult task of working out its life history in the wild and has taken wild larvae and pupae as well as rearing a pupa from the only fertile egg laid by a female moth. I think he deserves great credit for this marvellous piece of work, yet another of his methodical, painstaking and determined efforts. On 7th July my trap records at Chesterfield were broken with 52 species, mostly common stuff, but quite an encouraging result. From the 15th onwards July was a red-letter month by any standards. Messrs Hepworth, Elliot and I went to Wiltshire for a long week-end to look for some butterflies. My opinion of Wiltshire went up rapidly during that week-end as we saw butterflies in abundance and some of the cynics who talk about the complete disappearance of our butterflies may take hope in that the core in Wiltshire is allowed to spread. We really wanted to see *Apatura iris* L. and in this quest were extremely lucky, not only to see it flying around oak trees, but also coming down to sit on the dry road before 11.00 a.m., a wonderful sight and sufficient to carry us through the rest of the season if necessary. *Limenitis camilla* L. and *Argynnis paphia* L. were common but most rather worn. Other species such as *Aphantopus hyperantus* L. were abundant, in fact I have not seen so many insects since the early 1950's in the Chilterns. I will not enter into details of the week-end regarding localities for obvious reasons. If the 'Conifer Commission' are careful and consult naturalists before taking action, the insects of this region can be saved. We returned to Chesterfield on the 17th and on the 18th my family and I were off south again. We spent two days at my parents and I ran a trap inside the beechwood for two nights. Both were rather wet ones, but moths were abundant, *Discoloxia blomeri* Curt. was the commonest moth and one specimen of *T. emortualis* Schiff. was taken. As it appeared to be feamle it was saved for ova, without success. We then continued to Kent to stay with my mother-in-law. I got my usual plug-in at the market-garden opposite, a good site as there is a clear view out to sea at Sandwich Bay about a mile-and-a-half away. Among the most interesting species seen there between 20th July and 1st August were *Lygris prunata* L., *Sterrrha vulpinaria* H-S., *Leucania obsoleta* Hubn., *L. straminea* Treits., *Nycterosea obstipata* F., *Nonagria dissoluta* Treits., and *N. sparganii* Esp. Two specimens of *Celastrina argiolus* L. were tapped out of a hedge near the light at dawn one morning and further search for this species found it fairly widespread, a number being seen at St. Margaret's Bay on 30th July. Sandwich Bay was visited several times and the wild buddleia patch I always look on was well attended by butterflies plus one *Macroglossum stellatarum* L. A field trip to Orlestone Woods was made on 27th It was an extremely hot day, but I wanted to walk over as much ground as possible to look for *Euphyia*

luctuata Schiff. This was not easy as so much of the area has come under systematic afforestation. However, near the end of my endurance I kicked up one specimen in an area of rough brambles and then concentrated on this spot, covering nearly every square inch. They appeared to be very local, but I did get half a dozen. A female yielded ova and of these one hatched later in the year, the rest overwintered. Only one specimen came to light in a different locality that night along with 64 species of which *Paracolax derivalis* Hubn. was about the most interesting. A specimen of *Evergestis extimalis* Scop. also turned up.

Brian Elliot and I went to Dungeness for a week on 14th August. This was the most unfortunate visit I have ever made there because rain and wind made m.v. conditions hopeless on most nights. We took one specimen of *N. obstipata* F. at the lighthouse on 15th and I saw one specimen of *Colias croceus* Fourc. on the 16th. About the biggest 'happening' was the visit of a Rank Organisation photographer to the observatory to film wild life there. Fame came to me in the form of boxing a carefully placed *Luperina testacea* Schiff. on one of the posts. Later it cost me 17/- to take the whole family to the local cinema to see 'Daddy'. The scene lasted all of six seconds, but at least it was in colour! We did rather better at Rye by looking for pupae of *Nonagria geminipuncta* Haw. in reed stems. This was pretty hard work, but Brian had an even worse task with *Gortyna hucherardi* Mab. nearby, finding only one in about two hours. It would be pleasant to accompany one of these 'Tutt' characters who find several in every forkful of earth turned over! In Beckley Woods we hunted high and low for larvae of *Cucullia gnaphalii* Hubn. Either they are extremely uncommon or we were too late, *C. asteris* Schiff. being all we could find. Our week was cut a day short and we came back to my parents via Ansty Pond, Sussex, where we searched for pupae of *Nonagria algae* Esp. I found one in the first reed stem looked at, but then it was half an hour before we found another. After trial and error we discovered the secret of success in this lovely place. We were a little late as many had already emerged by 20th August. However, we concentrated our attention on live stems of *lacustris* which had turned yellow at the top. If this colour had moved well down the stem, it was nearly always a certainty that a pupa was housed within. Many of these in live stems had not emerged and we put this down to the possible lower temperature within these stems compared with that in dead stems. We got over a dozen each and some hatched in the car on the way home. We did not find it very wet in the area we found the pupae and one hardly needed wellingtons, let alone a boat.

Next day, 21st August, saw us on the Chiltern Scarp where we found a few *Lysandra coridon* Poda. However, much of my previous hunting ground was fenced in for sheep to graze and various grassland experiments. It is all very well having the sheep to keep down the grass, but I hate to think how the poor ants' nests will fare. Still, not having first hand knowledge of the experiment, I will not pass judgment until I see the status of *L. coridon* over the next few years. We went to Pamber Forest in the evening and drew almost a complete blank, probably due to clear conditions. When we got home and visited the m.v. trap in my father's beechwood things were very different, with plenty of insects and many second brood species. *Ennomos quercinaria* Hufn. was common and we found one *Lophopteryx cucullina* Schiff. My diary notes state that this night dispelled the theory that light inside a wood was no good.

I am sure the increased temperature under the high beech trees causes insects to fly inside the wood where they tend not to outside it.

Back in the Derbys. we visited Beeley Moor on 24th August and although the temperature dropped sharply we took several *Celaema haworthii* Curt. and two specimens of *Oporinia filigrammaria* H-S. Back on Beeley Moor on 26th conditions were slightly better and m.v. yielded *Lithomoia solidaginis* Hubn., *Plusia interrogationis* L., a female *Ammogrotis lucerneae* L. and several *O. filigrammaria* H-S. On the 30th I visited a local moor near Holymoorside where *Diarsia dahlii* Hubn. was easily the commonest moth.

August just about concluded the season, which, for me, had been a very pleasant one, fourteen new species and large numbers of insects on many occasions, as well as some very good weather. All we need is a good summer in 1968 to help the butterflies strengthen their numbers. May I end these notes by saying something prompted by my visit to the British Entomological Society's Annual Exhibition in October. Without, I hope, upsetting too many people, I feel it is time collectors began using stainless steel headless pins as a general rule. They are far better to look at in a collection as one is not confronted by a row of black pinheads. They never corrode and although I have heard the complaint that they 'twang' when handled with forceps, I have never found this any worse than headed pins. Many collectors also seem fanatical about taking rare moths, but are not particularly careful about setting them for exhibition purposes. Surely if one is to exhibit something, it is for others to look at and should therefore be as near perfection as possible. In this I include clean white paper under the specimens and labels which can be read. After saying all this I expect my 1968 exhibit will come under careful scrutiny by all readers. I cannot promise perfection but will do my best!

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Some Interesting Captures of Lepidoptera in South Essex in 1967

By R. TOMLINSON

My first trip of the year was made to Martinhole Woods, about one and a half miles away, on 4th March with my friend Don Down. I had looked this wood over earlier and found it to be predominantly oak with a scattering of hazel, hornbeam and birch, and decided to pay it a visit. As 4th March was a fine sunny day and quite mild I arranged to meet Down at the wood at dusk. I cycled there and set up my "Honda" E IV 300 portable generator and ran a 125 watt mercury vapour bulb from it in a sheet operation. Don appeared, and we began to have doubts over moths coming into light as it was a clear night and the temperature dropped. Our fears were soon dispelled, however, when the moths started to come in to our light in the clearing, and no less than 17 *Apocheima hispidaria* Schiff. flung themselves into the light, all but five of them hitting the ground around the sheet. Three melanic *Phigalia pilosaria* Schiff., two *Erannis leucophaearia* Schiff., a fairly early *Earophila badiata* Schiff. and a number of *Alsophila aescularia* Schiff. also came in. We packed up at 8.30 p.m. well satisfied with our captures.

Nothing else of note appeared until 15th April when a melanic *Lycia hirtaria* Clerck found its way into my garden light trap, then a very early *Phragmatobia fuliginosa* L. in the trap on 17th April, then yet another *L. hirtaria* on 27th April. These melanic *hirtaria* are the same in appearance as those I described earlier (*Ent. Rec.*, 78: 183). It is a pity that the female does not come to light so that I could raise a new strain.

Among the 43 moths captured in my garden trap on 13th May was a single *Orthosia advena* Schiff., and Down took one in his trap at Westcliff on the same night.

The attractive geometer *Selenia lunaria* Schiff. came into my garden trap on two occasions, 24th May and 2nd June, far more welcome visitors than a ♀ *Passer domesticus* (house sparrow) that got into the trap on 8th June. I have since fixed up a kind of wire frame just under the hopper of my Robinson trap, that allows even hawk moths into the trap but denies access to birds, and I have had no more trouble with them.

On 10th June I had a lift with my friend A. Cox to the Essex Naturalists' Trust Reserve called "Poors Piece Wood" where we met the honorary warden, Mr. G. A. Pyman and his son Trevor, both keen collectors who have become my firm friends. I quickly set up the generator and we were eager to see what would turn up at the sheet, for it was the first time mercury vapour light had been used in this very rich (entomologically speaking) area. It was a clear night, fairly cold after dark. We ran the light from 9.30 p.m. until midnight. Visitors to the sheet were *Pterostoma palpina* Clerck, *Notodonta ziczac* L., *S. lunaria*, *Lomaspilis marginata* L., *Deilinia pusaria* L., *Bapta temerata* Schiff., *Xanthorhoe montanata* Schiff., *Diarsia mendica* Fabr., *Lithina chlorosata* Scop., *Aethalura punctulata* Schiff., *Dysstroma truncata* Hufn., *Jodis lactearia* L., *Campaea margaritata* L., *Phlogophora meticulosa* L., *Apamea crenata* Hufn. and a *Clostera curtula* L.

From 15th June onwards, I ran my Robinson trap at a friend's house at Mucking during two weeks out of three. The trap was situated at the edge of fairly extensive reed beds, and incidentally only a stone's throw from the one-time residence of the late Rev. C. R. N. Burrows. On 19th June there I had an *Erias clorana* L., on the 21st a slightly worn *Deilephila porcellus* L., and on the 22nd a fine example of *Heliophobus reticulata* Vill.

I took the trap home to Stanford-le-Hope and ran it for a few days in the garden, I had 310 moths in the trap on 24th June, and from these I collected two *Polia nitens* Haw. The next night the trap took one *Hadena compta* Schiff., the first of three I captured this season.

The night of 27th June was very humid and close, and 382 moths were in the trap the next morning. I kept a *Leucania obsoleta* Hübn., a *Graphiphora augur* Fabr. and another *H. compta*, and yet another *compta* on 2nd July. I ran the trap at Mucking for the next few days, and the night of 4th July brought forth another *E. clorana*, a *Hydrelia flammeolaria* Hufn., a *Pseudoterpna pruinata* Hufn. and a *Spilosoma urticae* Esp. 5th July brought me another *L. obsoleta*, and there were three more in the trap on the following night. At the risk of seeming repetitive I may add that the night of 11th July brought another *obsoleta* to the trap. I ran the portable generator in the nearby One Tree Hill Woods on 12th July with a friend, and among the moths on the sheet were a *Pseudoips bicolorana* Fuessl. and the rather scarce *Xanthorhoe quadrifasciaria* Clerck.

The trap at Mucking on 13th July took more than 500 moths, and of these I kept one *Nycterosea obstipata* Fabr. and one *Perizoma alchemillata* L. I ran the Robinson trap at home in the garden for a few days from 18th July, and the night of 23rd brought me possibly my best catch of the year; a single slightly worn example of the very rare (in Essex) *Parascotia fuliginaria* L. I believe that this is only the third specimen to have been taken in this county.

According to Mr. H. C. Huggins, R. South is wrong when he states in the recent edition of "Moths of the British Isles", that A. B. Farn caught his *fuliginaria* in Essex in 1891. In fact Farn caught his insect in a big gas-lit trap at Greenhithe in Kent on 2nd August 1891. It was a small male in poor condition. This, together with a female from Blackmore's collection formed Lot 72 at the last portion of Farn's sale on 4th April 1922. The lot was bought by Bernard Harwood, acting as agent for Arthur Horne of Aberdeen, for 30/-. Mr Huggins does not think that Farn ever collected in Essex, except perhaps Epping. He says that the first specimen of *fuliginaria* captured in Essex was by Mr. Robbins at Walthamstow on 29th July 1901, caught allegedly whilst flying round a sugared post. Mr. Huggins has never heard of a *fuliginaria* being taken at sugar and says that no doubt the insect was attracted to its captor's light while he was inspecting his sugar patches.

A trip to Bradwell-on-Sea by Mr. and Mrs. Down, Mr. Huggins and myself, to see Mr. A. J. Dewick and his collection of Lepidoptera on 3rd December revealed that he (Mr. Dewick) had captured a slightly worn *fuliginaria* on 19th August 1959, the second Essex record, and mine I believe to be the third.

At this time in July, I paid a visit to a young fellow collector at Basildon, Master M. A. Rock, and upon inspecting his collection, I expressed surprise on seeing in it several examples of *Abraxas sylvata* Scop. which he had obtained from Langdon Hill Woods about two miles from my home, and a place I had yet to explore. He said he had taken the moths earlier in the year. Mr Huggins later informed me that he and his late uncle by marriage, Achie King, discovered it there in 1902. At that time it was part of Sir Joseph Dinsdale's estate, and they found *sylvata's* locality after an hour or so, and had just picked up half a dozen when a keeper appeared and threw them out!

Apart from the waved black caught in the garden, it was when I ran the trap at Mucking that I got the most consistent good finds during the latter part of the year. On 26th July I got a *Leucania straminea* Treits., on 27th, a nice form of *Arctia caja* L., very similar to that shown on Plate I, figure 1, of Series II of South's Moths of the British Isles, and one *Spaelotis ravida* Schiff.: on the 28th, the trap had somehow caught a night flying *Pararge megera* L., On the 30th I caught another *S. ravida*, and on the 31st a fairly worn *Lithosia griseola* Hübn.

I ran the trap in the garden from 5th August for a few days, and this date brought forth another *L. straminea*, an *Horisme vitalbata* Schiff. on the 10th, and a *S. ravida* on the 19th. My luck still held when I put the trap on at Mucking for the eight days commencing 21st August, on the 22nd I had *Nonagria sparganii* Esp., which I was particularly pleased to see, for apparently the insect had colonized wetland in the area other than that inundated by an advancing rubbish tip as I recorded in *Ent. Rec.*, 78: 302. On the 23rd I had another *N. obstipata* and another *sparganii* on the 25th; another *obstipata* was taken on the 28th.

I captured another *N. sparganii* in my garden on 30th August. At Mucking on 6th September a perfect specimen of *Acherontia atropos* L. was in the trap, and the 7th brought me the fairly scarce *Chilodes maritima* Tausch., and on the 9th there was a vagrant insect from the south of Europe, a *Leucania vitellina* Hübn.

The trap at Mucking is ideally situated to receive night flying insects, migratory or otherwise, for there are no competing lights for at least a mile in any direction. Talking of migratory moths, it is perhaps worth recording that the trap at Mucking caught an example of *Rhodometra sacraria* L. on 27th September, and another on the following night, and a female *N. obstipata* on the 30th. Other insects during this period were a *P. pruinata* subsp. *atropunctaria* Walker on the 27th September and *N. sparganii* on the 29th and a *Cirrhia gilvago* Schiff. on 2nd October. I caught other lepidoptera after that date but nothing of note. All in all, not a bad year for a local collector.

A word on my portable generator might not come amiss here; as mentioned it is the Honda E IV 300 and I have used it for two years now, and can thoroughly recommend it as a compact, dependable and safe power unit; it measures only 14"×10"×13" and weighs 40 lbs. The engine is a 4-stroke 55.4 cc, and so quiet that one can hold a normal conversation, without shouting, while it is running. It has other uses and, if it is a poor night and one feels that way, one can plug it in to a television set and watch that (Perish the thought!).

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51 King Street, Stanford-le-Hope, Essex. February 1968.

English Entomological Methods in the Seventeenth and Eighteenth Centuries*

PART III: MOSES HARRIS' *THE AURELIAN*

By RONALD STERNE WILKINSON, F.L.S., F.R.E.S.

Previous parts of this study have traced the development of English entomological methods from the mid-seventeenth century to the publications of Benjamin Wilkes and James Dufield. The next source in which collecting and rearing procedures were discussed was that *nonpariel* of eighteenth-century English entomological books, *The Aurelian*.

Lisney has shown that Moses Harris was born in 1730 and died *circa* 1788¹, but we know surprisingly little about his early years. He explained in the preface to *The Aurelian* that his uncle, also named Moses Harris, was a member of the original Aurelian Society. Young Moses attempted to join the group, probably in 1742, but as he was only twelve years of age he was obliged 'to defer it' until experience furnished him with 'sufficient Sagacity'². He may, however, have gained some inspiration from the several noted collectors who graced the membership of the Society. There was the artist Benjamin Wilkes, whose *Twelve New Designs of English Butterflies* appeared in 1742, along with the sheet of

collecting instructions (see Part II) which Harris certainly read. Wilkes announced in 1742 that "any Gentleman or Lady may See His Collection of Insects"³, and doubtless the precocious young Moses Harris was able to gain *entrée*.

There was also the elderly Joseph Dandridge, *doyen* of English collectors in 1742, yet still willing to give advice to beginners of a much later generation. Dandridge could trace his career to the previous century and the beginnings of scientific entomology in England, for he had worked with John Ray and James Petiver; his stories of 'the early days' must have enlivened many meetings of the Aurelian Society⁴.

The fire of 1748 that destroyed the Society's rooms in the Swan Tavern, Cornhill, put a temporary end to Harris' hopes for membership. Yet, as the preface to *The Aurelian* tells us, he continued to "take all Opportunities, to get Knowledge in the Times, Seasons, and Manner of breeding" insects. While beginning his career as miniature-painter, he produced coloured drawings of many species of Lepidoptera, and developed an interest in wing venation that was to lead to his early efforts at classification by that method⁵.

Harris' *Proposals for Engraving by Subscription a Collection of Prints of Butterflies & Moths* evidently appeared in 1758, although Lisney (no. 224) did not date the sheet. The *Proposals* announced that a fascicle, priced at half-a-crown and consisting of a plate with its text in English and French, would be published each month. By December of that year the first part of *The Aurelian* was being sold. Lisney's copy of the first part (Lisney 225) did not have a printed cover. Yet the printed cover that appeared with the second part (Lisney 226) was surely originally designed for the first part, for it reads "London, Dec. 16, 1758. Number I. of the Aurelian . . .", giving us in a round-about way the date of appearance of the original number. The same printed cover was used for the second part and the third (Lisney 227), the required information being amended in ink. The second part (Lisney 226) appeared on "February 9th 1759", according to the inserted ink date. Lisney's dates of 1758 for the second and third parts should certainly be amended to [1759]. Publication dates of subsequent parts are uncertain, and copies have been located of parts 1-4 only.

Lisney's assertion that "it is probable that the publication of the work in separate numbers ceased" after No. 4 (p. 162) does not square with his seeming acceptance of Hagen's evidence that 14 plates had appeared by 1765 (p. 158). It would seem rather that parts of *The Aurelian* continued to appear despite various delays, but that original parts beyond 1-4 (which survive in single known copies) are no longer extant or have not yet been discovered. This is by no means remarkable, as a similar work that appeared in parts, James Dufield's *New and Complete Natural History of English Moths and Butterflies* (London, 1748-9), is known only by six fascicles at the British Museum (Natural History), and I know of no surviving parts of Benjamin Wilkes' *The English Moths and Butterflies*.

Covers of the early numbers of *The Aurelian* indicated that Harris had "made this Part of Natural History his Study", and had "bred most of the Flies and Insects for these twenty Years". The inference is that Harris began his rearing activities at the age of eight—a prodigious performance indeed. By this time *The Aurelian* was published in complete form in 1766, Harris had been instrumental in founding the second Aurelian

Society, which, "Phoenix-like", arose "out of the Ashes of the Old", and was secretary of the group⁶.

The excellent illustrations in *The Aurelian* depict a miscellany of equipment. The frontispiece shows the author holding a clap-net in his lap and a chip-box filled with insects in his left hand, while an identically dressed figure (probably Harris, also) demonstrates the use of the net in the background. A title vignette contains a clap-net, probe or 'proowler' for larvae searching, chip-box with lid, beating sheet, two racket nets and breeding cage. Other devices are cleverly integrated into the colour plates, as shall be seen. There is a long and interesting passage in the preface explaining Harris' use of various nets:

"There are several Sorts of Nets made Use of to catch Insects, to wit, the Batfolder, the Racket, and the Scithers Net: The Batfolder is made of Musketta Gauze, and is form'd like the Batfolding Net made Use of to catch Birds; these may be had at the Fishing-Tackle Shops, by asking for them; they call them Butterfly Traps⁷.

The Method of using the Batfolding Net is thus: On seeing the Insect come flying toward you, you must endeavour to meet it, or lay yourself in its Way, so that it may come rather to the right Side of you, as if you intended to let it pass; then having the Net in Your Hands, incline it down to your right Side, turning yourself a little about to the Right, ready for the Stroke; not unlike the Attitude in which a Batman in the Game at Cricket stands, when he is ready to strike the Ball, only his Bat is lifted up, but your Nets must incline rather downward: When the Fly is within your Reach, strike at it forcibly, receiving the Fly in the Middle of your Net, as it were between the two Sockets of the Benders, that being the Part of the Net which best receives the Insect; and not only so, but should the Fly strike against the Belly or wider Part of the Net, the Course of Air caused by the Motion of the Nets, would carry the Fly with it out of the Net between your Hands, which I have often experienced. The Motion of your Hands in catching, must be from your Right Hip to your left Shoulder, not at all retarding the Motion, 'till 'tis as it were spent, closing the Nets in the Motion.

You are likewise to remember never to give the Stroke over-handed, unless the Situation of the Place oblige you to it. Having closed the Net with the Insect in it, immediately grasp both the Sticks in your left Hand, and with your Right lay hold of the bottom part of your Net, pulling the Gause pretty tight, giving that also to the Gripe of the left Hand, this confines your Fly from struggling. Put then your Hand against the Fly on one Side, and bringing the Top of your Forefinger on his Body, and with your Thumb on the other, squeeze him gently, then lay your Nets on the Ground, and take out your Fly by a Horn or a Leg, and holding him in an advantageous Manner by the Body in your left Hand, run a Pin thro' the thick Part of the Body, or Chest, perpendicularly and put it in your Box.

When you pursue a Fly you must catch him when in your Reach, in the same Manner, except its Course is along a Ditch, on the Left-hand Side of you, and then you will be able to touch it, the Position being very aukward; in this Case you must overtake it, and turning nimbly about, the Position will then be as in the first Case; the Fly then coming to the right Side of you. I having given you sufficient Instructions for the Use of the Batfolder, I shall next proceed to the Racket Nets, Which are

form'd of Wire about the Size of a Raven's Quill, turned round to a Circle, bending the Ends outwards by way Shanks⁸, which are made fast in a Brass Socket; this Circle or Ring of Wire is covered with Gause, and bound round with Ferret⁹; a round Stick of about two Feet in Length is fitted to this Socket, by Way of Handle. These Sort of Nets are what an Aurelian should at all Times carry about him; a Pair of these of about six Inches Diameter are the most convenient for that Purpose. The chief Use of these Sort of Netts are for catching Moths, sitting against a Tree, Wall, or Pales; or a Moth or Fly sitting on a Leaf, may be conveniently caught between a Pair of these.

The Scithers Net are no more than a small Pair of these Racket Nets, fixed on two Pieces of Iron which are rivetted across each other, with two of the Ends turn'd round in the Form of Rings, for the Admittance of the Thumb and Finger; in short, a Pair of Toupee Irons, or Curling Tongs, such as is used by a Hair-Dresser, are very well adapted for this Purpose, with a round Net fixed to the End of each Tang with binding Wire, or small twine well waxed; these Nets are principally adapted to take small Moths, etc."¹⁰.

Thus in the years between Wilkes and Harris, which were only fourteen to sixteen in number, the English collector's complement of nets had been increased by several sorts. We have examined the problem of James Petiver's mysterious net in an earlier part¹¹; it may have been either a bag-net or the 'scithers' of Harris (called 'forceps' by most later authors) which may have gone out of fashion in the interim or was simply not mentioned by Wilkes. My research in the Petiver papers since outlining the problem in 1966 provides evidence for the former thesis, that Petiver's 'Muscipula' was the Continental bag-net, which must have been temporarily overshadowed by the application of the clap-net to entomological collecting.

The bag-net, wholly lacking in Wilkes' list of apparatus, appeared (or reappeared) in *The Aurelian* in modified form. Explaining the difficulty of taking the adult *Apatura iris*, Harris suggested that the collector provide himself "with a Pole fifteen Feet long, with a Net at its upper End, the Mouth of which, when you have covered the Fly, is drawn together by a String, as a Purse is "¹². The matter sounds simple, but presumably few *iris* were taken by this apparatus! Years later Adrian Haworth (in his *Lepidoptera Britannica*) lengthened the unwieldy pole and divested the 'purse' of its string; the bag-net continued as a requisite for *iris* but did not come 'down to earth' in its present form until well into the nineteenth century, notwithstanding its Continental popularity all along.

Undoubtedly the authority of such writers as Wilkes and Harris helped to fix the clap-net so immovably in the English repertoire that it could not be dislodged from its primal position until after 1850 and did not disappear entirely until about 1900. A photograph conveniently reproduced by Richard Ford shows a group of entomologists, ca. 1900, with a clap-net that must surely have been among the last¹³. As may be expected, the design had to be defended at an early date against the claims of its European rival. It is true that the clap-net could be used as a beating-tray, and in experienced hands it was adequate for most needs. Yet the last argument was always one of tradition, and to-day no one will doubt that the demise of the 'batfolder' was a blessing. The wonder is that it

survived as long as it did, as Harris pointed out its defects in the same pages of *The Aurelian* that described its use.

The clap-net described by Harris was at least more portable than Wilkes' early design. It was constructed "to take in Half, or put to gather at Pleasure, by a Brass Socket in the Middle¹⁴, and carried convenient with the Benders in a Canvas Bag under the Coat"¹⁵, presumably, as Kirby and Spence phrased it sixty years later, to avoid being "stared and grinned at by the vulgar"¹⁶. The necessity of keeping the net under one's coat was not new even to Harris; when collecting at Cadiz in 1701, Jezreel Jones wrote James Petiver that he had "been suspected for one that studys witchcraft, necromancy and a madman" by those who saw him "following butterflies"¹⁷. Two other nets were mentioned in *The Aurelian*, making a total of six; there was the water net which Harris "fixed to the End of a long Stick" and used to take up mud and weeds in search of dragonfly larvae¹⁸, and a "beating Net" of uncertain provenance¹⁹.

Harris carried the inevitable pincushion, as well as a clasp-knife, needle and thread for repairing the nets, and chip boxes to serve as collecting receptacles. These were double-corked like Wilkes', but were papered as an added refinement. He used a beating sheet, and directed that for tall trees it "should at least be seven Yards long, and five broad"²⁰. A prowler was employed for probing high branches, "near sixteen or eighteen Feet long" for "vast oaks"²¹. This is probably the lengthy apparatus pictured in the title vignette. Two sorts of modified chip-boxes were described as field receptacles for larvae, one "in the Lid of which should be cut a Hole, as large as will about admit your Thumb to go in easily; this must be stopt with a Cork close fitted"²². Another and more elaborate box appears on plate XIX, fitted with "a thin Brass sliding Cover" over the "oblong Hole in the Lid"²³.

Harris' method of assembling was somewhat improved over that of Dutfield and Wilkes, as he not only put out decoy females in gauze-covered boxes but practised 'tying' as well. He explained that for such large moths as *pavonia*, *populi*, *tiliae* and *ligustri*, "the usual Method is, to tie the Hen to a Tree, Bush, etc., lightly tied or fastened round the Body with a Piece of sewing Thread, and there to be left all Night, and in the Morning, when you return, you will almost be certain to find Madam accompanied by her Spark, who will not desert his Mistress, though her Favours be ever so easily obtained"²⁴. The lantern is also mentioned as a method for attracting moths, and it is interesting to note that Harris searched for nocturnal larvae with a lantern after noting the location of their frass during the day²⁵.

The breeding cages described in *The Aurelian* are light, open and modern, being truly cages instead of mere boxes. Harris knew that some larvae would drown themselves if allowed, and cautioned that in such cases the sprig of foodplant "should fit the Mouth of the Bottle very nicely"²⁶.

Like Wilkes, Harris used cork-veneered setting boards without grooves, and card 'braces'. His description of setting is very similar to that of Wilkes, and close examination reveals more than a casual debt²⁷, although Harris' boards were covered with paper in the same manner as his boxes. In the era before the discovery of relaxing techniques, small

insects often had to be set in the field, and Harris suggested that braces should be taken along for that purpose, "otherways 'tis impossible to do it afterwards"²⁸. His plate of *Smerinthus tiliae* shows that insect set out in a collecting box, so apparently larger species were thus treated when time allowed²⁹.

Harris seems to have been the first English entomologist to make a thorough study of the museum beetle and its deprivations. The various stages of that insect are depicted on plate V of *The Aurelian*, and in the text the author explained that he had given up camphor as a preservative because it was not a sure preventive and was supposedly harmful to the colours of specimens³⁰. He advised treating cabinet drawers before corking by placing them "some Distance from the Fire, so as to obtain a little Warmth", then rubbing them "with a small Quantity of *Unguentum Serulium* . . . on a woollen Rag". Harris' *unguentum serulium* [*recte caeruleum*] or 'steel-blue ointment' was a common medical preparation of the day, composed principally of metallic mercury and hog's lard. Gum arabic was to be used when papering drawers instead of paste, which was attractive to pests³¹.

Although Moses Harris produced several important volumes after 1766, which will be discussed in the next part of this study, most of his contributions to entomological technique were made in the pages of *The Aurelian*. His advice was followed by generations of naturalists, who treasured their copies of the lovely work and called for three further editions—the final as late as 1840³². His methods were little modified until the first decades of the nineteenth century, and a copy of *The Aurelian* (should the collector be lucky enough to obtain one) is still the corner-stone of any library of early English entomological books.

Notes

- *The first part of this paper (to 1720) appeared in *Entomol. Rec.* LXXVIII (June, 1966), 143-151. The second part (Wilkes and Dutfield) was printed in LXXVIII (December, 1966), 285-292.
- ¹The most complete bibliographical *résumé* of Harris' works is given by Arthur A. Lisney in *A Bibliography of British Lepidoptera, 1608-1799* (London, 1960), 156-75. There is a brief account of Harris in the *DNB*. His date of birth is usually given as 1731, but Lisney owned an original drawing that indicated the correct year.
- ²Moses Harris, *The Aurelian* (London, ([1758]-66), [v], hereafter cited as Harris.
- ³Wilkes kept his collection "against the Horn Tavern in Fleet Street", and extended his invitation in the text of the engraved "title-plate" to *Twelve New Designs*. See the discussion of him in the second part of this study.
- ⁴Dandridge has recently been discussed in several articles. D. E. Allen paved the way with "Joseph Dandridge and the first Aurelian Society", *Entomol. Rec.* LXXVIII (April, 1966), 89-94. William S. Bristowe's interesting "The Life and Work of a Great English Naturalist, Joseph Dandridge, 1664-1746", *Entomol. Gaz.* XVIII (April, 1967), 73-89, has been followed by his "More about Joseph Dandridge", *Entomol. Gaz.* XVIII (October, 1967), 197-201. Natalie Rothstein's "Joseph Dandridge, Naturalist and Silk Designer", *East London Papers* IX (Winter, 1966), gives information on his trade.
- ⁵The account of the Cornhill fire in *The Aurelian* tells us all we know of the demise of the First Aurelian Society; "the *Swan Tavern* was burnt down, together with the Society's valuable Collection of Insects, Books, etc., and all their Regalia: The Society was then sitting, yet so sudden and rapid was the impetuous Course of the Fire, that the Flames beat against the Windows, before they could well get out of the Room, many of them leaving their Hats and Canes; their Loss so much disheartened them that

altho' they several Times met for that Purpose they could never collect so many together, as would be sufficient to form a Society, so that for fourteen Years, and upward [*i.e.* until 1762 or 1763], there was no Meeting of that Sort"; preface, [v]. Harris' work on venation will be discussed in Part IV.

⁶Harris' office is mentioned on the title of *The Aurelian* and the rise of the second Society in the preface, [v]. The *Proposals* and covers of the early issues also give us Harris' address at the time, "Mr Biddles Watch Maker in New Bond Street" (*Proposals*), presumably the same address as "the Golden Head in New Bond-Street, two Doors from Conduit-Street" (*Aurelian*, early parts, printed cover).

⁷"batfolder", bat-fowler or clap-net (see Part II). The passage concerning clap-nets available at tackle shops as "Butterfly Traps" is the earliest notice we have of entomological collecting equipment for sale in England. It indicates that by 1766 'aurelians' were common enough to cause a demand for such things.

⁸"by way Shanks", *i.e.* by bending the ends outward to form 'shanks' or appendages ("A part or appendage by which something is attached", *OED.*).

⁹"Ferret", a stout cotton or silk tape.

¹⁰Harris, [x-xi].

¹¹Part I, pp. 146-8.

¹²Harris, 7.

¹³R. L. E. Ford, *Practical Entomology* (London, 1963), plate 1. I am indebted to my friend Richard Ford for his information regarding this photograph, as well as for much advice about early collecting equipment described in these papers.

¹⁴*i.e.* connecting the two rods making up the net.

¹⁵Harris, [xi].

¹⁶William Kirby and William Spence, *An Introduction to Entomology IV* (London, 1826), 525.

¹⁷Jezreel Jones to James Petiver, 2 April 1701, Brit. Mus. MS. Sloane 4063, f. 76r.

¹⁸Harris, 54.

¹⁹Harris, 53.

²⁰Harris, 39.

²¹Harris, 39.

²²Harris, [xi].

²³Harris, 40.

²⁴Harris, 61.

²⁵Harris, 44.

²⁶Harris, 39.

²⁷Harris, [xii]. His debt to Wilkes' instructions (which were reprinted in *The English Moths and Butterflies*, with very minor changes), may be seen as follows :

Wilkes

Take a Fly out of your Box : see if the Pin be run through it perpendicularly, if so, stick it on one of your setting Boards, and with the point of a Needle . . . extend one Wing leisurely, till such Time as the Point thereof is even with the Nose of the Fly you are setting. That done, fix one of your Cork Bracers gently on that Wing, to prevent its giving way; serve the other Wings in same manner, and your Fly will appear extended as in the Prints. Let the Bracers remain on the Wings of Butterflies a Fortnight, on those of great Moths a Month.

Harris

Take a Fly, and observing if the Pin be perpendicularly run thro' the Body, place it on the Setting-board, then take your Point and gently raise one of the upper Wings, 'till such time as the Tip be even with the Nose of the Fly; this done, fix one of your Card Braces on that Wing, to prevent its giving Way; do the same by the Wings on the other Side, and your Fly will be properly extended. Let the Brace remain on the Wings of Butterflies a Fortnight, on those of large Moths a Month.

I have quoted the *Instructions*, as it is not possible to determine which text was paraphrased by Harris.

²⁸Harris, [xii].

²⁹Harris, plate XX.

³⁰Harris, 11.

³¹Harris, [xii]. The mercurial ointment, which "may be had at the Apothecaries . . . one Ounce is sufficient for twenty Drawers", was commonly mentioned in the dispensaries of the eighteenth and nineteenth centuries. For those dissatisfied with naphthalene or paradichlorobenzene, the formula follows from *The Dispensatory of the Royal College of Physicians, London* (London, 1746), p. 366: "Take of tried hog's lard two pounds, of quicksilver [metallic mercury] one pound, of the simple balsam of sulphur [sulphur boiled lengthily with an essential oil] half an ounce. Rub the quicksilver with the balsam of sulphur, till the quicksilver no longer appears [as a metallic substance]: then add by degrees the lard warmed, and diligently mix them". Turpentine can be used instead of balsam of sulphur, and the yield is enough to prepare forty-eight twenty-drawer cabinets.

³²There was a second issue of the first edition *ca.* 1773. The second edition appeared in 1778, with a second issue in the same year and a third *ca.* 1814. In 1794 a third edition was produced, with a second issue in the same year. The fourth edition, with additional material by J. O. Westwood, appeared in 1840, following advance copies in 1839; see Lisney for details.

Some Aspects of the Fauna of the Sahara

By J. L. CLOUDSLEY-THOMPSON

During June and July 1967, accompanied by Mr. and Mrs. Robin Thelwall in a Land Rover, my wife and I drove across the Sahara in an Autounion (D.K.W) "Munga 4," along the Route du Hoggar, on our way from London to Khartoum. Our original intention had been to drive along the North African coast, but the Israeli war put a stop to that. Although shortage of time precluded lengthy halts and most of the daylight hours were spent in driving, the following observations may be of interest, not only to biologists who have had an opportunity of visiting this fascinating region of Africa, but to others who may intend to do so—especially as we found it almost impossible, before our departure, to obtain any information about the route which could aid us in our preparations. Knowledge of the problems we encountered may enable others to be better prepared for similar eventualities. Naturally we expected some difficulties, but not such unpleasantness from officials in ex-French territories. Nor, of course, would anyone have hoped for such kindness as we experienced in Nigeria and Sudan.

We drove through France and Spain via Barcelona, to Algeciras where we took the ferry to Ceuta. Thence we went through *Eucalyptus* groves and grassy plains to Rabat where we turned east through green glades and forests of cork oak, with cryptic jumping-spiders (Salticidae) on the bark, numerous wolf-spiders (Lycosidae) on the sandy soil beneath the trees and clumps of pine with cicadas singing in the branches. At Fez we saw snake-charmers, who appeared to treat their defanged serpents in an unnecessarily rough and brutal way, groups of dancers and various side-shows in the *silk*. East of Taza we entered a high plain, much overgrazed, mostly by sheep, and dissected everywhere with gully erosion; egrets and storks were numerous. Most of the low hills were dominated by ruined stone forts. Then to Sidi-bel-Abbès, a modern French-style town and Frenda, where the country-side consisted of rolling hills and wide plains. South of Tiaret we saw the first sandgrouse and camels. The latter were dark brown in colour and shorter in the leg

than those of the desert further south. Later, we reached a region of wheat plantations with many insects and spiders, and large, fast-moving woodlice.

Before and after Laghouât, we crossed a high, arid plain dotted with clumps of grass and flat-topped *jebels*. The country became increasingly arid and the vegetation more scanty, with grass tufts confined to hollows and *wadi* beds. The *jebels* became steadily more and more numerous and showed evidence of considerable wind-erosion. The road then crossed the charming oasis of Bériane, after which the landscape with its limestone *jebels* was so much dissected by erosion that it appeared quite lunar. The fine, tarmac road, lined by electricity pylons, continued on through Ghardaia to el Goléa. The countryside became even more arid and sandy, with limited vegetation restricted to hollows; but there were never less than two clumps of grass in view at any one moment. Long serpents of sand were continually blowing across the road and we caught distant glimpses of the Grand Erg Occidental.

At the oasis of el Goléa where police formalities delayed us for nearly a day, insects were plentiful — especially tabanid and muscid flies—and ticks (*Hyalomma* spp.), and we saw a boy with a fennec fox. Here the tarmac road surface ended and the next stretch, across the Plateau de Tademout to In Salah, was extremely rocky and uneven. In fact, we found it the worst of the whole journey. Moreover, not only did we have one of our many punctures and trouble with the sparking plugs, but the air-filter bracket cracked and this fractured all the fan-blades; the engine boiled with a following wind and the radiator hose burst, so we lost a lot of water. I saw a muscid fly about 10 miles south of the derelict Fort Mirabel, a lizard and some camels. At dusk we dropped down a most spectacular, barren escarpment and through an awe-inspiring gorge, reminding us of those in the Simien Mountains of Ethiopia, below which vegetation again made its appearance.

The track to In Salah was now very sandy, with many drifts that might have been difficult to negotiate without four-wheel drive. The soft sand extended from about 50 miles north of In Salah to 40 miles south. We reached the town itself in a sand blizzard. This was no mere storm of fine dust, but big particles that stung the face, caused drifts several metres deep on the roads and restricted visibility like a snow storm. Petrol was available but not again until Tamanrasset, 420 miles south. We were refused help by the transport garage and curtly ordered by the Prefêt to leave the town before dusk. This we did, but not without some misgivings as all my efforts to try and manufacture fan blades from an old tin were without avail. I cut out some blades with a knife but it was impossible to attach them to the fan. Indeed, it became necessary to break off the two relatively undamaged blades that still remained on one side because their uneven weight was causing the bearings to seize up. We could find no sign of life in the intimidating, desolate waste beyond this miserable town, apart from one tick.

When we reached the edge of the sand, we crossed bare, rocky desert with *jebels* but little vegetation except in one *wadi* and in the formidable Gorge de Arak where there were tall reeds and tamarisk beside a well, and a fort occupied by a few scruffy, but friendly Algerian soldiers. Here there were plenty of Acrididae and other insects and we rested during the heat of the day which, combined with the steep rocky slopes, caused

the engine to boil. Beyond the gorge the country was more attractive, rocky with sand. We saw nomads with camels and a few drops of rain fell. Several grasshoppers came to the lights of our camp during the night. About 40 miles north of Tamanrasset we crossed a great expanse of fine white sand with black *jebels*, scattered *Acacia* trees and clumps of scrub. The only sign of life was a solitary wheatear.

Before In Ekker, an almost deserted military camp and air strip, we were misled by a signpost and took the wrong track. Fortunately we realised this and turned back before we had wasted too much fuel. There were some miles of welcome tarmac, but the time gained on them was more than offset at the end by the enormous delay of having everything searched by the military. At Tamanrasset, a pleasant Tuareg town at the foot of the Hoggar Mountains, we were again stopped and subjected to the intensive searching of all our possessions. As at In Salah, the mud-brick houses here were decorated, a corrugated effect being achieved by wavy lines made with the builders' fingers while the mud plaster was still wet. The next stretch without petrol was 570 miles.

Beyond Tamanrasset, the track became steep and rocky, traversed by *wadis* and long stretches of silvery sand. We saw several gazelles, some of them resting in the shade of overhanging rocks. After 100 miles, we entered a sea of yellow sand, mostly soft but sometimes hard and corrugated, through which projected occasional black *jebels*, almost covered by sand on their windward sides. Not a trace of vegetation could be seen and no animal life. Fortunately a strong wind continued to blow from the south so that our radiator did not boil again. The track was marked by metal beacons and old lorry tyres so that there was no danger of getting lost. A terrific dust cloud in the afternoon caused premature darkness long before sunset. Luckily it was high above our heads so we were able to drive on with headlights. When we camped for the night, a solitary beetle (*Ocnera hispidula* Forsk.) came to the light of the lamp.

All next day there was a strong wind from the south, dust and even a few drops of rain. We travelled across softish sand, at first white but later brown in colour. It was difficult in places to follow the track, which was not always signed and the sand storm of the previous day had largely obliterated old tyre marks. We saw fresh gazelle tracks, however, as well as some flies and other insects. At the Algerian frontier post of In Guezzam there were a couple of *Acacia* trees, a good well, some desiccated camel carcasses and a number of flies. We were kept waiting for an hour before anyone condescended to stamp our passports. At the Niger frontier, a few miles further on, a fat black soldier sprawled asleep on his chair in the shade of a delapidated sentry box. At our appearance a friend rushed up and handed him a rifle, but he continued to doze with it propped between his legs.

The first 200 miles or so through Niger were occupied by soft sand without any sign of life. Many of the beacons had fallen over or were missing, and old tyre marks were still obliterated. Then we began to pull out of absolute desert into Sahel savanna. The ground became firmer and, later, dreadfully corrugated. We passed a well where some Tauregs were watering camels. A number of pied-crows sat aimlessly around. Soon we were in *Acacia* desert-scrub with ostriches, bustards



Plate XI, Figs. 1-4: Central Saharan Scenery

From top to bottom: 1—*Acacia* trees at edge of *wadi*; 2—*Erg* (dunes);
3—*Barchan* dunes; 4—Wind-eroded *jebel*

(Photos: J. L. Cloudsley-Thompson)

and large pale gazelles. In the evening, *Pimelia grandis* Klug, *O. hispida* and some huge camel-spiders (Galeodidae) came to light. Next morning I saw a few termites, muscid flies and Thysanura.

The final run into Agadez was uneventful apart from a fault in the ignition circuit and punctures in both vehicles. The French hotel proprietor changed travellers cheques at an extortionate rate so that we could buy petrol and the immigration officials kept us waiting for six hours during the heat of the day, before stamping our passports. Then we were ordered to leave immediately, which we were only too anxious to do. On the road to Zinder, however, our troubles really started. First, the engine began overheating, so we camped for the night after 72 miles. We were visited after dark by a Tuareg nomad, very picturesque in black veil, coloured robes and hefty sword. He gave us a bowl of milk which was much appreciated. Next morning one of our three 2-stroke cylinder was not firing and we crawled at a rate of 6 m.p.h. into the village of Tanout, where a kindly Nigerian sold us 14 gallons of petrol for £7 sterling—enough to get us to Zinder. Here we found a Hausa mechanic and wasted two more days whilst he worked vainly on our wretched D.K.W. At length, in despair, we limped over the Nigerian border to be welcomed by a most charming Hausa immigration officer. Northern Nigeria where the Sudan savanna belt begins had had considerable rain since the end of May; there were large pools beside the road and all the hollows were green. About 80 miles north of Kano we began to see many hornbills. Striped millipedes (*Oxydesmus* sp.), columns of huge ponerine ants, 2.5 cm. long, which stridulated when disturbed, and giant red velvet mites (*Dinothrombium tinctorium* (L.)). Many insects came to our camp at night.

At Kano our car was completely stripped, rebored, new pistons fitted, distributor and dynamo overhauled and a new fan installed. The engineer, Solomon Ade Telle Ogundipe and his assistants stopped at nothing to make our stay a pleasant one while we camped in their garage. Solomon lent us his car to visit Kano market and the old town with its fascinating architecture of mud brick surmounted by innumerable spikes and other decorations. In the evenings he took us to the high-life clubs where we consumed immense quantities of excellent beer. After four days the engine had been run in and we set off for Maiduguri across wooded savanna with occasional *tebaldi* (baobab) trees and palms. Most of the land was cultivated and we passed herds of long-horned cattle. Many road-blocks had been set up on account of the war with the Eastern Region, but the police and soldiers manning them were invariably courteous and pleasant. In places where the bush was regenerating over areas of old cultivation, the ground was strewn with the long white trumpet-like flowers of lillies. Abdim storks, egrets, vultures and pied-crows were common. On 8th July we passed a swarm of white butterflies stretching from 40 to 25 miles west of Potiskum with stragglers for several more miles. Then the engine began "missing" again.

At Maiduguri we encountered heavy rain. Giant spirostreptid millipedes wandered about at dusk—one even wriggled into my sleeping-bag—and we were beset with mosquitoes. Next morning we crawled through heavy mud on two cylinders, with oil leaking again from the air-filter. We passed reed-buck, oribi, warthog, grivet monkeys and guinea fowl

and were continually held up at "barrages de pluie." We stopped the night at Fort Foureau, where *Macrotermes* sp. were swarming and dropping their wings. In the morning we crossed the Chari River by ferry to Fort Lamy, obtained visas and then waited through another hot and humid day and night while the only coil which had not been changed at Kano, as well as all the condensers, were replaced.

As we drove east on the last lap of our journey to Sudan the engine was running beautifully for the first time in the entire trek, despite a £300 bill for servicing in the United Kingdom, and we covered 155 miles before stopping for the night. No sooner had we unpacked the cooking things than a devastating thunderstorm struck us. We barely had time to secure the primuses, pots and pans from blowing away in the gale before the rain descended. Within minutes, the entire landscape, brilliantly illuminated by the continual lightning, was under water. Looking out from the D.K.W. we seemed to be floating in a vast sea, the ripples from the wind giving the appearance of rapid currents. When the rain stopped at about 01.00 hrs. we literally had to shout in order to be heard above the fantastic chorus of croaking toads and stridulating insects. Next morning we made slow progress through the sodden mud and covered only 50 miles in five hours before we reached the limits of the storm. All the way to Ate the road was one long, blue lake with geese swimming about in it with their babies. We saw many gazelles, a fox, eagles, pelicans, guinea-fowl, marbou storks and crowned cranes in profusion. At first we passed through *Acacia* woodland which later opened up to grassland with dôm palms—very beautiful country.

Just before Abéché we ran into the aftermath of yet another deluge and the "road" was impassable for some hours. Next day, however, we made good progress until the left rear wheel ball-races of the D.K.W. collapsed and the bearing came out. The Thelwalls returned 60 miles to Abéché and fetched a mechanic, but he could do nothing. As darkness fell they took him back whilst my wife and I camped in the road. A lorry stopped and the driver warned us to beware of brigands, but there was little we could do and we slept lightly. Next morning we were towed into the army camp at Abu Goulem, stopping every half mile to pour water onto the smoking wheel-hub. This completed the destruction of the axle, wheel-housing, brakes, etc. The next three weeks were a nightmare. The local authorities refused to recognise the visa issued in Fort Lamy or to allow us to cross the frontier into Sudan which was officially closed because of a border dispute. We were compelled to return to Abéché, a poor place with many flies, mosquitoes, (mostly culecines), lepers and beggars, and we were detained at the local police station. The police officers and administrative authorities treated us with gratuitous discourtesy. Our friends managed to get permission to cross the border but, by the time spares for our car had been flown to us from Douala, this permission was withdrawn. Under threat of imprisonment, we therefore had to fly back to Fort Lamy and thence to Khartoum, where we arrived, extremely annoyed and very much poorer than we had left England two months earlier. But the warmth of our welcome from the Sudanese more than compensated for everything.

The main biological differences between the western and eastern regions of the Sahara seem to lie in the fact that effective summer rains must move a bit further northwards in West Africa. The belt of *Acacia*

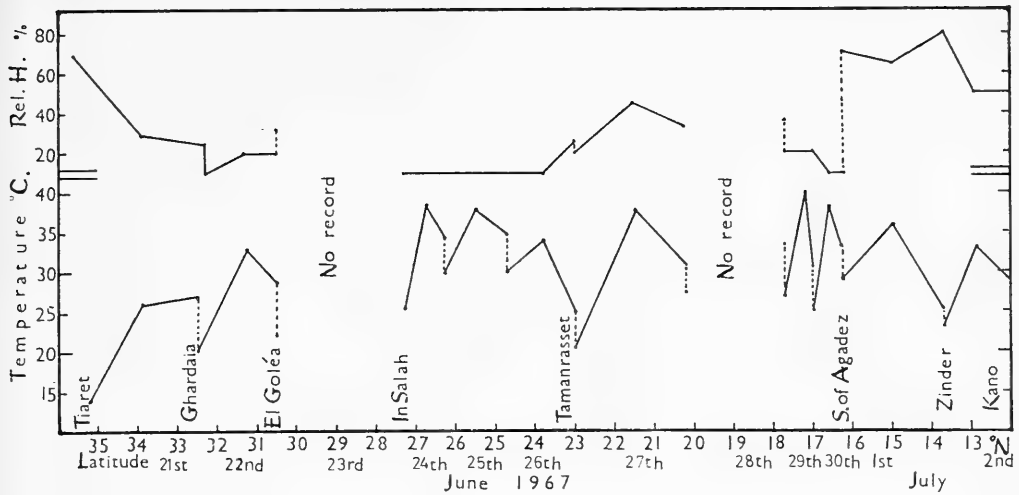


Fig. 5—Temperatures and relative humidity at different latitudes across the Sahara, recorded after dawn, about mid-day and at dusk (solid lines). Dusk to dawn readings are connected by broken lines.

desert-scrub is narrower in the west and woodland savanna extends further from the equator. Thus, the countryside around Kano (latitude 12° N) resembles that south of the 13°th parallel in Sudan, and Agadez (17° N) is comparable with Omdurman (15° 30' N). Another obvious factor is that overgrazing is not so acute in the west as it is in the proximity of the Nile. Fig. 5 gives some temperature and humidity readings taken with a whirling hygrometer at different stations across the Sahara. From this it can be seen that fortunately no extreme climatic conditions were encountered on this journey. The relative humidity was unusually high south of Tamanrasset (21° 30' N) on June 27, shortly before the great dust storm blew over. South of Agadez (16° 30' N) there was a steady decrease in temperature and increase of relative humidity.

A Second British Record of *Agathomyia falleni* (Zett.) with some Biological Notes on the Platypezidae (Dipt.)

By P. J. CHANDLER

(concluded from p. 173)

PLATYPEZID BEHAVIOUR

The characteristic to-and-fro movements of both sexes on broad leaves of bushes, shrubs and trees are peculiar to the Phoroidea (also including the Phoridae). Almost any suitable leaf may be utilised, but certain preferences have been noted. Verrall (1901, Add. to p. 13) referred to Yerbury's observations on choice; "and as a rule they prefer large leaves such as Spanish Chestnut (*Castanea*) and Plane (*Acer*)" (i.e., sycamore)

"but may occasionally be found on Oak (*Quercus*) or Ash (*Fraxinus*) while *Callomyia* prefers Portugal Laurel (*Cerasus*) and *Rhododendron*." Lundbeck (1927) found the leaves of *Acer* and *Rubus* most attractive; he had taken all his species of *Platypeza* on these genera, also *Callomyia amoena* Mg. on both, *Agathomyia falleni* and *A. elegantula* (Fall.) on *Acer* leaves and *Callomyia speciosa* Mg. once in very great numbers on *Rubus*. Hazel, Alder, Aspen and Hornbeam, Birch and in gardens, Lilac are recorded for various species in Scandinavia by Zetterstedt (1844), but these do not appear to be frequented as much in Britain where larger leaves are available; beech does not seem to be utilised although beechwoods are good Platypezid habitats, and isolated sycamores in such situations may produce many Platypezids. Some broad-leaved herbaceous plants, e.g., Coltsfoot (*Tussilago farfara* L.) may also be used. It is striking that the favourite choices of the Platypezidae in this country are aliens.

These movements were at first thought to be of protective value, enabling them to escape predators and only evoked when disturbed (Howlett, 1921). However, Kessel (1961) observed that their movement was not related to external disturbance and established that this was a phase of their feeding activity. The rapidity of movement is necessary in the search for food, as this consists of minute accumulations of matter on the flat surfaces of leaves. In contrast to Howlett's theory they are, in fact, more exposed to attack by predators by this behaviour and some mode of protection is essential in species which are both conspicuous and have populations maintained at relatively low levels. Kessel (*loc. cit.*) found that the sun-loving species which frequent foliage at the margins of woods and behave in this manner have well-defined morning and afternoon periods of activity, with a mid-day rest period between. He determined that the sudden beginning and ending of such periods are brought about solely by the altitude of the sun, and no other external factor was found to change significantly to affect them. Owing to this the periods are longer in more northerly latitudes. The protection gained by this is that the periods of greatest Platypezid activity alternate with the periods of greatest activity of birds, which are the major predators involved. No such periodicity was found in species which frequent conditions of deep shade only.

The males of many species form swarms in which they hover. Verrall (1901) related that Dr. J. H. Wood had informed him that he had seen males of several species "sporting in the air like *Anthomyiidae*"; Wood had often seen clouds of swarming males of *Platypeza consobrina* Zett., which were beyond the reach of his net. Then (Add. to p. 13) he mentioned Colonel Yerbury's observation that the males "hover in dull weather but sit (or to some extent run) about on leaves during sunshine". Lundbeck (1927) referred to these observations but had never seen the swarming himself. Swarming was also recorded in *Agathomyia collini* Verr. by Morley (1918). He observed a dozen of this small delicate species on 17.i. 1917, hovering about two feet above rank grass and settling for brief intervals on surrounding leaves of elm or sloe 3-6 feet from the ground, in the orchard of his garden in Suffolk. I have personally seen a small swarm of males of *Protoclythia modesta* (Zett.) on 3.x.1964 in Scrogginhall Wood, Bromley, about 7-8' from the ground under a hawthorn branch overhanging a woodland path; a female was taken, probably entering the swarm for copulation, when sweeping the net through it. Swarming has

been studied in several American species; it was first observed in *Platypezina pacifica* Kessel (Kessel, 1961) and later in *Protoclythia californica* Kessel (Kessel, 1962a) and *Agathomyia cushmani* Johnson (Kessel, 1962b). In each of these it follows the same pattern, a chimney-like opening in the trees being chosen for the site of swarming—coast-redwoods in the case of *P. pacifica*, while the level of the swarm was much lower than this in *P. californica*, which chose willows. The swarms evidently attract females, which are able to identify swarms of their own species and enter them, copulation immediately ensuing. It now appears that the males take the initiative in copulation, after recognition of a female as she approaches. The male eyes in all Platypezidae are holoptic (dichoptic in the females) and also divided into an upper half with large facets and a lower with small facets, giving them acute vision and enabling them to immediately determine the sex of any individual they approach in the swarm. After copulation the pair falls from the swarm to the vegetation below, over which the female drags the male backwards—the characteristic mating position, with the flies facing in opposite directions, results from the condition of the male genitalia, which are twisted through 180 degrees and folded under the abdomen. The genus *Calotarsa* Townsend, confined to North America, with only three known species, is the subject of a very interesting paper by Kessel (1963). These flies are the largest known Platypezids, often attaining 10 mm., and have brightly coloured males, which bear remarkable processes on the hind tarsi, including silver and black 'flags', which they use as flash-signals, when swarming, to attract females.

Oviposition has been observed in several species, and has been found to occur only for a limited period, often on a single day, in the case of a soft fungus so that all the larvae in a single fungus are necessarily of the same age and stage of development. It was originally thought that the broad flattened hind tarsi, characteristic of the family, were used for walking on fungi in an advanced state of decomposition, but this is not so as they generally only visit the host fungi when they are still very fresh. When ovipositing on gill fungi the females force their abdomen between the gills, keeping it in position for up to ten seconds, with their hind tarsi splayed out across several gills to give support; in the case of a Polypore the ovipositor is inserted into a pore. While so occupied they are rather sluggish and not easily disturbed. The fairly tough-skinned dorsoventrally flattened larvae feed between the gills or on the lower surface of a Polypore, rather than within the fungus tissue (a contrast to the usual habit of fungivorous Dipterous larvae).

SMOKE FLIES

The genus *Microsania*, which includes the smallest of the Platypezidae, predominantly black in both sexes, is of special interest. These minute insects are commonly referred to as Smoke Flies, owing to the attraction which the smoke of wood fires holds for them, in common with species of the Empid genus *Hormopeza*. Until this peculiar behaviour became known they were regarded as extremely rare. In 1921 G. Séverin first recorded finding males in large numbers in the vicinity of heath fires in Belgium; they flew in the smoke, and settled on hot ground and burnt vegetation. From a large material obtained in this manner, Collart (1933) was able to distinguish the three then known European species. The first record from Britain of this genus was by Collin (1934) who did not, however,

find them under the same conditions, although the conditions of capture in June 1930 were unusual, as Collin described:—"On the day of capture a short sharp shower was followed by a hot sunny period, the marram grass which I was sweeping dried up very quickly after the shower, and I was able to sweep almost as soon as the sun appeared; my first two sweeps produced five specimens of *Microsania* after which not a single specimen could be found." Of the five taken four (both sexes) were *M. pallipes* (Mg.) while one female was *M. pectinipennis* (Mg.).

Collin (*loc. cit.*) referred to Edwards' capture of a male of *M. pectinipennis* on a fowl-house window at Welwyn, Herts., 10.vii.1926. Edwards himself later (1934) recorded finding *M. pectinipennis* attracted to a smouldering bonfire at Welwyn on 21.vii.1934. He visited the locality again on 24.vii. and could find none after half-hour searching but within seven minutes of lighting a fire the first appeared and, five minutes later, hundreds had arrived. Sweeping in the smoke produced almost only males, but females (previously considered much rarer than the males) could be obtained by sweeping low over the smouldering embers. Edwards advertised for observations on smoke flies and (*op. cit.*, 32-33) published several of those he received, these referring to six counties; one of them stated that the flies preferred to fly where the smoke was densest. Morley (1938) recorded *M. pectinipennis* from the New Forest, Hants, where he found them flying in smoke from smouldering wood fires and settling quite happily on hot ashes, where they were not easily disturbed, and he took them from this situation without any difficulty, these captures including a pair *in copula*. More recently Russell (1960) recorded his observations on *M. pectinipennis* in Yorkshire; he found large swarms on 21.vi. and 1.viii.1960 near a bonfire in his garden—they did not appear until 9 p.m.—of those taken only two were females; several swarms were also found, each of 150-200 individuals near the upper branches of a sycamore in a neighbouring garden. If it is normal for the species to fly high this may account for the apparent rarity away from bonfires. Russell, however, also referred to its capture by K. G. Payne by sweeping a wood-margin by the quarry railtrack at Gundale, Pickering, on 29.vi.1956. Colyer & Hammond (1951) refer to the attraction of *Microsania* to the "acid smoke from a burning dump of old rubber". Parmenter (1966) records males of *M. pallipes* (apart from Audcent's Clevedon record in the Bristol List, apparently the only British record since Collin's) "in the smoke over the very hot embers of a bonfire" on Bookham Common, Surrey, 10. v. 1964. Three further species have now been described from Europe, and these as well as the Australian species *M. tonnoiri* Collart were taken in similar conditions.

Melander (1922) dealt with the North American species, which he assumed to be the same as the European *M. stigmatalis* Zett. and *M. pectinipennis*; he stated that males of both had been taken in a light trap at night, while females were caught on windows in houses—the situation in which Zetterstedt had taken them; they had also been taken several times on tents in woods, but he made no reference to their attraction to smoke (which had of course only been first recorded in Europe the previous year). Malloch (1935) established the distinctness of *M. imperfecta* (Loew.) from *M. stigmatalis* and described *M. occidentalis* Mall. from specimens previously confused with *pectinipennis*. Observations on the attraction to smoke of *M. occidentalis* in North America have been made

by Kessel (1947). In a later paper (1960) he refers to the capture of these flies in many localities. He had always thought that both visual and olfactory senses played a part in the positive tropism to smoke which they exhibit, but was now convinced that they are attracted by smell alone, as they were attracted to his car in large numbers for several days after it had passed through the smoke of heath fires, and to his clothing for days after contact with smoke. More recently (1965) he recorded the taking of *Microsania* as prey by its Empid congener *Hormopeza*. It might be pointed out that Aczél (1958) in his revision of the South American Platypezidae, seems to have overlooked Malloch's paper and regards the Neotropical *Microsania* as conspecific with the European species; future examination may prove them to be undescribed species.

The development medium of *Microsania* is still unknown and elucidation of this would be instructive from both the biological and, through knowledge of the larval structure, the taxonomic point of view. This is one of the many problems concerning the Platypezidae which are far from solved and any aspect of this group would certainly reward deeper study.

Note on *Agathomyia*.—The smaller species of this genus which I took with the *A. falleni* is not named in this paper as its true identity is not yet established without doubt. All specimens (24 from five localities, including 1967 captures) that I have taken are females and appear to be the species of which Wood (1910) recorded both sexes as British under the name *A. zetterstedti* (Wahlb. in Zett.). Wood's species is, however, not the same as that originally described by Zetterstedt (1844) whose description was of a single female known to him only from Wahlberg's letter; the abdominal colouration is quite different. But Wood's description agrees well (in both male and female) with Oldenberg's (1928) description of *A. unicolor*, and I believe that Wood's specimens, in the British Museum (Nat. Hist.) and my own are conspecific with *A. unicolor* Oldenberg. Confirmation by close comparison of the British specimens with the types of *unicolor* will, however, be essential before any dogmatic statements can be made. Taxonomic studies of the Palaearctic species of the genus *Agathomyia* are urgently required owing to the considerable confusion between earlier authors, the sexual dimorphism and the rarity of most of the species, before any real progress can be made in the study of their biology. The study of reared series would greatly help this as males and females could be associated—particularly necessary in the many small species of *Agathomyia* with predominantly black males, as the sexes appear at different times and are rarely taken *in copula*. All that is known about the development of *Agathomyia* is discussed above; I have also compiled an account of what is known at present about the development of the family as a whole, which is to be published elsewhere.

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Weston Research Laboratories, Taplow,
Maidenhead, Berks. 27.xi.1967.

Elaphropeza ehippiata Fall. (Dipt., Empididae) in England and Wales

By L. PARMENTER

Mr. K. G. V. Smith (1967) when describing a new species of *Elaphropeza* from Spain, *hutsoni*, in *Proc. R. ent. Soc. Lond.* (B) **36**: 153-5, recorded his sweeping two specimens of *ehippiata* from lush vegetation bordering a stream near Oxford and of Professor Varley's trapping it from soil under oak in his ground traps at Wytham Wood, Berkshire. Mr. J. E. Collin (1961) in *British Flies VI Empididae* p. 41, said that the species was far from being a common British species but he had seen it from Cambs., Essex, Gloucester, Oxford and Suffolk taken in June, July and August. But he gave no indication of its habitat. W. Lundbeck (1910) in *Diptera Danica III Empididae* pp. 272-4 said that the development stages were not known but the species occurred mainly in woods and thickets, on bushes and in low herbage. According to C. Morley and E. A. Atmore (1915) in their *Diptera of Norfolk and Suffolk* this species was found by Mr. Collin on a wall in a Newmarket garden in July 1886 and that Professor J. J. F. X. King found it at Orford.

Mr. Collin's list of counties may be lengthened for this tiny yellow fly with black shiny spots at the base of each wing has been taken at a few yards from the sea on the west coast of Wales to the top of chalk downs, although mostly in woodland.

In Pembrokeshire, 1948, I caught a male at the edge of Haverfordwest on a leaf of a lime tree on 31st July and a female on the following day on the pebbly floor of the stream as it left Castlebeach Wood, near Dale, in its last few yards to the sea. In 1952 a visit was made to the chalk down at Headley in the field known to entomologists as Stainton's Field and a male was caught on 11th June. Later that month on 29th a male and two females were gathered at Panshanger, Herts. In Suffolk in 1953 a female was swept in Dodnash Wood, near Flatford, on 25th July, and a male on 27th July nearby in Great Martins Wood. On 29th August next year, a male and female were captured in Sratsh Wood, Mill Hill, Middlesex. In Kent, at Blean, in damp woodland as were the Herts., Middlesex and Suffolk localities, a male was taken on 27th July 1965. Sir Christopher Andrewes kindly introduced me to a wet copse on the banks of the River Nadder near Wilton, Wiltshire, on 10th August and there we captured several of both sexes of *ehippiata*.

Mr. Smith treats *Elaphropeza* as a subgenus of *Drapetis* as it appeared in 1945, Kloet and Hincks' *Check List of British Insects* and Mr. Collin in 1926, *Ent. mon. Mag.* **42**: 147, said "it is probably correct to treat *Elaphropeza* . . . as a third subgenus of *Drapetis*". However, Mr. Collin in his 1961 monograph *op. cit.* treats it as a genus as did Mr. G. H. Verrall in his 1888 *List of British Diptera*.

Notes and Observations

CURIOUS BEHAVIOUR OF LARVA OF *ACHERONTIA ATROPOS* L.—CORRECTION (antea: 60). Owing to the omission of the operative words the sense of Mr. Sevastopulo's note was lost, and it is reprinted herewith.

Mr. O'Heffernan, in his note under the above heading (1967 *Ent. Record* 79: 263) appears to have overlooked my comment (*ibid* 79: 24) on his previous note (*ibid* 78: 212). I would repeat that the behaviour he describes, viz:—nocturnal feeding and daytime concealment, is completely normal for the brown form of the larva of *Acherontia atropos*, and that the same behaviour pattern is followed by the brown forms of other Acherontinae that I have bred.—D. G. SEVASTOPULO, F.R.E.S., Mombasa. 2.i.1968.

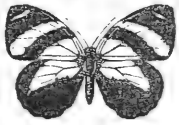
CONISTRA LIGULA ESP. IN WINTER—On 14th December 1967, when mothing after dark in a local wood, I found a mated pair of the dark chestnut moth. The evening was mild and humid. The male specimen died a few days later, but the female lived in a small cage outdoors until early March when it died without having laid any eggs.—T. D. FEARNEHOUGH, Drexel Cottage, 26 Green Lane, Shanklin, Isle of Wight. 25.v.1968.

EPIRRHOE ALTERNATA AB. DEGENERATA HAW.—A typical female specimen of the common carpet moth captured on 31st July 1967 deposited eggs on hedge bedstraw. The pupae subsequently obtained all passed the winter before emergence. Thirty imagines emerged of which 16 were typical and 14 were ab. *degenerata*, having very narrow black central bands on the forewings. There were no intermediate specimens. A pairing was obtained between two ab. *degenerata* specimens, but all the eggs laid proved to be infertile.—T. D. FEARNEHOUGH, Drexel Cottage, 26 Green Lane, Shanklin, Isle of Wight. 25.v.1968.

Current Literature

The *Aloeides thyra* Complex (Lep. Lycaenidae) by G. E. Tite and C. G. C. Dickson. Bulletin of the British Museum (Natural History) Entomology. Vol. 21, No. 7: 369-388+8 coloured plates. £2 13/0.

In the revision of this complex, 12 new species and 4 sub-species are described. An introduction explains the background to the complex and carries four text figures, 1 and 2 explaining the upper and underside wing patterns, and 3 and 4 show labial palpi of *A. penningtoni* showing bristles, and *A. natalensis* without these bristles. There is a Key to the species of the genus *Aloeides* Hübn., whereafter the species and sub-species are described, including the new species and sub-species which are illustrated in the fine plates. Plates 1-5, each in two panels showing upper and under sides show 110 figures while plates 6-8 are reproductions of four very intricate watercolour drawings by the late Gowan C. Clark, giving close details of the early stages of four species, including larval instars and enlarged structural details. The authors have tidied up another "complex".—S.N.A.J.



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LEPIDOPTERA OF KENT, VOL. II

This comprehensive work was completed with the instalment in our May issue and a limited number of separates, unbound, with stiff paper cover, is available for sale at 45/- per copy from The Editor, 54 Hayes Lane, Bromley BR2 9EE, Kent. (Postage extra)

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Northern Species of the Genus *Thorybes* Scudder, (Lepidoptera), and a New Abberation of *Thorybes pylades* (Scudder), from Southern Ontario

By P. A. DESMOND LANKTREE

(Department of Zoology, University of Western Ontario)

I. PRELIMINARY ACCOUNT

In the northern section of the north-eastern United States or in south-eastern Canada, the capture of a specimen of *Thorybes* which bears a costal fold is nearly always likely to lead to its correct determination as a male of *T. pylades* (Scudder), as distinct from *T. bathyllus* (Smith), the next most likely species, and from *T. confusis* Bell, which is even less likely.

The range of *bathyllus* has been given previously as from Florida and central Texas in the South, to Arizona in the South West; northwards to Sunderland in Franklin Co., Massachusetts, in the East, and to Milwaukee, Waukesha Co., in the Mid-West, having also been reported from Nebraska (Macy & Shepard 1941, Klots 1951). More recently (S. Moore, 1960), it has been reported from no less than fourteen counties in Michigan (including two in the northern and twelve in the southern lower peninsula), to which the specimens collected by the Vogels and illustrated in the present paper add a fifteenth county record with St. Clair Co.

The distribution of *confusis* is generally much more southern, and is known northwards only as far as Missouri, Maryland and the District of Columbia (Macy and Shepard). Dr. Moore reported "specimens from southern Michigan, which from their markings were thought possibly to represent the very similar *T. confusis* Bell, were sent for identification to A. B. Klots, who pronounced them all *bathyllus* on the basis of genitalic examination."

On the 8th June 1968, on a visit to localities in the general vicinity of Pinery Provincial Park in Southern Ontario with Mr. J. L. Rogerson, the writer took a specimen the identity of which was not at once apparent. In general appearance it closely resembled *Thorybes*, and though the wing spots were of medium size, the presence of a costal fold showed firstly that it was a male, secondly that it could not be *bathyllus* (which sometimes has maculation much reduced in size leading to confusion with *pylades*), nor thirdly *confusis* (in which the spots are usually smaller). It was also, however, unlike *pylades* in having a clearly marked postmedian band of hyaline spots extending in a rather Amblyscirtesian pattern into the subapical region of the forewings. This pattern was equally well defined above and below wing.

An unusual case such as this in the genus *Thorybes* merits that the possible occurrence of unusual circumstances, which might lead to a determination alternative to *pylades*, should at least be borne in mind. Such circumstances are those of accidental importation, which can still happen despite modern transport inspection precautions, storm-conveyed strays and exceptional acts of migration, all of which have been responsible on occasion for individual records of species far out of their normal range.

At least two Hesperiid species foreign to the Nearctic fauna have been

accidentally imported into Southern Ontario in the past, one of these establishing itself securely and expanding its range into several of the northern States. The other was Antillean, and while not a *Thorybes*, the genus *Thorybes* is indeed represented in the American tropics, the climatic regions of which have had a strong influence on the present day character of the Nearctic Lepidopterous fauna. Moreover, of the seven Nearctic *Thorybes* species one other besides *pylades* carries a costal fold, *T. drusius* (Edwards), though all too little is still known of this member of the group. It has been recorded from Texas and Arizona as well as Mexico and in being dark brown with hyaline spot bands, and in its wing shape and general appearance, is like others in its genus. Unfortunately, neither Skinner, nor Lindsey, Bell and Williams had access to this material and were unable to portray the genitalia, but W. J. Holland figured the type male (1931, Plate L, fig. 4), and while no doubt in a long series some variation would be evident, the macular pattern of the specimen figured is not particularly close to the Ontario *Thorbyes* example in question.

II. INVESTIGATION PROCEDURE

Clearly, for the latter, a genitalic dissection was called for and was duly carried out. At the same time, dissections were also made of normally marked ♂ *pylades* and of clearly and normally marked ♂ *bathyllus* individuals, and their permanent preparations, together with the adult specimens from which the dissections were made, are figured in the plate accompanying this paper. In the same plate are also figured normally marked ♀♀ of *pylades* and *bathyllus* for direct comparison purposes. The object of including *bathyllus* in the same series of illustrations is that, despite preclusion of this species from the determination being attempted (due to absence of a costal fold in the male), *bathyllus* and *pylades* females have sometimes been confused, and the Ontario example, which is fortuitously a male, might yet prove to be a variation unconfined to one sex, and simultaneously-presented standards of normality have value in convenience of reference.

Uniformity with the figures of Skinner and Williams was maintained by dissecting free in each case the left harpe and aedeagus and (unlike those authors), mounting them on the same slide as the main genitalic framework, and in the same aspect, after the usual preliminary tissue-softening, dehydration and clearing techniques. Realignment of disturbed aspect was, where necessary, obtained in mounting the prints. Distortion of the preparations was kept to a minimum, but slight rotation of the parts mounted, particularly the aedeagus, due to settlement during the drying process can considerably alter the form apparent as seen in one plane, which should be borne in mind in viewing two dimensional photographs.

Data for all material is given in the Explanation of the Plate. The two *bathyllus* specimens taken in Michigan by the Vogels are, with the associated genitalic preparation, housed in the collections of the Department of Zoology at the University of Western Ontario; the remaining material is in the private collection of the writer, who is also responsible for the photography.

III. RESULTS OF DISSECTION AND EXAMINATION

(i) The serrated distal edges and characteristic clog-like shape of the harpes (fig. 9 in the accompanying plate) confirm the identity of the ♂ *bathyllus* (figs. 6A and 6B) and agree with the figure published as normal for the genitalia of this species by Skinner and Williams, though these authors depicted the aedeagus the other way up from their more usual presentation of this organ. The pair of *bathyllus* selected for illustration herein were chosen for their clarity of markings, but less well marked males may be separated on dissection from *confusus*, which also lacks the costal fold, by the latter's possession of multiple small pointed sclerites within the aedeagus instead of the single "thorn" (as Skinner and Williams term it), in that of ♂ *bathyllus*, as well as by differences in the structural shape of the harpes.

(ii) It does not appear to be generally mentioned in recent texts that in a series of *bathyllus*, it is often possible to separate the sexes by the secondary characteristic of wingshape, and this was found to hold true in the present specimens, in which the difference was rather more evident than in the photographs. It is particularly clear in A. H. Clark's figs. g and h in Pl. 23 of his "Butterflies of Virginia". The tendency in males is for a straighter outer margin and sharper apical angle to the forewing*. The feature may vary individually, but a sharply angled forewing in *bathyllus* is strongly indicative of its being a male specimen.

(iii) The genitalia depicted in fig. 8 confirmed the identity of the normally marked *T. pylades* in figs. 4A and 4B, and agreed with the Skinner and Williams figure for the species.

(iv) The genitalia depicted in fig. 7 of the Ontario *Thorybes* were seen to fall well within the normal variation for such organs of the species *Thorybes pylades* by comparison with the previous dissection referred to, and with the figure of the species given by Skinner and Williams. The harpes are characteristically deep dorso-ventrally in shape, with straighter dorsal edges than in *bathyllus*, and with typically bidentate distal edges. The terminal processes of the uncas are also characteristically straight, and while the aedeagus has rotated slightly since mounting and its proximal region is slightly distorted, resemblance to *pylades* is ample in the original. The specimen illustrated in figures 1 and 2 of the accompanying plate is therefore a hitherto undescribed aberration of *T. pylades*.

IV. DESCRIPTION AND NOMINATION OF ABERRATION

The essential feature of this aberration is the presence of a complete postmedian band of hyaline spots extending from above the tornus to the sub-apical region of the costa, being equally well represented above and below both forewings. In shape, the band is like an unevenly opened out letter "S" on the left upper forewing, with a mirror image on the right. The completion of the band is effected by the addition of two well

*If the principal lines of direction of costae and outer margins in figs. 5B and 6B in the accompanying plate are drawn, produced to intersect, and the angles of intersection compared, the difference will be found greater than 10°, and while any angle made by wing-plane with image-plane during photography can introduce error, the point is here adequately illustrated.

defined, triangular hyaline marks; one in each of interspaces M_1 and M_2 of each forewing.

In descriptive recognition of this completion, the aberration is here-with named: *Thorybes pylades* (Scudder) ab. *integra* (ab. nov.) ♂.

V. TYPE LOCALITY OF ABERRATION

The specimen was taken N.E. of Port Franks in the hinterland of Lake Huron's south-eastern shore. The general area is characterised by the presence of undulating, forested sandy hills which screened both lake and shore from view; the tree coverage, though mixed, being mainly deciduous, and predominantly maple. The forest was periodically interrupted by wide, barren sandy tracks which transversely bridged the hills to the shore. The actual capture was made along a poorly defined trail through moderately open forest where the specimen was the only *Thorybes* seen flying; it was flying low and fast, following the trail approximately when intercepted. Less than a hundred yards away on the steep slope of one of the wide sandy tracks, a number of other *Thorybes* flew from time to time, usually singly and fast, in wide, erratic zig-zag flight from one wall of the forest to the other, occasionally settling briefly on the few bushes present. They were quite probably of the same species, which is no stranger in Southern Ontario, but none were captured. The day was warm and sunny with a hazy blue sky and shade temperature of 90°F.

(By contrast, the New Jersey specimens were easier to capture as they fed at the flowers of a tangled blackberry thicket grown up in a corridor between two sections of forest. It should be added that the locality described as "Morris Plains" in the plate is the mailing address for the area, but also a separate township. The locality is actually in the N.W. sector of Hanover Township, though both are in Morris County.)

VI. A NOTE ON DISTRIBUTION OF MORE NORTHERLY OCCURRING THORYBES

The more southern species *T. confusus* does not yet appear to have been recorded in Canada, and from present records of its distribution, it is the least likely of the three *Pylades* with a northerly range to be encountered even in the southernmost regions.

As far as the writer is at present aware, there are still no records of *T. bathyllus* for Canada either, but unlike *confusus*, its presence in certain likely wooded areas of the western part of extreme Southern Ontario is

EXPLANATION OF PLATE

1. Upperside, and 2, underside, of *Thorybes pylades* (Scudder), ab. *integra* ab. nov. ♂. Pinery Provincial Park, Lambton Co., Ontario. 8 June 1968. D. Lanktree.
- 3A. Underside, and 3B, upperside, of *T. pylades* ♀. Morris Plains, Morris Co., New Jersey, 6 June 1967. D. Lanktree.
- 4A. Underside, and 4B, upperside, of *T. pylades* ♂. Morris Plains, Morris Co., New Jersey. 8 June 1967. D. Lanktree.
- 5A. Underside, and 5B, upperside, of *Thorybes bathyllus* (Smith), ♀. St. Clair Co., Michigan. 8 July 1950. Hal and Ann Vogel (U.W.O. Coll.).
- 6A. Underside, and 6B, upperside, of *T. bathyllus* ♂. St. Clair Co., Michigan. 8 July 1958. H. and A. Vogel, (U.W.O. Coll.).
7. Genitalia of *T. pylades* ab. *integra* ♂ specimen in figs. 1 and 2.
8. Genitalia of *T. pylades* ♂ specimen in figs. 4A and 4B.
9. Genitalia of *T. bathyllus* ♂ specimen in figs. 6A and 6B.



1



2



3A



4A



5A



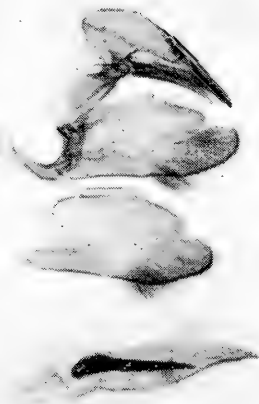
6A

3B

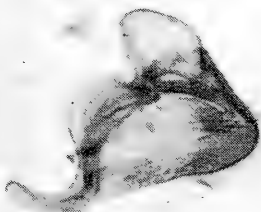
4B

5B

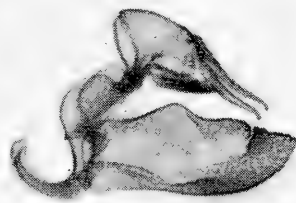
6B



7



8



9



to be both expected and suspected. Recent records show it to be widely distributed in southern Michigan, extending into the central area of the State, and the late Dr. Moore reported it from Wayne Co., which is just across the Detroit River (with its several islands) from Essex Co., Ontario, and the Vogels' records in the present paper are from St. Clair Co., which is across the even narrower St. Clair River from Lambton Co., Ontario. Whether it has been formerly overlooked, or is expanding its range in the area however, is still uncertain.

T. pylades has a much wider and to some extent rather surprising distribution, because its habitat requirements are not fully understood. Thus Lindsey, Bell and Williams report that it occurs throughout the United States and most of Canada, but though it is widespread, it is also very local. Its more usual habitats are the edges of woodland and forest borders with more open land adjacent, where the adult is attracted to feed at certain flowers, and oviposit on the larval food plants which have been described as "clovers and related species". However, there are many such areas from which *pylades* is evidently absent, and just what it does in the Prairie States and Provinces is not at all clear. In its northern range, Dyer recorded Cockle's taking it in the Kootenai District of British Columbia, Brooks gave six localities for it in Manitoba, and Riotte three localities from Northern Ontario, Favourable Lake being the northernmost. In the absence of specially adapted races (for only one race has so far been named), it might be expected that a species with a good northern distribution of localised habitats would be modified in its southern range, and it is unsurprising that some restriction is found in Georgia where, in the discerning judgment of Mr. Lucien Harris Jr., it is "usually to be found in the piedmont and mountain regions from mid-March through August" being "not as common as *bathyllus*". Again, from Macy and Shepard, that "southward, its distribution extends only into the highlands of Mexico as far as Oaxaca". Rather enigmatically however, in Florida, where higher land is limited to the more northern parts of the State, and none is very high, Kimball has reported it from twenty-two localities; six northern, nine north to north-central, and seven south-central to southern including Miami. That the latter records are for spring and fall, and that Kimball suggests the larval food is "probably many Fabaceae", may be important factors in its extreme southern distribution, but in coastal west central Florida at Tampa, it was recorded (by Morgan, 1933, per Kimball), as "fairly common, March-December".

VII. DISCUSSION OF MACULAR-BANDING IN THORYBES

The only other named aberration of *T. pylades* is Skinner's ab. *immaculata* (1911), the type of which was taken in Philadelphia and passed into that city's Academy of Natural Sciences. The situation of having on the one hand *immaculata* with its entirely unspotted forewings, on the other, a newly described aberration with a completed band of spots, and centrally, the norm with a partial band, raises the interesting question as to whether the tendency in present-day populations of *pylades* is in the direction of suppression of former characteristics or of expression of new ones.

The occurrence of pale spots of some form in the same general area as those extra in ab. *integra* is widespread in the *Hesperioidea*, and

examples from one or both sexes can be found in the *Hesperiidae* genera *Panoquina*, *Amblyscirtes*, *Euphyes*, *Poanes*, *Problema*, *Atalopedes*, *Polites*, *Hesperia* and *Carterocephalus*, the nearest resemblance to the *integra* pattern perhaps being in *Amblyscirtes eos* (Edwards) forewings. In *Pyrginae* genera (amongst which *Thorbyes* belongs), similarly in *Pholisora*, *Pyrgus*, *Xenophanes*, *Cogia*, *Celaenorrhinus* and *Urbanus*. However, the maculation referred to in the genera of these two Sub-families is not all the same thing, for not all the genera contain medium-sized dark brown species with hyaline spots, and while listed in a modern taxonomic sequence, which as nearly as possible follows evolutionary order from lower forms to higher, (dos Passos, 1964, was used throughout this paper), the whole extant Super-family is an assemblage of genera, or blocks of genera, of multilinear descent.

Spotting in forewing interspaces M_1 and M_2 is no less seen to be widespread, and in some cases it is evidently old. In *Thorbyes*, it is not limited to ab. *integra*, but occurs in normal *T. valeriana* (Plötz), (type ♂ figs. 8 and 8a in Pl. LXXV, not LXXIV as in text, in Holland, 1931; syn. *Phoedinus mysie* (Dyer)) from Arizona, and in genus *Cogia*, a similar and closely related genus to *Thorybes*, in *C. hippalus* (Edwards) from Arizona, New Mexico and Northern Mexico. In the *Megathymidae*, moreover, the Hesperioidean Family usually held lower than the *Hesperiidae*, these spots reach their greatest development, being large, solid, squarish blocks filling the interspaces in *M. yuccae* (Bdv. & LeC.), *M. confaqui* (Stecker) and *M. streckeri* (Skinner), especially in the females.

The constant repetition of the spot pattern in successive generations of normal *pylades* is clearly inherited, but not infrequently individuals are encountered which have small areas of dark scales present in M_1 and M_2 interspaces, (such as normally accompany and outline hyaline markings in this species), and even a "pin-point" of white in the dark area on occasion, (this tendency can be made out in figs. 3A, 3B, 4A and 4B of the accompanying plate). The positioning of the spot tendency in these interspaces with some frequency suggests that it is also inherited, but this is not to say that the sudden enlargement and sharp delineation of these spots as shown by ab. *integra* could not be phenotypic through environmental effect on the controlling genes; either cause would have to be demonstrated.

However, from the wide occurrence and sometimes considerable development of spots in these interspaces within the *Hesperioidea*, and from their establishment already in *Thorybes*, (*T. valeriana*), and in the not distantly related genus *Cogia*, one may be led to believe that the traces seen in normal *pylades* are remnant traces of former markings that completed the postmedian band, and that the present trend is towards suppression of these characteristics. The sudden, and apparently rare (from lack of previous records), strong expression as full size markings above and below wing in ab. *integra* is suggestive of a genetic cause and the possible work of a mutant gene.

VIII. SUMMARY

The present distribution of the more northern species of the genus *Thorybes* has been discussed. A new county record has been reported

for *T. bathyllus* in Michigan State, and a method suggested for distinguishing between sexes of this species by secondary characteristics, as observed from current material examined and other material figured elsewhere. A new aberration of *T. pylades* from Southern Ontario has been determined, described and named, and its possible causes and significance, and the general trend of maculation in the species discussed.

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POSTSCRIPT ON THORYBES SPECIES

It should be added that spotting in forewing interspaces M_1 and M_2 may be clear, particularly in the western species *Thorybes diversus* Bell (Oregon, California, Wyoming and Colorado), and to a greater or lesser extent in races *mexicana* (Herrich-Schaeffer), (Colorado, Utah and Central Mexico), and *nevada* Scudder (California to Colorado), of *Thorybes mexicana* (Herrich-Schaeffer).

Altogether, *T. diversus* and three races of *T. mexicana* occur as well as *T. pylades* in Colorado, *diversus* and *pylades* being closest and "easily confused" (Brown, F. M. 1956. *Proc. Denver Mus. Nat. Hist.* III-VII (V); 244-247), but as Dr. Brown points out and illustrates, the males of all these species and races are easily separable by their genitalia, while males of only *T. pylades* bear a costal fold. Should ab. *integra* be represented in the female sex of a Western example of *T. pylades* however, determination would be complicated by the lack of adequate knowledge of female Hesperiid genitalic differences, on which there is a great need for published work.

Notes on the Hod Hill, Dorset Colony of *Euphydryas aurinia* Rott. (Lep-Nymphalidae)

By ROBERT W. WATSON, F.A., F.B.A.A., F.C.C.S., F.Comm.A., F.R.E.S.

In 1944 I visited Hod Hill for the first time. During the war there was little grazing with the result that the vegetation over the whole area was in first class condition for the many butterflies which flourished there. *Aurinia* was found over the entire area, although in that year I was too late for larvae. There were many *Argynnis aglaia* L. particularly in the vicinity of the Roman Camp. On 7th August many females of this species were ovipositing. Many other species were abundant including a few *Hesperia comma*. L.

I visited Hod Hill again in the early spring of 1945 to collect larvae of *aurinia* for breeding. The larval webs were in abundance and 500 larvae were collected in a short time. The larvae are easy to rear and will take to honeysuckle if scabious is not available, but the cages must be kept in a warm sunny situation for the best results.

As with all local species care must be taken to ensure that as many as possible of the butterflies are returned after emergence to avoid reducing the strength of the colony. At this time I was breeding for aberrations. Each year from 1945 to 1950 larvae were collected whilst still in the web, a number varying from 500-100 being taken in these years. Mortality, mainly from parasites, varied but the percentage returned varied from 44 per cent. to 76 per cent.

In 1951 the evidence of increased grazing first became apparent. In particular the south east slope suffered. At this time there was a flourishing colony of *Lysandra coridon* Poda, which was virtually exterminated; the long grass on which they used to rest at sundown being eaten to the ground and the food plant trod by cattle until little could be found. Each successive year until 1965 the position became worse, the only refuge for *Aurinia* being the steep north west slope which although remaining ungrazed was subject to encroachment by scrub and the risk of fire.

I considered there was little hope of *aurinia* holding its own under these circumstances without some assistance. At this time the removal of even a few webs of larvae would constitute a serious risk unless the adults were returned.

It was decided, therefore, to increase the number bred in captivity. By collecting the webs in late February the incidence of parasitism was also greatly reduced.

In 1965 the Dorset Naturalists Trust completed the fencing programme and the result in this relatively short time is most encouraging.

In 1967 it was felt that there was now no need for this work to continue in the same way. During the past twenty-three years many hundreds of miles were covered as I make a practice of keeping the freshly emerged insects in the dark in boxes and returning them every second or third day. On release, if the weather was sunny, they would pair immediately and in some measure one could control the situation in the hopes that females would lay on the safe part of the hill.

In 1968 *Aurinia* was in great numbers and is again spreading over areas from which it has been absent for several years.

It is still necessary to execute the utmost discretion over the removal of larvae unless the unwanted adults can be returned after emergence.

"Porcorum", Sandy Down, Boldre, Lymington, Hants.
18th July 1968.

Pyralid and Plume Moths of Derbyshire

By D. C. HULME
(concluded from p. 163)

- 1033 *Ebulea crocealis* Hübn. Only three records are known for this species. H. Harpur Crewe recorded it at Breadsall in 1854 and E. Brown, at Drakelow, prior to 1863. More recently H. N. Michaelis has seen specimens occasionally in one restricted locality in Millers Dale, where it feeds presumably on *Inula conyza* DC., between 15th July 1948 and 1956.
- 1042 *Mesographe forficalis* L. Jourdain remarked that it was common over the greater part of the county though E. Brown was the only observer to include it in 19th-century lists. A. H. Turner and H. C. Hayward found it common at Repton, especially in gardens. Hayward noted the larvae on horse-radish and left us the single date of 25th June 1916 on a specimen in the county type collection. Messrs. Bilbie and Johnson have taken many at m.v.l. in the Coal Measures and Permian areas, their dates ranging from 21st May (at Hephthorne Lane in 1953) to 17th September (at Clay Cross in 1958). The writer caught several at Littleover between dates 25th June (in 1956) and 23rd August (one on night-scented stock in 1959). The only records for the Peak District National Park are single specimens at Youlgrave on 27th August 1958 (G. W. Wheeldon) and Beeley in early June 1960 (B. S. Fletcher).
- 1043 *Endotricha flammealis* Schiff. Two early records only: once prior to 1885 at Derby (G. Baker) and one in Derbyshire Entomological Society's type collection ca. 1890 from Mickleyover (Rev. R. C. Bindley).
- 1044 *Herculia glaucinalis* L. Spilsbury found the larvae abundant on dried leaves at Willington in 1865 and remarked the "cocoon very remarkable." H. Harpur Crewe found the species at Breadsall in 1854 and G. Baker encountered it once, prior to 1885, at Derby. There is a specimen in the county type collection bearing the data: Derby, August 1932 (F. R. Larkin).
- 1045 *Hypsopygia costalis* F. Before he left the county, the writer had the monopoly of records apart from two taken by J. H. Johnson (at his Hephthorne Lane m.v.l. on 13th August 1953 and in late July 1959), with a total of seventeen specimens taken at Littleover and one at Repton. The first county record was in 1948 and the dates of emergence range from 7th July (in 1956, 1958 and 1962) to 28th August (1948) and 8th October (1959 — the single Repton example). J. H. Johnson's recent specimen at Ault Hucknall on 9th July 1966 was noted with interest.
- 1048 *Pyralis farinalis* L. Jourdain remarked in the VCH list that this species was "common in nearly every stable." Hayward changed

- this summary in his 1926 list to "In most stables, and in warehouses in Derby." In an extensive study of the literature only two records have been discovered! These are Spilsbury's uninformative pre-1866 Repton listing and Hayward's fuller observation, supported by a specimen, of one found in cattle cake in a Derby Market Place warehouse on 3rd August 1922.
- 1050 *Aglossa pinguinalis* L. Again Jourdain gave "very common in most stables" and Hayward, obviously believing this to be exaggerated amended it to "common in most stables." And again only Spilsbury's bald Repton entry and one specimen found by Hayward in a Repton stable on 17th July 1920.
- 1060 *Hypochalcia ahenella* Schiff. Four records from the limestone dales. E. Brown noted it in Dovedale, prior to 1863, and H. C. Hayward found it in the Via Gellia on three occasions: 9th June 1917 (a few), 10th June 1922 (no mention of number) and 6th June 1926 (one).
- 1061 *Laodamia fusca* Haw. Hayward commented that the species "probably occurs on most heaths." H. N. Michaelis' recent reports of fairly common in the Dale of Goyt and on Combs Edge seem to confirm this summary, as does W. Bilbie's record of fifty taken at m.v.l. on twelve nights between 23rd May and 24th July 1960 at Clay Cross. One was taken at the Ault Hucknall m.v.l. on 14th July 1966 by J. H. Johnson. Previous records unearthed are as follows: Breadsall Moor, 8th to 18th June 1885 (W. G. Sheldon—not J. Hill as given in the 1926 list and probably the same record as G. Baker's "Little Eaton, prior to 1892") and June 1916 (H. C. Hayward); Holymoorside, 3rd to 6th June 1922 (James Douglas, H. C. Hayward) and Repton 21st July 1927 (Hayward).
- 1066 *Nephopteryx palumbella* F. First recorded in the county by H. N. Michaelis at Whaley Bridge on 30th June 1947 and noted there subsequently.
- 1073 *Salebria betulae* Deg. J. Hill recorded this species as rare, prior to 1905, at Little Eaton and Breadsall Moor. Hayward noted it at Willington about birch in 1917 and took one specimen there on 1st July 1918 and another at Repton on 7th June 1926.
- 1076 *Phycita roborella* Schiff. Hayward added this insect to the county list in 1917 when he found some pupae under rotten bark on an oak stump in Repton Shrubs on 18th July. A specimen bred from these is in the county type collection.
- 1078 *Plodia interpunctella* Hübn. Found in Derby grocer's warehouses, prior to 1866, by Spilsbury; twice prior to 1905 by J. Hill and commonly on 28th June 1922 by Hayward. The last named found one in his Repton house on 13th July 1918.
- 1079 *Ephestia elutella* Hübn. Found in Derby shops, prior to 1866, amongst bundles of dried herbs in druggist's shop by Spilsbury; once prior to 1905 by J. Hill and abundantly in grocer's warehouses in Full Street and the Market Place on 28th June 1922 by Hayward, who also found one in his Repton house on 10th July 1917. The VCH Burton record should be deleted
- 1082 *Cadra cautella* Walk. Hayward found one specimen in a Full Street, Derby, warehouse in 1922. The specimen is labelled 2nd October 1922 in the county type collection and 28th June 1922 in

his personal record book which points to it being a bred specimen.

- 1084 *Anagasta kuehniella* Zell. The first county record was in 1909 when J. Hill found this pest "common in Swaffield's Corn Warehouse, St. Mary's Bridge," Derby, from 8th to 12th November. W. St. John bred a specimen on 20th July 1917 from a larva found in flour at Derby. Hayward noted it at Repton on 4th June 1919 and abundantly "in Mr. G. Austin's Full Street warehouse and in cattle cake in the Market Place, Derby" on 28th June 1922. The writer found three larvae in separate packets of dried currants at Littleover in 1959, which spun up in tins, two emerging un-noticed before 17th February and the third, on 2nd June 1960.
- 1086 *Homoeosoma sinuella* F. One taken on waste ground near the writer's Littleover home on 22nd June 1960. Specimen confirmed by S. Wakely—see *Ent. Record*, 72: 219.
- 1088 *H. cretacella* Rössl. Only record: Millers Dale, 28th May 1956, one bred from *Senecio jacobaea* L. (H. N. Michaelis).
- 1098 *Euzophera pinguis* Haw. Only record: near Derby, prior to 1892 (G. Baker).
- 1099 *E. cinerosella* Zell. An early and a recent record: Etwall Hall, prior to 1866 (F. M. Spilsbury—not W. Garneys as given in *VCH*); Clay Cross, 24th June 1958, one taken by W. Bilbie and seen by the writer.
- 1105 *Acrobasis consociella* Hübn. Only record: once near Newhall, prior to 1866 (F. M. Spilsbury).
- 1107 *A. tumidella* Zinck. One beaten out of an oak in Repton Shrubs on 30th July 1919 by H. C. Hayward. He remarked that further search would probably disclose this handsome insect in many of our oak woods but this specimen remains the only Derbyshire example.
- 1109 *Cryptoblabes bistriga* Haw. Noted at three widely separated localities: Chesterfield, prior to 1858 (H. T. Stainton); Repton Shrubs, prior to 1866, on trunks of trees (F. M. Spilsbury); prior to 1892 (G. Baker); 4th July 1921, one, and June 1928 (Hayward); Little Eaton, prior to 1905, rare (J. Hill).
- 1112 *Achroia grisella* F. The early *VCH* Burton record should be deleted but Spilsbury's pre-1866 record from about beehives at Ticknall stands. Two of J. Hill's Little Eaton specimens, dating from before 1916, are in the Derby Museum collection. L. Holmes took several from his Littleover beehives in early August 1951.
- 1116 *Aphomia sociella* L. E. Brown and F. M. Spilsbury recorded this species from Repton but Hayward never found a specimen in his sixteen years of collecting micros. J. Hill noted it as a rarity at Little Eaton prior to 1905. The writer took a ♀ at electric light, in a thunderstorm, at Littleover, on 15th July 1958, and found dead ♂ and ♀ specimens in a tin of micros taken at B. S. Fletcher's Beeley m.v.l. trap in early June 1960.
- 1120 *Crambus pascuellus* L. Spilsbury listed this species at Repton, prior to 1866, Hayward found it locally common at Dawson's Rocks, near Repton on 7th July 1916, and took single specimens at Willington in June 1919 and on 20th June 1920. A. W. Richards netted one in Hardwick Park in 1922. The *VCH* Burton record should be deleted.
- 1126 *C. pratellus* L. Common throughout the county from Spilsbury and Hill's day to the present time. Hayward left only three dates:

- 23rd May 1918, at Repton; 24th June 1920 and 25th May 1921, at Willington. The many dated recent records range from 23rd May (one taken by the writer in Dovedale in 1961) to 25th July (one taken by the writer at Willington in 1962), with the main emergence between 9th and 30th June. Only one record of attraction to artificial light. A. H. Turner noted it as common, alongside the canal at Findern, on the isolated late date of 15th September 1955.
- 1127 *C. perlellus* Scop. A rare insect though twice noted as fairly common in one of the dales. P. B. Mason found it near Repton, prior to 1881, and Hayward recorded it as rare with a specimen there on 2nd July 1914 and another across the River Trent at Willington on 1st July 1918. J. Hill's pre-1905 record of fairly common in Millers Dale was confirmed recently by H. N. Michaelis, with the comment that the white form occurs on limestone in July (he has not observed *ab. warringtonellus* Staint.). A. H. Turner found several at Little-over on 27th July 1948, where the writer also took single specimens on 7th July 1956 (at blended light) and 18th July 1962. W. Bilbie found a specimen almost as darkly marked as *ab. warringtonellus* at Matlock on 6th July 1956 and a typical specimen on a coal tip at Clay Cross on 16th August 1956. B.S. Fletcher found one dead in his Beeley m.v.l. in early July 1960. The VCH Burton record should be deleted.
- 1128 *C. hortuellus* Hübn. Fairly common in meadows throughout the south of the county. Spilsbury listed it without comment in his 1866 Repton list (E. Brown's pre-1863 Burton record given in the VCH should be deleted though the status of common just over the border in Staffordshire is worth noting). J. Hill found it common at Little Eaton. Hayward left four actual dates for the Repton district: 3rd June and 8th July 1916, 27th May 1918 and 18th July 1926 with a general comment of "common in meadows." The writer's own records cover a very brief flight period of 30th June to 9th July. Five records only from the north: Via Gellia, 9th June 1917 (J. Douglas); Millers Dale and Whaley Bridge, fairly common since 1948 (H. N. Michaelis); Clay Cross, one on 4th June 1958 (W. Bilbie); and J. H. Johnson's capture of 80 at the Ault Hucknall m.v.l., between 4th July and 19th August 1966, points to this species being common in the extreme north-east.
- 1133 *Catoptria falsellus* Schiff. J. Hill recorded it as rare at Little Eaton (the other VCH record should be deleted). Hayward found it to be fairly common in some seasons in Repton Shrubs, between 1917 and 1926, and left the two dates of 20th July 1917 and 15th July 1920. R. G. Warren observed the species in Dovedale on 30th July 1950.
- 1136 *C. pinellus* L. H. C. Hayward took the first examples in Repton Shrubs on 3rd August 1916, when it was commonly beaten out of firs. He remarked that it was strange that so conspicuous an insect should have escaped previous observation. His only two subsequent records, however, were at the same place on 15th July 1917 and at nearby Ticknall on 20th July 1929. J. H. Johnson has taken four specimens in his Hepthorne Lane m.v.l. trap on 7th August 1953, 9th August 1958 (two) and in July 1959. W. Bilbie showed the writer specimens from Heath dated 28th July 1958 and Clay Cross, 25th June 1959.

- 1137 *C. margaritellus* Hübn. H. N. Michaelis added this grass-moth to the county list in 1937 when he took a specimen in the Dale of Goyt in August. He took a further three examples, well separated on boggy hillsides of the Longdendale Valley, on 31st July 1949.
- 1139 *Agriphila culmellus* L. An abundant species throughout the county. Included in Spilsbury and Hill's list to which F. C. R. Jourdain added his own Ashbourne record in the VCH (the Burton record should be deleted). The many dated records give a flight period of 1st July to 29th August. Outside these months Hayward took early specimens on 27th May 1918, at Willingotn, and 3rd June 1916, at Repton, and a specimen of an apparent second generation on 31st October 1921, in a Repton meadow. A few have been attracted to ordinary electric and m.v. lights.
- 1140 *A. geniculeus* Haw. Three records only: rare at Little Eaton, prior to 1905 (J. Hill); one taken in Lathkil Dale on 8th September 1956 (W. Bilbie); a well-marked specimen taken in Robin Wood, Stanton, on 24th June 1962 (D. C. Hulme).
- 1142 *A. inquinatellus* Schiff. Recorded from three localities in the Peak District National Park. Bunster, Dovedale, 24th July 1929 and 20th July 1933, three and one respectively on the open grassy hillside (H. W. Daltry); 24th July 1949, fairly common (R. G. Warren). First noted in Millers Dale on 14th August 1939 and on occasional visits after 1948 (H. N. Michaelis). Longdendale Valley, August 1951, common on the wooded slopes (H. N. Michaelis).
- 1143 *A. tristellus* Schiff. Common on lower ground throughout the county. Listed by Spilsbury at Repton, Hill at Little Eaton and Jourdain at Ashbourne in the VCH (the Burton record should be deleted). Dated records range from 28th June 1956 (at the writer's Littleover blended light trap) to 6th September 1962 (four taken at m.v.l. in Dovedale by D. W. H. Ffennell) but mainly in the period 6th to 29th August.
- 1158 *Stenoptilia pterodactyla* L. Recorded at Repton by Spilsbury, prior to 1866, and occasionally by Hayward, July 1915 to 22nd July 1926. J. Hill noted only one at Little Eaton prior to 1916. Hayward recorded this plume-moth at Willington in July 1922 and Ticknall on 1st July 1933. R. G. Warren found it fairly common in Millers Dale on 25th July 1937 (also seen here occasionally by H. N. Michaelis) and in Dovedale on 18th July 1948. The VCH Burton record should be deleted.
- 1160 *S. bipunctidactyla* Scop. The VCH record refers to Spilsbury's Repton listing. Hayward found it in Repton Shrubs, in September 1915, and in the Via Gellia, on 9th June 1917 and 4th July 1926 (abundant on the latter visit). Since 1948 H. N. Michaelis has found it common in Millers Dale and Bretton Clough.
- 1166 *Capperia britanniodactyla* Gregs. Hayward found it commonly in the Ticknall limeyards on 12th July 1928. On a further visit on 9th June 1929 he found larvae, pupae and imagines abundant about the extensive clumps of *Teucrium scorodonia* L. In Dovedale, R. G. Warren observed it commonly on 26th June 1949 and found a larva on 4th June 1950.
- 1172 *Amblyptilia acanthodactyla* Hübn. Included on the evidence of F. M. Spilsbury's single specimen from Willington prior to 1866.

The *VCH* record of one at Burton (no authority given and this species is not included in E. Brown's 1863 list) should be deleted.

- 1175 *Platyptilia gonodactyla* Schiff. Common in most areas, especially on waste ground and in the Trent Valley gravel pits. J. T. Harris noted it on Gresley Common, prior to 1885, and T. Gibbs found it abundant at Bretby about 1889. Strangely Hayward left no Repton records but listed several occurrences at neighbouring Willington and also found it common in the Via Gellia on his 10th June 1922 visit. The dated records and specimens give an extended period of emergence (23rd May in 1926 to 30th September in 1955) with overlapping of generations and no obvious peak. At m.v.l., W. Bilbie took one at Clay Cross on 20th June 1960 and J. H. Johnson, three at Ault Hucknall between 9th July and 18th August 1966.
- 1177 *P. ochrodactyla* Schiff. Only record a bald "Repton, prior to 1866 (F. M. Spilsbury)".
- 1178 *P. pallidactyla* Haw. Added to the county list in 1952 when H. N. Michaelis found it common in a restricted locality of Millers Dale.
- 1179 *Pterophorus pentadactylus* L. Jourdain gave this conspicuous plume as "very common and general" in his *VCH* list though the only 19th-century listing is that of Spilsbury. A. H. Turner and Hayward recorded it as common at Repton, the latter observer adding "especially about convulvulus in gardens" and leaving us one date of 10th July 1925. The writer observed many specimens at Littleover in the years 1956 to 1962, usually singly but a pair *in cop.* on 26th June 1959, and including a maximum for any one year of eighteen (between 5th July and 10th August 1961) and the extreme dates on the wing in the county of 15th June (1960) and 28th August (1962). The several records from the Coal Measures include two taken at J. H. Johnson's Hephthorne Lane m.v.l. on 9th July 1959.
- 1180 *P. baliodactylus* Zell. Dovedale is our only known locality with single specimens taken by H. W. Daltry on 2nd July 1926 and in 1933 and records from R. G. Warren on 20th June 1939 and 5th July 1953.
- 1181 *P. tetradactylus* L. This plume was wrongly included in the *VCH* and Hayward's 1926 lists on the evidence of a Burton, Staffs., record. The first record, not mentioned by Jourdain, was one taken at Littleover in ca. 1890, by the Rev. R. C. Bindley, the specimen now mounted in the county type collection. H. W. Daltry took two examples on a thyme-covered hillside in Lathkil Dale on 17th July 1929. H. N. Michaelis found it in Millers Dale; common in 1949, 1951 to 1953 and rare, 1954-56.
- 1186 *Adaina microdactylus* Hübn. The only Derbyshire specimen was taken by H. W. Daltry on 1st June 1926 in Dovedale, at a spring between the Stepping Stones and Lovers' Leap, where a few hemp agrimony plants grew. He added the specimen to the county type collection.
- 1189 *Oidaematophorus osteodactylus* Zell. One taken by H. N. Michaelis in Millers Dale in August 1956.
- 1191 *O. tephrodactylus* Hübn. Recorded from Breadsall Moor, prior to 1885, by G. Baker.

- 1192 *O. lithodactylus* Treits. Recorded at Drakelow by E. Brown, prior to 1863, and G. Baker, prior to 1885. Spilsbury's record from near Burton may refer to Staffordshire. Taken in Millers Dale by D. P. Lewis (one on 14th July 1904) and H. N. Michaelis (occasionally, 1948-56).
- 1193 *Emmelina monodactylus* L. Inaccurately summarised as "common" by Jourdain in the 1905 VCH list and "common and general" by Hayward in his 1926 list. The only records discovered are three Repton dates of Hayward: 7th October 1913; 1916-19, occasionally at ivy bloom and, after hibernation, at sallow bloom; September 1921, one in the county type collection.
- 1194 *Alucita hexadactyla* L. Certainly not "common and general" as given by Jourdain in VCH. Spilsbury listed it without comment in 1866. A. H. Turner and H. C. Hayward recorded it as common at Repton, 1910-19. Probably the status was exaggerated as Hayward left dates of only two specimens (September 1920 and 5th May 1923). The only other locality is Littleover, where the writer found eight specimens between 1950 and 1962, in the months of March, May, September, October and November.

KYLE and GLEN, Muir of Ord, Ross-shire. 23.i.68.

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Cosmopteryx druryella Zell. at Wicken Fen (Lep., Cosmopterygidae)

By LIEUT.-COL. A. M. EMMET, M.B.E., T.D.

Last September, while cleaning out a container which had held larvae from Wicken Fen, I found a corpse of *Cosmopteryx druryella* Zell. (*orichalcea* Staint.) at the bottom. I realised it must have come from a larva mining a grass or reed which I had taken there just a year before, and had vainly tried to identify as an *Elachista*. *C. druryella*, a strikingly beautiful moth, has not been taken, to my knowledge, for a number of years: even such experienced microlepidopterists as Messrs S. Wakely and the late L. T. Ford had never encountered it, so I sped to Wicken to search for it at the earliest opportunity.

Though I could recollect where I found the larva, I could not remember the food plant. The books were not helpful. Meyrick gives "leaves of *Milium*, *Hierochloe* and doubtless some other *Gramineae*"; and Ford echoes this, though he cautiously amends "doubtless" to "perhaps". Now neither *Milium* nor *Hierochloe* occur at Wicken Fen; so I was left with "other grasses" which is rather a wide field. Nevertheless, I persevered and spent a tedious and fruitless afternoon at Wicken, rummaging rather desultorily. Finally I gave up and directed my attention, in the dusk, to *Acrocerops imperialella* Mann which was unusually plentiful last year in the comfrey. And then, of course, when I was not looking for it, I found *druryella*. There before me were a couple of larvae in leaves of *Phalaris arundinacea* L.

It was now too late to renew my quest, but I returned the next day and found five more. Knowing Mr Wakely would be interested to meet a new micro, I invited him down and spent a third and final afternoon at Wicken searching in his company. My total bag for the three afternoons was fifteen larvae, which goes to show that they were neither common nor easy to locate. We could find no trace of *druryella* except along a stretch of about fifty yards in one of the droves, where it favoured the plants growing under the shadow of the bushes.

The larvae readily change their mines, but the renewal of the foodplant presented difficulty, since I now had to move to Kent and I knew of no local supply of *Phalaris*. I therefore gave the larvae a mixed salad of grasses and found that they took readily to one of the common meadow grasses (I think *Poa trivialis* L.). The majority of the larvae left their mines to pupate and spun long cocoons in rolled blades of grass; two, however, pupated in their mines like their cousin *C. liengiella* Zell., and a third spun up between the sheets of Kleenex lining the container. The last three were visible when held up to light and I was able to observe their development. I overwintered them in a shed in the garden where the temperature was hardly, if at all, higher than in the open. In early April the larvae began to stir, turning about several times in their cocoons, but ending up facing in the original direction—important, no doubt, for emergence. Pupation took place on the 18th, 20th and 22nd of April.

The pupae remained in the shed until the 30th of May, when I went to Ireland, taking them with me, so the conditions under which the insects were kept are unlikely to have forced them out early. Emergence began on the 5th of June and continued till the 11th. Mr. Wakely's moths, which were kept in the house, came out about three weeks earlier. All twelve of my pupae yielded moths (I had given three larvae to Wakely to add to those of his own finding): there were no parasites. The adults are of a retiring disposition and tend to conceal themselves immediately after emergence; one moth damaged itself by burrowing between the Kleenex sheets (not the one which had pupated in the Kleenex). Otherwise rearing them presented no problems.

It seems possible that this moth was temporarily lost though uncertainty regarding its foodplant. I have since learnt that Stainton gives *Festuca arundinacea* (tall fescue) as the pabulum (another grass not found at Wicken). Is it possible that through confusion of nomenclature it was really *Phalaris arundinacea* (reed grass) to which he was referring? If the latter is the normal foodplant in this country and this fact had been forgotten, it will explain why current entomologists have failed to find the moth. Meyrick gives the distribution as "Hants, Dorset, Wilts, Berks, Hereford, Suffolk, Norfolk, Cambridge, local", so clearly the moth used to be taken pretty generally in the south of England. Probably it would be found again if the larvae were looked for on *Phalaris* at suitable spots in mid-September.

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Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 24.vi.1968.

Wales: July 1967

By R. G. CHATELAIN

Few notes are published on collecting in Wales, and although the discovery of a previously supposed extinct Noctuid will probably lead to a surge of articles about a certain area in early August, I thought it might be of interest to record a few days spent in the principality last July.

I went first to Borth Bog, hoping to find a few larvae hanging on to the bog myrtle of the lovely red form of *Orthosia gracilis* Schiff. which the late Oliver Howard took there some years ago. In the event, I was too late but found half a dozen larvae of *Xylena vetusta* Hübn. A few *Coenonympha tullia* L. were flying. On the 4th July, I ran two lights in the bog but the night was cool and windy and few of the 45 species which turned up were of interest. *Plusia festucae* L. was quite common, as was *Hepialus fusconebulosa* de Geer. Other visitors included two mint *Scopula immutata* L. and a host of Pyrales.

The next night was spent in the woods between Corris and Machynlleth where results were extremely good in comparison with the previous night. *Mythimna turca* L. was one of the commonest species and I must have seen fifty of them. *Amathes ditrapezium* Schiff., *Craniophora ligustri* Schiff., *Anaplectoides prasina* Schiff., *Bomolocha crassalis* Treits., *Cleorodes lichenaria* Hufn., *Nudaria mundana* L., one *Venusia cambrica* Curt., *Hydrelia testaceata* Don. and the dark form of *Semiothisa liturata* Clerck were welcome visitors among the 85 species seen. Conditions on 6th were back to normal and little of note came to the sheets in a nice piece of woodland south of Machynlleth. *Turca*, *ditrapezium* and *crassalis* are the only species I bothered to enter in the diary.

On 7th July I drove up to Penmaenmawr where I spent three nights. Strong winds blew the whole time and one night was a complete blank. Nevertheless, at the top of Sychnant Pass, I managed to take ten *Amathes ashworthii* Doubl., one *Ammogrotis lucernea* L., three *Apamea furva* Schiff. and, surprisingly, an *Apatele alni* L. as well as plenty of *Agrotis trux* Hübn. *N. mundana* was found in cop. on a wall but searching the rocks by day in the high winds was unproductive.

I searched around Conway for larvae of *Nyssia zonaria* Schiff. and found them abundant on restharrow, thyme and burnet rose. After following one larva for several minutes, it started to nibble thyme, but I could not ascertain whether they were feeding or merely resting on the burnet rose.

Beetles at Mercury-vapour Light at Dungeness, Kent

By A. A. ALLEN

Late in 1959 Mr S. Wakely passed to me a tube of beetles that he had taken at m.v. light at Dungeness on the night of 2nd-3rd July of that year. Owing to pressure of other work they were not examined in detail until

recently, but, this being done, they appeared such a remarkable one night's catch—including species seldom if ever taken at light and two or three that are rare in any conditions—as to be worth placing on record. A list of the species follows (single specimens except where shown).

CARABIDAE: *Odontonyx rotundatus* Payk. (teneral). DYTISCIDAE: *Hydroporus palustris* L. GYRINIDAE: *Gyrinus marinus* Gyll. HYDROPHILIDAE: *Berosus affinis* Brul., 3 *Cercyon lateralis* Marsh. STAPHYLINIDAE: *Bledius opacus* Block, 3 *Deleaster dichrous* Grav. LEIODIDAE: *Leiodes ciliaris* Schm. CANTHARIDAE: *Rhagonycha limbata* Thoms. DERMESTIDAE: 3 *Attagenus megatoma* F. NITIDULIDAE: *Meligethes aeneus* F., *Soronia grisea* L. COCCINELLIDAE: *Anatis ocellata* L., 5 *Adalia 10-punctata* L. OEDEMERIDAE: *Nacertes melanura* L. SCARABAEIDAE: 5 *Aphodius ictericus* Laich. (= *nitidulus* F.). CURCULIONIDAE: *Otiorrhynchus ovatus* L., 2 *O. sulcatus* F., *Phyllobius parvulus* Ol., *Stenocarus fuliginosus* Marsh., and 31 *Dorytomus longimanus* Forst. (all, from their colour, recently emerged; both sexes present).

The most noteworthy feature of the list is the prevalence of weevils, a group not as a rule figuring largely in coleopterous light-catches. Not only are they represented by several species—five as against a maximum of two in other families—but the extraordinary number of *D. longimanus* brings up the total of weevils to well over half that of the whole catch. The species just noticed is a gregarious poplar feeder and there must surely have been a flourishing colony close at hand. In contrast to this experience I may mention that I do not remember more than one solitary weevil being thus attracted during a considerable amount of work with the m.v. lamp here, despite a fair representation of the group in the garden and of beetles at the light under suitable conditions. The two species of *Otiorrhynchus* above are flightless ground insects and doubtless reached the light by climbing.

A. megatoma, an introduced species regarded as rare, is not known to be established out of doors in Britain, but the present occurrence suggests that it may be beginning to find a foothold in the open. If so, the likeliest habitat is old carrion or (still more) birds' nests—frequented by its native congener *A. pellio* L.

Two other species deserve brief mention. *D. dichrous* is a conspicuous and normally scarce beetle which has been taken in flight, and also in the runs of mice, voles, etc., which are most likely its proper habitat. *L. ciliaris* is very nearly a new record for Kent, the only previous one known to me being contained in a paper on the Coleoptera, etc., of the Deal Sandhills by J. J. Walker, in which, having mentioned his capture there of *L. furva* Er., he writes '... I believe the allied *A. ciliaris*, another great rarity, has also occurred at Deal' (1900, *Ent. mon. Mag.*, 36: 98). This somewhat vague and unsatisfactory record is confirmed by the Dungeness specimen, in any case a highly notable capture.

Lest it be suspected that a few beetles picked up outside may have been accidentally included, I would add that Mr Wakely—to whom my best thanks are due—was quite positive on the point; there being among them only one specimen not taken at the light, viz. a *Donacia cinerea* Hbst. from some local reeds. Finally one may note that 1959 was an unusually good insect season by present standards.

Large Numbers of *Callimorpha jacobabae* at Dungeness in 1968

By R. E. SCOTT

During the years 1962-64 and 1966-68 I have been operating a moth trap nightly at Dungeness, Kent, and counting each night's capture to provide comparative numbers from year to year. During the first period I operated a Robinson 80 watt m.v. trap at the Dungeness Bird Observatory (grid reference: 085172) and during the second period a trap based on a standard 200 watt bulb at Boulderwall Farm (grid reference: 063196). The two periods are not therefore strictly comparable, the m.v. trap providing a considerably greater variety and number of insects.

Callimorpha jacobabae, the Cinnabar, was trapped annually, although in varying numbers, indeed Chalmers-Hunt (1962-68) records this species as being irregular in its appearance. In each year the peak occurrence was in late May and early June, the details being summarised in the following table.

Year	Trap	First Capt.	Last Capt.	Total	Peak Period	No. During Peak
1962	80w.mv	May 27	Aug. 1	310	June 2-17	257
1963	80w.mv	June 28	July 13	6		
1964	80w.mv	May 27	June 30	10		
1966	200w.	May 14	July 7	47	June 2-3	16
1967	200w.	May 12	July 21	162	May 30-June 5	76

It should be noted that the figures referred to by Chalmers-Hunt in his appendix (p. 362) concern 1962 and not 1963 as stated.

The first *jacobabae* in 1968 was taken on 18th May, followed by singles on 22nd May, 23rd and 24th. It was then noted in the trap daily from 27th May, with a marked peak of 149 taken on 3rd June and 346 were counted between 28th May and 8th June, and a further 113 between 14th June and 19th. The daily captures in 1968 are shown in the following table:—

May 27	5	June 4	21	June 12	3
28	72	5	3	13	5
29	23	6	2	14	7
30	3	7	6	15	9
31	17	8	27	16	76
June 1	25	9	4	17	5
2	18	10	6	18	3
3	149	11	4	19	13

The rapid deterioration in the weather following the 19th brought the captures to an end, but by this time a total of 490 individuals had been taken. The dates of the four highest captures, 28th May, 3rd June, 8th and 16th, produced a total of 324, exceeding the grand total for any of the previous years when counts are available. Throughout the period of its emergence in 1968 *jacobabae* was to be seen commonly over the entire Dungeness region, and numerous non-entomologists commented on the abundance of the "burnet" this year.

A comparison with the figures given above for the five years when counts are available show how abundant *jacobabae* has been this spring. The only numerically comparable year was in 1962, but even then the capture for the whole period of emergence, 310, did not reach the total recorded on the peak days in 1968. It must also be noted that the 1962

counts were obtained from an m.v. trap which should attract a higher proportion of the moths on the wing. Clearly the spring of 1968 has provided *jacobaeae* in numbers far in excess of anything previously recorded.

REFERENCE

- Chalmers-Hunt, J. M. 1962-1968. *The Butterflies and Moths of Kent*, Vol. II.
Dungeness Bird Observatory, Romney Marsh, Kent. 26.vi.1968.

Nomenclature

I have received the following letter from Professor D. Keith McE. Kevan of Macdonald College of McGill, University, Montreal, Quebec.

I have been following the articles on nomenclature in your pages with varied reactions ranging from detached amusement to disappointment that any entomologist nowadays should continue to have such a limited outlook as some still seem to have. However, I am pleased to see that, more recently, less myopic and parochial views are being expressed. May I therefore congratulate Mr. C. F. Cowan (1968 *Ent. Rec.* **80**: 109-112), on his lucid contribution "Any Number Can Join—But!". I would recommend that all those who think that difficulties over nomenclature are engendered out of sheer caprice (or even deliberately for their displeasure) should read his article carefully and also the *International Code of Zoological Nomenclature*. The latter, which was the outcome of an almost unbelievable amount of hard work by those concerned, is readily available at a very modest price, and, although there are undoubtedly some parts of the *Code* which still are liable to misinterpretation, there are relatively few cases in which real difficulties occur if the rules are followed. Stability in nomenclature is nearer now than it has ever been.

It must be admitted that Lepidopterists are among those who have suffered most seriously from "changes" in nomenclature, but this is undoubtedly because they have been so numerous with a correspondingly high proportion of rugged individualists and poor taxonomists among them. Ornithologists have had the same problems and seem to be weathering the storm. Admittedly the world avifauna is limited to only some 8000 species but the literature on birds has certainly been no less confused in the past than that on Lepidoptera.

As Mr. Cowan points out, the chief difficulty lies, not with the specific part of the binomen, but with the, as yet, very largely subjective recognition of genera, which is a problem of taxonomy, not of nomenclature *per se*. The two should not be confused. In many cases, with better techniques and less superficial studies, it is necessary, or at least desirable, to subdivide the older genera (merely consider what has happened to most of Linnaeus' original genera), whereas in other instances, no such subdivision may be warranted, or amalgamation of genera may even be indicated. Eventually we shall see a much greater degree of uniformity than we have at present (and, with it, uniformity in nomenclature). Whatever the outcome of a particular controversy, however, a global view should be taken, and not the partially informed opinions of those who are not serious students of systematics, who lack adequate literature resources, and who are concerned only with the limited faunas of their

own bailiwicks. If they wish to retain their own nomenclature, let them do so, but please, not in print.

Taxonomists do not enjoy spending large proportions of their time in determining the correct names of species (they have far more profitable things to do), but, having spent much valuable time on straightening matters out to the best of their abilities, it is distressing, to say the least, if their findings are arbitrarily dismissed. If one does not agree with the work of a given taxonomist, one should be prepared to undertake the necessary research in order to refute his conclusions. If one has not the time, the facilities or the talents to do this, then the less said the better.

Perhaps, in conclusion, I should make it clear that I am not a lepidopterist, so that I have never been "guilty" of perpetrating a name change in the Order. On the contrary, a species I once worked on has now quite a different name from what it then had, but I am not upset by this!

Notes on the Microlepidoptera

By H. C. HUGGINS, F.R.E.S.

***Acleris lorquiniana* Dup.** I was very interested to read (antea: 123) Mr. S. Wakely's note on breeding a few of the summer brood of this moth from Hampshire. His experience exactly agrees with my own, that all summer specimens have the jet black spot in the centre of the fore-wing. In all my captures and breeding dating, on and off, since 1910, and spread over Wicken, Horning, Ranworth, and Barton, I have found the late June and July ones to have this spot, and I have never seen it in an autumn one. W. G. Sheldon always insisted that it was in both breeds, but I believe this to be an error: many of his tortrices were purchased, and I am convinced that the black-spotted autumn ones were wrongly labelled by another collector. I note also that Mr. Wakely found the larvae difficult to collect; such is my own experience with the first brood. In the case of the second brood, which feeds on the flowers, not only is the food plant much easier to see, but the number of larvae per stem seems greater, possibly, as in the case of *A. hastiana* L., the second brood is much larger. I presume that *lorquiniana* like *hastiana* hibernates as a perfect insect, and probably a good number perish during the winter.

***Grapholita caecana* Schlag.** My experience in trying to breed this moth agrees with Mr. Wakely's. For a number of years I lived quite close to several places in East Kent where it was found, and I collected sainfoin stems from October to March, and never bred one, although on a warm evening in July, I could always get the moth buzzing round clumps of sainfoin. I am convinced the moth is a sainfoin feeder but the only near-first-hand reference I can find is Barrett's (XI: 221): "Mr. G. Coverdale told me he had found some larva in November feeding on the stems of *Onobrychis sativa*, from one of which he reared a specimen of this species" I fancy the larva feeds on some other part of the plant and winters elsewhere, occasionally in a stem. At the time I speak of, over forty years ago, *caecana* could be found in all hollows in the chalk where sainfoin grew, from St. Margaret's to Broadstairs. I imagine that war-time cultivation and "development" have much restricted its localities.

Curious flights of *Micros*. At the "South London" meeting on September 28th 1967, Mr. B. Goater informed the President that he had never seen *Cynaeda dentalis* Schiff. flying by day. During thirty years in Kent, I was never more than ten miles from a *dentalis* locality, and could get it when I liked by searching the viper's Bugloss flowers with a lantern after dark, but I only once saw it flying by day. This was on July 10th 1925, in a locality a few miles from Faversham. It was a heavy, overcast day with a threat of thunder, and in the late afternoon the moth began to fly freely; in all I must have seen a hundred in half an hour, when I packed up, as I did not wish to get soaked. I took about a dozen, some which I still have, as they were of a very small pale form.

***Melissoblastes zelleri* Joan.** Mr. L. T. Ford (Guide to the smaller British Lepidoptera: 17) states that this moth flies freely just after dusk. I think I must, in all, have spent several months in the locality where it is (or was) commonest, and I never saw it fly in the afternoon, evening, or at night. I found it to be a most extraordinary insect: on a calm, warm night, it was common sitting on *Echium* and other plants, about one foot from the ground with its wings half extended, but I could never get it to fly; I often picked it up and threw it into the air, but it only dropped. The moths could often also be seen paired on the sand, and would scuttle off when a light was turned on them, the big female dragging the unfortunate male backwards behind her. However on July 3rd 1949 I resolved to pick up a short set of *Aplasta ononaria* Feussl., so my son took me to Sandwich in the car. We got there by 7 a.m. in order to avoid sunbathers, etc., and by 8 I had seen enough ononaria to last me my life. We then had breakfast; it was blazing hot and we resolved to move on to Blean, to avoid the aforementioned pests, but just before going, at 9 a.m., I took a short walk, and a whitish moth I did not recognise, was flying freely. I netted half a dozen, and all were *zelleri*. I kept one for luck, which I afterwards gave to the late Mr. Smith for the York Museum.

***Schoenobius gigantellus* Schiff.** I used to find a certain number of this moth near here, in a locality now destroyed. It likes the more open parts of reed beds, and the female, more particularly, is usually seen flying between stunted reeds over open water, but usually is obliging enough to come to an electric torch focussed on her. I usually saw perhaps half a dozen males and a female in an evening, but on July 14th 1949 my son and I had an unforgettable experience. It was a hot, stifling night "with thunder duntin' round" and summer lightning playing everywhere the eye could reach; *gigantellus* began to appear before it was quite dark, and my son suggested we should stay until I had collected enough to complete a varied set once and for all. Accordingly we kept it up until just after twelve, by which time we must have seen over a hundred males and three females. I selected about a score of the males and, of course, kept all three females. One of these was the most beautiful I have ever seen, dull yellow with a dark brown median stripe from the apex to the base. She was flying over some rather deep water and was coming straight towards my hand-lamp when she ran into a spider's web between two reeds. This was more than my son could stand; he

was wearing thigh boots, and went straight after her, getting her when the water was within two inches of his boot tops, and before the spider had done any damage.

I have never known a night like this for *gigantellus*: the next year my late friend L. T. Ford, who wanted it badly, came over and on a hot, calm night the three of us (Ford, my son and myself) stayed out until 2 a.m., but only got about a score between us.

The females of this group, *gigantellus*, *forficellus* and *mucronella*, must be killed on the spot as they almost invariably knock themselves to bits in pill boxes, particularly damaging the points of their peculiarly shaped fore-wings. The males I have always found quite safe. Another insect of which the males are quiet but the females most restless is *Bactra furfurana* Haw. The worst of all I know is *Laspeyresia grossana* Haw. The first time I found this moth, I took 16, to make sure of a dozen, and on my return home two hours later, only a couple were fit to set.

65 Eastwood Boulevard, Westcliff on Sea. 22.v.1968.

The Larval Habits of *Pseudococcyx posticana* Zett. (Lep. Tortricina)

By LIEUT. COL. A. M. EMMET, M.B.E., T.D.

Certain species which used to be taken regularly by earlier generations of entomologists come to be regarded as rarities. Sometimes this is not due to their becoming genuinely scarce, but is because the knowledge of when, where and how to find them has been forgotten. I suspect that this is the case with *Pseudococcyx posticana* Zett., for, having learnt what to look for in Essex, I readily found it in Suffolk and Surrey as well. Yet none of my microlepidopterist friends seems to have first-hand acquaintance with the moth.

The Forestry Commission kindly grant me a permit to collect in one of their woods near Saffron Walden. As this was due for renewal, I spent the afternoon of the 24th March of this year examining their plantations of young Scotch firs so as to report any species which might be of interest to the Commission. After a long and almost fruitless search, I noticed a slightly discoloured flower-bud, and, on breaking it off, found that it contained a larva. There were six others on the same tree, two of them containing pupae, and the remainder larvae ready to pupate. At this stage the tenanted buds were extremely difficult to detect, and a second visit a few days later proved time-consuming and unrewarding. I therefore postponed operations until the 19th of April. By this time the buds aborted by the *posticana* larvae were easy enough to find, being small in size and of lack-lustre brown coloration, as contrasted with the bright *buoliana*-orange and swelling dimensions of the healthy growth. In some instances, the needles at the tip of the branch were beginning to wilt: those fully dead were due to old workings or other causes.

The affected buds were mostly situated from two to five feet from the ground on young trees about twelve feet in height. A single tree would harbour several larvae, and there would be a gap of perhaps twenty trees before the next batch. The larvae eat out the heart of the bud

and the extreme tip of the stem behind it. Prior to pupation they nibble an exit hole in the stem just below the bud, which becomes sealed with white resin; the larva pupates head inwards. The date of emergence of my specimens was from the 20th of April to the 4th of May, possibly having been slightly accelerated through the pupae being kept indoors. Thus the optimum date to search for the pupae is a brief period in mid-April.

As far as I can judge, the moth does no damage, since it only temporarily inhibits the flowering of a lower spray, without impairing the upward growth of the tree.

Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 18.v.1968.

Notes and Observations

TELPHUSA ALBURNELLA DUP. (GELECHIINAE) IN HERTFORDSHIRE.—I collected, on two occasions, during the first two weeks of May 1968 larval spinings amongst leaves and shoots of birch (*Betula* spp.) on Bricket Wood Common. During the ensuing weeks there emerged several specimens of *Anacamptis blattariella* Hübn. and on the 29th June a single specimen of *Telphusa alburnella* Dup. This is a new area in which I have found this species; the others being Stanmore Common, Middlesex, and Scratch Wood, Middlesex. Nearly all the larval spinings were gathered from a group of saplings. Unfortunately, I did not pay close enough attention to individual larvae, and am uncertain as yet of the habits of the larva of *T. alburnella*.—E. S. BRADFORD, 38 Oakwood Avenue, Borehamwood, Herts. 4.viii.1968.

MIGRANTS IN HEREFORDSHIRE, 1967-68.—On 1st July this year, I had an example of *Plusia ni* Hübn. in my trap in Ledbury, and on the following night I discovered two specimens of *Eublemna parva* Hübn. in my previous night's catch. All these specimens were not in the best condition, and it is interesting to note that their arrival followed the North African dust storm which occurred during the early morning hours of 1st July; a little of this dust fell patchily in the Ledbury district the same morning.

Last year I was fortunate to see a specimen of the Pyralid moth *Uresiphita gilvata* Fab. (*polygonalis* Hübn.) on 9th October 1967, also in the trap, while on 21st September 1967, a fresh and very fine specimen of *Acherontia atropos* L. was found sitting on the brickwork of my house, twenty yards from the trap.—Dr. M. W. HARPER, Cotham, Upperfields, Ledbury, Herefordshire. 13.vii.1968.

OBSELETE FORMS OF THE LYCAENIDAE (LEP.) IN DORSET.—Over the Whitsun holiday this year I was fortunate in capturing three obsolete varieties of this family during a visit to Dorset.

The first specimen was taken at Hod Hill at about mid-day on Saturday, 1st June, having examined in the region of sixty *Aricia agestis* Schiff. (brown argus), I was particularly delighted to take a perfect, though not very extreme, male *obsoleta* form of this species. That evening I paid a visit to Ballard Down, near Swanage, and was amazed to find such large numbers of blues settled on the long grass bents at the foot of the Down, a good proportion of them being *Lysandra bellargus* Rott. (Adonis blue). Despite a long search amongst this species, nothing in the way of a variety was seen. However, during that time I took an extreme male *obsoleta*

form of *Polyommatus icarus* Rott. (common blue), but unfortunately it was somewhat damaged, so I decided to keep it alive for breeding purposes. During the next few days I took several fresh female icarus in the hope that one of them had not already mated, but my efforts proved unsuccessful. However, I was rewarded early on 2nd June when I found a superb male *Cupido minimus* Fuessl. (small blue) ab. *caeca* sitting on a blade of grass in the company of others of the same species in the same locality.

This is the first year in which I have had such success with the Lycaenidae, although I searched similar colonies quite extensively in the past without good results. Perhaps these forms were the result of the long cold spell earlier this year; it will be interesting to see what the F2 generation produces.—A. D. R. BROWN, 9 Stoke Park Road, Stoke Bishop, Bristol. 23.vi.1968.

SPILOSOMA URTICAE ESP., AT PULBOROUGH, SUSSEX.—A most unrewarding season with the light trap in my garden this year suddenly changed to a glut of interesting species on the night of 18th June, when insects not only swarmed, but among them there appeared a number of species which although I have had them in various previous years, I have never had them in such numbers, and among the hoards of noctuae were many species in double figures that are more often present as single examples in a year. The species that made the most impact on me was, *Spilosoma urticae* Esp. of which twenty examples were in the trap or sitting upon a lighted wall before midnight, and doubtless there were others among the foliage that I did not see; the moths drifted about rather than flew. All were males as far as I could see and in mint condition, and as the garden is a good half mile from the river and brooks, this invasion in bulk came as a great surprise. The trap was not too attractive after this date until the 29th of June, when hoards of lepidoptera again appeared, and with them endless small black beetles, about an inch long, and this time the *urticae* were all females, some of which I kept to see if they were paired. All sat about in the cage for several days without much movement, and all finally deposited batches of cream colour ova, all of which turned to a deep blackish colour in the course of a few days, and then hatched, all at almost the same time, so that the leno on which the ova had been laid, had small masses of larvae standing together like flocks of sheep. Of course this hatching at a given time applied to each batch and not all the batches. They have accepted and taken to all the riverside plants offered to them, and this was welcome as I am not an expert on plants. While in part this glut of *urticae* must indicate a season in which there are plenty of insects about if only the weather is suitable for light-trap work, there must also be other factors at work locally, and one of these is almost certainly the fact that the powers that be have for several years been engaged in widening and deepening the River Arun.

Instead of the grassy banks that have from time immemorial been subject to deep flooding every winter, we now have steep flat mud banks, which in the finished areas have become covered with riverside plants, in place of dense coarse grasses, and these areas are in some part free from the deep and long lasting winter floods, while just back from the banks proper are wide areas of disturbed wet ground, again thick with water plants and not grass rushes or reeds. All this suggests reasons why this

species may be specially plentiful just now in the brooks, but not any reason for the coming of the species in numbers to my garden trap, but it may be that the recent building of houses all round me, has caused my trap to be at the bottom of a wide-mouthed funnel, and that on those nights when masses of lepidoptera are drifting about high up, this funnel is irresistible.—A. J. WIGHTMAN, Pulborough, Sussex.

STIGMELLA SUBERIVORA STNT. NEW TO WEST KENT AND THE LONDON AREA—On an excursion into East Kent on 29th April last, on which I accompanied him, my friend Mr. Chalmers-Hunt discovered mines of this species, then new to the county, and his record will no doubt have appeared by this time. Having learnt from him that it could possibly occur in my own area, I searched there the next day, beginning in the garden, where there is a self-sown bush of holm-oak (*Quercus ilex*), the foodplant, in a hedge. In a few moments the conspicuous mines of the 'Isle of Wight Pygmy' were detected, and as in East Kent the blister-like mines of *Lithocolletis messaniella* Zell. accompanied them. I found only one tenanted mine of the *Stigmella*, whose occupant next day emerged and spun its cocoon; this lately produced both an imago and a parasite. I then moved to a nearby derelict garden and found the mines quite common on a mature tree of the same species. (Curiously enough the next tree to it appears to be the allied cork-oak, *Q. suber*, after which the insect is named, but none of its foliage is within easy reach; I suspect that it too is patronised by *S. suberivora*.) This moth is evidently well established in the district, and most likely all round London, though hitherto, I understand, recorded only from a few coastal localities in the south-east.—A. A. ALLEN, 63 Blackheath Park, S.E.3. 14.vi.68.

TWO SPECIES OF DIPTERA PROBABLY NEW TO BERKS. FROM WINDSOR FOREST.—On 29th May 1968, in Windsor Forest when about to leave for home in the evening, I came upon a beech from which a large portion had recently broken off, exposing a surface of fairly fresh wood. A quick inspection revealed a male *Brachyopa* (Syraphidae) at rest on the latter where the trunk had split, just above a small water-hole. From its more projecting face, thicker hind femora, and somewhat larger size it appeared slightly different from *B. insensilis* Coll., the only species with which I was already familiar, and which I had previously taken in the Park as well as here at Blackheath (in both places at sapping elms, to which, indeed, that species appears almost confined). On examination later it was confirmed as one of the other species by the presence of a small antennal sensory pit; and the practically bare arista, transversely furrowed scutellum, etc., showed it to be *B. bicolor* Fall.

This is so far the rarest of the four known British species of *Brachyopa*. It has occurred twice in Herts. ('Little Gadderton', i.e. probably Little Gaddesden, and Bricket Wood near Watford), and in the New Forest, but I am unaware of any other capture. *B. pilosa* Coll., almost as rare as *bicolor*, has been taken in Windsor Forest by Messrs. L. Parmenter and A. Stubbs, and our remaining species, *scutellaris* Desv., will very likely also be found there; it is considered to be fairly common

Of *Elaphropeza ephippiata* Fall. (Empididae), a distinctive and pretty little species, I swept a few examples in the Park from shrubby maple, etc., on 4th August 1965; and one escaped from my net after I had been

sweeping under trees there perhaps half a mile from the first spot, on the day that *B. bicolor* was taken. Collin (1961, *Brit. Flies*, 6 (1): 41) states that this 'is far from being a common British species' and records it from Gloucs., Oxon., Suffolk, Cambs. and Essex only.—A. A. ALLEN, 63 Blackheath Park, S.E.3. 15.vi.68.

NOMENCLATURE—Mr. J. L. Campbell's letter in your June issue came as a breath of fresh air in a stuffy room.

It revived memories of my crusade of four years ago against the exclusive use of Latin names, a proceeding which in my opinion effectually hamstrings identification facilities.

This academic exercise in Latin names goes back many, many years.

I have before me a copy of 'The Field naturalist's Handbook', published in 1904 and the authors of this highly informative book were those reverend gentlemen J. G. and Theodore Wood; the price of this gold mine was one shilling.

This is what they have to say on the topic.

"Nomenclature is always a difficulty in science. The love of change merely for its own sake is unfortunately given more scope in entomology than in any other branch of science, except perhaps, ornithology, and few persons who write of insects or birds can resist the temptation to alter their names.

"It is bad enough that either the popular or scientific name should be changed, but when both are altered, identification is almost impossible. Yet this is done in the most reckless manner, and without consideration for the difficulties thrown in the way of others".

I find it very comforting to have my own convictions fortified in this manner.—L. G. F. WADDINGTON, 9 Greenleaf Avenue, Wheatley Hills, Doncaster.

POLIANA NATALENSIS (BTLR.) AND *P. oheffernani* GESS (LEPIDOPTERA, SPHINGIDAE).—I was very interested to see the brief reference to Gess' paper in the March *Entomologist's Record* (80: 86), and, through the kindness of Mr. Carcasson of the National Museum, Nairobi, I have been able to borrow a copy.

As a matter of interest, Mr. Carcasson writes that *oheffernani* is definitely our (i.e. the East African) species, but that our northern specimens appear to be much bigger, possibly Gess' specimens, being bred, were a little undersized. I understand that the National Museum has specimens from as far west as Sierra Leone. Many of the specimens in the National Museum have the pair of "heavy blackish longitudinal streaks on the forewing between veins M3 and Cu2" well developed, so that "the total or virtual absence" of these is not a distinguishing feature for *oheffernani*.

I have two females of *oheffernani* from Kampala in my collection, one bred and the other caught at mercury vapour light, and there are certain differences between Gess' description of the larva and mine. The most noticeable is the fact that my larva had a fairly dense coating of short, erect colourless pubescence, which is not mentioned by Gess. Incidentally the larva of *Xanthopan morgani* Wlk. is similarly clad. The other differences are as under:—

	Kampala larva	South African larva
Lateral stripes	All continued onto somite behind.	Not continued onto somite behind, except the 7th.
Spiracle	Purple, narrowly rimmed with white, with a narrow ring of white-speckled purple.	Centred with red.
Horn	Greenish yellow.	Green.
Dorsal stripe	Yellow.	Greenish white.
Sublateral area	4th to 10th somites with white-speckled purple blotches.	Area below spiracles finely maculated.
Head	Pale pinkish brown, an olive brown stripe on each side of median suture and a pale green lateral stripe.	A large proportion of the frons (but not clypeus) orange-brown.

Food-plants — My larva was found feeding on *Spathodea nilotica* (Bignoniaceae). Le Pelley (*Agricultural Insects of East Africa*), under *natalensis*, gives *Markhamia platycalyx* (Bignoniaceae), but in view of Carcasson's remarks this almost certainly applies to *ohoeffernani*. Pinhey (*Hawk Moths of Central and Southern Africa*) gives *Brachystegia* (Caesalpinaceae) for *natalensis*, and this might apply to either species.

The sequence of colour changes in the ovum—from green to black, and then back to green again—is most unusual, I was tempted to write 'unique'. and I know of nothing similar either from published records or from my own breeding experience.—D. G. SEVASOPULO, F.R.E.S., Mombasa, 19.vii.68.

CHRYSOTOXUM VERNALE LOEW (DIPTERA: SYRPHIDAE). A female of this species, stated by Coe to be rare, was taken in the area of Studland Heath National Nature Reserve known as Spur Heath on 1st June 1968.

No other examples of this species were seen at the time.

REFERENCE

- Coe, R. L. Handbooks for the Identification of British Insects, Vol. X, Part I. Diptera Syrphidae. The Royal Entomological Society of London.
—ALAN J. BROWN, 1 Weir View, Charminster, Dorchester, Dorset. 7.viii.1968.

We very much regret to announce that owing to ill-health, Mr Parmenter finds himself forced to give up the office of Honorary Treasurer, which he has filled with such efficiency during the past three years.

The Editor would be very glad to hear of any reader qualified for such a post, who would be willing to take over the duties of the Treasurer as from January 1st next, or earlier if he be willing. An honorarium of £50 per year is paid to the holder of this office.

Will any volunteer for this post please write to the Editor at 54 Hayes Lane, Bromley BR2 9EE, Kent.

GEOMETRIDAE

ARCHIEARINAE

Archiearis parthenias L.: Orange Underwing.

Native. Woods, heaths; on birch. Frequent and recorded from all divisions except 14, 16 (probably present in both), 2, 4, 9, 15.

F. T. Grant (*in litt.*) writes that at Darenth Wood, "they occur only where birch and bracken are present together". A. J. L. Bowes observes that at Denstroude, it flies very wildly, and early in the day comes to sallow catkins; and W. L. Rudland noted is at sallow, Wye, March 23, 1956.

A. M. and F. A. Swain took larvae on birch at Petts Wood, 1951; and Scott (*Proc. S. Lond. ent. nat. Hist. Soc.*, 1955: 73) records larvae beaten from birches, Bourne Wood, May 28, 1955. Kidner (*Diary*) noted larvae, St. Paul's Cray Common, May 31, 1919, and at Farningham Wood, June 9, 1929.

VARIATION.—In RCK are: ab. *intermedia* Lempke, Darenth Wood, one, 1924, I. Harman; ab. *obscura* Prout, North Kent, one, 1908, one, 1930, Eynsford, one, 1948.

Hyatt (*Entomologist*, 83: 93) records a specimen from Hayes Common, 1948, in which the hind wings are pale cream owing to an extreme scale deformity, but the forewings are normal.

FIRST RECORD, 1831: "I have reared it from a larva taken at Darenth Wood" (Stephens, *Haust.*, 3: 138); as "*A. notha* Hb." (q.v.) in error, the two species having been transposed.

A notha Hübner: Light Orange Underwing.

Native. Woods; on aspen.

1. Birch Wood (Stephens, *Haust.*, 3: 137). West Wood and Shooters Hill, formerly (W. West, in *Wool. Surv.* (1909)). Bromley Common, c. 1935. "kicked aspen trunks one afternoon and took about 30—they fluttered down in pairs" (W. A. Cope *verbatim*). Orpington, 1926, one only (F. D. Greenwood). Petts Wood, 1951, frequent; larvae on aspen (A. M. Swain). Between Farnborough and Chislehurst, one, March 23, 1945; one bred 1947 (S. F. P. Blyth). Farningham Wood (D. F. Owen). Woods near Bromley, flying plentifully, April 11, 13, 15, 20, 1948 (D. Lanktree).

3. Bysing Wood (H. C. Huggins). Kemberland, Broad Oak, flying fairly numerously in the sun, 3-5 p.m., March 14-15, 1945, 12 taken, all ♂♂ (C.-H.).

5. Westerham (R. C. Edwards).

6a. Darenth Wood (Stephens, *loc. cit.*); March 21-23, 1856 (Harding. *Ent. week. Int.*, 1: 11). Chattenden Roughs, rare (Chaney, 1883-87).

7. Detling, several, 1877 (Cave-Brown, *Entomologist*, 10: 162). Westwell (Scott, 1936).

8. Elham (W. E. Busbridge). Reinden Wood, four flying around sallow blossom, April 11, 1948 (A. M. Morley). West Wood, one, April 14, 1949 (Morley, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1949-50: 39).

11. Brethersden (G. V. Bull). Hoads Wood, April 15, 1954 (P. Cue); common, April 11, 1955 (W. D. Bowden); common, 1960 (M. Singleton). Aylesford, 1954 (G. A. N. Davis). Sevenoaks Weald, one, April 1959, twelve, April 7-17, 1960 (E. A. Sadler).

12. Long Rope, Orlestone, April 16, 1934, April 16, 1936, April 14-22,

1937; after dark sits curled up on aspen twigs (A. J. L. Bowes); imagines common, April 10, 1939, a larva on aspen, June 20, 1957 (C.-H.). Orlestone Woods, larvae quite common on larger aspens, June 3, 1965 (R. G. Chate-lain).

13. Tunbridge Wells district,* scarce (R. H. Rattray, in Knipe, 1916). Goudhurst, common (W. V. D. Bolt, *pers. comm.*, 1961).

FIRST RECORD, 1831: Stephens, *loc. cit.*; as *A. parthenias* (q.v.) in error, the two species being transposed.

OENOCRROMINAE

Alsophila aescularia Denis & Schiffermüller: March-moth.

Native. Woods, copses, hedgerows, bushy places, orchards; on oak, apple, cherry, plum, beech, hawthorn, maple. Frequent and found in all divisions. "Generally common" (V.C.H., 1908).

The moth is aptly named, though frequently out by the end of February in Kent. In 1921, Kidner (*Diary*) observed one at Sidcup on January 21, and another in 1913, drying its wings on April 20; and in 1956, W. L. Rudland recorded having seen it at Willesborough as late as April 29.

Theobald (*J.S.-E. Agric. Coll., Wye, 1908* (17), 105) reported it as a fruit pest in Kent in 1908; and Masee (*Rep. E. Malling Res. Stn., Supplt., 1928-30: 198*) states that "during 1930 this moth was found everywhere in Kent, especially in apple orchards, and in certain centres it caused nearly as much defoliation of apples as the Winter Moth".

I beat the larva at Little Hall Wood, Broad Oak, from young oaks in May 1947, and reared the insect (C.-H.); and Briggs (*Rep. E. Malling Res. Stn., 1955: 143*) records the larva as common at East Malling on apple, cherry, and plum. D. R. M. Long has taken the larva on beech and hawthorn at Bromley, on oak at Ham Street, and on maple at Eynsford.

FIRST RECORD, 1861: Lewisham (Fenn, *Diary*, 2.iv.1861).

GEOMETRINAE

Aplasta ononaria Fuessly: Rest Harrow.

Resident, perhaps native. Coastal sand-dune and chalk, shingle beach; on *Ononis arvensis*. Extremely local in 4, 8, 15; casual in 5, 16.

A second generation, probably partial, was observed in 1945, 1947, 1949, 1950, 1952, and 1959. The species is not known to breed outside Kent, but odd imagines have occurred at Burley, Hants, 1909; Tilgate, Sussex, 1947; and Southsea, Hants, 1959.

4. Sandwich.—Has occurred on the sandhills in a number of scattered colonies ranging over a distance of about 3 miles, and except in 1947 when it appeared in the town, has never been taken more than a few hundred yards from the coastline.

First noticed here on July 12, 1923, when H. G. Gomm (*Entomologist*, 57: 112) took a ♀ on St. Georges golf-links. Not observed again in this division until June 20 1947, when R. P. Demuth (*in litt.*) saw about 20 at light and "many more sitting inverted on grass stems" just south of Princes Links Club House. On August 19, 1947, G. H. Youden (*in litt.*) found second generation insects on the sandhills and in the town: "they swarmed to my car lights and were flying round the street lamps at Sandwich—I must have seen over 100"; and this same observer writes that on June 26 that year, one was taken at the Deal end of the sandhills.

On July 2, 1949, in a small area of golf course rough, I counted some 70 imagines in about 2 hours, but noticed that the strength of this colony showed a marked decline in after years, and at the same time the *Ononis* at this spot tended to become overgrown by grasses and other plants (C.-H.).

J. A. Parry (*in litt.*) found larvae plentifully in May 1948, on *O. arvensis* just north of the club-house, where he says they show a marked preference either for very young plants or those low on the ground, and in sheltered positions with sunny aspect. R. P. Demuth (*in litt.*) found larvae where he discovered the moth and says: "May 30, 1948 . . . we got about 60 in two hours. It was sunny and they were sitting on the tops of the sprays of rest harrow . . . they varied from half to full grown".

In 1950, A. M. Morley noted a fresh ♀ on September 16, an abnormally late date even for the second generation; and in 1959, P. B. Wachter observed second brood specimens plentifully on August 29. An exceptionally early occurrence is of a single ♀ that I noted in 1952, on June 15 (C.-H.).

The records show that *ononaria* was seen here annually from 1947-61; also most years since, though less numerously. 1963: May 26, eight larvae (G. Haggett); June 30, July 14 (3) (P. Gummer). 1965 and 1966: Several noted both years (B. K. West). 1967: July 2 (one) (C.-H.).

5. Westerham, one taken at house light, August 19, 1947 (R. C. Edwards).

8. The moth was first seen in Britain in 1866 by B. Piffard (*Ent. mon. Mag.*, **3**: 110), who wrote: "On or about the 18th of July last, I captured a specimen of *A. ononaria* in the Warren at Folkestone, amongst *Ononis arvensis*".

Folkstone. — 1869: July, two taken in the Warren by F. O. Standish (Standish, *Entomologist*, **4**: 323). N.d.: F. O. Standish is stated to have taken another here (S. Webb *teste* Fenn, *Diary*, 19.ix.1884; Briggs, *Ent. Rec.*, **8**: 13). 1871: June, ♀ taken by W. Purdey (Purdey, *Ent. mon. Mag.*, **8**: 92; Briggs, *Entomologist*, **29**: 128). N.d.: Two taken by Mr. Holiday (Briggs, *Ent. Rec.*, **8**: 13). 1900: July 1, two taken in the Warren by J. P. Barrett (Porritt, *Ent. mon. Mag.*, **53**: 70).

The species was not seen again at Folkestone until June 26, 1937, when A. M. Morley (*Entomologist*, **71**: 145) took three moths in the Warren, and during the following few days seven more, a number of ova, and on August 7 three larvae.

The records show that except during the period 1941-44 when the area was closed to the public, *ononaria* was seen annually in the Warren from 1937-60 inclusive; and about 1948 at least nine colonies were known to exist over a range of about 2 miles, some of which were later obliterated by roadmaking and cliff falls. Though much less often noted during the past decade, the moth still occurs here, has almost certainly done so for at least the past thirty years, and indeed may well have been present at this locality for a very much longer period. Single specimens were observed by me, July 23, 1963, July 12, 1968 (C.-H.).

Shepherdswell near Dover.—1947, single specimens taken by G. H. Youden at light, August 18, 22 (G. H. Youden).

15. Dungeness.—1932, one taken August 20 (Hughes, *Entomologist*, **69**: 107). 1934, one taken by R. P. Demuth, August 6 (R. P. Demuth *in litt.*) (1935 is given in error in *Entomologist*, **69**: 107). Between New Romney and Dungeness, a "small colony was discovered on Romney Marsh" in

1949, by F. C. Stanley (Morley, *Trans. Folkestone nat. Hist. Soc.*, **1949-50**: 18). Lydd-on-Sea, one, July 3, 1957 (Wakely, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1957**: 15).

16. Folkestone Town, one in m.v. trap, August 29, 1952 (Morley, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1952-53**: 42).

[The following records need confirmation. Four in Burney coll. sale. erroneously stated to have been taken by Piffard, in the Warren, July 1866 (*Entomologist*, **27**: 104, 135). One, "taken at Folkestone, 3rd August 1877 by C. Bailey", in C. E. Fry sale, and previously unrecorded "wants looking into" (*Entomologist*, **29**: 127; *Ent. Rec.*, **7**: 317). ♀, in Dale coll., labelled "Folkestone 1867 Mr. C. Woods" (*Ent. mon. Mag.*, **45**: 176)]

VARIATION.—There is considerable variation in my series, particularly in regard to colouration. On the average, Folkestone specimens are noticeably darker than those from Sandwich, and *ab. rubraria* Prout which has frequently occurred at Folkestone, is relatively seldom observed at Sandwich. On the other hand, I have a number of examples from Sandwich in which the normal dark suffusion is almost absent and the specimens are of a rather uniform ochreous appearance; and one from here in which the suffusion is markedly spotted and of a pale greyish-brown. Second generation specimens tend to be appreciably smaller and frequently show traces of a third forewing fascia, and in one such specimen from Folkestone this is quite clearly marked and thus conforms to *ab. trifasciata* Stauder.

FIRST NOTICE, 1866: Piffard, *loc. cit.*

***Pseudoterpna pruinata* Hufnagel ssp. *atropunctaria* Walker: Grass Emerald.**

Native. Heaths, gravel pits, shingle beach; on broom, gorse. Local, and mainly (if not wholly) absent from the chalk. Apparently a partial second generation some years.

1. Near Sydenham, 1859 (Cox, *Ent. week. Int.*, **6**: 188). Chislehurst (Cockerell, *Entomologist*, **16**: 233, **18**: 56); (S. F. P. Blyth); larvae, May 22, 1920, June 8, 1926 (Kidner, *Diary*). Erith, common, July 5, 1883, common, June 29-July 29, 1884; St. Paul's Cray, one, July 21, 1890 (Fenn, *Diary*). Shooters Hill; Blackheath; Lee; larvae on broom and furze (West, *Ent. Rec.*, **18**: 172). Dartford Heath (James, *Entomologist*, **25**: 67); young larvae fairly plentiful, August 30, 1932 (Kidner, *Diary*); very common (B. K. West); 1953 (A. S. Wheeler). Bexley; Farnborough; Keston (Wool. Surv., 1909). Ruxley near Sidcup, larvae, May 10, 1927, May 25, 1928; Keston, larva, June 11, 1923 (Kidner, *Diary*). Hayes, five moths high up on pine trunks early one morning, odd ones since (W. A. Cope); one August 7, 1947 (J. F. Burton). Petts Wood, singletons at light annually, 1947-50 (E. Evans); one, July 25, 1953 (A. M. and F. A. Swain). West Wickham, 1951 (E. E. J. Trundell). Abbey Wood, 1952 (A. J. Showler). Bromley, 1959 (1), 1962 (1), 1963 (1), 1965 (4), 1966 (1) (D. R. M. Long).

3. Broad Oak, one at light (C.-H.).

4. Sandwich, one, 1964 (D. G. Marsh).

6a. Chattenden, one, July 16, 1869 (J. J. Walker MS.); (Chaney, 1884-87). Darenth Wood (G. Law). [Chattenden] (Porritt, *Entomologist*, **7**: 181). Greenhithe* (Farn MS.).

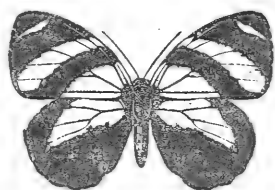
7. Syndale Valley (H. C. Huggins). Boxley, one in Maidstone Museum (C.-H.); 1953 (A. H. Harbottle).

10. Brasted (Adkin, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1901**: 23);

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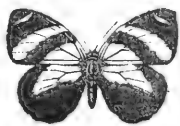
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THE RESPONSE to previous announcements regarding above has been so exceptional that the stock of most numbers has been reduced to the required level and the offer of "sale prices" has now been withdrawn.

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LEPIDOPTERA OF KENT, VOL. II

This comprehensive work was completed with the instalment in our May issue and a limited number of separates, unbound, with stiff paper cover, is available for sale at 45/- per copy from The Editor, 54 Hayes Lane, Bromley BR2 9EE, Kent. (Postage extra)

CHANGE OF ADDRESS

- A. J. Showler, now of 12 Wedgewood Drive, Hughenden Valley, High Wycombe, Bucks.
- G. Botwright, now of 30 Valley Road, Newhaven, Sussex.
- J. Briggs, now of Frimley House, Deepdale Close, Slackhead, Beetham, nr. Milnthorpe, Westmorland.
- J. A. C. Greenwood, now of The Thatches, Forest Road, Pyrford, Woking, Surrey.
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-

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THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

(Founded by J. W. TUTT on 15th April 1890)

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All material for the TEXT of the magazine must be sent to the EDITOR at 54 Hayes Lane, Bromley, Kent.

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THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

Edited by S. N. A. JACOBS, F.R.E.S.

with the assistance of

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By T R E Southwood and Dennis Lester



Maruca testulalis (Geyer). × 2. Photo. by D. J. Carter



Male genitalia of *Erebia inuitica* Wyatt. (Holotype
Endicott Mountains, Alaska, 28th June 1965.
Magnification x18. Mounted by B. C. S. Warren, slide No. 2591

Some structural characteristics of *Erebia inuitica* Wyatt

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

In 1966 Mr. Colin W. Wyatt published a brief description of an unrecognised species of *Erebia* from Alaska. (Zeit. Wiener Ent. Gesell. Jg. 51, pp. 93, 94, 1966.) He only possessed one male specimen which was among a number of butterflies collected for him by an Eskimo boy. When Mr. Wyatt came to set the specimen he recognised that it was an undescribed species and kindly sent it to me to examine with permission to dissect it. This readiness to make use of a unique specimen in order to obtain accurate knowledge of its true nature, rather than retain it intact in his collection as "probably"—is characteristic of Mr. Wyatt.

On looking at the specimen of *E. inuitica* I at first wondered if it could be an Alaskan form of the little-known Asiatic *E. kindermanni*. The resemblance was suggested by comparison of the specimen with the photographs of the female *E. kindermanni* in my Monograph of the genus (see figs. 1630 and 1631). These photos are practically the same size as the male *E. inuitica*. The figure of the latter with the original description was considerably enlarged, which I feel was unfortunate, for in my experience such enlargement always gives a somewhat misleading impression and hinders recognition. Dissection, however, showed *E. inuitica* to be a species close to *E. christi*! The body of the specimen had been somewhat damaged and the genitalia broken, but I was able to make a serviceable mount of it, a photograph of which is shown on the plate accompanying this note. The magnification of the photograph is $\times 18$ diameters, the same as used in my works for all photographs of the complete (entire) male genitalia (when taken by myself), regardless of the size of the species.

On comparing the photograph of *E. inuitica* with fig. 279 in my Monograph (*E. christi*), the similarity of the two will be obvious. Had the new species been found anywhere in the European Alps one could scarcely have done other than accept it as a race of *E. christi*. Yet I feel this would have been mistaken. It is a case which points to the importance of the less obvious structural differences in the genitalia of the *Erebia*. The two species belong to the "*Epiphron*-Group," of which there are only two Asiatic representatives: *E. kefersteini* and *E. kindermanni*. Both are clearly distinct from *E. inuitica*, their claspers are shorter with the terminal neck thicker and blunter, the spine "system" of the claspers markedly different; the last a most important character in *Erebia*. The dorsal structures are also distinctive. Only two species of the group have a somewhat similar spine system to *E. inuitica*, of these, as noted, *E. christi* is the most so. The spines in *E. inuitica* are all of a coarse type, and are distinctly separated everywhere. In the two Asiatic species the spines situated proximally are coarse and well separated, those distally are extremely fine and practically touching: the latter feature is characteristic of very fine spines in all species of the group. The variation that always is present in the actual sizes and forms of the spines never affects the nature of the system, which remains constant. This holds in all groups of *Erebia*.

E. inuitica differs from *E. christi* by the greater length of the combined head and neck of the claspers, which is also narrower and terminates more rounded. In *E. christi* the termination is broad. The uncus in *E. inuitica* is slightly heavier, blunter and thicker at the tip, while the brachia curve sharply up at their extremities, a feature that does not appear in any other species of the group. These characters may be considered slight to uphold the two species as distinct, but it must be remembered that the characteristic differences in many species of the group are not visibly extreme, but they have been proved constant when we have plenty of specimens to examine. Further one must remember the immense geographical distance that separates the two species and the very restricted distribution of *E. christi* in the Alps and the fact that no intermediate form exists (so far as known), in Asia.

I have thought it well to publish this photograph of the genitalia of the holotype of *E. inuitica*, in spite of the slight damage, for it is more than likely that other specimens of this species will be found in other districts of Alaska or the N.W.T., or may actually exist in some museum collection or even in private collections. There is no possibility that after dissection *E. inuitica* could be mistaken for any other species. I may add that there is also no possibility this specimen could be an hybrid, for all the species known to occur with *E. inuitica* (i.e. *E. rossi*, *E. fasciata*, *E. disa*, *E. youngi*), have genitalia of a very specialised formation, a cross between any of these could not result in structures making the least approach to those characteristic of the *epiphron*-group species.

Maruca testulalis (Geyer): "The Bean Pod Borer" (Lep.: Pyralidae) bred out at East Malling from French Beans

By J. M. CHALMERS-HUNT.

Dr. G. H. L. Dicker of East Malling Research Station, showed me two specimens of a Pyralid moth which were bred from larvae feeding on the immature seeds in pods of French beans. He informs me that the beans had been imported as a trial consignment of out-of-season fresh vegetable from Malawi, Africa, and that he received the larvae on April 3, 1967, when they were in the final instar. The adults emerged three weeks later. Dr. Dicker adds that being an internal feeder, the Pyralid was overlooked, and it also survived whatever disinfestation treatment was applied whilst the consignment was in quarantine.

I submitted the moths to Mr. P. E. S. Whalley (British Museum, Natural History), who kindly determined them as *Maruca testulalis* (Geyer), a pest species of cosmopolitan distribution, but so far as is known, not previously noticed in Britain, Zimmerman (*Insects of Hawaii*: 56-58), who figures the insect well, and gives an informative account of the species, cites the following host plants: *Cajanus indicus*, cowpea, garden beans, garden peas, *Gliricidia sepium*, hyacinth bean, lime beans, *Maoma urens*, pigeon peas, (also blossoms), *Sesbania grandiflora* (in fresh and without flowers), *S. tomentosa* (in flowers), and probably a number of other legumes.

I wish to thank Mr. D. J. Carter (Br. Mus., Nat. History) for the excellent photographs of the East Malling examples.

Atropos and the Bees

By AN OLD MOTH HUNTER

Why Linne should have given this handsome moth such lugubrious names I know not: Acheron was associated by the ancient Greeks with a stream in the nether world on the banks of which the shades of departed persons wandered. Atropos* was one of the three Fates, those unseemly women whom Macbeth encountered on a blasted heath near Forres. She was described by the ancients as a hideous old woman with a limp, the purpose of the limp being suggestive of the slow march of Fate—so 'tis said. But those of us who have shouldered the musket know that so far from being slow she travels a good deal too fast at times, even though we ourselves have dodged the scissors with which she cuts the thread of life.

On his thorax—for Linne's Atropos was male as well as female—the Death's head has an object the shape of a skull with two dots which suggest orbits; but the crossed thigh-bones beneath, which would have proclaimed his piratical habits are missing. And just because he bears this device on his back he has earned such a reputation as a marauder that most rustics kill him at sight.

Yet the only crime that has ever been fathered upon him is the robbing of beehives, and so firmly has this thievish habit become attached to him that it has been repeated in ninety per cent. of the books about moths. None of the English authors doubts it.

Barrett repeats the tale but gives no references. "It is strongly attracted by honey," says he, "but prefers to take it in larger quantities than flowers supply, and is well known to enter beehives for this purpose. It has even been caught while hovering about hives, and instances are well known in which it has been securely fastened down inside the hive, and completely covered with wax by the indignant bees. This, however, is a rare circumstance, and possibly only occurs when the moth has happened to die within the hive . . . the stridulous voice of the moth has been observed to arrest and control bees in a manner similar to that produced by the voice of their queen . . ."

Kirby and Spence, in 1818, referred to Kühn, who related a tale about some monks who kept bees, and noticing one evening that there was a kerfuffle going on in one of the skeps, lifted it up to see what all the fuss was about, whereupon an animal, which they took to be a bat, flew out. Apparently they were able to catch the intruder, who proved to be our friend Atropos.

Obadiah Westwood also appeared for the prosecution. In 1848 he wrote: "Another peculiarity connected with the history of this moth consists in its attacking bee-hives. It is singular that a creature with only the advantage of size should dare, without sting or shield, singly, to attack in their strongholds these well-armed and numerous people; and still more singular, that amongst so many thousands of bees it should always contend victoriously. Hüber, who first noticed the fact asks. "May not this moth—the dread of superstitious people—also exercise a secret influence over insects, and have the faculty, either by sound or by some other means, of paralysing their courage?"

*Since Greek is not taught in schools nowadays I hope I shall not be thought priggish if I mention that the accent is on the 'At', and on the 'Ach' (Ak) in Acheron

More recently (1948) Dr. Skat Hoffmeyer wrote that *Atropos* "can often be taken round beehives. They stay in the hives for only a few minutes and the bees do not do them any considerable harm. In Denmark *atropos* is often found near beehives, both alive and dead; so it is possible that the bees are successful sometimes after all." (*De Danske Spindere*, p. 16).

So much for the prosecution. Now for the defence. It is, I admit a weak one, but it is put up by two writers for whom I have great respect, two astute and acute observers who took very little on trust and certainly would never have placed any confidence in an Old Wives' Tale. Here is what Mm. Gélin and Lucas said about *A. atropos* in their excellent conspectus of the Lepidoptera which occur in Western France (1911):—

"The captures of *atropos* in beehives have given rise to a belief which appears to be without foundation. The moth has been accused of regaling itself with bees' honey. However, so far as we are aware this moth has never been captured at sugar, whereas other *Sphinx*, notably *elpenor*, have taken by us at sugar on several occasions."

Browsing on some old copies of *The Zoologist* recently I came across a first-hand and excellent account of an *atropos* not only observed, at close range, flitting round a beehive but actually entering it and disappearing inside, where it remained for some minutes. More, the moth was observed to reappear and was netted as it emerged. It is in the issue of that magazine for November 1869, Second Series, vol. 4, No. 50, page 1913, and the observer was the Reverend Charles A. Bury. Here it is. I have compressed it a little and omitted one or two flowery passages.

"I have read, as has everyone else who is conversant with bee literature, certain remarkable doings of the death's-head moth, of its love of honey in general and of its boldness in particular in entering bee hives and regaling itself uninvited on the stores laid up by the bees for their own and their master's benefit. I have read, too, that on the bees assailing the intruder the moth has the tact to utter certain sounds so nearly resembling those emitted by the queen bee that the angry attackers immediately fall back and allow the visitor to leave their hive unmolested after satisfying himself with a fabulous quantity of honey.

"Now, as this remarkable proceeding has been stated as a fact by men of veracity and careful observation it is not fit for the likes of me to doubt its correctness. Nevertheless, it is always pleasant to verify by one's own experience the observations and assertions of others.

"My beehives occupy a sort of balcony just outside the window of my study, situated on the first floor, and as I sit at my open window the busy hum of my industrious little neighbours sounds pleasantly. Well, on the 15th of June I resolved to 'raise' one of those hives, which was crowded with bees that seemed indisposed to 'swarm.' The process of 'raising' consists in placing a flat-topped hive beneath the stock-hive with a connection between them. To effect this I had to mount a ladder and face the bees—not exactly the most pleasant situation to be in! I succeeded, but the bees were not too well pleased and poured out in a continuous stream, covering the entire front of the hive. Few took wing, for it was now twilight.

"While watching their proceedings from the ladder something so like a bat flitted round that it did not attract my particular notice; but on descending the ladder and going up into my study I leaned my head out of the window to within a foot of the entrance of the hive, and then I saw what I could not fail to recognise as a death's-head moth flit backwards and forwards once or twice before the hive, dash at the entrance, force its way through the cluster of bees, and disappear within!

"I had only a small net intended for landing trout not catching moths to help me capture the intruder; so rigging this up I waited anxiously, with the net close to the hive, to intercept the moth when it emerged. In about five minutes the death's-head came out in no small bustle, as I thought—for it was now almost dark—with five or six bees hanging on to its legs. Instead of taking wing the moth scrambled, fast enough, over the cluster of bees to the top of the hive, and my net was instantly over it. The bag of the net, however, fell over the cluster, and though I had the moth safely within I had also some hundreds of bees within and without the net and hanging in its meshes. The consequence was that I could neither catch the moth with my fingers nor bring the net into my room, and after running round and round in the net with marvellous celerity my prisoner effected its escape—it was off like a shot.

"Next evening I kept watch and ward for my friend the death-head, and at last it appeared, dashed against the window, and I saw it no more. I must add that I had distinctly heard certain sounds which I can best describe as rather musical squeaks coming from apparently inside the hive while the moth was in it; but whether those sounds resembled the notes, real or imagined, of the queen bee I cannot tell, never having succeeded in catching the sounds attributed by others to her majesty.

"Now for the sequel. This morning, 2nd of October, I was arranging a piece of carpet with which the above-mentioned hive had been covered all the summer as a protection from rain, when lo and behold! between the folds, sleeping perhaps the unquiet sleep of satiety, there lay the moth—at least a moth of the same species, and since this species is by no means common with us I have little doubt it was the same insect. It is the finest British specimen I ever set eyes on. As it has never been seen flying round the hive since 16th June, I more than suspect I have afforded this lover of honey a lodging as well as board all these months; in fact that my lodger descended every evening, entered the hive, made a hearty supper, and then quietly went up to bed again in the old carpet.—C. A. BURY."

One hesitates to pour cold water on the pleasant little sequel; but it seems unlikely that the moth found on 2nd October was the one which raided the hive on 15th June. If it had gone "to bed again in the old carpet" every evening from 16th June to 2nd October it might have become somewhat 'rubbed' and then Mr. Bury would not have described it as "the finest British specimen I ever set eyes on." The June moth (or another June immigrant) perhaps laid eggs on a potato patch nearby and died shortly afterwards, the October specimen having resulted from one of those eggs.

* * * *

What I now want to know is:—(1) Can the male or female *A. atropos*, or both, emit a scent which either pleases or repels bees?; (2) Can the moth's squeak repel or please bees?; (3) Is the moth's squeak of the same

pitch and timbre as a note emitted by a queen bee?; (4) Does a queen bee emit any note at all?; (5) Is *A. atropos* immune from bee-sting?; for it seems plain that a moth that had no means of protection would soon be stung to death inside a hive, long before it had time to make a substantial meal of the stored honey.

Lubbock (*Ants, Bees and Wasps*, 1929, pp. 220 *seq.*) asserts that bees possess "a keen sense of smell." Were the "five or six bees" which were "hanging on to its legs" savouring the moth's scent when the June Death's-head emerged from Mr. Bury's hive? Lubbock also states that "it is generally considered that to a certain extent [bees] . . . possess the power of hearing"; yet he could not obtain any response by bees to "tuning-forks extended over three octaves" nor to shrill whistles nor to a violin; moreover his experiments with colours offer no solution to the problem so far as concerns the colouration of the moth.

Any suggestions, please, from those who really do know something about bees, which I do not?

*For the chemistry of bee-stings (apitoxin) see Wigglesworth (*Insect Physiology*) indexed under 'venom'.

The Macrolepidoptera of Stirlingshire and South Perthshire

(Notes and additions to the list published by D. L. Coates, *Entomologist's Record*, Vol. 80, No. 1, p. 7 and No. 4 p. 104)

By GEORGE THOMSON

So often in the standard works on our butterflies and moths do we come across the names Rannoch, Aviemore, Inverness and (for some obscure reason) Roxburgh that one would think that the creatures did not exist elsewhere in Scotland or that nobody bothers to collect outwith these sacred areas—which might be very close to the truth. It was, therefore, pleasing to see the name Stirling appear in our literature. However, contrary to what Mr. Coates might think, his was not the first comprehensive list from this part of the country. The Stirling Natural History Society (now existing in the form of an Archaeological Society) published in its Transactions (XV 1927-1930) "The Butterflies and Moths of Stirling and District" by Morris and Allan McLaurin, being a list of the Macrolepidoptera found between 1919 and 1928 within a radius of twelve miles of Stirling by the brothers. My experience of this part of Scotland is extensive as far as the butterflies are concerned, but it is only since May 1967 that I have run a Rothamstead Light Trap in my garden. I have collected in the countryside around Dunblane since childhood, particularly on Sheriffmuir, but in the last six years I have explored most of the countryside in the south west corner of Perthshire.

My records, together with those from the paper by the McLaurin brothers make a valuable supplement to Mr. Coates' list. However, for convenience, I have listed only those species which were not included in that list or where additional comments are necessary. In concluding it should be noted that, though Mr. Coates defined his area as that within a radius of twenty miles of Stirling, he includes quite a number of

records from Balmaha (almost twenty-five miles from the centre) and Findo Gask (twenty-one miles away)—hardly in "Stirling and District". For this reason, I have preferred to refer to the areas as Stirlingshire and South Perthshire.

(The letter 'M' is used to indicate that the insect was recorded by the McLaurin brothers, i.e. from within twelve miles of Stirling.)

SATYRIDAE

Maniola jurtina L.

The form in Dunblane approaches sub-sp. *splendida* B. White and has included one ab. *anommatata* Vty.

Coenonympha tullia Müll.

Very variable, sometimes approaching sub-sp. *scotica* Stgr. or *philoxenes* Esp. Also at Letham.

Aphantopus hyperanthus L.

Loch Vennacher—has included both ab. *arete* Müll and ab. *lanceolata* Shipp.

NYMPHALIDAE

Clossiana selene Schiff.

Found in scattered localities throughout the area, but subject to local disappearances.

C euphrosyne L.

One specimen taken on 14.vi.68, Trossachs.

Messoacidalia charlotta Haw

Sheriffmuir and other localities near Dunblane.

M. charlotta scotica Watkins

Loch Vennachar.

Vanessa cardui L.

Two specimens taken Dunblane 1966.

LYCAENIDAE

Polyommatus icarus Rott.

Widespread and common.

Lycaena phlaeas L.

Usually common, sometimes very common—about 20% *coeruleopunctata* Ruhl.

Thecla quercus L.

Larvae found by Dr. C. W. N. Holmes near Loch Chon.

Callophrys rubi L.

Found in almost every locality where Blaeberry (*vaccinium*) abounds.

SPHINGIDAE

Acherontia atropos L.

One specimen found at Balquhiddar Station in the 1950's.

Hippotion celerio L.

One dead specimen of this moth was found by Mr. J. C. Metcalf in his garden at Milngavie—probably a 1965 arrival.

LASIOCAMPIDAE

Macrothylacia rubi L.

Very common, Sheriffmuir.

Lasiocampa quercus callunae
Palmer.

M

Philudoria potatoaria L.

M

ARCTIIDAE

Phragmatobia fuliginosa L.

Fairly common, Dunblane and Callander.

Parasemia plantaginis L. Very local, Dunblane.

DREPANIDAE

Drepana lacertinaria L. M

LYMANTRIIDAE

Orgyia antiqua L. M

Dasychira fascelina L. M

NOCTIDAE

Agrotis trux lunigera Stephens. M

Amathes agathina Dup. M

Anarta myrtilli L. Common on heather moors throughout area.

Hadena rivularis Fab. M

Heliophobus calcatrippae View. M

Apamea oblonga Haw. M

Meristis trigrammica Hufn. M

Euclidimera mi Clerck Found in many suitable places, including Sheriffmuir, Loch Venachar and Carron Valley.

GEOMETRIDAE

Cosymbia albipunctata Hufn. M

Xanthorhoë munitata Hübn. Common around Dunblane.

X. spadicearia Schiff. M

Ortholitha mucronata Scop. M

O. chenopodiata L. Very common in South Perthshire.

Colostygia pectinataria Knoch. Uncommon but found in most of the area.

Earophila badiata Schiff. Very common, Dunblane.

Perizoma albulata Schiff. One only, Dunblane.

Lampropteryx suffumata Schiff. Very common near Bridge of Allan.

Triphosa dubitata L. M

Chesias rufata Fab. Found uncommonly throughout area.

Carsia sororiata anglica Prout. M

Gymnoscelis pumilata Hübn. M

Oporinia christyi Prout. One only, Dunblane.

Operophtera brumata L. Not uncommon, Dunblane.

Hydrelia flammeolaria Hufn. M

Venusia cambrica Curtis M

Selenia tetralunaria Hufn. One specimen taken, Dunblane on 12.vi.68.

Poecilipsis lapponaria Boisd. M

Ectropis biundulata Vill. Very common near Bridge of Allan.

Gnophos obscurata Schiff. M

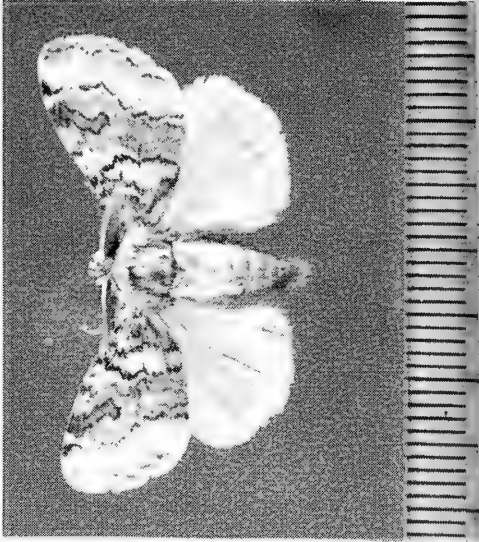
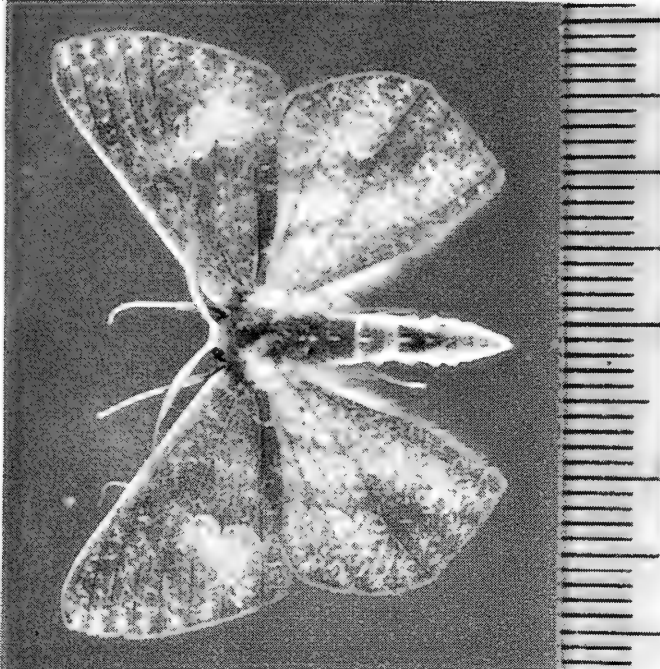
G. obfuscata Schiff. M

Itame wauaria L. Very common, Dunblane.

Chiasmia clathrata L. Very common in most of area — abundant around Dunblane.

Dyscia fagaria Thunb. Very common, Flanders Moss.

Perconia strigillaria Hübn. M



Top left.—*Othreis paulii* sp.n. ♀. Top right.—*Thatassodes figurata* sp.n. ♀.
 Lower left.—*Plusia illuminata* sp.n. ♂. Lower centre.—*Maceda sarura* sp.n. ♀.
 Lower right.—*Dasychira nandarivatu* sp.n. ♀.

HEPIALIDAE

Hepialis sylvina L.

M

H. hecta L.

M

98 George Street, Dunblane, Perthshire. 17.vi.1968.

Some New Species of Lepidoptera from the Fiji Islands

By G. S. ROBINSON, F.R.E.S.

(Department of Zoology, University of Durham)

During studies of the Fijian macrolepidoptera by H. S. Robinson and myself, several new species have been found. Four new species are described below and an infra-subspecific name is raised to species rank. All type material and genitalia preparations have been deposited in the British Museum (Natural History), hereafter referred to as B.M. (N.H.). Scale lines on the drawings below are all of 1 mm.

Many of the type specimens were taken at Nandarivatu, a locality over 1100 metres above sea level in the north of Viti Levu, about 25 miles from the north coast. This is an area of primary montane rain forest which is only now being exploited by the Department of Natural Resources as an area suitable for the planting of conifers. Most of the forest around Koro-O is as yet unaffected.

Maceda savura sp.n. (Noctuidae, Westermanninae)

Male: Abdomen black; antennae, palps, head and thorax olive-brown; fore and midlegs brown banded with white at articulations; hindlegs white with brown bands; underside of body, coxae and femora of all legs white. Forewing olive-brown dusted with purple; purple occasionally concentrated in medial band and spreading to lower termen; subterminal line of vague purple dots; two transverse purple median bands equidistant from small purple reniform. Hindwing black, two conspicuous large white dots in middle of costa and middle of termen both extending to edge of wing. Male genitalia: (Fig. 1) Valve dilated at apex, furnished with long hairs; clasper short, unspecialised; uncus simple; aedeagus with a group of fine spines at tip.

Female: Similar to male.

Diagnosis: There appears to be no significant difference between the genitalia of *M. savura* and *M. mansueta* Walker (List Specs. Lep. Het. Brit. Mus. 13. 1141, 1857) the only species of *Maceda* close to it. The only difference is in the presence of the two white hindwing dots which are a constant character in *savura* but which in *mansueta* are represented only by a diffuse white mark on the termen. *Savura* is larger than *mansueta*, having a mean wingspan of 34 mm. (♂) and 36 mm. (♀), whereas *mansueta* is 3 mm. smaller.

Distribution: Fairly common in Suva, Nausori and Nandarivatu, all localities on Viti Levu. There is a series of *savura* in the B.M. (N.H.) collection, all labelled "Tinchialit, N. New Caledonia, E. Cheesman." There are no specimens of *mansueta* from New Caledonia but it does occur sparsely in Fiji. Thus it seems that *savura* is a west Pacific off-shoot species from *mansueta*, which possibly evolved in Fiji then spread to New Caledonia.

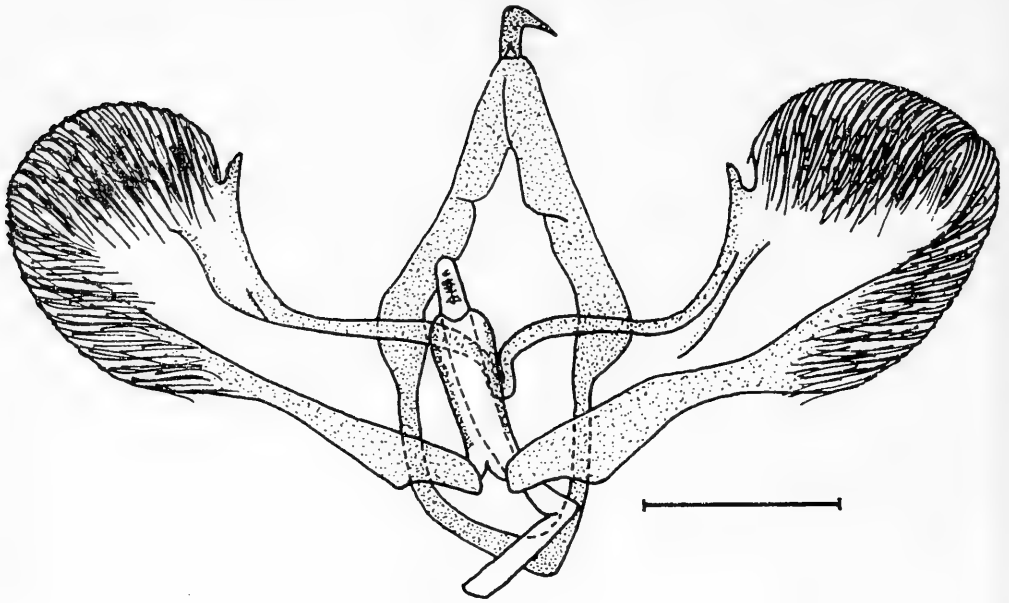


FIGURE 1

Holotype: ♂ Koro-O (Nandarivatu), 6.ix.1967, H. S. Robinson. In B.M. (N.H.).

Paratypes: ♀ Koro-O, 6.ix.1967, at M.V., H. S. Robinson. In B.M. (N.H.). ♂ "Fiji", January 1967, at M.V., H. S. Robinson. In B.M. (N.H.).

Plusia illuminata sp.n. (Noctuidae, Plusiinae)

Male: Head, thorax and legs bronze-brown, abdomen paler. Two conspicuous lateral tufts of black hairs and large tuft of black hairs covering tip of abdomen. Corema black. Forewing ground-colour black-bronze, iridescent; black dot on termen, terminal fascia grey speckled with bronze; two transverse lines between termen and conspicuous gold dot; median fascia between gold dot and costa, extending to meet inner transverse line; large patch of creamy brown scales extends from base of wing, curving outward to gold dot, touching it in some specimens, and continued to costa; small black rectangle extending posteriorly from subcostal vein, edged inwardly by fine white transverse line, lies in the centre of this patch. Hindwing grey-brown dusted with black at termen, fringed with white scales. Genitalia: (Fig. 2) Simple, valves tapering, with a pair of small projections from clavus tipped with very fine spines; two lightly sclerotised plates on juxta; uncus simple, lightly clothed with fine bristles. Aedeagus bearing nine stout cornuti in the middle and a dozen fine thorn-like cornuti at the base.

Female: Unknown.

Diagnosis: Differs from *Plusia acuta* Walker (List Specs. Lep. Het. Brit. Mus. 12. 922, 1857) to which it bears a superficial resemblance in the possession of black abdominal tufts and corema—in *acuta* they are cream—and in the shape of the valves which in *acuta* have a bulbous tip. The most striking diagnostic features of *illuminata* are the creamy-brown basal wing patch and the black tufts and corema. It is separated from *P. eriosoma* Doubleday (Dieff. N. Zeal. 2, p. 285) by the black tufts

(lacking in *eriosoma*) and the longer uncus and slightly shorter valves. *P. chalcites* Esper (Schmett. Ab. Nat. 4) lacks black tufts and corema and has longer and more slender valves than *P. illuminata*.

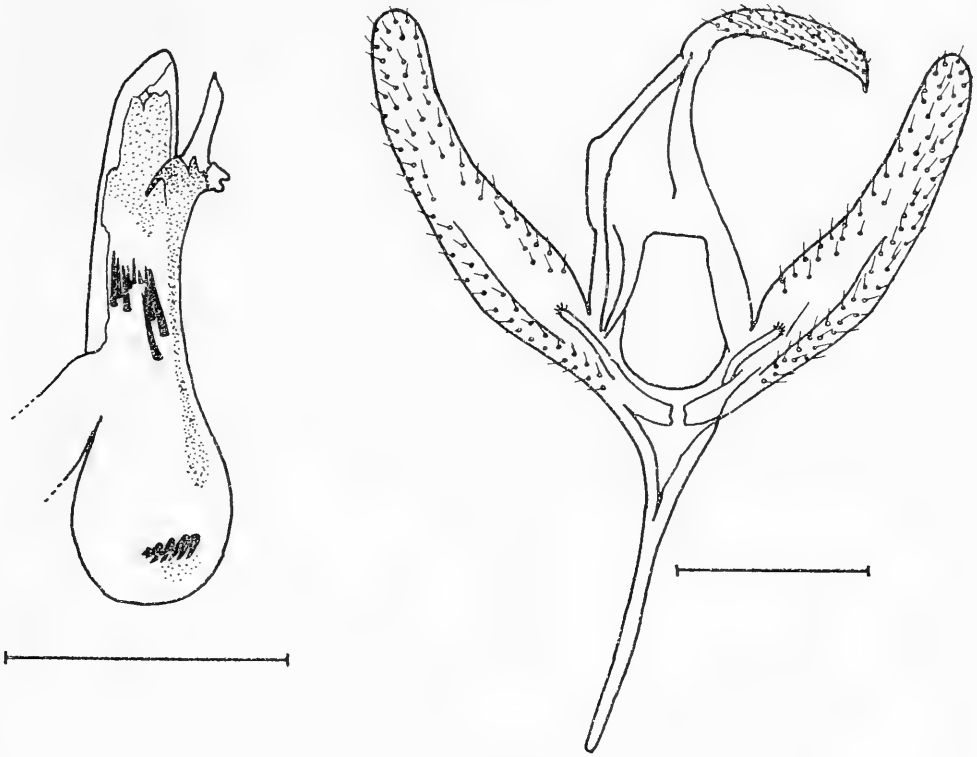


FIGURE 2

The holotype of *Plusia illuminata* was described by Warren (Seitz, *Macrolep*, 3, p. 349) as ab. *illuminata* of *P. eriosoma* but it is clear from the above that Warren's holotype represents a good species and I retain Warren's name, keeping his type specimen as the holotype.

Holotype: (♂) Ninay Vailey, Central Arfak Mts. (New Guinea), 3500 feet, xi.1908-i.1909. In coll. Rothschild, B.M. (N.H.).

Paratypes: (♂) Suva, Fiji. v.1966 at M.V. (H. S. Robinson), in B.M. (N.H.). (♂) Suva, Fiji, ix.1966 at M.V. (H. S. Robinson), in B.M. (N.H.).

Distribution: Known from Suva (Fiji) and from several localities in New Guinea.

Othreis paulii sp.n. (Noctuidae, Ophiderinae)

Male: Head, dorsal region of thorax, upper part of forelegs and palps red-brown; abdomen, underside of head, thorax and forelegs yellow-orange. Forewing olive-green with pale olive-green transverse medial band edged with purple-green; deep terminal band of pale olive-green, tinged with mauve; reniform stigma a small white dot edged with dark olive-green, these dark scales extending in narrow transverse band down middle of medial band from costa to inner margin. Hindwing orange-yellow with large black crescentic mark; termen and apex black with six small terminal white marks between veins. Genitalia: (Fig. 3) Uncus mandibulate: juxta with medial suture, doubly peaked; vesica base heavily sclerotised, set with rows of fine spines; aedeagus with twelve cornuti of varying size.

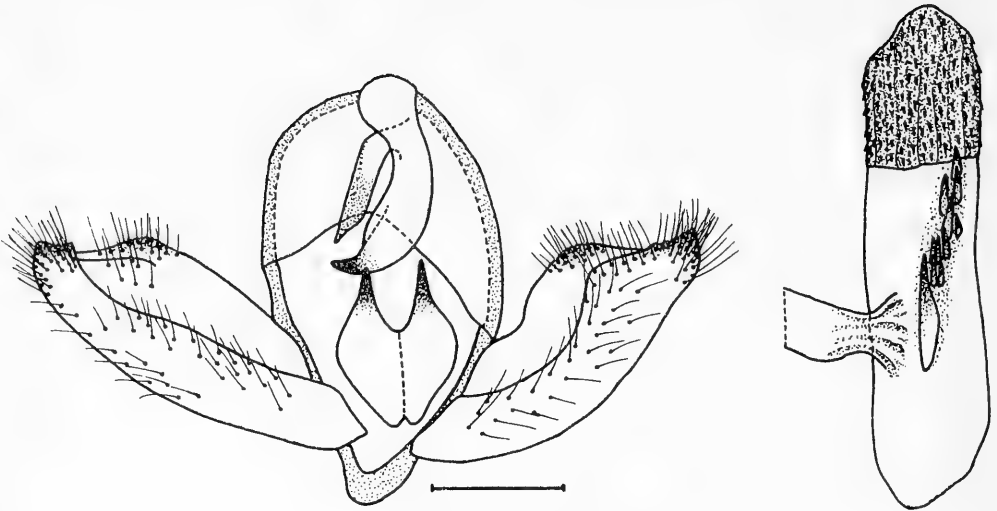


FIGURE 3

Female: Forelegs, palpi and dorsal surface of thorax dark purple-brown and foreleg tibia lacks large tuft of scent-hairs of ♂. Forewing pattern similar to male but ground colour purple, the darker olive-green markings being replaced by black. Whole of forewing mottled with black and lightly speckled with bright green at base and towards inner margin. Hindwing identical to that of ♂.

Diagnosis: The closest apparent ally of *paulii* is *Othreis fullonia* Clerck (Icones II. pl. xlvi, figs. 1-4, 1764).

Both ♂ and ♀ differ from *fullonia* in having a much more oblique apex to the forewing. In wing patterning the ♀ differs from *fullonia*, lacking the large triangular reniform, the posteriorly convergent medial band and the white triangle between the reniform and tornus. The male of *paulii* is similar to that of *fullonia* but the tear-drop shaped reniform stigma of *fullonia* is absent in *paulii*. The best differentiating character in the male is the shape of the juxta; in *fullonia* it is elongated, about 4 mm. long whereas in *paulii* it is shortened, about 1 mm. in length. There are size differences too: ♂ *paulii* have a wingspan of 70 mm., the ♀ 76 mm., whereas the respective measurements of *fullonia* are 91 and 93 mm.

Distribution: Known only from Nandarivatu, northern Viti Levu, Fiji, more than 1100 m. above sea level.

Holotype: ♂ Nandarivatu 5.ix.1967 at M.V. (H. S. Robinson). In B.M. (N.H.).

Paratypes: ♂ Koro-O (Nandarivatu) 6.ix.1967 at M.V. (H. S. Robinson), in B.M. (N.H.). ♀ Nandarivatu 5.ix.1967 at M.V. (H. S. Robinson). In B.M. (N.H.).

This species is named after Mr. D. K. Paul, Assistant Conservator of Forests, Fiji, who made it possible for H. S. Robinson and me to collect at Nandarivatu and to whom we wish to express our thanks for his help and encouragement.

Dasychira nandarivatu sp.n. (Lymantriidae)

Male: Head, thorax and abdomen white speckled with brown; tarsi with brown bands; antennae white with brown pectinations. Forewing ground-colour pale grey; terminal fascia brown; termen with a line of crescentic black spots; subterminal white line parallel to termen edged inwardly by grey transverse band. Medial transverse band brown within a border of narrow white transverse lines edged with black; two black transverse lines at wing base bordering a brown field (black in several of the paratypes). Reniform conspicuous, obliquely elongate, brown edged with black. Hindwing grey with pale brown subterminal line. Wingspan: Type—34 mm. Mean of 9 males—34 mm.

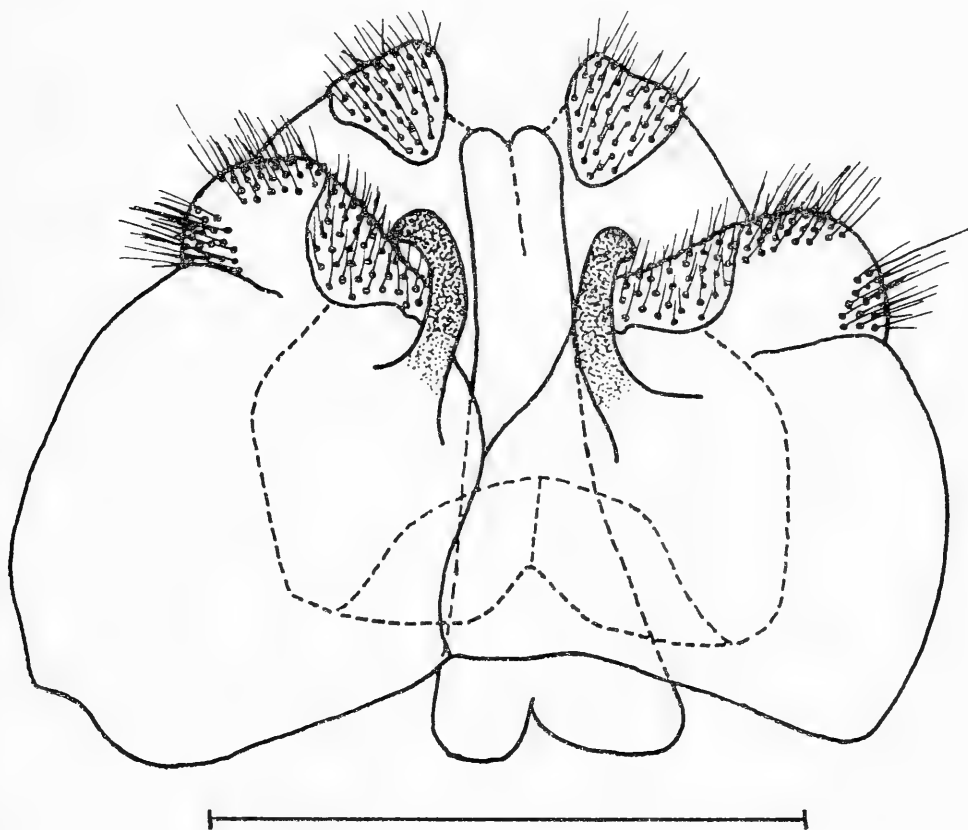


FIGURE 4

Genitalia: (Fig. 4) Remarkably small; valves fused ventrally, bearing two slightly curved claspers with clubbed ends. Uncus apparently absent, functionally replaced by a pair of finely spined, flap-like socii. Aedeagus simple, longitudinally channelled on either side and only thinly sclerotised.

Diagnosis. Differs from *D. fidgiensis* Mabille & Vuillet (Novit. Lep. p. 5, t.1., f.2.) which it superficially resembles in having smaller genitalia (1.5 mm. in width as opposed to 2.5 mm. in *fidgiensis*), in the claspers being almost straight and slender (in *fidgiensis* they are swollen and curved back on themselves) and in having shorter and stubbier socii. The wing pattern differs in that *fidgiensis* is never so heavily marked with

brown; the forewings of *nandarivatu* appear much shorter and hence more rounded. The distinct reniform of *nandarivatu* is never so conspicuous in *fidgiensis*. The dark hindwing termen of *fidgiensis* is lacking in *nandarivatu*. *Nandarivatu* is consistently smaller, *fidgiensis* rarely having a wingspan of less than 40 mm.

Distribution: Known only from Nandarivatu, north Viti Levu, Fiji, more than 1100 m. above sea level.

Holotype: ♂ Nandarivatu, 5.ix.1967 at M.V. (H. S. Robinson). In B.M. (N.H.).

Paratypes: 8 ♂♂ Koro-O (Nandarivatu), 6.ix.1967 at M.V. (H. S. Robinson). In B.M. (N.H.).

Thalassodes figurata sp.n. (Geometridae, Geometrinae)

Male: Head, thorax and abdomen green, white below; abdomen with white intermittent dorsal line. Legs and antennae pale creamy brown. Forewing rich bluish green marked at termen and along costa with crescentic white dots. Median line of three white crescents between 4, 3, 2 and 1b, heavily shaded towards termen with white dots. Hindwing rich bluish green speckled uniformly with white crescents except between 2 and 3 and in the anal fold. Holotype wingspan 40 mm.; mean wingspan of paratypes: 42 mm.

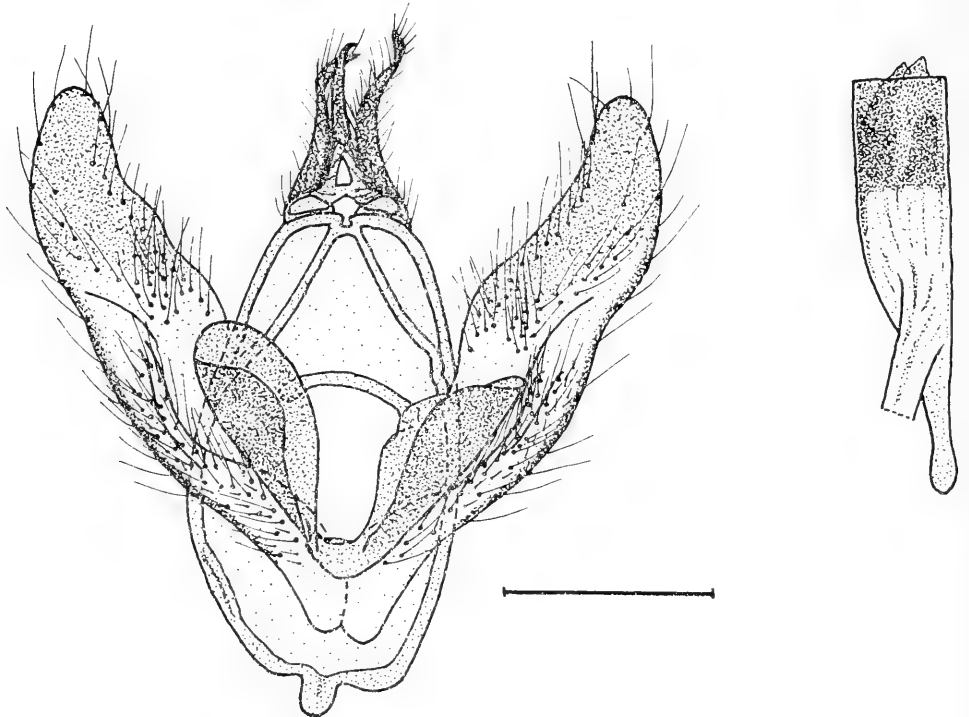


FIGURE 5

Genitalia: (Fig. 5) Uncus simple; two long slender socii; pair of small heavily sclerotised flaps at base of valves. Vesica base heavily sclerotised and set with very fine spines; no cornuti.

Female: Similar to male but larger (mean wingspan of paratypes: 48 mm.) and tip of forewing more oblique.

Diagnosis: *Figurata* appears to have no close ally in *Thalassodes* and is distinctively different in wing pattern alone from every other member of the genus.

Distribution: Known from Nandarivatu, Fiji, over 1100 m. above sea level. There is one specimen from Vunidawa, Fiji (R. H. Phillips), in coll. B.M. (N.H.) which was given the MS name of *figurata* by L. B. Prout.

Holotype; ♂ Nandarivatu, 28.vi.1968 at M.V. (H. S. Robinson). In B.M. (N.H.).

Paratypes: 13 ♂♂, 10 ♀♀ Nandarivatu, ix.1967 and 28.vi.1968 at M.V. (H. S. Robinson). In coll. H. S. and G. S. Robinson and in B.M. (N.H.).

I am very grateful to Messrs. D. S. Fletcher and A. H. Hayes of the British Museum (Natural History) and to Dr. L. Davies and Mr. J. Richardson of the Department of Zoology, University of Durham, for their help and encouragement in the preparation of this paper.

Rearing the Jersey Tiger (*Eupalagia quadripunctaria* Poda)

By L. G. F. WADDINGTON

Previous articles of mine on the above subject in issues of Sept. 1963 and Nov. 1964 described how a measure of success finally rewarded my efforts, but two factors still remained to be solved to my satisfaction.

Firstly, the best method of dealing with newly hatched larvae, and secondly the best foodplant.

Thanks to the kindness of my friend at Plympton, I was supplied with batches of ova in August 1965 and August 1967. Only a limited number were retained and the remainder were given to other collectors.

As I was already critical of starting the larvae off in plastic boxes, I decided to use plastic tumblers instead.

I had a supply of these—fitted with bakelite lids—which originally contained Abbey Cane Syrup, marketed by Martineaus of London, and with the aid of a large red hot nail I melted a circle in the lid and an $\frac{1}{8}$ " hole in the bottom.

After glueing a circle of muslin inside the lid, they were ready for use; I treated two of these tumblers and stood them in glass tumblers which provided stability and left room for a little water at the bottom for the foodplant.

Dealing with the 1965 batch, I put dead nettle in one tumbler and stinging nettle in the other, making sure that the top of the spray impinged on the muslin.

As soon as the larvae hatched out, they were put straight in the tumblers and these were housed in the garage; it was noticeable that the larvae soon sought the muslin-covered lid where air and food were available.

Condensation was very slight and confined to the bottom half of the tumbler, and consequently no losses occurred through this.

By Oct. 21st many had changed skins 3 times, and on account of the cold were brought into the kitchen.

By Nov. 5th it was obvious that the larvae on dead nettle were much further advanced than those on stinging nettle, so the latter was discontinued; however, it must be stated that in both cases growth was irregular.

The stinging nettle larvae did not take kindly to the change of diet, and many subsequently died.

As the larvae got too large for the tumblers, they were transferred to hurricane glass cages, and by the end of November many were $\frac{3}{4}$ grown.

Early in December the largest were put into the breeding cage, and some began to spin up in the moss by the middle of the month.

By March 9 the last larva had spun up.

Moths commenced to emerge on Jan. 29 1966 and continued throughout February and March, the last emergence taking place on April 14.

Dealing with the 1967 batch of ova, the same procedure was adopted, except that dead nettle was used exclusively.

On Oct. 1 I put about 20 larvae in a hurricane glass cage and brought it into the kitchen, but after three weeks they showed no more progress than those in the garage; however, on account of the cold in early November, the remainder were brought into the kitchen.

By the end of November a number of larvae were full fed and transferred to the breeding cage.

Bitter cold winds and heavy snowfalls were the order of the day in early December, which ruined the dead nettle and I had recourse to the old sheet-anchor-lettuce, and this was used up to the end.

The first emergence took place on Jan. 18, 1968 and continued during February, the last one taking place on the 22nd; all regrettably typical.

The upshot of these experiments finally convinced me that ventilation is an all important factor in rearing the larvae, particularly in the very early stages, while dead nettle is far and away the best foodplant.

If this is not readily available, I suggest you remove to a locality where it is.

A final thought—the modified methods adopted clearly speeded up larval growth, resulting in emergencies two months earlier than previously experienced.

Current Notes

I am informed of the floating of The British Butterfly Conservation Society, whose title speaks for itself. The problem is a difficult one, and the society's preliminary programme contemplated between 1968 and 1971 is set out as follows:

- (a) Assisting in an evaluation of the present status of species in the wild;
- (b) examining, assessing and reporting of potentialities regarding particular species requiring conservation;
- (c) general discussions with statutory and voluntary bodies enabled to assist in conservaton;
- (d) specific discussions with specific bodies on possible projects for conservation in the wild, and breeding and re-introductions.

Peter Scott is named as President, Thomas Frankland as Chairman, and Robert Goodden, of Over Compton, Sherborne, Dorset, as secretary.

—ED.

Some Moth Records from Dungeness, 1967

By R. E. SCOTT

During 1967, a Rothampstead moth trap was operated nightly at Boulderwall Farm, Dungeness, Kent (grid reference 063196). The trap is based on a standard 200 watt light bulb and consequently the numbers trapped nightly are only a very small proportion of the flying insects. The only gaps in the continuous running of the light were July 25-27 and August 31-September 27.

The following list contains some of the more interesting captures.

- Notodonta ziczac* L.: Two on June 2, five on August 1-3 and one on August 24.
- N. dromedarius* L.: One on August 25.
- Dasychira fascelina* L.: Singles on July 4, 6, 11 and August 2.
- Euproctis chrysorrhoea* L.: Thirty-two taken between July 10 and August 9, with most, eight, on July 14.
- Nola albula* Schiff.: One on August 1.
- Eilema pygmaeola pallifrons* Zell.: Two taken on July 14, one on 15.
- Spilosoma urticae* Esp.: Thirty-one taken between June 25 and July 16, with most, nine, on July 6.
- Phragmatobia fuliginosa* L.: Singles on July 21, 22, August 2 and 9.
- Agrotis denticulatus* Haw.: Ten taken between May 28 and June 13.
- A. ripae* Hubn.: One on July 5.
- Amathes sexstrigata* Haw.: One on August 30.
- Hada nana* Hufn.: Thirteen taken between June 4 and July 15.
- Scotogramma trifolii* Hufn.: One on July 28.
- Hadena w-latinum* Hufn.: Singles on June 1, 4 and 5.
- H. bicolorata* Hufn.: Seven taken between July 8 and 20.
- H. conspersa* Schiff.: One on May 30, six between July 1 and 10, and one on July 29.
- H. lepida* Esp.: Seventeen between May 13 and July 7, and twelve between July 19 and August 10.
- Leucania straminea* Treits.: One on August 4.
- Arenostola pygmina* Haw.: Fourteen taken between July 23 and August 28, with four on August 24.
- A. phragmitidis* Hübn.: One on August 3.
- Nonagria sparganii* Esp.: One on August 25.
- N. geminipuncta* Haw.: One on August 20 and 25.
- N. dissoluta* Treits.: One on August 1, 3, 26 and 27, three on August 29.
- Coenobia rufa* Haw.: One on August 2.
- Caradrina ambigua* Schiff.: One on June 15, August 28, and three on August 30.
- Eremobia ochroleuca* Schiff.: One on August 2.
- Petilampa minima* Haw.: One on July 29.
- Gortyna hucherardi* Mab.: One on October 13.
- Eumichtis lichenea* Hübn.: One on October 1.
- Earias clorana* L.: Ten taken between July 3 and 16.
- Plusia chrysitis* L.: Three on August 29.
- Unca tripartita* Hufn.: One on June 5, July 10, 21, August 1, 16 and 27.
- Thalera fimbrialis* Scop.: One on July 11 and 13, three on July 20.

Notes and Observations

HAPALOTIS VENUSTULA HÜBN. IN THE WOKING DISTRICT.—In June 1967 I took a specimen of this little noctuid near Bisley for the first time, but on the very warm night of June 18th 1968 I was surprised when this species came freely to my m.v. light on the edge of Chobham Common and still more so when I had several examples in my trap here on the night of June 30th this year. This small insect might well be overlooked in many areas, though it seems to have turned up in many new localities of late.—C. G. M. DE WORMS, Three Oaks, Woking, Surrey. 10.ix.1968.

SOME MIGRANTS AT WOKING, SURREY.—It has been fairly well established that the famous dust storm which is presumed to have emanated from North Africa and to have shrouded so much of the countryside of Southern England on the morning of July 1st 1968, a day when the thermometer was in the 90's, brought with it quite an immigration of lepidoptera borne in the high altitude wind currents. That very night *Laphygma exigua* Hübn. appeared in my trap here as I believe it also did in several other such devices on that date. On July 9th I was surprised to find a *Heliothis peltigera* Schiff. in the trap, as I had only once before seen it in this area just after the last war. This remarkable natural phenomenon is also presumed to have been responsible for the appearance of a number of *Plusia ni* Hübn. and *Eublemma parva* Hübn. which were also recorded in the South in early July.—C. G. M. DE WORMS, Three Oaks, Woking, Surrey. 10.ix.1968.

EPIRRHOE ALTERNATA MÜLLER, AB. TENUIFASCIATA SCHIMA.—In Ent. Rec. **80**: 21 (1968) Mr. T. D. Fearnough published an interesting note on a brood of *Epirrhoe alternata*. From his description ("very narrow black bands") it is clear that he obtained 16 typical specimens and 14 ab. *tenuifasciata* Schima, not *degenerata* Haworth. In the latter aberration the central band of the fore wings is divided into two parts, a costal one and an inner marginal one. This may clearly be seen from the original description which Haworth gave of his unique specimen from Kent of what he considered a new species: ". . . fascia medio anticarum alarum, que degenerata est in strigam interruptam fasciae formem puncto ordinario atro costam versus" (Lep. Brit.: 333, 1809).

Ab. *tenuifasciata* was described as having: "Central area narrowed but not divided" (Verh. zool.-bot. Ges. Wien 74-75: (78), 1925). In the same periodical, vol. 77: (76)-(78), 1927, Schima wrote, that he captured a ♀ with narrow central area near Dürnkrot (Austria). From this he bred 10 normal specimens and 18 with narrow central area. In one ♂ of the latter group the band was divided, so that this was true *degenerata*.

From Mr. Fearnough's breeding we may assume that *tenuifasciata* is dominant to the normal form. But the results of Schima are not in accordance with this assumption. Possibly the brood was too small to obtain reliable figures. It is at any rate clear that ab. *tenuifasciata* is a hereditary form, not an environmental one. True ab. *degenerata* is apparently the extreme development of *tenuifasciata* and no doubt very rare.—B. J. LEMPKE, Oude Yselstraat 12, Amsterdam 10.

EUROIS OCCULTA L. IN SURREY.—A female specimen of this unusual visitor to the South of England came to my mercury vapour light trap here on the night of 30th July last. It would be interesting to know whether any other similar records have been obtained.—J. L. MESSENGER, Stonehaven, Wormley, Godalming, Surrey. 7.ix.1968.

COMMENTS ON "NOTES ON SOME SOUTH AFRICAN LEPIDOPTERA".—I can, perhaps, add a little information to that given in J. S. Taylor's paper (1968, *Entomologist's Record*, 80: 149-156) based on my East African experience.

Metarctia metus Stoll.—Not an East African species, but should not the specific name be *meteus*?

Siccia caffra Wlk.—Although I have not bred this species, the food-plant of all known *Siccia* larvae is said to be Lichens.

Dionychopus similis Mschl.—I notice that Hampson (*Catalogue of the Lepidoptera Phalaenae*) treats *similis* as a synonym of *amasis* Cr., whilst Gaede in *Seitz African Bombyces* ignores the name altogether.

Spilosoma lutescens Wlk.—A common moth of the Kenya Coast, less so in Uganda. Food-plant records are:—*Canna* (Cannaceae), *Commelina* (Commelinaceae), *Bidens pilosa* (Compositae), *Entada abyssinica* (Mimosaceae), *Ficus*, *Morus* (Moraceae), *Boerhavia* (Nyctaginaceae), *Russellia juncea* (Scrophulariaceae), *Tacca pennatifida* (Taccaceae) and *Lantana* (Verbenaceae). Kenya larvae appear to differ from South African, being black with a greyish dorsal line and oblique greenish yellow lateral stripes. Pupal duration in Mombasa about ten days.

Cyana pretoriae Dist.—I have had the same experience with *C. rubristriga* Holl. in Kampala, and have a suspicion that the food-plant is *Ipomoea* sp. (Convolvulaceae). Seitz uses the generic name *Chionaema*.

Heliothis scutigera Guen.—Not, I think, an East African species, but should not the specific name be *scutuligera*?

Psalis pennatula F.—Similar habits in East Africa, but I have found the larva very delicate in captivity.

Lymantria modesta Wlk.—East African food-plant records are *Rhus vulgaris* (Anacardiaceae) and *Maurua hoehnelii* (Capparidaceae).

Rhodometra sacraria L.—Usual East African food-plant is *Oxygonum sinuatum* (Polygonaceae).

Nudaurelia walbergi Bsd.—East African food-plants are *Schinus molle* (Anacardiaceae), *Ricinus* (Euphorbiaceae) and *Acacia* (Mimosaceae).

Urota sinope Westw.—In addition to *Erythrina abyssinica* (Papilionaceae), the larva is recorded as feeding on *Eucalyptus* spp. (Myrtaceae) in East Africa.

Bombycopsis indecora Wlk.—An imposing list of food-plants in East Africa. *Barleria*, *Justicia* (Acanthaceae), *Chrysanthemum*, *Laggera alata*, *Microglossa*, *Vernonia amygdalina*, *Zinnia* (Compositae), *Ipomoea* (Convolvulaceae), *Leonotis africana* (Labiatae), *Gossypium* (Malvaceae), *Albizzia* (Mimosaceae), *Cajanus cajan* (Papilionaceae), various Ferns (Polypodaceae), *Rosa* (Rosaceae) and *Coffea* (Rubiaceae).

Finally, might I appeal to Mr. Taylor to give the families after his plant names, I am completely at sea with *Styraciflua* and cannot find it in any of my botanical books.—D. G. SEVASTOPULO, F.R.E.S., Mombasa, 18.viii.1968.

Current Literature

Plant Nematology; W. R. Jenkins and D. P. Taylor: Reinhold, London; xviii+270 pp, £5 16/6.

The authors, Dr. Jenkins of Rutgers University and Dr. Taylor of the University of Illinois, have shouldered a heavy task in providing a text book which can be the basis of this obscure, though important, study. They state early in the book that in their opinion, not more than two per cent. of the existing species have so far been named. They have produced the book now in order that the student may set out on original work with a good general grounding in the principles of nematology rather than a taxonomic study.

To introduce the materials with which the student will have to work, the first four chapters are devoted to a systematic examination of these diverse aspects, starting of course, with the nematode and its allies, then their gross morphology which stresses the small size of plant nematodes. Next the food sources of nematodes generally are mentioned, showing their relation with practically the whole of the animal and vegetable kingdoms, both living and dead. Habitats show that while some species are generally distributed in the soil, others are only able to exist in more localised sites.

The student is then given a very concise history of the study of plant nematodes, from 1743 up to the present day. The life-cycle is mentioned, and it is shown that the various species may be bisexual, hermaphroditic, or parthenogenetic. Nearly three pages are given to a general account of the relationship between nematodes and crop production, and, as is the case with all chapters, a selected list of relevant literature for further study is given.

Chapter two gives a detailed account of the anatomy and morphology of the nematode, with excellently clear drawings of the details. Chapter three is devoted to nematode damage to plants, illustrated by a micro-photograph, and an air photograph of an infected field of soya beans: chapter four follows up with an account of extension of injury to plants when the nematode is accompanied by certain virus species of which they are vectors. Ensuing chapters are each devoted to various groups of nematodes, while the final two chapters deal with chemical, biological, and non-chemical methods of control. A glossary of 12 pages and an index complete the book.

The book is well illustrated throughout by photographs and beautiful line drawings of these difficult subjects, the drawings being the work of Mrs. Eleanor W. Langman of Douglas College, Rutgers University.

Being produced in the United States, it is natural that much local material is dealt with, but the skilful handling of the subject by the authors makes the book of the greatest value to students everywhere. The language is clear and concise; the general treatment lifts the subject away from the taxonomic level. The book is very well printed on good paper and bound in strong cloth boards, and no agricultural library or student can afford to be without it, representing as it does, the latest development of a subject which is of high economic importance.—S.N.A.J.

Extinct and vanishing Animals by Vinzenz Ziswiler, translated from the German by Fred and Pille Bunnell. Longmans 1967; x+133 pp. 35/-.

Although this book does not touch on insects, its subject must be near to the hearts of all true nature lovers, and it will be read with interest by all. This is not a sentimental appeal for the protection of declining species; it puts forward valid reasons why they should be saved from destruction, and the author rightly points out that extermination is equivalent to sawing off the branch on which one is sitting. The book is well bound and is printed on good paper; it is profusely illustrated by photographs, drawings and diagrams.—S.N.A.J.

Practical Work in Biology, edited by **G. R. Meyer**. Warne. xiii+217 pp. 12/6.

The authors state that this book is designed for the use of O-level students, but that it can be used both before and after that level. It presents some 200 problems, arranged together with the relative instruction, the instructional portions being marked by a marginal vertical line. The introductory chapter will be found most useful, as it sets out general rules for the performance of the various tasks involved in the study of biology, including drawings, dissection instruments, rules for dissection, the structure of the microscope, rules for using the microscope, examining objects with the low power objective, and also with the high power objective, and finally "the scientific method".

The text is divided into—I, A Survey of Man; II, A Survey of Flowering Plants; III, How to recognise that a Thing is living; IV, The Cell; V, Animals and Plants as Transformers of Energy; and VI, The Variety of Living Things.

The book is well illustrated with drawings and diagrams of both subjects and apparatus; it is well printed and strongly bound in cloth-surfaced paper cover. It should be welcomed both by the student and the teacher, both for its scientific value and for its reasonable price.—S.N.A.J.

Kritisches über die Mitteleuropäischen Pomoidideae-Minierer aus der Gattung *Lithocolletis* by **Ing. Dr. Dalibor Povolny**. Acta Universitatis Agriculturae, Brno, Vol. XV: 587-594. iv. 1967.

This study of Apple-feeding *Lithocolletis* species follows the author's paper on those feeding on plum species, and is particularly interesting because the author relegates our *L. concomitella* Bankes to a synonym of *blancardella* Fabr. The species *L. mespilella* Hübn., *cydoniella* Denis and Schiff., *blancardella* Fabr., *oxyacanthae* Frey and *sorbi* Frey are treated; *pomifoliella* Zell., *torminella* Frey and *pyrivorella* Bankes are sunk under *mespilella* Hübn. and *pomonella* Zell. and *gregori* Povolny are sunk under *cydoniella* Denis and Schiff., all of which goes to simplify what has been a very trying complex in this family. There are twelve figures of male genitalia, and a table of food plants of the five species left in this group.—S.N.A.J.

Neue und wenig bekannte Taxone aus der Tribus Gnorimoschemini Povolny, 1964 (Lep. Gelechiidae) by **Dalibor Povolny**. Acta Scientiarum Academiae, Brno. II New Series, 3, 1968.

The author continues his work in this Tribe of Gelechiidae naming seven new species in the present paper. It is illustrated by 85 genitalia figures and 21 figures of forewing wing-pattern. Orders from abroad should be

addressed to Academia, Publishing House of the Czechoslovak Academy of Sciences, Vidičkova 40, Prague.—S.N.A.J.

The Pocket Encyclopaedia of Plant Galls by Arnold Darlington, illustrations by **M. J. D. Hiron**. Blandford Press, London. £1 5/-. 191 pages with 293 colour illustrations and 21 black and white pictures.

An excellent introduction to plant galls covering their variety and cause, occupants and life history with a chapter on practical work including collecting, rearing and preserving. The illustrations are mostly from colour photographs but enhanced by the inclusion of beautifully executed coloured and black and white drawings which take up 89 of the 191 pages depicting a well chosen selection of galls and gall causers. There is a good but short reference list of books, etc., and compactness is helped by restricting authors' names to the index. Highly recommended for all field naturalists.—L.P.

Some Aspects of the Natural History of the Folkestone District. The Folkestone Natural History Society, vii+102 pp. £1. This interesting book is published to celebrate the centenary of the society. It consists of sixteen papers on various subjects relating to the natural history of the district, ranging from an account of the history of the society by Vera F. P. Day, Hon. Secretary, to subjects of geological, botanical and zoological interest, including an article on some of the Lepidoptera of the district by A. M. Morley, O.B.E., M.A., F.R.E.S., well-known to so many of our readers. The Geological Basis of the Folkestone Area and The Geographical pattern of that District, by G. H. Hones, B.Sc., are two papers of greatest value to the visitor, and the final paper "On Foot through the District" by Margery H. Walton will assist anyone wishing to work the area. One can safely say that whatever one's outdoor interest may be, there is something suitable in this book. It is bound in cloth boards, and well printed on good paper, and I might say a "must" for anyone who works this productive area.—S.N.A.J.

Evolutionary Trends in the Genus *Aricia* (Lepidoptera) by Ove Hoegh-Guldberg. This is No. 9 of the *Aricia Studies* series, and gives an account of further field work and breeding experiments with *Aricia allous* Gr.Hb. and *A. agestis* Schiff. Chapter I deals with the present European distribution of the species, Chapter II describes some improvements in rearing techniques, Chapter III deals with cooling experiments, describing 32 forms so obtained. IV deals with the effect of light on larvae and imagines. V consists of notes on experiments on the use of vitamin E as a possible agent in increasing fertility, the foodplants in various districts, *Apantales arcticus* Thomson a parasite bred from wild Swedish larvae, and finally the nomenclature is discussed, giving the latest views on the subject.

There is a very fine coloured plate of three panels of fifth instar larvae for comparison, and the paper is copiously illustrated by means of half-tone plates of early stages and imagines, also of breeding techniques, and the results of experiments are clearly tabulated. The author and his collaborators are worthy of the highest praise for their work.—S.N.A.J.

Norwegian Species of *Dicrorampha* Gn. (Lep. Tortricidae) by **Magne Opheim**, *Opuscula Entomologica* 33 (1968) Lund, Sweden. In this article Mr. Opheim reviews the situation of this genus in Norway and adds five species, *D. alpinana* Treits., *D. consortana* Steph., *D. agilana* Tengst., *D. aeratana* Pierce & Metc., and *D. saturnana* Guen., to the six previously mentioned by Haanshus in 1933. There follows an account of each of the eleven species together with their distribution.—S.N.A.J.

The Oxford Book of Insects by **John Burton** with **I. H. W. Yarrow, A. A. Allen, L. Parmenter** and **I. Lansbury**: 4to., viii + 208 pp., 50/-. This very well conceived book should serve the purpose of leading the non-scientific reader a little closer to scientific entomology, for it gives coloured illustrations of insects of all orders, whereas almost all, if not all such books previously issued, show the less-known orders by line drawings. Naturally, in dealing with so large a subject, much thought must go to the selection of insects to be shown to illustrate the various families, and one must congratulate the authors concerned on the way they have performed this duty. The butterflies all receive attention, as do the hawkmoths; the other families receive their share of attention. A very wise policy is shown by illustrating most of the species in their natural resting positions as field observers will see them, instead of the customary "set" positions. Good figures of larvae and other early stages, where of particular interest are shown. On page 55 a regrettable printer's error labels the male Green-veined White as the Bath White.

Many formerly neglected insects, such as the sawflies, receive good attention, and the beetle plates are also improved by interesting drawings of early stages and other life history characteristics where these are likely to come under observation.

The system of the book is to show the coloured plates on the right hand side, with notes on the species figured on the opposite page, which is headed by a general note on the order or family concerned. At the end, nine pages are devoted to the biology of insects; their classification and structure, an explanation of the insect orders, a note on metamorphosis, and finally a note on protection from enemies. A bibliography of works recommended for further information, arranged by orders, gives twenty items, four periodicals and three societies (unfortunately omitting the British Entomological and Natural History Society (late "South London"). A good index completes the book.

My only adverse criticism is that while the "other orders" are shown on the plates by their scientific names, with vernacular names added in the descriptions where they exist, the Lepidoptera are given their vernacular names on the plates, and where these do not legitimately exist, as in the case of many microlepidoptera the names of a more or less recent list, for which a vernacular name was propounded for every species, whether it existed or not. These names mean nothing to the scientifically interested, and tend to foster the unfortunate trend of to-day to avoid the use of scientific names because "Latin" is to-day a dirty word.

The book is well bound in cloth, and is well printed on good art paper, and the colour work is generally of good standard. The artists are to be congratulated, and the book should have a place on the shelves of all interested people.—S.N.A.J.

Elements of Entomology by **Harold Oldroyd**. Weidenfeld & Nicholson, ix + 312 pp., 45/-. At first, one might think from the title that this was just another account of a well-worked subject, but on opening the book one would see that this is something different. The Introduction starts off by pointing out that the book is intended "to bridge the gap between school and university or between courses of general biology and courses on zoology and specialised entomology."

The matter is skilfully handled so as to stimulate thought and offer suggestions to the reader. Chapter I, Insects and other Animals, explains the structure of the insect and tabulates the differences between the four classes of Arthropoda. The text gives a minimal description of the physiology of the insect. Chapter 2, under the title of Immature Insects needs no explanation. The next five chapters deal with many modifications of the insect. Chapter 9, Insects and Sound, deals with many modifications in various insects for stridulation and the appreciation of sounds. Ten deals with flight and 11 and 12, adaptations to terrestrial and aquatic life respectively. Thirteen and 14 deal with some of the great variety of feeding habits; 15, 16 and 17 with social insects, 18 gives many ideas on the why and wherefore of insect behaviours, and 19 contains facts and ideas about many insects inimical to man and animals. Chapter 20 discusses some aspects of the impact of the insect on human food, stored and growing, with considerable reference to the locust. Twenty-one, Insects in the Home, gives many interesting examples of insect nuisance, ranging from the pollution of food and disease vectors to wood borers. A few wise words are added under the heading of "Insects in the Mind". Twenty-two discusses beneficial insects, from the domestic bee, the silkworm and the lac insect as purveyors of direct benefit, to pollinators and insects as food for primitive people and also marketed as "delicacies" when canned, and finally the very important subject of biological control of insect pests. The final chapter, 23, Insects in the Future, gives many suggestions as to how the course of man's interference with Nature will affect future insects and entomologists. An Appendix gives a list of orders and sub-orders of insects; a bibliography mentions 129 items for more specialised reading on the subjects raised in the text, and an index complete the book. The book is well printed and bound in cloth boards. The text is illustrated by line drawings, and a series of fifty excellent and interesting photographs.

Student or not, the reader who finds this book dull is past praying for!—S.N.A.J.

Warne's Picture Reference Books edited by John Clegg 45 pp., 5/- each, have now produced the four further books foreseen in my review (*antea*: 179); No. 5, Flowers of the Summer, by George E. Hyde; No. 6, Flowers of the Autumn; No. 7, Pond and Stream Life and No. 8, Trees (1) are all by George E. Hyde. They follow the same pattern as the first four and will give great pleasure to many Nature Lovers, and encouragement to young naturalists.—S.N.A.J.

The Dance Language and Orientation of Bees by **Karl von Frisch**, translated by Leigh E. Chadwick. 566 pp. + 454 figs. Belknap Press of Harvard University Press and O.U.P. 110/-.

This magnificent book comes as the result of more than fifty years of personal observation and research by the great master of bee behaviour,

Prof. von Frisch. The first part is entitled *The Dances of Bees* and starts by describing the techniques used by Frisch and his co-workers in the study of bee dances, the design of their observation hives, the way bees are trained to visit artificial feeding places, how individual bees are caught and marked so they can be recognised, the measurement of the tempo and direction of the dances and the precautions which the observer must take before trying to interpret what he sees. It goes on to describe in great detail the two main forms of communication by dance, the well-known 'round dance' and the 'tail-wagging' dance, and concludes by describing other types of dance used by bees, the importance of floral scent brought back on the bodies of the foragers in guiding recruits to the harvest, and of sounds made by the bees and of queen substance, and the 'dialects' of different races of honey bee.

Part Two is called *The Orientation of Bees* and is a discussion of the way bees find their way to the goal and back to the hive. It deals rather briefly with the importance of visual landmarks near the hive, and solar navigation on long distance flights, and goes on to discuss in detail what is known about the orientation of bees by polarised light. Some interesting remarks are made about navigation in other animals, both invertebrate and vertebrate. The final section concerns itself with the final stages of a bee's journey to or from the hive.

The book is an object lesson in patient and skilful observation coupled to ingenious experimental technique, which has enabled the author to penetrate far into the mysterious world of the bee hive. It is written with the modesty of a true master describing his life's work, and Mr. Leigh Chadwick's translation has lost nothing of the freshness and excitement of personal experience. It is a long book, and there is a summary at the end which is a lucid statement of the present state of knowledge, but Frisch himself expresses the hope that people will wish to read the whole, likening his record to a long hike, the charm of which is in the totality of impressions, the little details and the glimpses of yet untrodden paths. Readers who fulfil that hope will derive much pleasure for themselves.—B.G.

Wild Animals of the British Isles by **Dr. Maurice Burton**, xxvi + 222. Frederick Warne & Co., Ltd. 40/-. Although the subject of this book is not entomological, it is worthy of at least a short notice, for there are many insects associated with our wild animals, and some knowledge of the ways of those animals is necessary for the entomologist who would search their haunts. The book is most interestingly written, and the casual look which I had promised it was drawn out into a reading session. Mammals, reptiles and amphibians are dealt with, and many creatures which are not usually treated such as domestic animals gone wild (or feral), receive their amount of interesting comment as do all the truly wild species. There are 40 plates, coloured and black and white, and many excellent text figures. The book is well printed and bound, and would deserve a place on the shelves of anyone in town or country, who has an interest in living things.—S.N.A.J.

Nature Trails in Britain: This sixteen page pamphlet is published by British Travel in association with the Council for Nature, and lists by counties the various sites open, with a short description of each. In these days of educational excursions, this pamphlet should be useful to all concerned.—S.N.A.J.



locally common (R. M. Prideaux). Sevenoaks, July 18, 1920, July 24, 1922 (Gillett, *Diary*); one at light, August 1, 1948 (Busbridge, *Diary*).

11. Watlington (W. A. Cope); one bred 1912 (E. Goodwin coll.). Shipbourne, one, August 1914, in P. A. and D. J. A. Buxton coll. (C.-H.). Aylesford, common, 1953-54 (G. A. N. Davis); one, July 14, 1957, in G. A. N. Davis coll. (C.-H.).

12. Ham Street, July 1934, one (A. J. L. Bowes); one, July 12, 1946, one, July 30, 1951 (C.-H.); August 15-20, 1960 (C. R. Haxby and J. Briggs); June 24, 1953, June 25, July 1955, July 7, 1956 (W. L. Rudland); three larvae beaten from broom in Orlestone Woods, from which 1♂, 2♀ emerged 1960 (M. Singleton and M. Enfield). Willesborough, one, July 13, 1954 (W. L. Rudland). Ashford Warren, larvae on broom (E. Scott).

13. Pembury (Stainton, *Man.*, 2: 34). Tunbridge Wells (Beeching, *Ent. Rec.*, 2: 229).

14. Hawkhurst, 1950, one at light, one at buddleia (B. G. Chatfield).

15. Dungeness—The species is perhaps more frequent here than anywhere else in the county, imagines being observed annually and in fair numbers flying over the shingle at dusk (C.-H.). Usually common in July (A. J. L. Bowes): several, September 8, 1934, "doubtless a second emergence" (de Worms, *Entomologist*, 33: 104); larva on broom, June 6, 1950, three imagines, June 6, 1950, one, September 22, 1955 (E. C. Pelham-Clinton); over 80 imagines, June 28-August 31, 1962, all in m.v. (R. E. Scott); larvae on gorse, 1966 (B. K. West).

16. Folkestone* (Ullyett, 1880).

VARIATION.—Cockerell (*Entomologist*, 18: 56) records a "brown" ab., from Chislehurst.

FIRST RECORD, 1859: Stainton, *loc. cit.*

Geometra papilionaria L.: Large Emerald.

Native. Woods; on birch, hazel, alder. Fairly frequent in 1, 3, 6-8, 10-14; perhaps casual elsewhere. The imago is mainly observed at dusk or at light, and excepting the curious instance cited in the *First Record*, appears never to have been noted really plentiful. Beale (*Zoologist*, 4130) records once taking it at sugar at Tenterden.

The larva which is best searched for and not beaten owing to its tenacity, chiefly occurs on birch, but has also been noted on hazel by E. A. Sadler at Sevenoaks Weald, and on alder by S. Wakely near Tunbridge Wells.

4. Ickham, occasionally, 1954-59 (D. G. Marsh).

15. Dymchurch, one, 1952 (Wakely, *Ent. Rec.*, 65: 43).

16. Lympne (Heitland, *Entomologist*, 31: 221). Folkestone Town, two ♂♂, 1955 (A. M. Morley).

FIRST RECORD, 1831: "Occasionally, Darent-wood; once in a lane near Birch-wood I saw many dozens of the wings, several in fine condition strewn about under an old oak" [probably the work of bats—C.-H.] (Stephens, *Haust.*, 3: 178).

Comibaena pustulata Hufnagel: Blotched Emerald.

Native. Woods; on oak. Probably casual in 4, 15.

1. Recorded from many localities in this division in the past. Recent occurrences are: Petts Wood, at light, two, 1947, one, 1949 (E. Evans); 1948

(A. M. and F. A. Swain). West Wickham, 1951 (E. E. J. Trundell); two, at m.v. light, July 1, 1963 (C.-H.). Abbey Wood, one, 1951 (A. J. Showler). Bexley, six, June 13, 1952 (A. Heselden). Sparrow Common, larva (Haynes, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1955: 88). Blackheath, one, 1960 (A. A. Allen). Bromley, in m.v. trap, 1960 (4), 1961 (5), 1962 (5), 1963 (5), 1964 (5), 1965 (7), 1966 (2) (D. R. M. Long).

3. Bysing Wood (H. C. Huggins). Clangate Wood, Sturry, one bred June 28, 1932, from beaten larva (Busbridge, *Diary*). Thornden Wood, one, June 11, 1933 (A. J. L. Bowes). Den Grove, frequent at light and flying at dusk, 1934 and subsequent years (C.-H.).

4. Ickham, occasionally, 1954-59 (D. G. Marsh).

5. Downe (de Worms, *Lond. Nat.*, 1956: 62).

6. Longfield (Jennings, *Entomologist*, 4 (54), ii). Fawkham (E. J. Hare).

6a. Darenth Wood (Stephens, *Haust.*, 3: 181); six ♂♂, June 25, 1925 (F. T. Grant); (E. J. Hare); odd specimens (B. K. West). Greenhithe (Hodgkinson, *Zoologist*, 2328). Swanscombe Wood (*Ent. mon. Mag.*, 1: 190) Chattenden, one, July 16, 1869 (J. J. Walker MS.); (Chaney, 1884-87); common, June 17, 1893 (Fenn, *Diary*).

7. Wigmore (Chaney, 1884-87).

8. Folkestone Warren, a few (Knaggs, 1870). Wye* (C. A. Duffield). Elham; Dover (W. E. Busbridge). Gorsley Wood, one, c. 1946 (R. Gorer). Near Waldershare (E. & Y., 1949).

10. Brasted, one (R. M. Prideaux). Sevenoaks, June 24, 1920 (Gillett, *Diary*); (W. E. Busbridge).

11. Watringbury (V.C.H., 1908). Brook Street Wood, larva beaten from oak, 1931 (F. D. Greenwood). Hoads Wood (G. V. Bull); (P. Cue). Tonbridge, about 12 at light, 1939 (H. E. Hammond). Sevenoaks Weald, two at m.v.l., June 18, 24, 1959, four, July 8-14, 1960 (E. A. Sadler).

12. Ham Street, common at light about 12.30 a.m., June 30, 1934 (A. J. L. Bowes); frequent in Orlestone Woods (C.-H.); common, 1959-60 (M. Singleton). Willesborough, singletons, 1955-56, 1958; Wye, one, 1956 (W. L. Rudland). Chartham (P. B. Wachter). West Ashford, one at light, 1959 (M. Enfield).

13. Pembury (Stainton, *Man.*, 2: 36). Tunbridge Wells, one, 1958 (L. R. Tesch per C. A. Stace). Goudhurst, three at light, 1958 (W. V. D. Bolt).

14. Tenterden (Stainton, *loc. cit.*). Iden Green, one at light, 1950 (H. Boxall). Hawkhurst, several at light, 1952-53 (B. G. Chatfield).

15. Dungeness, one, June 30, 1953 (Wakely, *Ent. Rec.*, 66: 109).

VARIATION.—*Ab. stigmatisata* Stauder, a ♂ which I took at Long Rope Wood, Orlestone, July 2, 1946 conforms to this very scarce form, though I have numerous examples from the same locality that are transitional to it (C.-H.).

Evans (*Entomologist*, 80: 286) records a pink form from Petts Wood; and I have one that is similar; both are apparently referable to *ab. rosea* Cockayne (C.-H.).

FIRST RECORD, 1775: "Oak of honor by Peckham" (Harris, *Aurelian's Pocket Companion*, 31). This may possibly refer to Surrey, in which case the first record will date from 1830: Birch Wood (Curtis, *Br. Ent.*, 300).

Thetidia smaragdaria Fabricius ssp. **maritima** Prout: Essex Emerald.

Native. Salt marsh borders; on *Artemisia maritima*. Casual in 12.

Note: The casual occurrence of this and another salt marsh species, *Agdistis bennetii* Curtis, in the valley of the Stour (div. 12) is very remarkable (C.-H.).

2. Queenborough, one, July 5, 1856 (T. Ingall *Diary, teste* South *Entomologist*, **28**: 44). Sheerness Dockyard, 1872. a forewing only (Walker, *Ent. mon., Mag.*, **9**: 163). Near Sheerness, one rather worn, taken July 1, 1873 (Hodgson, *Ent. mon. Mag.*, **10**: 180). Gravesend to Sheerness (1896, Tutt, *Br. Moths*, 249) (I know of no instance of the occurrence of *smaragdaria* west of Sheppey—C.-H.). Leysdown, common, about thirty bred 1920, from 1919 larvae; larvae again common 1922; Harty Ferry, one (H. C. Huggins). Queensbridge, Sheppey, June 24, 1938, June 30, 1947, June 24, 1949; a larva, May 3, 1948 (R. C. Edwards). Shellness, several larvae, August 25, 1950 (S. Wakely; Edwards, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1951-52**: 27). Queensbridge, Sheppey, one, June 1950, one, June 28, 1952 (G. Law). Graveney, three larvae on *A. maritima*, taken by P. Cue, September 12, 1957 (P. Cue); is the only confirmed occurrence of this species on the mainland of Kent known to me apart from the casual appearance in div. 12 (C.-H.).

[4. Deal (1871, Morris, *Br. Moths*, **1**: 138).]

12. Chartham, a single ♂ taken by P. B. Wacher at m.v.l., July 13, 1955 (P. B. Wacher).

VARIATION.—Edwards (*Proc. S. Lond. ent. nat. Hist. Soc.*, **1951-52**: 27) exhibited a "bluish" *ab.* from Sheppey.

FIRST NOTICE, 1856: Ingall, *teste* South, *loc. cit.*

Hemithea aestivaria Hübner: Common Emerald.

Native. Woods, copses, parks, gardens; on hawthorn, birch, willow, *Rhamnus catharticus*, Spanish chestnut, currant. Frequent and found in all divisions. "Generally common" (V.C.H. (1908)).

The moth normally appears at the end of June, and continues on the wing throughout the first fortnight or three weeks of July; in 1963, however, W. L. Rudland noted one at Willesborough on September 12, which was perhaps a second generation specimen.

The larva has been noted on hawthorn at Iwade (div. 2) (B. K. West); on birch and hawthorn at Bromley, on willow at Crofton (D. R. M. Long); and once on *Rhamnus catharticus* at Lydden (div. 8), May 21, 1950, from which I reared the imago (C.-H.). It has also occurred plentifully at Pine Wood (div. 3) on Spanish chestnut (J. A. Parry); and a young larva was taken on currant, Sidcup, October 9, 1937 (Kidner, *Diary*).

FIRST RECORD, 1844: Charlton sand-pit (Bedell, *Zoologist*, 735).

Chlorissa viridata L.: Small Grass Emerald

Resident? Woods.

The locations rather suggest that the moth may be a temporary resident or casual adventive from Surrey and Sussex.

10. Westerham (Carrington, *Entomologist*, **19**: 202).

12. Ham Street Woods, one taken by C. A. W. Duffield, May 31, 1949 (Scott, 1950).

13. Tunbridge Wells, 1891 (Beeching, *Ent. Rec.*, **2**: 229) .

[(Folkestone, 1912 (Rait-Smith, *Ent. Rec.* **25**: 174); determination erroneous (W. Rait-Smith, *in litt.*.)]

FIRST RECORD, 1866: Between Westerham and Crockham Hill not far from the Schoolhouse "on the sloping bank as we leave the thicker shrub, I have taken several good species, such as *Nemoria viridata*. . . ." (Carrington, *loc. cit.*).

***Thalera fimbrialis* Scopoli: Sussex Emerald.**

Resident. Shingle beach; on yarrow, gorse.

15. Dungeness.—Has occurred over a range of some three miles of shingle, but seems chiefly to be located in the region of the old light-house, and so far as is known its distribution does not reach Greatstone, Lydd, or the Hope and Anchor. Is decidedly local, apparently preferring places in which there is considerable growth of *Arrhenatherum elatius*, upon the stems of which the imago has frequently been found resting at night.

The species was first discovered on July 28, 1950, by A. M. Morley and G. H. Youden, close to the old level crossing; and with D. G. Marsh and C. G. M. de Worms, a total of 8 ♂♂ and 8 ♀♀ had been taken by August 6 (Morley *et. al.*, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1950-51**: 36, 50-52; Morley and Youden, *Ent. Gaz.*, **3**: 193). On August 4, 1951, working independently of the above, I found the insect in fair numbers, including some just emerged, in a very restricted locality not far from the light-house, also at m.v.l. by the old Pilot Inn, as well as odd ones elsewhere (C.-H., *Ent. Rec.*, **64**: 10).

The species has probably been seen annually since 1950, indeed, we have records of its occurrence for almost every year following its discovery, and the indications are that it is fairly well established. The following are among the records—1954, in some numbers (P. B. Wacher); 1955 (R. F. Birchenough); 1956, July 28 (W. L. Rudland); 1957 (P. Cue), July 28 (A. E. Gardner); 1958 (P. Cue); 1959 (A. L. Goodson); 1963, three ♀♀, July 18 (C.-H.); 1964, July 17 (R. G. Chatelain); 1965, seventeen July 11 (1), 13 (1), 19 (3), all at m.v.l. (R. E. Scott); 1968, at Boulderwall, including several just emerged, August 3-5 (C.-H.); 1967, at Boulderwall, July 19 (3), 21 (1), August 23 (1), all at m.v.l. (R. E. Scott).

The moth normally reaches optimum numbers about August 1, but in 1952 was seen on the wing as early as June according to Kettlewell (in *Ent. Rec.*, **65**: 305), yet was still out and in good condition on July 25 that year (C.-H., *Entomologist*, **86**: 106).

The feral larva was first discovered in 1952 by H. B. D. Kettlewell, who noticed several among yarrow heads collected in August that year; and on June 2, 1953, found others "over a considerable area of the Ness", some of which were full grown (Kettlewell, *Ent. Rec.*, **65**: 305-307). Also found by R. F. Bretherton, who took two on yarrow, September 24, 1955, and three at night, June 3, 1956; and by A. L. Goodson, who took two on yarrow, September 19, 1960. The species is clearly not confined to yarrow, and about 10 p.m. on August 3, 1965, it was an interesting experience to find a ♀ ovipositing in the wild on gorse, two ova being laid close to a top shoot, both of which duly hatched on August 14, together with a number of others laid subsequently by the same individual in captivity (C.-H., *Ent. Rec.*, **77**: 228).

FIRST RECORD, 1950: A. M. Morley and G. H. Youden.

Hemistola chrysoprasaria Esper: Small Emerald.

Native. Hedges, copses, wood borders; on *Clematis vitalba*. Mainly on the chalk, where it is locally plentiful in lanes and on downs. Recorded from all divisions, except that it is notably absent from 9. Apparently scarce or casual in 2-4, 10-16. "Generally distributed on the chalk" (V.C.H., 1908).

Obs.—On September 7, 1947, in the town of Bromley (div. 1), W. A. Cope and I beat ninety larvae from one roadside *C. vitalba* bush (C.-H.); F. T. Grant (*in litt.*) states that he found 26 larvae at Whitehill (div. 6) on May 25, 1916, having spotted them by the "partly eaten half-withered leaf"; and Green (*Ent. Rec.*, 53: 79) records taking full fed larvae in Kent on July 11, a very late date.

2. Dartford district (B. K. West).

3. Whitstable, one taken by D. Pierce, c.1948 (C.-H.). Eddington at light, July 5, 1949; three, 1951 (D. G. Marsh).

4. Ickham, occasionally, 1954-59 (D. G. Marsh).

10. Sevenoaks, one at light, July 19, 1947 (W. E. Busbridge, *Diary*).

11. Sevenoaks Weald, one, July 25, 1960 (E. A. Sadler).

12. Ashford Town, June 30, 1933 (E. Scott); 1954, 1955 (P. Cue). Chartham (P. B. Wachter). Willesborough, one in m.v.t., July, 1961 (M. Singleton); two, 1963 (W. L. Rudland).

13. Goudhurst, frequent at m.v.l. (W. V. D. Bolt, *pers comm.*, 1961).

14. Sandhurst (G. V. Bull).

15. Dymchurch (Wakely, *Ent. Rec.* 65: 44). Greatstone, one, July 21, 1963 (C.-H.).

16. Folkestone Town (Morley, *Ent. Rec.*, 64: 171).

VARIATION.—Bowman (*Proc. S. Lond. ent. nat. Hist. Soc.*, 1915-16: 129) exhibited two abs., bred from Kent larvae, in which the transverse lines converge; and Wright (*Proc. S. Lond. ent. nat. Hist. Soc.*, 1962: 53) two taken near Ashford, August 5, 14, 1962, in which much of the green scaling is replaced by cream.

In RCK, is one with "transverse lines approximated," "North Kent/1918/L. W. Newman"; and one with basal line almost absent, "North Kent/vii 1927/L. W. Newman."

An ab. having converging cross-lines and partly united with white suffusion on forewing, bred by B. K. West, Dartford, 1946, is the holotype of ab. *contracta* (C.-H., *Entomologist*, 94: 283, pl. 7, fig. 8).

FIRST RECORD, 1794: "*Phalaena Lucidata*, Dartford Emerald Moth . . . woods about two or three miles beyond Dartford, particularly on the skirts of Darnwood and near the banks of the Thames at Queenhithe" (Donovan, *Nat. Hist. Br. Ins.*, 3: 67).

Jodis lactearia L.: Little Emerald

Native. Woods and their vicinity; on birch, Spanish chestnut. Recorded from all divisions except 5, 16 (doubtless present), 9, 15. Generally less frequent now in 1 than formerly; few records for 4. "Generally common" (V.C.H., 1908).

The larva was taken on birch, Brasted Chart (div. 10), September, 1912, and reared (Gillett, *Diary*); and at Wateringbury (div. 11) I took a number on Spanish chestnut in 1964 and 1965, and reared them (C.-H.).

1. Recent records are:—Joydens Wood (B. K. West). Falcon Wood, Shooters Hill, one, May 28, 1947 (J. F. Burton). Abbey Wood, at light.

1951 (A. J. Showler). Farningham Wood, several, June 22, 1955 (A. A. Allen). Hayes (de Worms, *Lond. Nat.*, 1956: 62).

4. Ickham, 1954-59 (D. G. Marsh).

FIRST RECORD, 1859: Tenterden, abundant (Stainton, *Man.*, 2: 36),

STERRHINAE

Cyclophora pendularia Clerck: *orbicularia* Hübner: Dingy Mocha

Native, probably now long extinct. Woods; foodplant unrecorded.

Note: It is now more than 60 years since this species was last seen in the county.

1. "Woods near Erith" (Stephens, *Haust.*, 3: 199). Deptford, "I used to take it on the palings of my garden at Deptford forty years ago and it was then reckoned a great rarity; there was a rope-walk immediately adjoining the garden, and a double row of willows seven hundred yards in length" (E. Newman, *Ill. Nat. Hist. Br. Moths*, 73). Lee, one taken by C. Fenn, on a lamp, August 23, 1862 (Fenn, *Diary*). Near Plumstead, taken by B. A. Bower, pre. 1909 (H. C. Huggins). Blackheath, one; West Wickham (V.C.H., 1908); H. C. Huggins tells me possibly the Blackheath record is based upon Bower's capture (C.-H.).

6. Longfield, one emerged August 4, 1876, from a larva that was beaten out (Jennings, *Entomologist*, 9: 208).

6a. Chattenden Roughs, rare, May and August (Chaney, *Rochester Nat.*, 1885: 9).

[13. Tunbridge Wells, a doubtful record (Knipe, 1916)].

14. Tenterden, two by beating (in 1853) (Beale, *Zoologist*, 4130).

FIRST RECORD, 1831: Stephens, *loc. cit.*

C. annulata Schulze: Mocha

Native, woods, copses; on maple. Perhaps now extinct in 1.

1. West Wickham, 1859 (Barrett, *Ent. week. Int.*, 7: 75); one (Lockyer, *Young Nat.*, 8: 104). Shooters Hill Wood, two, May 28-June 2, 1863; Bostall Heath, August 11, 1863, August 19, 1865; Joydens Wood, one, August 11, 1875, one, September 3, 1888 (Fenn, *Diary*). Derrick Wood, fairly common (W. Barnes in *Wool. Surv.*, 1909). Sidcup, one, July 23, 1911 (Kidner, *Diary*). Bexley (V.C.H., 1908).

3. Blean Woods, one, May 26, 1866 (Fenn, *Diary*). Herne Bay, one; Pine Wood, one (D. G. Marsh). Den Grove, larva beaten from maple, June, 1939; three imagines May 13-14, one, May 22, 1944; one, May 24, 1953 (C.-H.).

5. Westerham (R. C. Edwards).

6. Longfield (Jennings, *Entomologist*, 4 (54), ii). Greenhithe (A. B. Farn MS.). Eynsford, ♀, June 22, 1902 (Shaw, *Trans Cy. Lond. ent. nat. Hist. Soc.*, 1902: 17). Fawkham, larva (E. J. Hare).

6a. Darenth Wood (Stephens, *Haust.*, 3: 199); (Curtis, *Br. Ent.*, 447); May 31, 1863 (Fenn, *Diary*); (West, *Ent. Rec.*, 18: 172). Greenhithe, May, 31, 1859 (Fenn, *Diary*). Cobham Great Wood, May 23, 1868 (J. J. Walker MS.). Chattenden, June 2, July 26, 1869 (J. J. Walker MS.); 1894 (Gurney, *Proc. Nonpareil ent. nat. Hist. Soc.*, for September 20, 1894, in *Entomologist*, 27: 360); 1895 (Rose, *Ent. Rec.*, 7: 22); larvae abundant, September 17, 1911 (Kidner, *Diary*); May 25 (16), June 1 (5), July 27, 1912; May 16, 1919; May 26, 1923, May 26, 1925, June 6, 1927 (F. T. Grant); 1949 (S. Wakely). [Chattenden] (*Entomologist*, 13: 163); three at sugar, August

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with the assistance of

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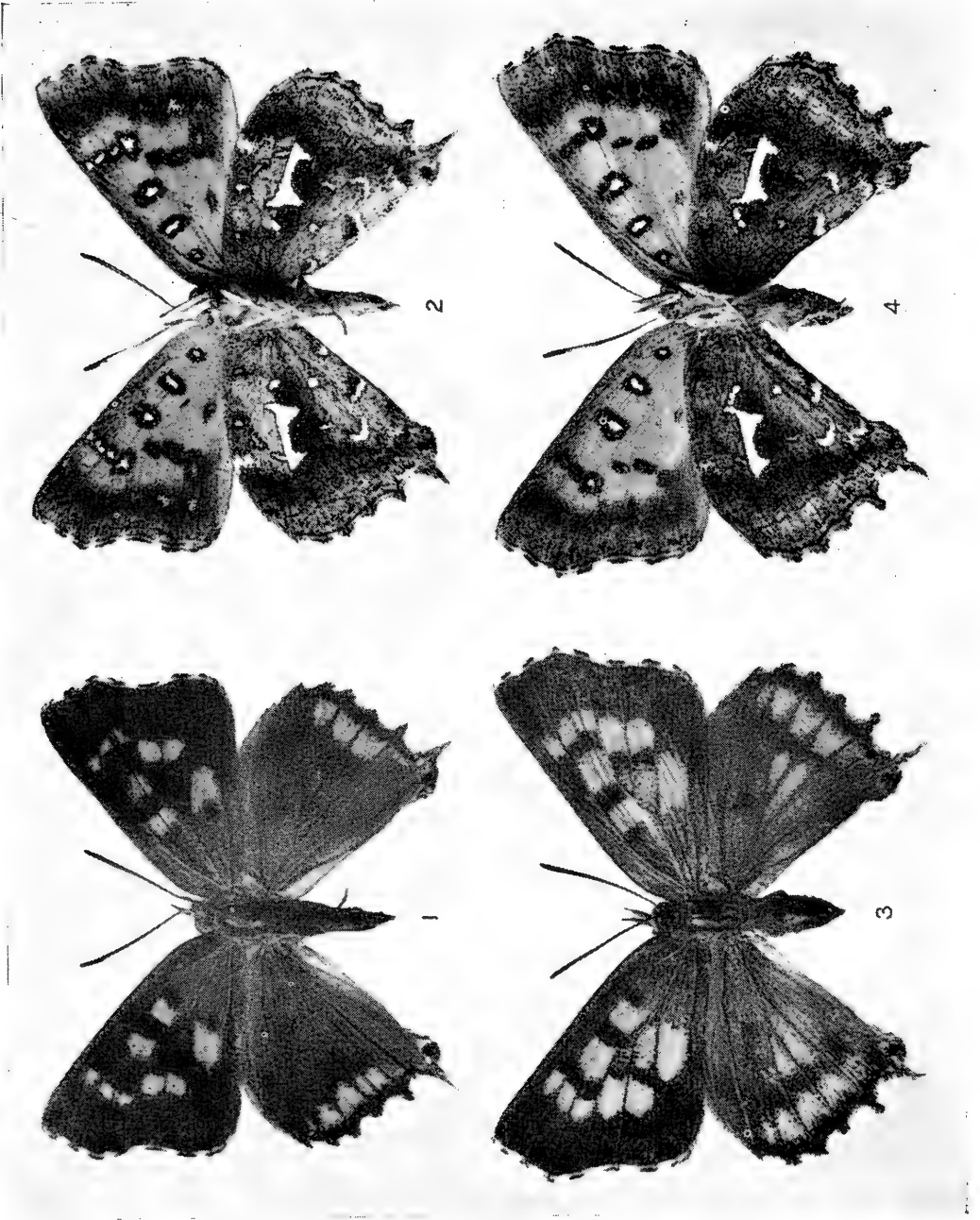
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Phasis braueri spec. nov.

Fig. 1. ♂ Holotype (upperside).

Fig. 2. ♂ Holotype (underside).

Fig. 3. ♀ Allotype (upperside).

Fig. 4. ♀ Allotype (underside).

Figures approximately 1.5 times natural size.

Photo: H. N. Wykeham.

Some Observations on the *Phasis thero* (L.)* group (Lepidoptera : Lycaenidae) with a description of a New Species

By C. G. C. DICKSON

Apart from Murray's description of *Phasis clavum* (which was considered to be a variety of *Ph. thero* (L.)), **the group has received little attention from the taxonomic point of view since Trimen's day, and in spite of the fact of its containing what appears to be a third, clearly defined species. This latter insect was known to Trimen and he refers to specimens of it (under *thero*) which were taken by Colonel Bowker in the Eastern Cape Colony; while a clear and concise description is given by him of the butterfly which is now known as *clavum*, under his "Var. A." of *Zeritis thero*.

While *Ph. thero* is largely a coastal butterfly, *Ph. clavum* (which is a good species in itself) is more of an island insect although the ranges of the two do overlap in places. The latter species occurs, for instance, on Piquetberg Mountain, but *thero* has been obtained just at the base of this mountain and, again, further inland near Citrusdal.

Ph. thero is known by the writer to occur, in the Cape Province, at least as far to the N.W. as Lambert's Bay, where it is of a particularly dark form, and as far east as Lake Pleasant, near Knysna; but from the records of others its range extends farther in either direction. *Ph. clavum* is plentiful in Little Namaqualand (Kamieskroon, Springbok, etc.) and, in an easterly direction, extends at least into the more westerly portion of the Great Karroo. There is some decided local variation in both these insects but without, it is believed, any actual intergrading with the butterfly which is described in this article.

The present butterfly was found in the Queenstown district of the Eastern Cape Province by Mr. N. A. Brauer but it occurs also, in a somewhat different form, with the orange-red markings of the upperside, in some cases, not so pronounced and often with a lighter background to the hindwing underside, in some of the more karroid areas of the Cape far to the west or S.W. of Queenstown.

Phasis braueri spec. nov.

This insect is somewhat intermediate in appearance, in certain respects, between *Ph. thero* and *Ph. clavum* but it exhibits certain clearly characteristic features of its own. In wing-shape it resembles *thero* quite closely, with the forewing a little more elongated and the outer—and inner—margins of the hindwing forming a rather less obtuse angle than is usual in *clavum*. The outer-margin of the forewing is, however, nearly always less concave than in *thero*. The projection at the end of vein 2, in the hindwing, is shorter than in *thero* but more apparent than in *clavum*, in which it is always very much reduced, while the one at the end of vein 1b is fully developed in the present insect.

The orange-red marking of the upperside is particularly well

**Papilio thero* Linnaeus, Mus. Lud. Ulr. Reg., p. 328, n. 146 (1764).

**Murray, Desmond P., 1935. "South African Butterflies: A Monograph of the Family Lycaenidae", pp. 104-105, fig. 49a.

developed in all wings in the female and in the male more so in the hindwing submarginally than it normally is in *thero* (in which there is sometimes complete absence of this marking—and, far more often so, in the case of *clavum*). On the underside both sexes are readily distinguishable from *thero* by the absence or less continuous formation of some of the silvery-white markings of the hindwing (but with such reduction less pronounced as a rule than in *clavum*). These markings also have a purer white tone than is usual in *thero*, in which they tend to have a slightly golden tint. In some of the females of *Ph. braueri* this more golden tint may, however, be present.

Male. Upperside.

Forewing. The orange-red markings as in *Ph. thero* and varying in their degree of development in different specimens. White divisions of cilia clearer than in *thero*.

Hindwing. The submarginal orange-red markings between the veins large and prominent in areas 2-4; the marking in area 1c mainly lake. White divisions of cilia clearer in hindwing also, than in *thero*.

Underside.

Forewing. Close to that of the other two species, allowing for the usual degree of variability in these insects; the grey markings between the veins, within the dark band parallel with the margin, present to a variable extent as in *clavum*, especially in the lower half of the band. There is less brown clouding near the inner-margin than in the other two insects if specimens of these are considered as a whole.

Hindwing. Light and dark areas of the wing almost as in *thero* but the light portions less smooth in appearance and more irrorated with fine dark scaling—as is also the case with the light submarginal area of the underside of the forewing. Small silvery-white marking in the cell short and more or less rounded, not comparatively large and markedly elongated as in *thero*. Owing to their being more broken up into separate markings, the very irregularly disposed smaller light discal markings do not give the impression of a sinuate chain of markings, as is normally the case in *thero*.

Length of forewing: 17-21 mm. (20.5 mm., in holotype).

Female. Upperside.

The orange marking lacks the decidedly reddish tone which is so apparent in fresh male specimens.

Forewing. Orange markings so enlarged as to virtually form an orange field in which the remaining blackish-brown spaces themselves form a pattern of dark, mainly contiguous spots. Cilia with the white spaces considerably longer than the dark divisions at the vein-ends.

Hindwing. Discal area with marked orange suffusion (in addition to the prominent submarginal orange markings), which is strongest in areas 1c-3, and which continues less clearly through the cell, almost to the wing-base. Submarginal marking in area 1c largely lake, as in the male.

Underside.

Forewing. Practically as in the male; the orange colouring more extensive towards the costa, between the upper discal spots and the dark band parallel with the margin.

Hindwing. Also substantially as in the male. In the allotype, the marking in the cell is in the form of two small dots, which are united in

one of the wings.

Length of forewing: 18.5-24.5 mm. (22 mm., in allotype).

The palpi, in both sexes, are closer to those of *thero* and have more white scaling along their main portion laterally than in *clavum*. Antennae also nearer to those of *thero* and having more light scaling beneath than in *clavum*.

♂ Holotype, EASTERN CAPE PROVINCE: Queenstown, 20.iii.1966 (N. A. Brauer); British Museum Reg. No. Rh. 17080. ♀ Allotype, data as holotype, 5.xii.1965; British Museum Reg. No. Rh. 17081.

Paratypes presented to British Museum (N.H.), as holotype, 26.x.1963, 1♂; 4.xii.1965, 1♀; 5.xii.1965, 2♂♂; 6.xii.1965, 2♂♂; 12.xi.1966, 2♀♀; 9.xii.1967, 2♂♂.

Paratypes in the author's collection, as holotype, 5.xii.1965, 1♂; 9.x.1966, 1♂; 12.xi.1966, 1♀; 9.xii.1967, 1♀.

Paratypes in Coll. N. A. Brauer, as holotype, 4.xii.1965, 1♂; 5.xii.1965, 2♂♂, 2♀♀; 9.x.1966, 1♂, 1♀; 12.xi.1966, 1♀; 9.xii.1967, 3♂♂, 5♀♀.

Paratype in Coll. C. D. Quickelberge, as holotype, 28.xi.1966, 1♂ (C.D.Q.).

Paratypes in Coll. C. W. Wykeham, as holotype, xi.1967, 2♂♂.

Paratypes in Coll. Transvaal Museum, as holotype, 4.xii.1965, 1♂; 9.xii.1967, 1♂, 1♀; Fincham's Nek, Queenstown, 22.iv.1962, 1♂, 2♀♀ (N.A.B.).

Variation of the type which might be expected occurs in some of the paratypes, this applying largely to the orange markings of the upperside. In some females the discal orange colouring of the hindwing is considerably reduced and in one example there is only a slight indication of it. In nearly all specimens of both sexes the silvery-white marking in the cell, on the hindwing underside, is in the form of a single small spot, but this is occasionally doubled (or partially so), more often in female specimens. In one of the males this marking is actually prolonged into a distinct short streak which joins the large marking beyond the cell. One or two of the male paratypes have the smaller markings of the hindwing underside even less completely developed than is usual in this insect, and partially absent.

Uitenhage specimens which were taken by Col. Bowker, and mentioned by Trimen (*op. cit.*), would seem to have been very close to the present Queenstown examples—this also applying to specimens from a locality on the Addo road known to the late Gowan C. Clark and which the writer visited in his company in 1950. The complete life-history had already been recorded from material from this spot.* A large female which was caught by the author at Oudtshoorn on 28th October, 1949, agrees well with Queenstown females apart from its lacking the discal orange suffusion of the upperside of the hindwing.

There is no very pronounced difference in the male genitalia, but this does not preclude specific status, many other cases of closely related species with similar genitalia being known. The following slight differences are observable in the actual specimens which have been compared by the writer: the aedeagus is less robust in proportion to its length in both *braueri* and *clavum*; the juxta is correspondingly reduced in size in the first two insects, the arms of the juxta being longer and more slender

*Clark, Gowan C. 1942. J. ent. Soc. S. Afr. V: 111-115, Pl. III.

in the case of *clavum*; the distal lobe of the valve is more strongly serrated in *thero*, from Melkbosch Strand.

The ♂ genitalia of *Ph. thero* have been figured by Monsieur Stempffer—Stempffer, H., 1967. Bull. Br. Mus. nat. Hist. (Ent.), Suppl. 10. p. 172, fig. 154.

This striking Lycaenid is named with pleasure after my friend Mr. N. A. Brauer who, after very long experience of the butterflies of the Western Cape, was able to pay special attention in more recent years to those of the Queenstown district.

Mr. Brauer, in a letter to me, has stated:—"This insect occurs locally in the Queenstown, Whittlesea, Tylden, Tarkastad and Cradock areas. As observed by Clive Quickelberge, its range of flight is never far from a species of dull-green "Taaibos" or *Rhus* (Anacardiaceae) growing in the above-mentioned areas; and this is known to be its food-plant. Males perch high up on these tall shrubs and chase rival males from one shrub to another. Females are very much scarcer than the males and are usually found on the lower branches of the shrubs. In both the Queenstown and Cradock areas I have observed females some distance from these shrubs. Both males and females are difficult to find after the sun has reached its zenith. In Queenstown the peak of the insect's emergence from the pupa appears to be reached in November, although specimens have been found on the wing from October to April."

Mr. G. E. Tite has very obligingly read the manuscript of this paper before its publication; Mr. C. D. Quickelberge has kindly loaned specimens for study; and Dr. L. Vári has given the writer access to the Transvaal Museum specimens of this insect for inclusion in the type-material.

"Blencathra," Cambridge Avenue, St. Michaels' Estate, Cape Town.

Notes on *Adela cuprella* Thunberg

By S. WAKELY

On the 27th April 1968, the British Entomological and Natural History Society held a field meeting at Chobham Common, Surrey. During a break for lunch some of the insects taken during the morning were being passed round for inspection and among these was a fine specimen of *Adela cuprella*. It had been taken from willow by Mr. P. J. Chandler, a dipterist, who was kind enough to pass it on to Mr. R. Uffen. None of the microlepidopterists present, including myself, had ever taken this species previously and after lunch Col. Emmet, Raymond Uffen and I made our way to the particular willow trees described by the captor and tried by beating the branches to dislodge others that might be present. Unfortunately it started to rain but Col. Emmet managed to take several. I gave up as the rain got worse and the ground was very swampy.

On reaching home that evening I phoned Mr. Richard Fairclough to tell him the news and he suggested a return trip the following day. Accordingly we went there and this time the weather was more kind and the sun shone most of the time we were collecting. Richard had brought his son Alan with him and his keen eyesight materially assisted in the capture of about thirty specimens. Most of the willows were past their prime as regards their catkins' attractant powers to insects, but occasionally a tree was found with hosts of bees and diptera present enjoying the

nectar from the catkins. We soon discovered that these were the bushes where *cuprella* were to be seen, often several at a time, in a kind of dance over the twigs with an occasional rest on a leaf. Owing to the height of the trees we had to tie a net to a longer stick and in this way on one occasion three were captured in the net at the same time. During a few dull spells when clouds obscured the sun we found that the moth could be disturbed from the tops of the trees by using a long stick, but, as they came down, owing to their dark hindwings and the shade from the bushes, they were most difficult to see and the uneven ground and swamp didn't make things any easier. These particular sallows extended along a natural drainage ditch or gully extending for over half a mile and moths were taken all the way along this stretch of the common although most were netted over trees in bloom.

On the following Saturday (4th May), Col. Emmet was able to visit the place again and managed to augment his series.

Our experiences on these trips enabled us to realise how easy it is to overlook this species. For one thing it appears to frequent the wettest places where tall and often ancient sallows grow and such places are not as a rule visited even by collectors during the end of April, when it is so wet in the vicinity of the low ground.

Very few of my friends had ever taken this species and I wrote to several and asked them if they knew of recent (or old) records of this pretty species. The most recent record came from Mr. E. Sadler who took one in the New Forest, Hants, near Ringwood, on the 25th April 1962.

Mr. John Heath sent me a pair of moths which he took, with others, on the 30th April and 1st May 1958, at Holker Mosses, N. Lancs. He said he had failed to find the species present on visits in other years.

Mr. S. C. S. Brown, of Bournemouth, wrote that he took the moth in plenty on the 25th April 1935, by Holmesley Railway Station in the New Forest, flying around willow blossom.

Mr. J. D. Bradley said he took several specimens at Wimbledon Common, Surrey, at the end of April or early May 1939. This appears to be the first record this century of the occurrence of *cuprella* at Wimbledon, but it was the best-known locality for it in the previous century.

Mr. S. N. A. Jacobs has a specimen which he took at Limpsfield Chart, near Westerham, Kent, on the 13th May 1940. He also sent me a list of the specimens in Fassnidge's collection, all from Southampton: One on 8th May 1923; four on 13th April, and nine on 14th April 1946; and nine on 16th April 1947.

Mr. M. Chalmers-Hunt wrote that he had two specimens in his collection labelled W. H. Harwood, 1885, but without locality. Other records which he unearthed are as follows:—

"One specimen in the Bentleyan Collection. On the Continent this frequents sallows when in bloom" (1849, Stainton, *An Attempt at a Systematic Catalogue of the British Tineidae & Pterophoridae*, 10). ["This is the earliest positive record to the species in the British literature I can trace." (C.-H.)].

Newcastle on Tyne; Darlington (*Stainton Man.* 2: 300). 1857.

Rathowen, Co. Westmeath (Mrs. F. J. Battersby, *Ent. mon. Mag.*, for 1866, per Beirne, *A List of the Microlepidoptera of Ireland*: 133). Beirne (*loc. cit.*) says of the species as Irish: "I include this species as doubtful

until confirmation is available; although it is likely to occur here, the above record is not reliable."

Wimbledon Common, 1867, April 23 (two), 29 (about a dozen); also noted in 1866 (Tuely, *Entomologist*, **3**: 301).

"*Adela cuprella* is now more abundant and generally distributed over Wimbledon Common than I have seen it since 1866" (Tuely, *Entomologist*, **5**: 81, communication dated 21.iv.1870).

Wimbledon, "flying over shallows," April 23 (F. G. H. Whittle, *Entomologist*, **22**: 152). 1889.

Dartmoor, 1889 (Still, *Entomologist*, **23**: 14).

Dunham, Old Park (J. Chappell, *teste* Ellis & Mansbridge, *Lepidoptera of Lancashire and Cheshire*: 240).

At meeting of City of London Entomological Society, April 18, 1893, Mr. Gates exhibited "living examples of the local *Adela cuprella* from Wimbledon" (Battley and Simes, *Ent. Rec.*, **4**: 161).

[King's Lynn, Norfolk] E. A. Atmore, writing April 17, 1894, records having taken *Adela cuprella* in 1894 (Atmore, *Ent. Rec.*, **5**: 155).

King's Lynn and Horning; not rare (C. G. Barrett, *Lepidoptera in Victoria County History of Norfolk* (1901): 158).

Rowardennan, Stirlingshire (1901, K. J. Morton, *teste* J. J. F. X. King, *Microlepidoptera in Fauna, Flora and Geology of the Clyde Area*).

Wimbledon and Barnes Commons (H. Goss and C. G. Barrett, *Lepidoptera in Victoria County History of Surrey* (1902): 142).

Fairlight, Sussex (Bloomfield, *teste* H. Goss and W. H. B. Fletcher, *Lepidoptera in Victoria County History of Sussex*: 200).

Loch Maree, Ross-shire, June 25, (1909) (Dorothy J. Jackson, *Ent. Rec.*, **22**: 131). ["I suspect wrong determination owing to late date."—C.-H.].

Willington, Derbyshire, May 13, 1918, H. C. Hayward, exhibited at Derbyshire Entomological Society, 2.xi.1918 (Hayward, *Lepidoptera of Derbyshire*: 47).

Glamorgan: "I was very pleased to take a specimen of the very local *Adela cuprella* flying above sallow at Llanishen on May 13, 1922 . . ." (Norton, *Entomologist*, **57**: 15).

Caversham (W. Holland and A. H. Hamm, *teste* J. J. Walker and B. M. Hobby, *Lepidoptera in Victoria County History of Oxfordshire*: 83).

The following old records have been found by the author:—

Wimbledon Common, Surrey: 17 specimens taken on 13th April 1856.—*The Entomologist's Weekly Intelligencer*, No. 3: 19 (1856).

Wimbledon Common: 17 specimens taken on 2nd May by C. Healy.—*E.W.I.*, No. 188: 43, 1860.

Wimbledon Common: C. Healy reported visiting the Common on 17th February 1861, for the purpose of searching for larval cases beneath the shallows. He found the "whole of the shallows had been cut down and a house built on the site!"—*E.W.I.*, No. 235: 5, 1861.

Upton, near Newark, Nottinghamshire: One taken on window, 11th April 1939.—*Entomologist*, **72**: 169.

In spite of *Adela cuprella* being such a local species it is widely distributed in Britain. Meyrick gives it as occurring as far north as Sutherland as well as in E. Ireland.

I can find no record of the larva having been found in this country. Stainton says in *The Natural History of the Tineina*, **13**: 144: "*Cuprella* is so partial to the blooming sallow bushes that there is little doubt the

female deposits her eggs in the blossoms of *Salix caprea*, *triandra* and *repens*. There is a wide field yet open here to the observant entomologist!" This was published in 1873 and it seems that the last sentence still holds good to-day. Several of our authors seem to repeat each other in saying the larvae inhabit a broad flat case of leaf fragments on fallen leaves of willow.

26 Finsen Road, London, S.E.5. 8.x.1968.

More About Greek Butterflies, June 1968

By R. F. BRETHERTON, C.B., M.A., F.R.E.S.

My wife and I were so well pleased with our first visit to Greece in April, 1967, that we decided to repeat it in June this year, concentrating (apart from days in Athens at the beginning and end) on the Peloponnese and reaching some of the less well-known places. For these we were now better equipped, since my wife had spent the winter in acquiring the rudiments of the modern Greek language. One can get on without this, but it certainly added much to the interest and enjoyment of our holiday.

We reached Athens by a night flight from London in the small hours of Saturday, 15th June, and spent that day in visiting the National Museum, with its astonishing display of golden treasures from pre-historic Mycenae and the Temple of Hephaestus (often called the Theseion), both of which had been closed on our previous visit on Easter Monday last year. Early next morning we picked up our hired Volkswagen and set off on the 160-mile drive to Sparta, by the excellent road which passes Corinth, Argos and Tripolis. Our first lengthy stop was at the top of the pass between Argos and Achladocampos, where we ate our sandwiches surrounded by bare and desolate mountains. A few butterflies were flying in a dry gully, and I had my first sight of the Greek Marbled White, *Malanargia larissa* Hubn., which was accompanied by the Brimstones *Gonepteryx cleopatra* L. and *G. farinosa* Zell., *Pontia daplidice* L., *Colias crocea* Fourc., *Maniola jurtina* L. and many obviously migratory *Vanessa cardui* L. After passing the densely cultivated plain round Tripolis we diverged to look at the remains of the fine temple of Athena Alea at Tegea, where several of the Mediterranean Comma, *Polygonia egea* Cramer were seen. This might be called the "Ruins Comma": it enlivened almost every archaeological site we visited, probably because these give undisturbed footholds to its food-plant *Parietaria officinalis*. We also enjoyed the small local museum. It has for some time been the rule that finds of statuary, pottery, etc., from excavations must be housed locally, instead of being carried off to Athens or (still earlier), to the British Museum. Besides stimulating local interest, this makes it easier for the visitor to appreciate their setting, instead of being overwhelmed by the sheer mass of material, as we had been in the National Museum in Athens. Beyond Tegea the road climbs through fine hill country to the Pass of Kleiusura (about 840 m.), whence it drops steeply into Sparta. There had been heavy rain here earlier in the day, and vegetation was plentiful and green; a couple of short stops yielded more *M. larissa* and *G. farinosa* and also some *Pieris ergane*. We reached our hotel in Sparta about 5.30 p.m. and stayed four nights there. Though otherwise excellent

it had no restaurant, so we dined nightly in the town square, watching the parade of local youth and beauty and attended by two of the thinnest and hungriest cats I have ever seen.

Modern Sparta is a pleasant agricultural centre, dominated on the west by the towering range of the Taygetos mountains. The ancient site, and indeed most of the surroundings, are covered with olive groves and are useless for collecting, though there is some better ground beside the (dry) Eurotas torrent along the road to Mystra. In this kind of country, both here and elsewhere in the Peloponnese, a few ordinary species were fairly common where there was water or irrigation—*Iphiclides podalirius*, *Pieris rapae* L., *Pontia daplidice*, *Colias croceus*, *Pararge megera*, *P. maera*, *Maniola jurtina*, *Coenonympha pamphilus* (as the striking ssp. *marginata* Ruhl), *Polyommatus icarus*, Rott., *Carcharodus alceae*—but there was very little else; on the dry, scrub-covered hillsides there was, at low levels usually nothing at all. Moreover, most butterflies were wary and difficult to catch, particularly in the brilliant sunshine and heat. Only in occasional water-courses, mostly dry, was there more variety, but even in such places butterflies were not abundant. I found that, at least outside the mountains, one could travel a long way and work very hard and yet bring in very few desirable insects.

From Sparta we first visited the ruins of the mediaeval city of Mystra, which climb fantastically up the steep slopes of an outlier of the Taygetos. Despite good scrub vegetation, there were few butterflies except in the ruined castle on the summit (650 m.), where *Iphiclides podalirius* and *Papilio machaon* were numerous but almost uncatchable. However, on the way down I caught single specimens of *Pieris krueperi* (which we saw nowhere else in the Peloponnese, though we had met its first generation last year at Delphi), *Strymonidia spini*, *Agrodiaetus admetus* and *Spialia orbifer*; and in the afternoon we found an abundance of common species by the Eurotas between Mystra and Sparta.

On the next day, which was showery and threatening, we drove south to the little port of Gytheion and then on by an appalling road across the bare limestone of the middle prong of the Peloponnese to Areopolis on its western side. Thence we descended by a zigzag track to the sea at Kelepha, intending to rejoin our outward route by a circuit on a road clearly marked on our maps. This road, however, proved not to exist, and after much casting about we had to return by the way we had come. Though the coast is very fine, all this country is bare and desiccated, and our only effective collecting was done in the afternoon in a water-course, filled with oleanders and chaste trees (*Vitex agnus-castus* L.) in full blossom, half way back to Gytheion. Here butterflies were fairly numerous, including many *Leptidea sinapis*, a few *Pararge egeria* and *P. roxelana*, and *Reverdinus orientalis*, as well as many *Iphiclides podalirius*. *P. roxelana* is a fine but frustrating creature. At the slightest alarm it takes refuge in the middle of the nearest bush and then cannot be caught; so, though I saw quite a number in various places, I failed to bring home an adequate series. On our way back in the evening two promising water-courses were noted in the hills just north of Gytheion, and we explored them in great heat on the following day. There we had the thrill of seeing at close range (though not catching) two *Charaxes jasius*, and I secured another *A. admetus*, *Limenitis anonyma* (worn), and

several *P. ergane* and *G. farinosa*, flying with many *G. cleopatra*. The distribution of these Brimstones was interesting. *G. cleopatra* was widespread at all altitudes, though commonest in the plains; *G. farinosa* we saw in several places, all at medium heights (300 to 1,000 m.); *G. rhamnii* only high up on mount Chelmos at 1,500 to 1,700 m.

On 20th June, another brilliant morning, we left Sparta westwards for Kalamata and Pylos by the road which crosses the Taygetos by the high Langada Pass, variously put in the books at 5,000 or 6,000 feet. We did this with some trepidation, since our guide-book used alarming adjectives about the dangers of the road. But in fact reconstruction work in the spectacular gorge was well advanced. We, together with a picturesque convoy of gipsy-owned donkeys, had to wait twice for some time while army-manned bulldozers pushed rocks from in front of the car, and the going was rough, particularly on the Messenian side of the pass; but there was no real difficulty. We stopped for an hour on the top. There were many butterflies on a thyme-covered slope below fine pine woods, and I saw several species new for the expedition—*Melitaea didyma*, *Issoria lathonia*, *Mesoacidalia aglaia*, *Hipparchia fagi*, *Hyponephele lycaon*, *Callophrys rubi*, *Glaucoopsyche alexis*, *Aricia montensis* (very different from the *A. agestis calida* flying with it), *Lysandra escheri*, *Aporia crataegi*. Several paths opened through the forest towards the higher slopes, and I regretted afterwards that we had not devoted more time to this admirable locality. The rather tedious descent through several gorges offered no obvious places for collecting, and Kalamata was intolerably hot, so we went on again across the cultivated plain of Messenia until we found some trees which gave exiguous shade for a lunch break, but no butterflies. Towards the coast the country became barer but more interesting, until we dropped down to Pylos, a small port on the almost land-locked bay of Navarino. Here we stayed two nights in the excellent little Xenia hotel. It was, incidentally, the only place we struck where the food was both good and interesting; and the sunset view across the bay to the island of Sphacteria is one of the finest I have seen. The bathing was also delectable.

We devoted the next morning to the recently excavated palace of King Nestor at Old Pylos, a few miles to the north; and the afternoon to the remains of the Crusader and Venetian castle at Methone, to the south. At the former, though the lepidoptera were not notable, I caught a specimen of the curious Neuropteran which is represented on the tie of the British Entomological and Natural History Society: the long "legs" are in fact extremely thin and elongated hindwings. I had thought that this was a purely tropical insect. At Methone a vast expanse of undisturbed weeds within the castle roused hopes of finding a good Skipper, perhaps *Gegenes pumilio*: but it produced nothing better than *C. alcaeae*, which was the most frequent Skipper everywhere we went. In the evening we cruised round the Bay of Navarino in a motor-boat and were shown the memorials to the English, French and Russian sailors killed in the battle in 1827 which secured the independence of modern Greece. We also saw through the clear water the alleged remains of some of the fifty Turkish and Egyptian ships sunk in that "untoward incident."

From Pylos we drove some sixty miles north along the coast road, before returning inland to revisit Andritsaina and the Temple of Bassae,

where we had experienced such execrable weather the year before. We took our lunch break in a magnificent pine wood, which had the reed-beds of the lagoon of Kaiapha on one side and sand-dunes and the sea on the other. I should expect night collecting there to be very profitable, but all we saw of interest at noon was a numerous but very local colony of the curious Neuropteran already mentioned. We reached Andritsaina about 3.30 p.m. and, after drinking tea, drove on up the road to the temple of Bassae, which is magnificently placed on a limestone shelf at about 1,100 m. It is, I think, perhaps the most impressive single monument of classical Greece which remains. The evening was still hot and sunny, and there was good collecting round the temple and the nearby curator's house. *M. larissa*, almost all males, were present in hundreds, and there was small numbers of *A. crataegi*, *G. farinosa*, *P. roxelana*, *H. fagi*, *Brintesia circe* and *Nymphalis polychloros*, besides many of the ordinary species. At sunset we returned well content to our hotel in Andritsaina, and were there greeted by a swarm of the small *Ca'ocala eutychea* Tr. which invaded the corridors and rooms.

The next day, 23rd June, we made a long and circuitous journey in great heat via Karytaina and Tripolis to Kalavryta in Achaia, under Mount Chelmos, where we had arranged to spend five nights. We had company—and Greek conversation—on the way, as we gave lifts first to a man who wanted to get to Athens and later to a local school-mistress who had missed the bus from her home village. The country was also interesting and in places spectacular, but we saw no butterflies of note until in the late afternoon we crossed the high "Aroania Neck" about ten miles from our destination. There, on a wooded slope at 1,000 m., *Satyrus bryce* and *Argynnis paphia* were flying: we did not see these elsewhere.

Kalavryta is a cool and pleasant market town placed at about 750 m. on the slopes of Mount Chelmos, whose summit (2,355 m.) is about seven miles as the crow flies to the south east. Northwards a rack railway (but no road) drops through a tremendous gorge beneath the famous monastery of Megaspeleion to the Gulf of Corinth, 14 miles away. The area has been relatively much collected by Dr. Martin Holtz (1901), P. Haig-Thomas (1930), Brig. Gen. van Straubenzeec (1932), Major Gen. Sir George Johnson (1965), and, most recently, by Dr. J. Thurner and other Austrian lepidopterists; but there is clearly still much to be found out about it. Our own efforts were badly hampered by poor weather and by a ruined car-tyre, but were nonetheless reasonably successful.

We visited the Cherkobus plateau, below the summit ridge of Chelmos at about 1,700 m., on 24th and 26th June. We drove up the rough road from Kalavryta and then turned to the left at its summit along the new road, described by Johnson, which flanks the mountain. This now goes for over a mile, but is still incomplete and seems to be used only by the lorry which brings down the milk from the herds on the plateau. Its surface was appalling, and on our first visit we abandoned the car after a little way and walked on to where the original path turns steeply upwards through the forest to the plateau. On our second visit we tore one of our tyres on a sharp rock and, having changed the wheel, were without a spare and with no possibility of getting one nearer than Patras. We felt it was too risky to face the roughness of even the ordinary road in this condition, and therefore could not pay a third visit to Mount

Chelmos.

On both our visits the day clouded soon after noon, and the second was cool and rather windy from the first, so our captures were rather limited and we did not attempt to scale the slopes above the plateau towards the summit, where there were still some drifts of old snow.

In the forest *Polygonia c-album*, *Nymphalis antiopa*, *Fabriciana niobe* and *Gonepteryx rhamni* were numerous, and the first patches of the pink-flowered spiny vetch, *Astragalus* sp., were attracting dozens of ovi-positing *Colias crocea*. Higher up, mainly on the plateau itself, we secured a few of our principal quarry, *C. aurorina heldreichi* Stdgr., but they were difficult to catch and most were more or less chipped or worn. While we were eating our sandwiches I sighted a large white *Colias* which I hoped might be the rare white female form *fountanei*; but, alas, it was only a fine *C. crocea* f. *helice*. The *Astragalus* was also patronised by females of *Plebejus pylaon*, and I took a number of both sexes. I think it has not been previously noticed that the form of *pylaon* here is much closer to the *pylaon lycidas* of the Simplon Alps than to the *pylaon sephyrus* of northern Greece and Macedonia: it is quite as large as *lycidas* and even more brightly marked on the underside in both sexes. But *lycidas* uses a different, yellow-flowered vetch, *Astragalus exscapus* L. as its larval food-plant. The vetch is almost the dominant plant in the drier parts of this plateau, probably because of its power to resist the heavy grazing.

In damper places *Parnassius mnemosyne athene* was flying freely: it has strong intra-marginal black markings, which Dr. L. G. Higgins has pointed out to me are characteristic of the most southerly European races of this species. I looked in vain for *Aricia anteros*, which was taken by Johnson and van Straubensee at this spot. But there was an interesting compensation. When I came to set my "*pylaon*," I saw that one of the females clearly did not belong to that species. It was much smaller, and on the underside the ground colour was bright brown instead of greyish and the brilliant orange marginal lunules had no trace of the white scaling above and around them, which is characteristic of *P. pylaon*. Its identity defeated me until after my return to England I showed it to Dr. Higgins. He at once said it was *Plebejus eurypilus* Freyer, and we confirmed this by comparison with his series from Asiatic Turkey. The only previous record of this species in Europe which I can trace is that by Rebel of a single female caught, also on Chelmos, by Dr. Martin Holtz in 1901: "*Lycaena Eurypilus* Frr, Chelmos on 15.vii at about 1,800 m. a fresh female, which entirely agrees with specimens from Asia Minor. This and the following species [*L. panagaea taygetica* Rebel, of which Holtz took three specimens high on the Taygetos on 10th July, 1901] represents a highly interesting extension of the Greek butterfly fauna." (Translated from the German.) The date, however, is misprinted, since other parts of Rebel's article show that Dr. Holtz was elsewhere in July and only visited Chelmos on 15th August. Seitz says that the larva of *P. eurypilus* feeds on *Astragalus echinus*: on Chelmos it probably uses the same vetch as *P. pylaon* and *C. heldreichi*. Because Rebel's record had not been repeated I omitted *P. eurypilus* and *L. panagaea* from my recent "Distribution List of the Butterflies of Southern and Western Europe." Dr. J. Thurner has recently re-discovered *L. panagaea*, also on

Chelmos. It is gratifying that both can now be firmly accepted as European butterflies.

On the way back to Kalavryta on our second visit I stopped in order to walk up the "dry wadi" described by van Straubenzee and Johnson to a spot, at perhaps 1,200 m., where a spring gave moisture and good vegetation. During a short gleam of sunshine Lycaenids flew in numbers, including many *Lysandra amandus*, *Agrodiaetus ripartii* and *Meleageria daphnis* and a single specimen of *Cyaniris semiargus helenae*. I had hoped to get *Spialia phlomidis* here, but the only Skipper I saw was a *Reverdinus* which, because of its small size and dull colour I took to be *R. marrubii*; dissection, however, shows it to be structurally identical with the large *R. orientalis* taken near Sparta and in April 1967 at Olympia and other low-lying places. It looks as if there are two forms in Greece, one large and double-brooded at low levels and another small and probably single-brooded in the mountains. On the previous evening I had found a similar damp spot about a mile above Kalavryta at about 900 m. in what is, I think, the same wadi. There many of the same Lycaenids were settling for the night on rush heads, and they gave me the only really easy collecting I had in Greece. At this lower altitude they included *Lysandra thersites*, *L. dorylas* and a worn *Maculinea arion*, which were not seen higher up.

Our second day at Kalavryta began with cloud and rain, so we decided to take the train down the gorge to Dikoptron on the Gulf of Corinth and to break the return journey at the little station of Zachlerou and to walk up the mule-track to visit the monastery of Megaspeleion if the weather permitted. The gorge was indeed worth seeing, and on our return to Zachlerou there was enough sunshine to encourage us to make a start and to allow of the capture of an *A. admetus* and some *L. dorylas*. But alas! When we were halfway up the thunder rolled, the heavens opened, and despite the shelter of some thick trees we were soon soaked to the skin. So, having struggled back to Zachlerou down the path, now in places a torrent, we dried ourselves in the restaurant and took the mid-afternoon train back to Kalavryta. The day was, however, redeemed by a fine evening, which gave me the haul of Lycaenids recorded above.

We repeated the attempt to visit Megaspeleion on our last day, and this time it was fine and extremely hot—so that the alcoholic refreshment offered to visitors at the monastery was particularly welcome. Though the monastery itself was re-built in modern style after an explosion in 1934, it contains an astonishing collection of early Byzantine manuscripts and embroidery, inspection of which kept us a considerable time before we returned to the butterflies. The great cliff above and below it is a rich collecting ground, but difficult to work. The best results came from a trail of dessicated plums which had fallen on to the path from a cart or a mule. These were very attractive to Nymphalines and Satyrines, though, surprisingly, not at all to Blues or Skippers. I took here a couple of small, dull-coloured "Graylings" which appear to be referable to *Hipparchia semele* and not, as might be expected in Greece, to *H. aristaeus*. Dr. Higgins has confirmed this by dissection, but it is not yet clear whether both, or only one, of these species occur in the Peloponnese. *H. fagi* was also numerous here. As we found elsewhere in the Peloponnese, it is a small race, which could easily be mistaken

for *H. alcyone* or *H. cypriaca*, neither of which we saw.

We left Kalavryta early on 28th June and drove, gingerly but without mishap, over 50 miles of mostly rough road to Patras, where we obtained a new spare tyre without difficulty but at unwelcome cost. A halt on the way to collect on a steep mountain-side near Kelanos (c. 750 m.) yielded a single *Spialia proto*, flying with a number of *C. alceae*, but nothing else of interest. After lunching beside the sea outside Patras, we had a hot and rather tedious drive eastwards along the coast road, much obstructed by many lorries and buses. The hotel we chose in the late afternoon at Xilokastro, though it faced a delectable pine-wood and bathing beach, proved to be quite the worst we have yet met with in Greece; and the pine-wood seemed to contain no butterflies at all.

On the next evening we were due to hand back our car in Athens. We spent most of the morning, again in great heat, in the extensive ruins of Old Corinth. *P. egea* was particularly in evidence, and *Pyronia cecilia* was added to our list of species: it seems to be rather local in Greece. We then cut across to the Argos road and found a shady spot for lunch beside a stream in some woods beyond the village of Solonos, which I had noted on our outward journey to Sparta. The heat had driven most of the butterflies to shelter also. A number of magnificent *Pandoriana pandora* were flying over the water under the big plane trees, and in a railway culvert which spanned a dry water-course nearby I disturbed quite an assemblage of species, including several *P. maera*, *P. megera* and *Strymonidia spini*, about a score of that brilliant Tiger moth, *Euplagia quadripunctaria* Poda, and, best of all, a couple of *Hipparchi allionii* G.-H., (*fatua* Frr.), of which I caught one perfect male. This is a very local and elusive species in Europe, and its capture was a satisfying conclusion before we made the last stage of our journey back to Athens in the late afternoon. There, on the following day, the shade temperature reached 95° F., and this deterred us from doing anything very energetic. However, during a ramble on the hill of the Pnyx, beyond the Acropolis, I completed the list—77 species of butterflies—with a specimen of *Lampides boeticus*, which, surprisingly, we had not seen anywhere else.

I am much indebted to Major General Sir George Johnson, K.C.V.O. for information about Mount Chelmos, and to Dr. L. G. Higgins for help with identifications and for the dissection of several doubtful specimens.

Species of butterflies seen were as follows:—

Erynnis tages L. Ch., few worn.

Carcharodus alceae Esp. General at all levels, never abundant.

Reverdinus orientalis Rev. Gyth., several large, presumably of 2nd brood; Ch., two small, probably of single brood.

Spialia orbifer Hubn. Mys., Ch., few, father worn.

Sloperia proto Ochs. Kelanos, one fresh male.

Adopoea lineola Ochs. Ch.

A. flava Brunnich. Gyth., Ch., Bass.

Ochlodes ventata Brem. & Gr. Ch.

Papilio machaon L. General, but much less common than the next species.

Iphiclides podalirius L. General, often common, especially at low levels.

Parnassius mnemosyne athene Stichel. Ch., many.

Leptidea sinapis L. Gyth., Ch., Meg., locally common.

Pontia daplidice L. General; the commonest White.

- Pieris brassicae* L. General.
P. krueperi Stdgh. Mys., one female of the summer brood.
P. rapae L. General and common.
P. mannii Mayer. Only noticed certainly at Achl.
P. ergane G.-H. Kleisura Pass, Gyth., Ch., locally common.
P. napi L. Ch., one.
Aporia crataegi L. Tay., Bass., mostly worn.
Colias crocea Fourc. General and abundant; several *f. helice*.
C. aurorina heldreichi Stdgr. Ch., not common and going over.
Gonepteryx rhamni L. Ch., few.
G. farinosa Zell. Widespread at medium levels.
G. cleopatra L. General, especially common at low levels.
Charaxes jasius L. Gytheion, two seen.
Limenitis reducta Stdgr. (*anonyma* Lewin). Gyth., few worn
Melitaea didyma Esp. Tay., fresh, Meg., worn.
Issoria lathonia L. Tay., Ch.
Fabriciana niobe L. Ch., many.
Mesoacidalia aglaia L. Tay.
Argynnis paphia L. Aroania Neck.
Pandoriana pandora Schi. Solonos, many.
Vanessa cardui L. General, abundant but mostly worn.
V. atalanta L. Athens, Ch., singly.
Polygonia egea Cramer. Widespread, especially in ruins.
P. c-album L. Ch., few.
Nymphalis antiopa L. Ch., several in forest.
N. polychloros L. Bass., Ch., Meg.
Melanargia larissa Hubn. Widespread at medium levels; males locally abundant, females singly elsewhere.
Pararge aegeria L. Gyth., Ch., few.
P. megera L. General at low and medium levels.
P. maera L. Widespread, especially in ruins.
P. roxelana Cramer. Gyth., Bass., Ch., Meg., usually singly.
Hipparchia semele L. Meg., two small males.
H. fagi Scop. Tay., Bass., Meg. (numerous), Ch., Aroania Neck.
H. fatua, Freyer (*allionii* G.-H.). Solonos, two fresh.
Pseudochazara amalthea Friv. Ch., Meg., few.
Brintesia circe F. Bass., Aroania Neck, Karytaina, Ch., Meg., common.
Satyrus bryce Hubn. Aroania Neck, few.
Maniola jurtina L. General and common, very worn except high up.
Pyronia cecilia Vall. (*ida* Esp.). Old Corinth.
Hyponephele lycan Kuhns. Tay., Ch., Aroania Neck, numerous.
Coenonympha pamphilus marginata Ruhl. General at low and medium levels.
Strymonidia ilicis Esp. Achl., Tay., worn.
S. spini Schiff. Mys., Solonos, singly.
Callophrys rubi L. Ch., still fresh.
Heodes tityrus Poda. Ch., Meg., local.
Lycanophora phloea L. Widespread, not common.
Lampides boeticus L. Athens, several on Mouseion Hill.
Lycanopsis argiolus L. Gyth., few worn.
Philotes vicrama schiffermulleri Hemming. Ch., one very large female.

- Glaucopsyche alexis* Poda. Tay., numerous.
Maculinea arion L. Ch., one worn.
Plebejus pylaon Frhst. Ch., plentiful; very large, and resembling ssp. *lycidas* Trapp from the Simplon Alps.
P. eurypilus Freyer. Ch., one fresh female: apparently only the second European record.
Aricia agestis calida Verity. Sparta, Gyth., Tay., Pylos.
A. montensis Verity Tay., flying with the last species, but very distinct.
Cyaniris semiargus helenae St McGr. Ch., one fresh male.
Polyommatus icarus Rott. Common generally at low and medium levels; many ab. *biarcuata* Tutt.
Lysandra thersites Cantener. Mys., Ch.
L. escheri Hubn. Mys., Tay., Ch, Meg.
L. amandus Scheven. Ch., numerous in the upper wadi.
L. dorylas Schiff. Ch., Meg.
Agrodiaetus admetus Esp. Mys., Gyth., Meg. Singly, not seen on the same ground as the next species.
A. ripartii Freyer. Ch., Meg., locally abundant.
Meleageria daphnis Schiff. Ch., locally common.

Achladocampos Pass=Achl.; Bassae=Bass.; Chelmos and Kalavryta=Ch.; Gytheion (watercourses in the hills to north and south west)=Gyth.; Megaspeleion=Meg.; Mystra=Mys.; Langada Pass, Taygetos Mountains=Tay.

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CORRIGENDA for "Northern Species of the Genus *Thorybes* Scudder (Lepidoptera), and a new Aberration of *Thorybes pylades* (Scudder) from Southern Ontario" *antea* : 213-219.

In title p. 213, line 2, for Abberation read Aberration.

P. 213 line 41, for *Thorbyes* read *Thorybes*.

P. 214 line 17, for *Thorbyes* read *Thorybes*.

P. 216 line 4, for *Thorbyes* read *Thorybes*.

P. 218 line 5, for *Thorbyes* read *Thorybes*.

P. 218 line 15, for *Thorbyes* read *Thorybes*.

P. 218 line 24, for *M. confaqui* (Stecker) read *M. cofaqui* (Strecker).

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Naming Aberrations -- If You Must

By S. R. BOWDEN

I should like to offer some remarks about the naming of the so-called "aberrations" of Lepidoptera. Whether aberrations should be given Latin names at all is a question that I do not intend to discuss: obviously particular aberrations may need to be referred to in some way or other, and the language and type-face employed for this purpose do not seem to raise any issues of principle. My own view is that in any polymorphic situation the distinct morphs must have names. It is not so easy to make out a case for aberrations in the true sense, but let that pass.

If an aberration is to deserve a name, it should be recognisable in a specimen, and it should, by definition, fall outside the normal range of variation of the species. An extreme form connected with the type by a series of commoner intermediates has no claim to a name. This usually implies that a nameable aberration has a distinct genetic basis; nevertheless it is a phenotype, not a genotype, that is named, and there are no doubt instances in which differing genetic constitutions produce indistinguishable phenotypes.

A form may be an aberration in one subspecies but be within the normal range (or even constitute the type) in another subspecies of the same species. Thus "Thompson's pale yellow", of extreme rarity in European *Pieris napi* L., seems to be the usual form in Oregon *P. napi marginalis* Scudder. If so, it is strictly an aberration of *P. napi napi*, not of *P. napi*.

In a variable species in which visible aberrations are many, it is important to delimit a particular aberration correctly when describing it. Many descriptions are burdened with irrelevant details about the specimen in front of the author, and often the feature which alone justifies the separation and naming receives no emphasis. In consequence a later author, finding that his specimen differs in some minor point, claims a "new" aberration.

Just as a species has a normal range of variation, so has an aberration. Such variation may be due not only to environmental factors (voltinism, temperature) but also to interaction of the gene concerned with the range of combinations of other genes normally encountered in the species. In particular cases, as when a single mutation breaks a normally stable pattern, the variation may easily be greater than that visible in the typical form. No additional aberrations are thus generated and names given to the variants sink as synonyms.

When one is dealing with a complex of related forms it is particularly desirable to determine any effect of temperature upon them, since phenotypes differing on this account cannot properly be given separate names unless there is a marked discontinuity at some point on the scale.

Combination-forms, in which one aberration is simply added to another, should never be separately named, and if a worker does not know whether his form is due to the association of more than one factor acting independently, he had better wait until he does: there is never any urgency. Similarly hybrids should not receive names, other than those of the known parents. Unusual combinations of forms produced by hybridization should not be named as aberrations.

Only if two aberrant factors acting together produce a phenotype that

would not be predicted from their separate effects is there a reasonable case for naming this phenotype as a distinct aberration.

Certain kinds of aberration occur over a wide range of species: for example, recessive albino forms probably occur in all species of *Pieris* and *Colias*. It is certainly better to emphasise the similarity of such forms by calling them all "albino" than to give them Latin names of their own. The description and figuring of presumable albinos have often in the past been ambiguous: ex-black areas vary in their residual colour, even in the same species. Albinism affects only melanin pigments; absence of (say) pterin coloration is not albinism, and full albinism can co-exist with normal pterin pigmentation.

* * *

It will be of interest to apply some of these principles to the seven "aberrations" of *Callimorpha jacobaeae* L. set up by R. W. Watson in the *Entomologist's Record* **79**: 33-35 and **80**: 181-183. The beautiful coloured plates and the interpreted breeding experiments enable us to reach some conclusions, which would be hazardous on the basis of descriptions alone.

Firstly, *intermedia* and *nigrofimbriata* are synonyms of *coneyi*, the visible differences between them being matters of degree. *Intermedia* and *nigrofimbriata* occur only in those broods in which *coneyi* is expected, and counting them as *coneyi* leaves proportions close to expectation.

It appears that *flavarosea* also is *coneyi*, modified either environmentally or by combination with something else, perhaps even albino?—but this is a rather desperate suggestion from one who has never seen an albino cinnibar moth.

Nigrociliata is a synonym of *rubrasuffusa*, which again is probably a combination-form, but nameable if found to be *coneyi* modified by a gene which in typical *C. jacobaeae* produces no visible effect.

The solitary *pallida* looks like *flavarosea* but probably is not. One hopes that further examples will occur in controlled breeding, perhaps including temperature experiments.

"Ab. *coneyi* Watson" is the name of a most interesting form, which is making it possible to explore the genetics of pattern-formation in *Callimorpha*. The other names, on the evidence presented, are not established as belonging to separate entities. Further breeding may establish "*rubrasuffusa*" and perhaps "*flavarosea*." Otherwise it may be desirable to re-describe *coneyi* to include them.

DEATH OF A MOTH.—On the afternoon of August 11, whilst attending a corn field being harvested on this estate, a geometer was noted flying towards me along the hedge by which I was standing, slowly losing height as it approached. It landed on a fallen branch at my feet, where it fanned its wings out and downwards beneath the body and around the twig, and then fell on its back. I had by this time recognised the moth as a male *Hydriomena furcata* Thunb. and on picking it up, realised that it was not feigning death but had indeed died, an event I had never previously observed in the wild among lepidoptera, and one which, though no doubt commonplace, has probably seldom been witnessed. The moth in question was very worn, but otherwise undamaged.—E. A. SADLER, West Tisted, Hants. 20.ix.1968.

Breeding *Lysandra coridon* ab. *syngrapha*

By MAJOR-GENERAL C. G. LIPSCOMB, C.B., D.S.O.

In August 1966 I captured an *L. coridon* ab. *syngrapha* and decided it was time I realised one of my life's minor ambitions by attempting to breed this form of *coridon*.

Accordingly the butterfly was placed in a talc cylinder with a container at the bottom holding a sod of downland turf and with a perforated metal top. Additional ventilation was provided on two sides by cutting windows in the talc and fixing nylon netting over them. For nourishment a small bunch of downland flowers was placed in a bottle set in the turf. This home seemed to suit the lady because she laid upward of 100 eggs in the fortnight or so that she lived.

The eggs were laid indiscriminately on the various plants that comprised the turf so that although *H. Comosa* was present it was not necessarily selected for egg laying—I have no reason to believe that this state of affairs is any different in the wild so that either the young larvae, when they hatch in the spring, must be uncommonly good walkers or it must lead to a high rate of wastage.

During the autumn the eggs were removed with the aid of forceps and scissors and placed in a plastic container to over-winter. Butter muslin was secured over the top of the container which was kept in a meat safe on a north facing wall.

During the first week in March the eggs were placed on growing plants of *comosa* in 4" flower pots—a wire cage was constructed over each pot and a length of one of my wife's discarded nylon stockings stretched over this completed the job. The pots were sunk in the ground and a cloth placed over them to keep the rain out.

Towards the end of June I found I had 98 well-grown larvae and very little growing food plant left. Accordingly I liberated half of them on a local *coridon* down and continued feeding the remainder on cut *comosa* which I placed in large plastic containers with a layer of dry peat at the bottom in which the larvae pupated most successfully.

All the butterflies to emerge were quite normal and they were placed in an airy breeding cage well supplied with flowers but for some reason seemed most reluctant to pair—In desperation I sent a number to Alan Collier, the Master hand in such matters, and he was successful in getting pairings and eggs. I myself eventually got several observed pairings when I put the butterflies under a large semi-circular gauze meat cover standing on my lawn in full sun — once paired the females were placed in the talc cylinder where they again laid freely.

I eventually found I had between 300 and 400 eggs for over-wintering and I had visions of being able to stock all the local downs with this lovely variety. Large quantities of *comosa* were grown from seed in 8" pots and all seemed set for a successful breeding season this year when in March I again distributed the eggs amongst the pots of growing food plant.

However, success was not to be so easily attained as I soon found that all the *comosa* plants were infested with greenfly which literally smothered every scrap of fresh growth—I have yet to find the answer to this problem as the best I could do was to lay the pots on their sides and try and brush the fly off. This was never really successful as a

great many remained on the lower parts of the plant, and in the early stages *coridon* larvae and the fly are of the same size and colour and so can easily be destroyed together.

This disinfestation had to be carried out at least once a week and to add to my difficulties the plants began to wilt and die, no doubt as the direct result of the fly sucking their vital juices. To cut a sad story short, I was eventually left with two fairly healthy pots of food plant and 36 full fed larvae. I put a layer of peat on top of each pot to assist pupation but I made the mistake of letting it get damp when I watered the plants and as a result 19 pupae went mouldy and died. From the 17 survivors there emerged 9 males, 5 females and 3 ab. *syngrapha*—about what could be expected from a normal recessive in the F.2. generation.

It was some consolation that I had realised my ambition and incidentally learnt a lot in the process, but I should be most grateful if somebody could tell me how to control greenfly under these conditions.

Zygaena (Mesembrynus) diaphana Staudinger and *Zygaena (Agrumenia) carniolica* Scopoli in Georgia (Transcaucasia)

By HUGO REISS, Stuttgart

Zygaena diaphana ingens Burgeff (comb. nov.)

Professor H. Burgeff (1926: 14) described *ingens* as a subspecies of *Zygaena purpuralis* Brünnich as follows: "Gigantic specimens from Tiflis the bulk even 3-4 times larger than *purpuralis*, forewing length 17-18 mm. (instead of 15-15.5 mm.), width behind the apex of the forewing ca 7 mm. (instead of 6 mm.). Antennae dainty, hardly larger than in the nominate form. Red spots narrow, 1, (3, 5, 6), (2, 4), separated by the chief veins. Middle spot terminated abruptly, of which spot 6 projects and is strongly developed. Apex of hindwings narrowly edged with black. Red a pale carmine, almost carmine-rose, which on the forewings is somewhat lighter than on the hindwings. Black ground colour of forewings almost without gloss. Legs even in the ♀, black (8♂, 8♀ from the neighbourhood of Tiflis via Bang-Haas)."

A male from the coll. Burgeff is illustrated in colour (Reiss, 1930: 8, pl. 1g).

Holik & Sheljuzhko (1953: 176) wrote on the distribution of *ingens* Burgeff: "The ssp. *ingens* Burgeff is not restricted to the neighbourhood of Tiflis, as is shown by the material before us, which agrees perfectly with Burgeff's description. Further authentic localities are: Borzhom, 2♂, 1♀, 5-6.vii.1910, leg. Xienzopolski, 1♂, coll. Staudinger, Berlin, leg. Christoph, 28.vi.1880; Berg Bolshoje Pozharistshe, near Borzhom, 3♂, 2♀, 17-26.vii.1915, leg. Kotshubei, 2♂, 2♀, 13-15.viii.1932, 1♀, 28.vii.1937, leg. Tkatschukov; Mitarba, near Bakuriani, 4♂, 1♀, 21.vii.1932, leg. Tkatschukov; Abas-tuman, 6♂, 4♀, 23-29.vii.1914, leg. Sheljuzhko, 1♂, leg. Haberhauer, 1882, in coll. Staudinger; slopes of the Zekar-Pass, near Abas-tuman, 1,800 m., 4♂, 1♀, 28.vii.1914, leg. Sheljuzhko, 8♂, 3♀, 12.vii.1917, leg. Kotshubei".

A study of the genitalia of a male and female by W. Gerald Tremewan, Woodham, Weybridge (personal communication) and a male by Fr. Heller,

Stuttgart, on fresh specimens collected at Tiflis, 28.v-9.vi.1964, by Prof. Otto Slaby, Plzn, showed that *ingens* Burgeff is conspecific with *diaphana* Staudinger and is not a subspecies of *purpuralis* Brünnich. According to Prof. Burgeff (personal communication), the type specimens of *ingens* in coll. Burgeff were dissected by Dr. B. Alberti and an examination of the genitalia confirms that the subspecies is referable to *diaphana* Staudinger.

Zygaena carniolica achalzichensis Reiss ab. **iberica** Kolenati (**stat. nov.**)

Holik & Sheljuzhko (1956: 209) reported on *carniolica* in Georgia as follows: "Kolenati (1846: 94) recorded the occurrence of *Zyg. onobrychis* Fabr. in the Caucasus. In the same place he described and named a var. *iberica* Kol.:

Var. 99. Iberica Kolenati. Viridi-caerulea, macula alarum anteriorum apicali lineari, arcuata, coccinea, nunquam albo-cincta. Habitat in Iberia. Note 1. Iberia is listed as a province in the upper Kyros (=Kura) and corresponds with to-day's Georgia (Tiflis, Kutais). Thus was given the first description of a Transcaucasian form of *carniolica*, and it is peculiar, that later authors carelessly omitted to comment on this form of *carniolica* flying in Georgia. Lederer (1870: 29) wrote: I do not know the variety *iberica* Kol.—pp."

Holik & Sheljuzhko (1956: 209) placed *iberica* Kolenati as the main Georgian form of *Zygaena carniolica* Scop. and placed *alta* Reiss (1921) and *achalzichensis* Reiss (1935) as synonyms.

In Kolenati's time, the term "var" was also used for aberrations. According to the description, *iberica* is a form in which the white edging of the forewing spots is missing (nunquam albo-cincta). I have no examples of this form from Georgia in my collection and neither have I seen one in other collections. Even Holik & Sheljuzhko (1956: 210) noted no specimen of *carniolica* from Georgia, without white edging on the forewing spots, in the large amount of material that they examined. They noted only one specimen of *carniolica* in Staudinger's collection, with the determination label "var. *iberica* Kol." and the inadequate locality "Kaukasus". In this specimen only the forewing spots 1, 2, 3 and 4 are finely edged with white. It does not agree with Kolenati's description and is merely transitional to *iberica*, while the locality label "Kaukasus" does not prove that the specimen came from Georgia. With regard to *carniolica alta* Reiss I refer readers to a previous paper (Reiss, 1941: 62).

It follows that *iberica* Kolenati can only be placed as an aberration of ssp. *achalzichensis* Reiss. The name *arragonica* Holik & Sheljuzhko (1956: 210), note 1), proposed to replace *occitanica iberica* Staudinger, which they considered to be preoccupied by *iberica* Kolenati, is unnecessary and now falls as a synonym of *iberica* Staudinger (**syn. nov.**).

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The Coleopterous Fauna of Stones at Staines, Middx.

By J. MUGGLETON, B.Sc.

This paper is an account of the Coleoptera (beetles) found under a group of stones at Staines, Middx. Although the species involved are commonplace, it is intended to show that in a locality where suitable habitats for beetles are rapidly decreasing (as a result of the requirement of land for building space), a single habitat in a small area can still support a number of species. Furthermore, I believe that this type of habitat may become of increasing importance in built-up regions. For as long as there are gardens, there will always be some stones around (e.g. rockeries, crazy paving, etc.) which will afford shelter to beetles. Additionally, the other fauna of these stones may provide a source of food for the predatory species.

This particular group of stones was chosen because their close proximity to each other and ease of access offers a good opportunity to study the habitat in this locality. The records presented below were made principally in 1962 and from 1965-1967. In some cases additional records from 1961, 1963 and 1968 have been included. As the term stones is rather ambiguous, included below is a detailed description of the habitat.

The Habitat

This is a group, now of twenty-one stones (twenty-four in 1965), lying in some waste-ground bordering a narrow gravel drive. It is 100 yards from the River Thames and is surrounded by houses and gardens. There is a small clump of trees on the west side. The altitude is about forty-six feet. The soil in this locality is an alluvial type and corresponds to the Brown Vega of Kubiěna (1953).

The area of ground covered by each stone ranges from 240 cm.² to 870 cm.². The average area covered being 576 cm.². All these stones occur within an area of 7 m.².

The surrounding vegetation consists of, *Urtica dioica* Linn. (Stinging Nettle), *Aegopodium podagraria* Linn. (Ground Elder), *Cirsium arvense* (Linn.) Scop. (Creeping Thistle), *Galium aparine* Linn. (Goosegrass) and the grasses *Dactylis glomerata* Linn. and *Lolium perenne* Linn. The nearby clump of trees contains, *Abies alba* Mill. (Silver Fir), *Acer negundo* Linn. (Box Elder), *A. pseudoplatanus* Linn. (Sycamore), *Ilex aquifolium* Linn. (Holly), *Sambucus nigra* Linn. (Elder) and a dead specimen of *Chamaecyparis lawsoniana* (A. Murr.) Parl. (Lawson's Cypress).

Both *Rana temporaria* Linn. (Common Frog) and *Bufo bufo* Linn. (Common Toad) occurred under the stones in 1962. Toads were still present in 1965, but absent in 1966 and 1967. One was found again in September 1968.

The invertebrate inhabitants (excluding the beetles) of these stones include representatives of the following groups, spiders (*Dysdera* sp.), harvestmen (Opiliones), mites (Acari), centipedes (*Lithobius* sp.), millipedes (Diplopoda), woodlice (*Porcellio*, *Philoscia*, *Oniscus* and *Armadillidium* spp.), snails (*Helix aspera* Mu. and *Cepaea* sp.) and slugs (*Agriolimax*, *Milax* and *Arion* spp.). The only other insects found are various dipterous and lepidopterous larvae. Examples of the latter include *Noctua pronuba* Linn. (Large Yellow Underwing) and *Diataraxia oleracea* Linn. (Bright-line Brown-eye).

Species List (Coleoptera)

This list refers only to those species which are active (or at least visible) under the stones in the daytime. Further species may be present beneath the soil, but to find these would necessitate considerable disturbance of the habitat.

The months of occurrence of each species are indicated by roman numerals at the end of each entry. Where a species of previously regular occurrence is no longer found, the entry is enclosed with square brackets.

Family CARABIDAE

[*Carabus violaceus* Linn. One or two specimens were found each year from 1960 until 1962. No specimens have been found under the stones or in the near vicinity since 1962, vii, viii].

Nebria brevicollis Fab. This species is found in small numbers in all the months indicated below. However, the numbers reach two peaks, one in May and the other in September. Immaturely coloured specimens can be found at both times, indicating two emergence periods. Those emerging in September must overwinter and re-appear the following year. That only single specimens are found early in the year may indicate that few survive the winter. In any case the numbers are reinforced by the emergence in May, from individuals that must have overwintered in an immature stage. At the times of emergence the beetle becomes common (up to twelve being found on a single occasion) and up to four may be found together under one stone. However they soon disperse, ii, iii, iv, v, vi, viii, ix, x.

Notiophilus biguttatus Fab. Never common, and only recorded as single specimens, but found every year. The occurrence of one specimen on 28.ii.62 would seem to indicate that it overwinters as an adult under the stones, ii, iv, v, vi, viii, ix.

Bembidion lampros Hb. A single specimen was found in May 1967.

Bembidion quadrimaculatum Linn. A single specimen was found on 15.iv.67.

Badister bipustulatus Fab. This appears at irregular intervals in the months shown below. It was more common in 1965 than in 1967, and was absent in 1966 (see below), iv, v, vi, ix, x.

[*Harpalus aeneus* Fab. This species was found in 1961 and 1962, but has not occurred since, iv, vii, viii].

Harpalus latus Linn. This species is found every year. Its numbers reach a peak in May. Eighteen individuals were found on 13.v.66 and seventeen on 31.v.67. This must mark the emergence period, the species does not appear to hibernate as adults. It is often found

in groups of up to six under a single stone, iv, v, vi, vii, viii.

Harpalus rufipes D.G. One or two examples have been found each year, except 1967. It was formerly (1961) more common, iv, v, vi, vii, viii.

Amara aenea D.G. This species occurs usually as single specimens and was found in 1962, 1965 and 1967 (see below). Its appearance in both the spring and the autumn suggests that it hibernates in the adult stage, iv, v, viii, ix.

Feronia madida Fab. This has occurred every year from 1961-1967. In most years it first appears in the middle of April, although one was found on 23.iii.66. It is found in small numbers in the early part of the year, but it is most frequent in July and August, when specimens have been found in cop. The larvae can be found some years in March and April. It appears that overwintering takes place in both the adult (in the ground, not under the stones) and larval stages. Both the black and red legged forms of this species are present, iii, iv, v, vi, vii, viii, ix.

Agonum dorsale Pp. Southwood (1963) states that this species is sometimes found in large groups, and I have previously commented on the gregarious behaviour of this beetle under these stones (Muggleton, 1966). However since then further details have been noted. The groups of beetles first appear in the autumn and remain together until the end of April. The earliest such a group has occurred was on 2.ix.67, when thirteen were found together under one stone. The largest group found consisted of twenty-three specimens and this was on 12.xii.65. At the end of April the beetles disperse to other stones in the area, where they are found singly or in pairs. Pairs in cop. have been seen at this time of the year. Towards the beginning of June the beetles cease to be found under the stones.

With the exception of the group of twenty-three found in December 1965, the groups have always been found under the same stone. This stone measures 20 cms. × 20 cms. and is sheltered by a sheet of tin, it is therefore drier than the other stones. The numbers of this species were greatly reduced in 1966. This may have been because the ground beneath the stone, under which the large group had been found in the previous December, was under water for several days. This coincided with the disappearance of the beetles.

The gregarious behaviour of this species may serve to enhance the effect of its green and orange warning coloration, i, ii, iii, iv, v, vi, viii, ix, x, xi, xii.

Agonum mülleri Hb. Two examples of this species were found in May 1967.

Family HYDROPHILIDAE

Megasternum obscurum Mm. This was first found in September 1968 and has since been found up to the date of writing. It may have been overlooked in previous years, ix, x, xi.

Family SILPHIDAE

Phosphuga atrata Linn. This species was found in 1961, 1963, 1965 and 1966 but is never common, having been seen on only ten occasions in these four years. It was found most frequently in 1965. It has

been observed feeding on snails (*Cepaea* sp.) under the stones and is probably attracted to the stones in search of its prey. It is present under the stones after both hibernation and emergence, iv, v, viii.

Phosphuga subrotundata Le. Found only in 1962, 1965 and 1967, it was most frequent in 1965 when it was recorded on nine occasions. In this locality both this and the previous species hibernate under bark and in rotten wood, iv, v, vi, vii.

Family STAPHYLINIDAE

Oxytelus laquaetus Mm. This species appears to be on the increase. In 1965 it was recorded on only three occasions (and then only as single specimens) as compared with twelve occasions over the same period in 1967, when up to four individuals were seen at one time, iv, v, vi, ix, x.

Oxytelus rugosus Fab. This species was first recorded on 29.iii.67. Ten individuals were found on 30.iv.67, and thereafter it occurred regularly. This is not a new species to the locality, previously it has been found on carcasses. The sudden appearance of this species and the marked increase in the numbers of *O. laquaetus* may indicate some change in the conditions under the stones. There had been a considerable dumping of garden refuse near the stones in 1966 and again in 1967, and this may have attracted these two species, iii, iv, v, viii, ix, x.

Philonthus cognatus S. This occurs each year with an increase in numbers at the beginning of May. The species is most frequent in May and June, iii, iv, v, vi, viii, ix.

Ocypus globulifer Fc. A species which is found every year but is never common, iv, v, vi, vii, viii, ix, x.

[*Ocypus olens* Mu. This species occurred on nine occasions in 1961 (with up to three individuals found at one time), three occasions in 1962, once in 1963 and twice in 1965. It was absent in 1966-1968, v, vi, vii, viii, ix].

Tachyporus hypnorum Fab. This appears irregularly and is never as plentiful as the next species. Only one specimen was found in 1966, iv, v, vi.

Tachinus humeralis Gr. After *A. dorsale* this is the most consistently occurring species. From 1965-1967, it was present on 57 of the 61 occasions on which records were taken in April and May. The numbers found on separate occasions fluctuate from one to nine throughout the period during which it is found. There appears to be no peak period. Unlike other species, it maintained its numbers in 1966. However, it was less plentiful in 1967 than in previous years, iii, iv, v, vi.

Family HISTERIDAE

Onthophilus striatus Ft. One specimen was found on 20.v.67.

Hister cadaverinus Hf. One specimen was found on 23.vii.61 and another on 15.v.65.

Family RHIZOPHAGIDAE

Rhizophagus depressus Fab. One specimen was found on 6.v.67. The

occurrence of this species is surprising and it had probably originated from one of the nearby fir trees.

Family SCARABAEIDAE

Aphodius granarius Linn. One specimen was found in May 1963.

Discussion

As yet it is difficult to see any trends or to indentify any pressures that may be influencing the coleopterous fauna of these stones. However two events may be significant. These are the disappearance of *Carabus violaceus* and *Ocyopus olens*. The intensification of garden cultivation must eliminate suitable habitats for these large predators. Their size must also draw to them the unwelcome attention of the gardening public, who are liable to destroy anything large and black on account of their being "pests" or "poisonous". One person I know of believes that the Stag beetle (*Lucanus cervus* Linn.) is a harbinger of death and must be killed!

The absence of *Amara aenea* and *Badister bipustulatus*, together with a reduction in numbers of *Tachyporus hypnorum*, in 1966 can be accounted for by a sudden cold spell in mid-April of that year. This coincided with the time at which these species first appear under the stones. The numbers of these species had recovered by 1967.

On the credit side, six new species were recorded in 1967 and it remains to be seen whether these are casual species or whether they will become established. One, *Oxytelus rugosus*, is clearly well established. However I was unable to make observations in the spring of 1968 and could not investigate the status of the remaining five species.

At first sight the absence of the smaller Staphylinid species (e.g., the Aleocharinae) may appear surprising, especially when compared with Allen's (1964) list from a suburban garden. However most of the beetles present use the stones for shelter; clearly the smallest species can find adequate shelter under plant litter etc. and would have no reason to seek the shelter of the stones.

Several interesting observations, which have not been dealt with here, have arisen from this investigation. For example, certain species are only found under specific stones and other species occupy different stones at different times of the year. These problems remain to be investigated at a future date.

Conclusion.

A total of twenty-seven species have been found in this habitat, and of these seventeen may be regarded as regular or typical. Of the remaining ten, seven are casual species and three are no longer found. I think this shows that even in a built-up area, a single habitat can profitably repay investigation.

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On *Paralabis aborensis* (Burr) (Dermaptera : Carcinophoridae) comb. nov.

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This species was originally described by Burr (1913) under the genus *Euborellia* Burr. He (1915) did not include it in his revisionary work on the subfamily Carcinophorinae, based on genitalia. Therefore its correct generic position remained in doubt. The author has examined the type and other specimens of the species determined by Burr. The genitalia was dissected from one of the specimens which on examination revealed that this species should be placed under the genus *Paralabis* Burr.

Material examined—(i) 1♂, Reg. No. 2156/19, 4♀♀, Reg. Nos. 2392, 2394-96/19, Rotung, 1,400 ft., 24-26.xii.1911, under the leaf stem of plantain; (ii) 1 nymph and 1♀, Reg. Nos. 2308, 2313/19, Janakmukh, 600 ft., 17, 19.xii.1911 and (iii) 1♂, Reg. No. 2432/19, Dibrugarh, N.E. Assam (India), 17-19.xi.1911, Abor exped., all collected by Kemp, determined by Burr and deposited in the Zoological Survey of India, Calcutta. All these specimens have been referred by Burr (1913). The specimen with Reg. No. 2156/19 has been designated by him as Nomotype, whereas, in the Zoological Survey of India this as well as the specimen with Reg. No. 2396/19 have been labelled as type. In my opinion Burr's Nomotype is the actual type.

Description.—The description given by Burr being very brief, the following additional characters are given below:—

♂ : Head somewhat triangular, depressed, frons tumid, sutures distinct, posterior margin gently concave. Antennae 19-segmented(?). Pronotum slightly longer than broad, median suture well marked, anterior margin truncate, sides a little reflexed, straight and parallel, posterior margin gently rounded. Elytra present in the form of narrow lateral flaps on mesonotum in all the specimens examined excepting in one ♂ with Reg. No. 2432/19 where it is wanting. Penultimate sternite triangular, punctate, with posterior margin gently rounded. Ultimate tergite transverse with median suture faint, feebly punctate. Forceps subcontiguous at base, ridge present in basal one fourth only, inner margin finely crenulate, tapering, right branch more curved and crosses over the right branch. Genitalia typical of the genus with parameres broader at base and narrowed apically, tip rounded, outer margin regularly convex and inner margin emarginate. Preputial sacs with two sclerotised denticulate rods at the end.

♀ : Structure of head, antennae and pronotum same as in male. Sides of abdominal segments rounded, smooth and without longitudinal keel. Last tergite slightly narrowed posteriorly. Penultimate sternite triangular, smooth with posterior margin obtusely rounded. Forceps a little less asymmetrical than male.

Remarks.—This species comes very close to *Paralabis pervicina* (Burr) but differs by its general colouration, pubescent body, depressed head, shape of pronotum which is longer than broad with posterior margin gently rounded, legs uniformly coloured, ultimate tergite with a longitudinal keel on sides, penultimate sternite with posterior margin gently rounded and forceps subcontiguous at base.

I am thankful to The Director, Zoological Survey of India, Calcutta, for providing facilities.

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A New Genus and Species of Ephemeridae (Ephemeroptera) from Madagascar

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Mme J. Fontaine (1968) has recently described a new mayfly nymph, belonging to the superfamily Ephemeroidea, from Madagascar. She was not, however, able to determine its correct taxonomic position, although she believed it to be an Ephemeridae. No scientific name was assigned to this nymph.

Based on a detail study of the taxonomic characters and phylogenetic relationships of all the genera of the Ephemeridae, I find this nymph to be a new and unique genus, correctly placed in the family Ephemeridae. Therefore, based on her description, I propose the name *Fontainica josettae* gen. n. and sp. n., in honour of Mme J. Fontaine.

The nymph is clearly not referable to the African genus, *Eatonica* Navas. The characters given in Demoulin's (1968) description of a nymph, which he believes to be *Eatonica*, are clearly those which would seem predictable on the basis of the phylogenetic position as determined by adult characters. The nymph of *Eatonica* is most similar to *Hexagenia* Walsh of North America, although it differs in a number of characters.

Fontainica is most closely related to the North American genus, *Pentagenit* Walsh. The majority of nymphal characters, particularly in regards to the legs and mouthparts, display a high degree of similarity between these two genera. Also, the frontal process of *Fontainica* seems to represent a simple modification of the bifurcate condition in *Pentagenia*.

Female subimagos of Ephemeridae from Madagascar, which have previously been discussed by Demoulin (1966) and Fontaine (1968), cannot be definitely placed in any genus. These may prove to be the adults of *Fontainica josettae*. The wing venation, however, is similar to that of *Eatonica*, but quite unlike that of *Ephemer* L.

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Notes and Observations

MOTHS IN SUFFOLK.—I came here on retirement from Balsham, Cambridge, in August last year, and have been running a mercury vapour Robinson trap in the garden all this year. I find the numbers of insects attracted each night far more than at Balsham. I think the following captures might be of interest to readers: June 14, *Apatele alni* L. (1), and another on 15th, and also on that date there was a specimen of *Meliana flammea* Curtis, which I believe to be the first Suffolk record. Meyrick mentions the county in the distribution of the species but it is not mentioned in the list of the Suffolk Naturalists' Society (1937). There was also one *Cucullia lychnitis* Rambur, a species recorded from Woolpit and Beccles in 1890 and not again until 1934, when one was taken at light at Holton, Lincolnshire. Lastly, on 18th July, I was surprised, to say the least, to take a specimen of *Thamnonoma brunneata* Thunb. I believe years ago Dr. Worms took one at Wicken. I know this insect well, having netted it by day in the Aviemore area on several occasions.—(Rev.) GUY A. FORD, The Rookery Farmhouse, Norton, Bury St Edmonds, Suffolk. 24.vii.1968.

A RARE VARIETY OF POLYOMMATUS ICARUS ROTT.—While searching the grasses on the North Downs for *P. icarus* in early September, I had the good fortune to net a freshly emerged male specimen, of a uniform grey colour instead of the usual blue, in fact, the colour of dry slates. In my experience of over fifty years of collecting, I have never seen one like it. On the day in question, only a few *P. icarus* were seen at all.—A. E. STAFFORD, Corydonis, 83 Colborne Way, Worcester Park, Surrey.

LATE EMERGENCE OF MELANARGIA GALATEA L.—On the 28th August 1968 I observed a fresh female *M. galatea* at rest on a Cotswold (Gloucestershire) hillside, it having apparently emerged during the previous day or two. This is an exceptionally late date for this species, and I have not previously seen an emergence later than the first week of August. No other *galatea* were seen on this date, all others having died off some fortnight earlier, and it is doubtful whether this specimen could have been fertilised.—N. A. WATKINS, 18 Old Sneed Park, Stoke Bishop, Bristol. 9. 8.x.1968.

OCCURRENCE OF APAMEA ZOLIKOFFERI FREYER IN SCOTLAND.—I have to report the capture of a specimen of *Apamea zolikofferi* Freyer at Millden, Glenesk. Angus, on 13th September 1968. Its identity has been confirmed by Dr. de Worms. The moth, a male in very fresh condition, was taken in a standard mercury vapour trap with 125 watt bulb, plugged in to the mains at Millden Lodge. The weather at the time was quiet, overcast, and rather warm for the time of year with a very light north wind. A decidedly unexpected visitor to this well-known grouse moor.—Major-General SIR GEORGE JOHNSON, Castlesteads, Brampton, Cumberland. 10.x.1968.

HERSE CONVULVULI L. AND PARARGE AEGERIA L. ON CANNA.—A specimen of the Colvolvulus Hawkmoth was found in my m.v. trap on the morning of 12th September, a night when 523 moths (a high number for here) were counted in the trap. By a remarkable coincidence the last time a

specimen of *convolvuli* was taken was on 11th September, 1964, and the time before that was on 12th September, 1960. Previously two specimens in August 1955, and one sent to me from Arisaig, caught on 1st September 1950, so the moth can be considered a quadrennial or quinquennial visitor here. A large moth noticed on South Uist this summer was probably of this species.

For the first time since September 1951 the Speckled Wood has been noticed again on Canna. One was reported by a visitor who saw it by the path in the wood behind my house on 10th and 11th August. I myself saw this specimen on 13th August, and another in a different plantation the same day, about 200 yards away. Both specimens had damaged hind wings and appeared to be males. The second was seen again on 16th August, and again on 24th August, after a spell of wet weather which ended a severe drought here; it had remained very much in the same spot, but could not be found again on 26th August.

The nearest *aegeria* colony is that in the woods at Kinloch in the Island of Rum, about 17 or 18 miles away as the crow flies. Mr. Peter Wormell tells me this colony has been flourishing this summer. The area planted with trees on Canna is now something like 16 acres as compared with 6 in 1951, so there is now a sufficient habitat for *aegeria* should sufficient numbers drift over from the Rum colony.—J. L. CAMPBELL, Isle of Canna, Scotland. ix.1968.

EUPITHECIA MILLEFOLIATA RÖSSLER AT WOKING.—On 7th August 1968 I took in my trap here a Pug which, though somewhat worn, I felt sure was *E. millefoliata*. This has recently been confirmed by Mr. D. S. Fletcher at the Natural History Museum. Since its recognition as a British species just after the last war, the Yarrow Pug has seldom been found far from the coastal seaboard of the south-eastern parts of England. However, Prof. J. C. Dacie has recorded two examples of this species recently from Wimbledon which indicates this insect is either increasing its range or perhaps more likely it is overlooked and probably much more widespread than is supposed.—C. G. M. DE WORMS, Three Oaks, Woking. 10.x.1968.

AMPHIPYRA BERBERA RUNGS AT WOKING.—Since this species was separated from *A. pyramidea* by Svensson late in 1967, the habits and habitats of these two Copper Underwings have engaged the attention of most field lepidopterists during 1968. It is of interest to note that the first *A. berbera* came to my m.v. trap on 8th August with a few more in the following week, while *A. pyramidea* did not appear till 9th September after my return from Ireland where I went on 23rd August. I think it has been the experience of most collectors that *A. berbera* is in fact generally earlier in emergence than its near relative and this also goes for most examples found in collections, since both species seem to be fairly equally distributed certainly over the southern portion of the British Isles. It now remains for the respective life-histories to be worked out, chiefly to see whether the larvae are readily distinguishable. This may not be too easy on a big scale as the species do not lay freely in captivity and their larvae are none too numerous to obtain in the field.—C. G. M. DE WORMS, Three Oaks, Woking. 10.x.1968.

MORE RECORDS OF BRACHYOPA (DIPTERA: SYRPHIDAE).—I was interested to read Mr. A. A. Allen's note on this genus in your September issue. It may be that the species of *Brachyopa* are commoner than the published records suggest. These flies are superficially very like Muscids, and I am sure that many collectors of the popular hover-flies overlook them for this reason.

I took a single male of *Brachyopa bicolor* Fall. at rest on a solitary Larch trunk at Ystradfellte, Brecon, on 23rd May 1964. *B. scutellaris* Desv. has occurred in my garden here. I also have taken *B. pilosa* Collin only in Windsor Forest.—R. M. PAYNE, Westwood, Highwalls Avenue, Dinas Powis, Glamorgan 21.ix.68.

BUTTERFLIES ON BUDDLEIA, NEAR WARWICK.—The following table indicates number of species during August and September since 1964, feeding on Buddleia and Michaelmas Daisies and recorded at mid-day.

SPECIES	1964		1965		1966		1967		1968	
	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.	Aug.	Sept.
<i>Pararge aegeria</i> L. (Speckled Wood)	—	5	—	—	—	1	2	6	2	3
<i>P. megera</i> L. (Wall Brown)	6	3	1	—	1	1	8	1	10	5
<i>Maniola tithonus</i> L. (Hedge Brown)	—	—	—	—	—	—	—	—	4	—
<i>Coenonympha pamphilus</i> L. (Small Heath)	1	—	—	—	—	—	—	—	—	1
<i>Aglais urticae</i> L. Small Tortoise-shell	11	34	31	—	8	30	16	57	14	307
<i>Nymphalis io</i> L. (Peacock)	15	—	9	13	27	14	48	9	134	79
<i>Vanessa atalanta</i> L. (Red Admiral)	49	19	—	1	47	70	16	41	1	22
<i>V. cardui</i> L. (Painted Lady)	—	3	—	—	6	13	1	—	4	3
<i>Polygonia c-album</i> L. (Comma)	8	1	1	2	1	—	—	1	6	3
<i>Polyommatus icarus</i> Rott. (Common Blue)	3	1	—	—	—	—	—	—	1	1
<i>Lycaena phlaeas</i> L. (Small Copper)	—	—	—	—	—	2	2	1	—	1
<i>Gonepteryx rhamni</i> L. (Brimstone)	1	—	—	1	1	2	9	—	2	7
TOTAL	94	66	42	17	91	133	102	116	178	432

In addition *Pieris brassicae* L., *P. rapae*, L., and *P. napi* L. are always numerous.

As the table shows 1968 has been a prolific year for *A. urticae*, *N. io* and *P. megera* but the immigrants, *V. atalanta* and *V. cardui* were below usual numbers.

I was also extremely pleased to note during July an increase in *Strymonidia w-album* Knoch feeding on nearby privet in quantity.—
DAVID BROWN, 25 Charlecote, nr. Warwick.

CONTINUED SURVIVAL OF COENONYMPHA TULLIA AB. PHILOXENUS (LEP. SATYRIDAE).—During the past two summers Bob Craske and myself have visited the well-known colony of this butterfly on Fenn's Moss south of Whitchurch in Shropshire. This moss supports the most southerly colony of this insect in the British Isles and the form of *philoxenus* is peculiar to this area, differing materially from that found further north.

During the past two summers Bob Craske and myself have visited the well-known colony of this butterfly on Fenn's Moss south of Whitchurch in Shropshire. This moss supports the most southerly colony of this insect in the British Isles and the form of *philoxenus* is peculiar to this area, differing materially from that found further north.

It is therefore a matter of concern that no apparent effective steps are being taken to ensure its continued preservation.

Because of the difficulty of access, our visits have admittedly been confined to the southern part of the moss, where a good deal of piecemeal peat extraction is taking place—This is accompanied each spring by the indiscriminate and uncontrolled burning by peat cutters of large areas of the moss—The excuse for the burning is that it assists the extraction of the peat but the areas destroyed in this process have very little relation to this requirement. On both our visits we had ample evidence of the destructiveness of this policy and this year, apart from a few strays, this butterfly was virtually confined, in the southern part of the moss, to a very restricted area of a few acres that had escaped burning for a number of years.

To make matters worse, the existence of this butterfly is further threatened by a new development, because we were told, on our last visit, that a company had acquired the peat cutting rights of the whole of the centre of the moss and installing machinery for cutting and extraction.

With this general destruction of its habitat, the future of this attractive insect looks gloomy indeed. It is therefore hoped that local public bodies that are interested in conservation will take up its cause and prevent this most interesting colony from following others in the midlands to extinction.

MAJOR-GENERAL C. G. LIPSCOMB, C.B., D.S.O.

IMMIGRATION REPORTS OF DANAUS PLEXIPPUS L. (MONARCH BUTTERFLY), DURING OCTOBER.—Mr. L Hugh Newman has advised me that the B.B.C., a member of whose "Country Parliament" team he was, that they have received the following letters reporting sightings of the Monarch Butterfly during the early part of October:

"We had ten of these foreign butterflies about which a news-reader spoke one evening this week. They were on a large clump of michaelmas daisies on a sunny afternoon about a fortnight ago (i.e. 6th October). With them, and dwarfed by them, were some red admirals. We were so intrigued by the strangers that we stayed watching them for quite ten

minutes. We tried to identify them from a rather elementary book, but were unable to do so. We thought that they were unusual by both size and marking, but did not, of course, know how unusual. We wish we had photographed them and feel distinctly honoured by their visit now that we know what they were."—MARGARET COLEMAN, 114 Monmouth Road, Dorchester, Dorset.

"I spotted two magnificent butterflies on my michaelmas daisies, first attracted by their great size, 4 ins wing span, and their unusually brilliant colouring . . ." (post card dated 18th October 1968).—Mr L. DENNYS, 5 Stantons Row, Tremar Coombe, St. Cleer, Liskeard, Cornwall.

"I understand you require information regarding the Milkweed butterfly. Whilst on a stroll in this locality I spotted one and was able to catch it. The butterfly is a female with a wing span of four inches. Date caught, October 13, 1968. I hope this is of some value."—R. SMITH, 33 St. James' Road, Bexhill on Sea, Sussex.

I understand that a specimen has been received from Cornwall by the British Museum, and will be duly reported officially, and Mr. A. H. Sperring informs me that he saw a specimen at Seaford, Sussex on 13th October, which will be reported in the Proceedings of the British Entomological and Natural History Society.

It would seem that this is a genuine immigration, for bird watchers have reported several North American species from the Scillies and along the South Coast.

I will be most pleased to receive any further reports of captures or sightings.—Ed.

1896 (Turner, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1896: 57); (*Ent. Rec.*, 1: 64, 5: 221); Chaney, 1884-87).

8 Folkestone, woods (Knaggs, 1870). Woolwich Wood, one, June 3, 1900; three, May 27, three, June 5, 1901 (H. D. Stockwell, *Diary*; Stockwell, *Entomologist*, 34: 26); one, June 20, 1954 (W. D. Bowden). Shepherdswell; Temple Ewell; Whitfield (E. & Y., 1949). Elham, one at acetylene light at Wingmore, June 30, 1934 (W. E. Busbridge *Diary*). Covert Wood, June 13, 1949 (G. H. Youden). Womenswold, July 1, 1951 (W. D. Bowden). Haddling Wood, ♀, May 10, 1952 (D. G. Marsh, *Dairy*).

10. Seal (Carrington, *Entomologist*, 31: 76).

Wateringbury, 1901 (E. Goodwin, MS); (V.C.H., 1908). Shipbourne (P. A. & D. J. A. Buxton coll.). Aylesford, one, 1954 (G. A. N. Davis).

12. Ham Street, May 24, 1935, one by A. M. Morley (Scott, 1936); one, May 27, 1954 (E. J. Hare); July 28, 1956 (R. F. Bretherton).

13. Pembury, common (Stainton, *Man.*, 2: 39). Bidborough (Knipe, 1916).

14. Tenterden, common (Stainton, *Man.*, 2: 39). Woodchurch, one, August 6, 1899 (H. D. Stockwell, *Diary*). Sandhurst, 1930; at light, August 20, 1945; August 2, 1948, also at light (G. V. Bull).

16. Folkestone, one, 1934 (A. Riddell teste A. M. Morley); two at m.v.l. in the town, August 24, 1952 (A. M. Morley).

VARIATION.—Riding (*Ent. Rec.*, 11: 213) records one taken at Tunbridge Wells, by C. E. Partridge, c. 1894, which conforms to ab. *obsoleta* Riding.

According to Barrett (*Lepidoptera of the British Isles*, 7: 317), in the Dover district, S. Webb found a race producing a variety of forms in some of which the cross-lines were much intensified and blackened (cf. Barrett, *op. cit.*, pl. 327, figs. 2a, 2b).

The following named abs. are in RCK:—*sertaria* Dannehl, "Dover/21.26.vii.1877/S. Webb" (2); "Dover/27.iii.1878/S. Webb (2, one of which figured in Barrett); "Caught Chattenden/7.6.77/S. Webb" (1). *fasciata* Lempke, "Chattenden/21.5.1900" (1). *extenuata* Dannehl, "Bexley bred 1900/brood 2/L. W. Newman" (1).

A remarkable melanic ab., taken at Pegwell Bay (div. 4 or 9) by Dudley Wright, September 1896, and thought to be either this species or an "Acidalia", was exhibited by E. E. Green, at Entomological Society of London, November 4, 1896 (Goss, *Entomologist*, 29: 371).

FIRST RECORD, 1809: "Habitat in Cantio frequens . . ." (Haworth, *Lep. Brit.*, 2: 312).

C. albipunctata Hufnagel: **pendularia** sens. auct.: Birch Mocha

Native. Woods, heaths; on birch. Recorded many times from 1, 6a (Darenth Wood), 11-13.

A. M. and F. A. Swain took the larva on birch at Petts Wood, in 1951; and D. R. M. Long took it on this at Crofton. A. R. Kidner (*Diary*) records taking the larva on the following dates: Darenth, September 24, 1909, September 25, 1910, September 26, 1913; Joydens Wood, September 25, 1911; St. Paul's Cray Common, September 27, 1909, September 2, 1911, August 31, 1912, August 2, 1913, September 15, 1922, September 20, 1928, September 21, 1936; Darenth, October 2, 1931.

In 1957, R. F. Bretherton took a moth at Orlestone Woods on September 22, an abnormally late date, and perhaps representing a partial second generation.

3. Blean Woods, pair *in cop.*, May 18, 1866 (Fenn, *Diary*).
5. Derrick Wood*; Farnborough* (*Wool. Surv.*, 1909).
6. Greenhithe (A. B. Farn MS).
7. Wigmore Wood (Chaney, 1884-87).
8. Horndean Wood (Knaggs, 1870). Woolwich Wood, two, May 25, 1896; four, June 5, one, June 9, 1901 (H. D. Stockwell, *Diary*). Dover, one, 1911, in Stockwell coll. (C.-H.).
10. Westerham (R. C. Edwards). Sevenoaks, a larva, 1946 (F. D. Greenwood).
14. Tenterden, very common (Stainton, *Man.*, 2: 39). Woodchurch (Scott, 1950).
15. Lydd Village, August 1965 (D. W. H. Fennell).
16. Folkestone Town (Morley, *Ent. Rec.*, 64: 171).

VARIATION.—Barrett (*Lep. Br. Is.*, 7: 325) mentions specimens from Dover, with "dark purple blotches along hind margin."

An extreme melanic specimen, bred by a Mr. Shrosbree from Birch Wood larva, was exhibited by C. Miller at Entomological Society of London, October 7, 1861, and became the holotype of *ab. decoraria* Newman (cf. Newman, *Zoologist*, 7798; Bond, *Entomologist*, 9: 217; Prout, *Entomologist*, 53: 53).

W. A. Cope took a ♀ *ab. subroseata* Woodforde, on Bromley Common, May 1948, from which a number of this *ab.* appeared in the F2 generation, among many typical specimens (C.-H.).

In RCK are the following *abs.*:—*unicoloria* Lamb., two, Darenth, 1900, bred; *striata* Lempke, one, "Kent/Harwood/13.v.1903," one, "North Kent /v.1929/L. W. Newman," one, "Bexley/June 1906/L. W. Newman"; *linearia* Lamb., one, "North Kent/7.1929/L. W. Newman," one, "Darenth bred/5.90."

FIRST RECORD, 1833: Birch Wood (Curtis, *Br. Ent.*, 447).

C. *pupillaria* Hübner: Blair's Mocha

Immigrant? Gardens.

6. Otford, ♂, taken by W. B. Manley in m.v. trap, August 22, 1955 (Manley, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1956: 1; idem, *Entomologist*, 89: 121); one, 1959 (French, *Entomologist*, 95: 176).

16. Folkestone Town, ♂, taken in m.v. trap, October 3, 1962 (Morley, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1962: 42).

FIRST RECORD, 1956: Manley, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1956: 1.

C. *porata* L.: False Mocha

Native. Woods; on oak. Casual in 2.

1. Birch Wood (Stephens, *Haust.*, 3: 200). Sydenham (Cox, *Ent. week. Int.*, 6: 188). West Wickham (Barrett, *Ent. week. Int.*, 7: 75); (Allchin, *Ent. week. Int.*, 8: 3); (Carr, *Entomologist*, 34: 108). Dartford (James, *Entomologist*, 31: 57). Bexley (Carr, *Entomologist*, 33: 47; idem, *Entomologist*, 34: 108). Shooters Hill; Lee; Lewisham; Derrick Wood; Blackheath (*Wool. Surv.*, 1909). Sidcup, one, 1912; Bexley Park Wood, one, 1912 (A. R. Kidner, *Diary*). Chislehurst (S. F. P. Blyth). Petts Wood, 1951, larvae on oak (A. M. and F. A. Swain).

2. Sheerness, one, May 25, 1868 (J. J. Walker MS.).

3. Blean Woods, one, May 13. one, May 31, 1866 (Fenn, *Diary*); on

June 9, two, June 11, 1934 (T. G. Edwards, *Diary*). Chestfield, August 14, 1939; Whitstable, one, 1943 (P. F. Harris). Great Hall Wood, ♀, beaten from cover, June 29, 1946 (C.-H.).

5. Chevening, September 16, 1912 (Gillett, *Diary*).

6. Gravesend (H. C. Huggins). Shoreham* (H. E. Hammond).

6a. Darenth Wood (Stephens, *loc. cit.*); May 29, 1859 (H. Tomkins, *Diary*); two, July 26, 1911 (F. T. Grant). Greenhithe, May 23, 1859 (Fenn, *Diary*). Chattenden, several, 1869 (J. J. Walker MS.); two larvae, September 17, 1911 (A. R. Kidner, *Diary*); 1912, 1927 (F. T. Grant). Swanscombe Wood, larvae (F. T. Grant). Cobham (H. C. Huggins).

7. Chilham, June 10, 1951 (W. D. Bowden).

8. Horndean Wood (Knaggs, 1870). (Folkestone (V.C.H., 1908), may refer). Woolwich Wood, one, June 5, one, June 9, 1901 (H. D. Stockwell, *Diary*; Stockwell coll.) Dover. (E. & Y., 1949), may refer).

10. Brasted Chart, September 4, 1912, August 16, 1913 (Gillett, *Diary*), Westerham (R. C. Edwards).

11. Yalding (V.C.H., 1908). Shipbourne, one, August 20, 1914 (P. A. & D. J. A. Buxton coll.). Hoads Wood (P. Cue). Aylesford, 1953, 1954 (G. A. N. Davis).

12. Ashford* (Chittenden, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1899: 107); noted in the town by P. Cue (E. Scott). Ham Street, June 1, August 18, 1935, August 20, 1939 (A. J. L. Bowes); de Worms, *Entomologist*, 31: 140; not uncommon in Long Rope and adjacent woods, 1939, 1946-51 (C.-H.); June 2-4, 1950, June 1-2, 1956 (R. F. Bretherton); 1958, (de Worms, *Entomologist*, 92: 69); four, May 13, 1960 (R. G. Chatelain). Wye, one, May 27, two, August 12-14, 1953, one, August 5, 1954, one, May 25, 1956 (W. L. Rudland).

13. Pembury (Stainton, *Man.*, 2: 38). Tunbridge Wells, one, August 3, 1896 at field meeting of N. London Nat. Hist. Soc. (Tremayne, *Ent. Rec.*, 8: 191); rather scarce (Knipe, 1916). Goudhurst, one, 1960 (W. V. D. Bolt).

14. Tenterden (Stainton, *Man.*, 2: 38). Sandhurst (G. V. Bull). Woodchurch, six, August 6, 1899 (H. D. Stockwell, *Diary*).

16. Folkestone Town (A. M. Morley). Priory Wood, two, June 19, 1965 (R. G. Chatelain).

VARIATION.—I have examples of abs. *rubearia* Lamb., *linearia* Lamb., and *punctularia* Lamb., from Kent (C.-H.); and Morley (*Proc. S. Lond. ent. nat. Hist. Soc.*, 1947-48: 33) exhibited *rubearia* Lamb., and *linearia* Lamb., from Ham Street dist.

The following named abs. are in RCK: *delinearia* Silb., Herne Bay, bred May 29, 1906, L. B. Prout (1); *uniformata* Lempke, Yalding, 1900 (1); *basirubra* Cockayne, holotype, Eynsford, July 1900, J. Greenwood (1); *rubearia* Lamb., North Kent, 1917, L. W. Newman (3), Bexley, bred 1901, L. W. Newman (1); *linearia* Lamb., Herne Bay, bred 1906, L. B. Prout (1), Erith, 1900, Goddard (1).

FIRST RECORD, 1831: Stephens, *loc. cit.*

C. *punctaria* L.: Maiden's Blush

Native. Woods; on oak, birch.

1. West Wickham (Barrett, *Ent. week. Int.*, 7: 75); larvae on birch and oak (Huckett, *Ent. week. Int.*, 10: 51); 1893 (Robinson, *Entomologist*, 26: 224); 1900 (Carr, *Entomologist*, 34: 108); 1951 (E. E. J. Trundell). Bexley (Carr, *Entomologist*, 33: 47; idem., *Entomologist*, 34: 108); one,

- June 24, 1951, one, May 15, two, August 29, 1952 (A. Heselden). Kidbrook; Lee; Shooters Hill; Derrick Wood, Farnborough; Beckenham (*Wool. Surv.*, 1909). Chislehurst (S. F. P. Blyth), Petts Wood, 1946 (A. M. and F. A. Swain); annually 1947-50 (E. Evans). Crofton, larva on oak (D. R. M. Long). Well Wood, two, 1948 (C.-H.). Dartford, odd specimens seen most years (B. K. West). Farningham Wood, larva (Haynes, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1951-52**: 81). Shooters Hill Wood, one, May 15, 1956 (A. A. Allen). Orpington (R. G. Chatelain).
3. Blean Woods, one, May 31, 1866 (Fenn, *Diary*). Herne, one, June 4, 1937 (P. F. Harris).
4. Deal, one, August 22, 1892 (Fenn, *Diary*). Ickham, several, 1954-59 (D. G. Marsh).
6. Gravesend (H. C. Huggins). Shoreham* sparingly (H. E. Hammond).
- 6a. Greenhithe, May 23, 1859 (Fenn, *Diary*). Darenth Wood, May 28, 1859 (H. Tompkins, *Diary*); larvae (Huckett, *loc. cit.*); (H. C. Huggins); (E. J. Hare). Chattenden, June 2, 1869 (J. J. Walker MS.); (Chaney, 1884-87); (H. C. Huggins); June 10, 1927 (F. T. Grant). Cobham (H. C. Huggins).
7. Wigmore Wood (Chaney, *loc. cit.*). Westwell, May 29, 1949 (E. Scott).
8. Lady Wood (Knaggs, 1870) (Folkestone (V.C.H., 1908), may refer). Kingsdown (Tutt, *Entomologist*, **20**: 227). Woolwich Wood, one, June 3, 1901 (H. D. Stockwell, *Diary*). Dover, two, 1910 (H. D. Stockwell coll.). Lords Wood (E. & Y., 1949).
9. Cliftonville, one, September 5, 1950 (W. D. Bowden).
10. Brasted (R. M. Prideaux). Westerham (R. C. Edwards); May 8, 1937 (Coote and Jacobs, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1937-38**: 37).
11. Yalding (V.C.H., 1908). Aylesford, two, 1952-53 (G. A. N. Davis). Hoads Wood (P. Cue, *teste* E. Scott); larvae (M. Enfield).
12. Ham Street (Scott, 1936); not common in Long Rope, 1946-51 (C.-H.); (de Worms, *Entomologist*, **81**: 140); June 2, 1956 (R. F. Bretherton); one, July 1959, common, May 1960 (M. Singleton). Ashford, 1950 (E. Scott). Willesborough, one, May 25, one, June 4, two, August 22, 1954, one, June 5, 1955, one, July 27, 1964 (W. L. Rudland).
13. Pembury, common (Stainton, *Man.*, **2**: 38). Tunbridge Wells (E. D. Morgan); one, 1957, one, 1958, (L. R. Tesch *per* C. A. Stace). Goudhurst, one, 1950 (W. V. D. Bolt). Iden Green, two, 1951 (H. Boxall).
14. Tenterden, common (Stainton, *loc. cit.*). Sandhurst (G. V. Bull). Hawkhurst, one 1952 (B. G. Chatfield).
15. Dymchurch (G. V. Bull). Dungeness, June 13, 1962 (T. W. Harman).
16. Near Hythe (Morley, 1931). Folkestone, seventeen, 1951 (Morley *Ent. Rec.*, **64**: 171). Folkestone*, October 12 (2), 14 (1) 1959 (French, *Entomologist*, **59**: 177).
- VARIATION.—In RCK. is ab. *erythrescens* Preiss, “*Dartford 4.5.1900” (1); and I have one, Ham Street, August 1946, which I judge to be referable to ab. *naevata* Bastelb. (C.-H.).
- FIRST RECORD, 1859: Stainton, *loc. cit.*

C. *linearia* Hübner: Clay Triple-lines

Native. Woods; on beech.

1. Birch Wood (Stephens, *Haust.*, **3**: 201). West Wickham (Robinson, *Entomologist*, **26**: 224); (Wells, *Ent. Rec.*, **3**: 35). Pauls Cray Common.

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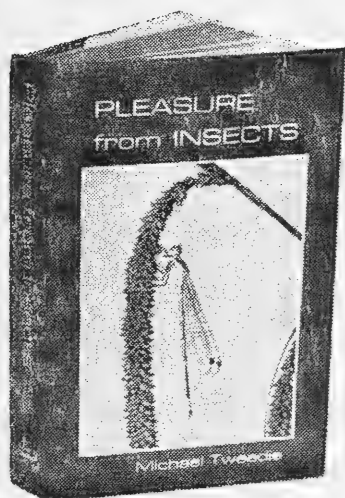
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On an instable race of *Pieris adalwinda*, located in Scotland

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

In spite of all the work that has been done in connection with *P. napi* and *P. adalwinda* it may not yet be generally realised that *P. napi* has been derived from *P. adalwinda*. Recently, the study of the androconial scales of a remarkable *Pieris* race from Scotland has once again emphasised the fact; irrefutably. This race in the past has been referred to as "*P. napi*," although the great majority of the females resemble *P. adalwinda* or *P. bryoniae* closely, many of them having a yellow ground colour on the upper side as in those species.

Mr. Thomson of Dunblane, having collected this race for many years, became doubtful that it could be correct to accept it as *P. napi*. Wishing to get the scales examined he sent a few specimens to Dr. Stopher of Deal, who brought the matter to my notice. After some correspondence Mr. Thomson offered to supply me with the necessary material, and during the past summer (1968), collected a series of some 57 specimens in the months of May, June, July, August and September, from a number of localities in Perthshire, Stirlingshire and Fifeshire, which he kindly gave me. The specimens had not been set when I received them, so that I was able to mount the scales of several before they had been on the setting boards, always an advantage when scales are required, as well as from the remainder after setting. Examination of the scales gave very unexpected results. This race is in an absolutely instable condition. No fewer than four types of androconial scales are recognisable, all similar to types known in other species. In spite of this range of variation the scales are perfectly formed, even when two or three of the types appear in one individual. Each type seems to be a normal component of the race: they are not restricted to any particular locality or generation.

In the following notes I refer to these types by the names of the species in which they exist as the normal type: namely the "*narina*", "*adalwinda*", "*marginalis*" and "*napi*" types.

It must be remembered that there is some variation in the scales of all *Pieris* species. Thus in typical *P. adalwinda* from Scandinavia, the body of the scale varies in width, and often is exceptionally developed in the northern regions where the species only has one generation in the season. The scales of the second generations in all species of the *P. napi* and *P. melete* groups of the genus, are characterised by a reduction in width of the neck of the scale compared with that of the first generation scales. This reduction causes many second-generation scales of *P. adalwinda* to resemble the first-generation scale of *P. marginalis*. It may often be difficult to distinguish between those two forms; but the second-generation scale of *P. marginalis*, with its long and narrow neck, is absolutely distinct from any *adalwinda* scale.

All the figures of scales mentioned in the following definitions were published in my paper in the *Entomologist's Record* for 1967, on plates 6 and 7; and the figure numbers are those used on those plates.

1. "*Narina*" type. A primitive scale, body oval, tapering gradually from the point of greatest width to the extremity, practically or completely without any constriction marking the start of the neck (as fig. 8.

P. marina). This primitive form of scale, in many slightly varying forms, occurs in all Nearctic species of the *napi*-group, also in the Palaearctic *P. kamtschadalis*: a testimony to their common origin.

2. "Adalwinda" type. Body oval, variable in width, neck short and broad (as fig. 22, monogenerational *P. adalwinda*, Lapland; or fig. 15, 1st generation *P. marginalis*, or transitional between these). The more slender form of the body seems most frequent in the Scottish insect (as fig. 15).
3. "Marginalis" type. Body oval, slender, with marked contraction to the neck, which is long and narrow (as fig. 20, *P. marginalis* 2nd generation).
4. "Napi" type. Body tending to be circular, with very marked contraction to neck, which is long and somewhat variable in width, but narrower than in the *adalwinda* type. (As fig. 6, *P. napi* 1st generation).

The "adalwinda" and "marginalis" types occur with greatest frequency.

There is no reason to doubt that these types in this case are all products of one race, for though they occur as pure types in some individuals, they also occur mixed in varying proportions in many. Thus the *narina* form occurs with the *adalwinda* or *marginalis*; *adalwinda* with *marginalis*, or with *marginalis* and *narina*; *napi* with *adalwinda*, or with *marginalis* and *adalwinda*. In all these the scales remain perfectly developed. The seasonal forms, as known elsewhere, appear in either generation in the Scottish race, and even together in some individuals.

This remarkable race seems to be a form of *P. adalwinda* in which the normal continuity of development has somehow been broken. It has been shown in the past that *P. adalwinda* has been derived from the Asiatic hybrid strain (*P. narina* × *P. dulcinea*), which also spread to N. America where it gave rise to a number of distinct species. The appearance of these various types in a fluctuating race of *P. adalwinda* is therefore understandable as partial reversion, the *napi*-like formation springing from the *dulcinea* element. It may be recalled that breeding experiments proved that typical *P. napi* carries a very definite element of the *dulcinea* strain (Warren 1967, p. 141). This must have been passed on to *P. napi* by the medium of this fluctuating form of *P. adalwinda*. Before leaving the details concerning the scales, it may be noted that though so many types are present in the Scottish insect the true *P. bryoniae* type does not occur: one further indication that the latter species did not originate from the *narina-dulcinea* strain. But the very large, primitive scale, so often seen in *P. bryoniae* does occur in some individuals in Scotland, as in most species of the *napi* and *melete* groups, though not in *P. napi*.

Turning to the superficial features of the Scottish race, the most conspicuous are of course the markings of the females. The majority of these are of the form described as *radiata* in *P. bryoniae* by Röber. In this the nervures of the forewings, and sometimes hindwings also, on the upper side are outlined in black, lightly or heavily. In the Scottish race many have the areas between the nervures also suffused with black. They most often have a white ground-colour and a few specimens can resemble *P. napi* exactly. Some however (estimated at about 25% by Mr. Thomson), have a yellow ground-colour. In these the dark suffusion can occur as in the white specimens. The yellow colour is not that of the well-known Irish yellow specimens (as illustrated by Müller and Kauts 1939, plate 1, figs. 5, 6), but close to that of the *flavescens* form of *P. bryoniae* (as

Müller and Kautz, plate 5, fig. 7, or between that and fig. 6). All these female forms are of course characteristic of *P. adalwinda*, though they do not habitually occur in one locality. They concur with the characters of the scales in connecting the Scottish race with *P. adalwinda*.

A further character connecting with *P. adalwinda* is the colouring of the under side. This mostly is darker than in normal *P. napi*, the dark scaling on the nervures is more black than grey. There is also a not infrequent tendency for the marking on the hindwing to spread on each side of the nervures, especially on the basal half of the wing. The ground-colour is often a deeper yellow, especially in the females, with a tinge of orange, somewhat as in the figure given by Müller and Katz (pl. 10, fig. 4). These features are normal to *P. adalwinda*, but like all other characters, very variable in *thomsoni*. It is impossible to leave this race under the obliterating name of *P. napi*. It is a fluctuating race of *P. adalwinda* and must have a distinctive name. Müller and Kautz (1939), used the name "*britannica*" Vty. for it. Fortunately that misleading title is ruled out, for the types of *britannica*, which are in the Oberthür collection, came from the south of Ireland. The Irish race, though different from that of England, is certainly a race of *P. napi*. It is Mr. Thomson's work and observations that rescued this unique race from oblivion, so I am naming it *P. adalwinda* subsp. *thomsoni* n. subsp. The male holotype and female allotype and one male and female paratype (the latter being a yellow one), are from Sheriffmuir, Dunblane, Perthshire, at 600 feet altitude; and one male and one female paratype from Dunblane at 200 feet altitude, all in the Thomson collection; and 11 paratypes in the author's collection, of which two males and four females come from the Carron Valley, Stirlingshire, two males and two females from the Kilsyth Hills, Stirlingshire, and one female from St. Andrews, Fifeshire. How far to the north and south the new subspecies extends will have to be worked out later; also the question whether typical *P. adalwinda* still exists in Scotland.

It is not possible to assume that *thomsoni* is a race deviating from typical *P. napi*, for as well as the facts already given connecting it with *P. adalwinda*, it is known that disturbance of the normal conditions causes *P. napi* to revert to *P. adalwinda*. In cases of natural, dwarf examples of *P. napi* taken in central or southern Europe, the scales revert to the *adalwinda*-type. Were *thomsoni* a *napi* race obstructed in normal development, a pure *adalwinda* scale would certainly exist, as it does when the two species are crossed. It seems, however, that when some change affects the normal development in *P. adalwinda* a mixture of characters, indicative of its compound parentage become evident.

It has been mentioned before that the differing neck width of the scales in *thomsoni* that are seasonal characters in other species, occur together in either generation in *thomsoni*. In *P. napi* this seasonal difference is slighter than usual, and I have frequently wondered at this failure of what must be a generic character. The reason now becomes apparent. *P. napi* is still affected by the fluctuating state that prevailed in the *thomsoni* stage.

The subsp. *thomsoni* is a living link between *P. adalwinda* and *P. napi*, which has disappeared as *P. napi* emerged. The existence of this race raises some interesting questions. Each variety of scale type it produces might have been said to be a "new" mutation (had we no previous know-

ledge about it) But are all varieties really "new" or "mutations", suddenly appearing? These ideas seem to be refuted by *thomsoni*. The scale types are not new, but characters that have long formed part of the normal elements of *P. adalwinda*. The latter occurs in Eastern Russia in Europe far to the south of Scotland, in its typical form. Change of latitude or altitude has not affected its normal development. Yet the fluctuating stage *thomsoni* must have existed in many areas. It is even quite possible that it still exists in Scandinavia in some restricted district.

The reappearance of suppressed characters is only an outburst of variation in an hitherto stable sphere. This may have been helped by a weakening of the existing state through long periods of isolation, but it may only be an instance of alternation of variation from one sphere to another, for variation is never wholly absent, in some sphere, though it may be less obvious at times. It is known that some slight varieties are repeated with frequency in a given species. This points to their being normal attributes of that species, not mutations. Those extreme aberrations, so prized by collectors, are more probably true mutations, pathological alterations. But these do not lead to the development of new races or species, or should they do so it must be an extremely rare occurrence, for most congeneric species only differ from each other by alterations in the degree of development of existing features, and not by the introduction of abnormal peculiarities.

We can note however that each scale type existing in *thomsoni* has elsewhere in the group become prevalent in a separate species; mostly in the Nearctic Region. *P. adalwinda* must date from the same remote period as those Nearctic species, for as well as a common origin with them, it has existed long enough to cross the entire width of the northern area of the Palaearctic Region, just as *P. oleracea* has crossed N. America from the Pacific to the Atlantic. But *thomsoni* is not an hybrid, merely a phase of variation in an existing species. Therefore should it give rise to a constant, new race, such a race will not show the characteristics of an hybrid, for though coming from a hybrid stock it is the direct offspring of a single species. For this reason *P. napi* has the qualities of a pure species; if it reverts it is to one form, the most recent, constant ancestral one. This is impossible for hybrids. When variation reasserts itself they cannot revert to one form, for varied features and characteristics are disclosed; contending fragments of their mixed parentage.

At present in *thomsoni* the *napi*-scale is produced, occasionally, in perfect form as the only type in an individual, also a few females marked as normal *P. napi* can be found.

Considering the presence of *P. napi* in central and western Europe and the absence from that region of *P. adalwinda* or any *Pieris* race retaining any of the other scale types present in *thomsoni*, it must be acknowledged that in all probability *thomsoni* will eventually be replaced by *P. napi* in Scotland. This makes it all the more important to record its existence at the present time.

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Apropos *Atropos*

By C. F. COWAN

The Old Moth Hunter covers much ground in his fascinating survey of the "Death's Head" (antea, p. 243). Its names, noise, and notorious night-robbery all give rise to interesting thoughts. An attempt is made below, in the interests of historical accuracy, to record the main early references on the subject. I am grateful to the authorities for permission to study the old literature in the libraries of the British Museum, the British Museum (Natural History), the Hope Department of Entomology, Oxford, and, in particular, the Tring Museum.

NAMES

In early times in this country the moth was known as the "Bee Tyger Hawk"; not in allusion to the robbing of beehives but as a graphic double reference to the black and yellow striped abdomen. Benjamin Wilkes so called it in 1842¹, when picturing the larva and the adult of the specimen bred by that elusive naturalist Joseph Dandridge. This was very likely the same one as had been illustrated, but given neither name nor collector, by Albin in 1702². It had been found fully fed in July (Wilkes said June), and emerged late in October. Its foodplant was the [white] Jessamine [*Jasminum officinale*], and in his next work Wilkes (1748)³ called it the Jessamine Hawk Moth.

But on the continent it was already the "Papillon à tête du mort" for such as Réaumur (1734)⁴, and "Caput mortuum" was a popular name for it. Under the latter name it was reported as having been captured in 1751 by both Pieter Osbeck in Java, and his fellow Swede Frederic Hasselquist in Cairo, when relating their respective journeys to China and Palestine.

As for its zoological name, *Acherontia atropos*, it is really not fair to blame Linnaeus for "such lugubrious names." He was not even responsible for *Acherontia*, which was created long after his death. And how apt *atropos* is, far preferable to "caputmortuum." On a well marked specimen the "cross-bones" certainly do appear below the skull. Atropos, the daughter of Nox and Erebus, was always depicted by the ancients veiled, and bearing that pair of scissors to cut the thread of life. Here is her veiled face, and the fatal scissors below!

Actually, it was the Dalek, G. E. Avelin, in whose 1756 paper⁵ edited by Linnaeus the name *Sphinx atropos* was first published. He may have coined it himself, though one senses that it came from the master's hand. Avelin drew attention in his brief paragraph to Réaumur's oft-repeated tale (1836)⁶ of the panic caused in Brittany by a mass invasion of the moth, owing to its forbidding colour, the emblem of death on its back, and its "sonum tristissimum." It is possible that Linnaeus had not then heard the sound himself; he did not mention it in his 10th edition of *Systema Naturae* in 1758, but was later to make a percipient comment.

Daleks, incidentally for Young Moth Hunters, were Swedish highlanders from Dalarne, the ancient province N.W. of Stockholm.

NOISES

There is no mystery now as to the nature of the sound of the adult *atropos*. I tape-recorded it at Millom in South Cumberland on 15th May

1961 and, when played back slowly, two distinct phases are heard; first suction, then expulsion. In his thought-provoking book published that year, Dr. P. T. Haskell (1961: p. 122)⁷ describes its production and its frequencies. Evidently those who claimed that the sound could not emanate from the head, since it continued when the head was removed, are wrong. If their facts were right, it continued from the severed head.

By coincidence, on the following page Haskell describes the Queen Bee's piping, which appears to be analogous though not identical as to production, and of a slightly higher frequency. He does not consider, however, that mimicry is proved (p. 133); of which more anon.

So Linnaeus was not far out as to the source of the squeak when saying, in 1767⁸, that it hisses by rubbing the palpi against the tongue; "*stridet allidendo palpos ad linguam*". But the sound is not stopped by removing the palpi. It is actually created by sucking and expelling air past a membrane into and from a cavity at the base of the proboscis. *Atropos* is, in fact, blowing double "raspberries"; or, as Haskell more elegantly expresses it, this is not an organ-pipe method, but a pulsed sound mechanism. The pulses can be detected in a slowed recording. The first to deduce the exact seat of the sound was Carlo Passerini of Firenze, who wrote to Duponchel about it in 1828⁹, and the latter added a note about the membrane.

NIGHT ROBBERY

One would never expect a lepidopterist to discover this weakness of *atropos*, and it was indeed a Swiss apiarist who, by repute, first reported it. Franz Huber (not Hüber) was blind from the age of eighteen, but then became internationally known through his detailed experimental researches on his bees, made with the help of his wife and a close friend, and later his son J. P. Huber. He published his famous book in 1792¹⁰, but did not make the discovery which interests us until 1804, a year in which *atropos* was abundant in Switzerland. He described the now familiar events, and the way the bees reacted to the repeated visitations by building narrow defiles at the hive entrances, in two letters to his friend Pictet, which were published in a Swiss periodical later in the same year¹¹. Pierre Huber republished his father's first book in an extended two-volume edition in 1814, with all the later observations, and several translations were made.

The tale of Kühn's kerfuffle in the monastery has not been traced, nor even the reference to it by Kirby and Spence. It should be interesting, as Kühn (?the same), who lived at Eisenach in Thuringia, was active up to about 1790, so his account would have anticipated Huber's. Another such incident was mentioned within two years of Huber's publication, which had certainly happened long before. Latreille ("An. 13", i.e. 1805 or 1806)¹² said that in 1779 some beekeepers in Thuringia had noticed a disturbance in a hive and, on investigating, had found it was caused by this moth. This might have been the same episode, but Thuringia was an old bee-farming region. Another story featured by early nineteenth writers told of a riotous mob looting a Thuringia monastery in 1524. When they reached the Pastor's house, he routed them by throwing his beehives among them. This seemed rather callous of the Pastor (towards his bees), and happily the earlier account was traced (Eckstorm, 1617:

p. 210). Actually, the Pastor kept an apiary in his porch. Seeing the plunderers approaching, he quickly shook each hive, and withdrew ("*singulos apiarii alveos repente concussit. & sese subduxit*"). That singular strategy sufficed.

The only other first-hand eye-witness to *atropos*' nocturnal activity known at present is the Old Moth Hunter's friend Rev. C. A. Bury (1869)¹⁴. He undoubtedly had two or more *atropos* at his hive at Sandown, I.O.W., in June and in October, each of which appears to have escaped unscathed.

Were I an apiarist, I am sure that my gorge would rise at seeing my little pets molested, and their dedicated handiwork, not to mention "my" honey, ravaged by such a hulking great intruder. It is just possible that, however subjective, my subsequent account of the crime would be prejudiced. But making every allowance for possible exaggeration, it surely cannot be doubted that *atropos* has frequently entered hives of the old type, that it usually has got away with it, but has occasionally been caught and slain.

It is surprising that Gélin and Lucas [1912]¹⁵ should suggest, solely because *atropos* is never found at "sugar", that it is not attracted to honey. Man-made sugar is not a patch on fresh bees' honey! But if the moth is not foraging, what else could it be doing? This question certainly could bear investigation. The Queen's evening lullaby might attract *atropos* on its early twilight flight, purely out of curiosity. Or it might be the fruity scent, the aura of warmth, or some other emanation from the hive. Original observations would be valuable, but they would have to be protracted if they are to outweigh Huber's. Unfortunately the old-fashioned hive has become even rarer in this country than *atropos* itself, and the moth does not seem to favour the modern "pre-fabs." *Atropos* is not equipped, as is for instance *convolvuli*, for flight refuelling. It has a truncated tongue, a short blunt instrument admirably adapted for working on honeycombs. Did Linnaeus, in naming it so neatly, have his own tongue in cheek: "*atropos* of the atrophied proboscis?"

Barrett surely exaggerated in saying that the moth's voice has been observed to arrest and control the bees like that of their queen. Bees can recognise their own queen from another; this monstrous apparition would instil panic or confusion, not impose control. Bees are intelligent beings, they recognise one another as naturally as do humans. Surely the moth's voice, whether as larva, pupa, or adult, is simply a normal all-purpose defence; anti-bat, anti-sparrow, anti-mouse, even anti-human; which it utters instinctively when alarmed. When the moth is attracted into the hive, past the sentries, its extraordinary agility and speed as a pedestrian (which makes tape-recording quite hectic!), its nocturnal habit, and its natural chitinous "skin" and thick scales, combine to protect it from the hive population, all somnolent after a hard day's work. When, eventually, the roused bees harrass it, it instinctively utters its repeated squeaks. These naturally confuse, and perhaps terrify, the army, but one can hardly believe that they fall-in and drill to *atropos*' tune. When lucky, the moth escapes; occasionally it may die, and the sensible bees, unable to eject the huge carcass from their home, wall it up and seal it off as Barrett describes.

NOTE

After the foregoing had been submitted, Tutt (1906)¹⁶ was, belatedly, consulted on *atropos*. He devoted 13 pages to an exhaustive treatment of hive visitation and of sound production.

Over 25 documentary references are given for the former. One is faulty; "Huber, 1804; *Nouv. Observ.* ii, p. xi, 299." This telescopes Huber, 1804—my reference No. 11 as listed—into the 1814 second edition of Huber's book. Tutt identifies the Kühn reference! Though only brief, Kühn (1781)¹⁷ does antedate Huber. No monastery was mentioned, merely beehives in the garden of a priest (einige Geistliche), at Eisenach in September 1779.

Over 50 references are given for discussions of the cry, for which eleven solutions were proposed at various times. Tutt approved particularly of Moseley's (1872)¹⁸ detailed analysis. Moseley confirmed Passerini, giving another reference for his solution (Passerini, 1828a)¹⁹. It may be mentioned that Passerini was probably forgotten because Duponchel, despite his original support, later decided erroneously against it.

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OCTOBER BUTTERFLIES—The michaelmas daisies and buddleias in our gardens here in West Essex and East Hertfordshire have been brightened this year by a welcome invasion of peacocks, red admirals and small tortoiseshells. The first two of these have been here in greater numbers than I can remember having seen before. In the Much Hadham area, too, they have been abundant. My daughter in West Shropshire (on the Montgomeryshire border) writes that there were seven red admirals on a clump of michaelmas daisies in her garden last week.—P. B. M. ALLAN, Bishop's Stortford. 28.x.1968.

The Large Tortoiseshell Butterfly: a Further Note

By P. B. M. ALLAN

It was with not a little pleasure that I read Mr H. G. Short's interesting paper on *Vanessa polychloros* L. in last December's *Record* (vol. 79, No. 12, pp. 306-7); his valuable observations concerning the pairing of this fine butterfly in captivity are welcome indeed. I have always felt that Boisduval and his confrères Rambur, Graslin and Guenée must have been satisfied that some proof of a spring pairing of *polychloros* had been obtained and recorded; but unhappily being immobilised these last few years I have been unable to visit libraries in order to search the Continental literature, both the periodicals and the proceedings of various societies.

What I want to know now is the evidence upon which Boisduval based his assertion that *polychloros* pairs in the spring and whether that assertion was based on a pairing—or better still several pairings—observed out-of-doors or only in conditions similar to those recounted by Mr. Short. Also whether the subsequent assertions of Rambur, Graslin and Guenée were based on their individual personal observations or only on Boisduval's evidence. Unhappily during a long life I have met with so many erroneous assertions made from mistaken interpretations of insect behaviour or even by slips of the pen, which have been copied by many subsequent writers, that I have become a little sceptical about some recorded assertions of insect bionomics.

Happily Mr. Short's evidence of the pairing of *polychloros* is irrefutable so far as concerns the pairing habit of this species in captivity in England. No confirmation is required; if it were, doubtless his careful observations would be confirmed by every lepidopterist who bred this butterfly in similar conditions in the South of England. But for my part I feel that I still want to know what the pairing habit of this species is in England *out-of-doors*, where it has to undergo four winter months when frost and the heavy damp of fogs prevail. For the occurrence of quite a number of our Lepidoptera is governed by the mean temperature between October and March. Possible examples of this are, among the butterflies, *Melitaea cinxia* L. the Glanville Fritillary,* *Thymelicus acteon* Rott. the Lulworth Skipper, *Lysandra bellargus* Rott, the Clifden or Adonis Blue, and among the moths, *Zygaena meliloti* Esp. The New Forest Burnet, *Leucochlaena hispida* Geyer the Beautiful Gothic, and a number of others which are to be found only south of a line drawn from Bristol to London. There is a number of species too which, formerly common north of the Thames, have withdrawn to the south of it during the last hundred and fifty years.

All these species can flourish continuously in our island only when the mean winter temperature is never below 42°F. (Dr. T. A. Chapman pointed this out in this magazine many years ago). Their range will not extend normally to those parts of England where the mean winter temperature is only 40°F. If the mean temperature throughout the winter in Mr. Short's greenhouse was not more than 2-3°F. higher than it was out of doors this may have to be taken into account. Lepidoptera are (to us,

*Mr. Short, writes me *in litt.* "I am not convinced that *cinxia* for instance is controlled by the winter temperature. The young larvae need a lot of sun, and the controlling factor could well be the amount of sun in late summer."

extraordinarily) sensitive to atmospheric conditions, as indeed every moth-hunter who goes sugaring knows. Aridity and humidity, radiant heat stored up by the earth, and particularly by rocks, not to mention shelter from persistent east winds (causing aridity during a particular phase of metamorphosis) a daily maximum of sunshine or a prolonged canopy of cloud, or some weeks of snow and a long succession of frosts during a severe winter—all these things may count in the life-history of a lepidopteron.

An obvious difficulty facing us in this matter of mean winter temperature in the case of the Large Tortoiseshell butterfly is of course that *poly-chloros* is known to have occurred in places a good deal further north than Mr. Short's Surrey greenhouse. Yet it may be significant that during at least the last forty years this butterfly has been on the decline in all parts of our island north of Lat. 52°N. except in the extreme east. Ford in his *Butterflies* (1928, p. 128) writes that "it is now well established only in the eastern part of Suffolk and north Essex." Certainly it used to occur, and not uncommonly, a good deal farther north than it does to-day. Newman (1871) recorded it north of the Thames from Cheshire, Cumberland, Derbyshire, Durham, Lancashire, Northants, Nottinghamshire, Shropshire, Warwickshire, Worcestershire, and Yorkshire. Barrett (1893) mentioned North Wales, Leicestershire, Northumberland, and, significantly, the Tweed and Clyde districts, Aberdeenshire and Argyll. The farthest north it attains to-day (1968) to my personal knowledge is Herefordshire; if other lepidopterists have taken or seen it recently in a county north of that shire I hope they will send their reports to our Editor.

But here there are so many imponderables that in the present state of our knowledge it is useless to speculate about the cause or causes of this decline. What with the felling of great areas of woodland, e.g., as at Yardley Chase (total destruction), the Forest of Dean, Wychwood, Rockingham, Sherwood and a dozen other of the former forests of England, with the clearance of millions of acres which were cultivated less than a half-century ago, the felling of elms and oaks in hedgerows; in other words the enormous encroachments on the fertile countryside caused by the spread of mankind in an already densely populated island, a density that is increasing yearly at an ever-accelerating rate, area climates and microclimates* are constantly being changed; climatic changes which albeit imperceptible by man may be, and in many cases are, fatal to Lepidoptera.

Yet apart from the imponderables one can say with some assurance that so far as Western Europe is concerned *climate* is the over-riding factor, over-riding many other factors, which determines the occurrence of a particular lepidopteron in a particular place. Thus it is climate which decides the latitudes and longitudes between which a lepidopteron can find conditions congruous with all its physiological requirements. If one of

*I use the terms 'microclimate' and 'areaclimate' *sensu lato*, since although the literature of the subject is now extensive, observations made to-day are seldom of value in the case of the British butterflies owing to the lack of means of comparison with the condition prevailing fifty years ago. Uvarov's *Insects and Climate* appeared in 1931 (*Trans. Ent. Soc. Lond.*, **79**: 1-247) and Cloudesley-Thompson's *Microclimates and the Distribution of Terrestrial Arthropods* in 1962 (*Ann. Rev. Ent.*, **7**: 199-222), both valuable to lepidopterists. There is a short bibliography in *The Concept of Microclimate from an Entomological Point of View* by C. C. Coulianos in *Opuscula Entomologica*, 1968 (vol. 33, Parts 1-2, pp. 51-57).

those requirements cannot be supplied in a particular environment the insect must go elsewhere—or become extinct in that place. The following species became extinct in this island between 1800 and 1900, all of them before the 'imponderables' mentioned in the previous paragraph would have had to be considered. With the exception of the Large Copper (which may have been exterminated in the neighbourhood of Whittlesea Mere by collectors but is known to have occurred in other localities where I have found no evidence of collecting) there are records of only a few sporadic captures—as we should expect—after the year 1900.

Cyaniris semiargus Rott. (Mazarine Blue), *Lycaena dispar* Haw. (Large Copper), *Lycaena virgaureae* L. (Middle Copper), *Aporia crataegi* L. (Black-veined White), *Laelia caenosa** Hb. (Reed Tussock), *Lymantria dispar* L. (Gipsy Moth), *Simyra albovenosa* Göze (Reed Dagger), *Apamea pabulatricula* Brahm (Union Rustic), *Apatele strigosa* Schf. (Marsh Dagger), *Trachea atriplicis* L. (Orache), *Epicnaptera ilicifolia* L. (Small Lappet), *Hadena dysodea* Schf. (Small Ranunculus), *Leucodonta bicoloria* Schf. (White Prominent), *Coscinia striata* L. (Feathered Footman), *Euphyia polygrammata* Bork. (Many-lined).

Why did these species of the larger British Lepidoptera become extinct in England between 1800 and 1900 while they were, and are, still common, or at least frequent, in the countries fronting our island? The answer to that question can only be that one or two conditions were operating in the case of each of them: the climatic change, though imperceptible to us humans, had been too fast for their powers of adaptation to cope with or that each of these species had reached the limit of its powers of adaptation. And are not many more species, at present in our country, on the way out? Ask any experienced elderly lepidopterist how many species of the larger moths which were accounted common fifty years ago are rare to-day. I dare say such a man could give you a list of twenty and more.

It may be that the Large Tortoiseshell is one of these species which for some years have been "on the way out" of our island. I can think of only two butterflies which, having become extinct in many places in England, suddenly made a 'come-back'. I say 'suddenly' because their appearances occurred in places which for years had been regularly 'worked' by lepidopterists. These two species were *Limenitis camilla* L., the White Admiral, and *Polygonia c-album* L., the Comma. In 1934, when for some years the plenitude of these two species in the south of England had been declining, both these butterflies appeared north of the Thames, and not uncommonly, in places whence neither had been recorded previously. In 1936 I watched several of both species flying in a West Hertfordshire woodland which I had visited several times every year since 1920. Next year they were reported from Essex, and by 1938 both had reached almost to the coast of that county, where they were seen in some numbers.

I regard these two species as exceptions in the experience of most lepidopterists. For at least a century the Large Tortoiseshell is known to have occurred, and quite commonly, in the neighbourhood of Manningtree, in the valley of the river Stour in Essex. In 1966 Mr Derek Ashwell told me that he could no longer find the insect there where he had found it for several years previously. Yet in view of the constantly increasing 'im-

**Sic* Barrett (*Lep. Br. Is.*, 1895, Vol. 2, p. 313) and most of the modern books. Kloet and Hincks (*Check List*, 1945) spell it (probably correctly) *caenosa*.

ponderables' above mentioned it seems unlikely that *polychloros* will make a 'come-back' in this country within the lives of many lepidopterists living to-day. It *may* happen; but at present, in view of its known and recorded declension from so many and so widely dispersed localities, it seems doubtful.*

* * * *

It must be rare for a lepidopterist to find two *polychloros* in cop. out of doors. Mr. Short tells us that in his greenhouse "they begin to move on the first sunny day when the temperature reaches 50°F., usually in March" (that is to say 50° in the greenhouse) and that "pairing occurs quite soon after the insects move in the spring." How many collectors throughout England between Trent and Channel make a practice, annually, of prowling daily for two or three hours between mid-March and mid-April on the outskirts of a wood where *polychloros* has been caught previously? Fifty? A hundred? I doubt if there are ten who do. It seems to me that the odds against any lepidopterist repeating Mr. Wykes' experience (*Entomologist*, 81 (1948), No. 1017, p. 42) must be some hundreds to one.

On 17th April Mr. Wykes perambulated a Suffolk wood where there were a good many *polychloros* which in his opinion had hibernated in that wood. "In the wood," he wrote, "they seemed to settle mostly on the tree-trunks"; but he does not appear to have noticed a pair in cop. Which is not surprising in view of the colouration of the undersides of these insects' wings.

Mr. Short makes the (significant to me) remark that "one must be patient to get eggs from a wild ♀ captured in the spring. It may be necessary to keep it for 3-4 weeks." Why is this? Moreover, the female which Mr. Wykes netted on 17th April had its body "much distended with eggs", yet it was not until a fortnight later that "some warmer weather brought it into activity" and it laid a batch of 150 eggs. In most of the instances in which I have reared British butterflies, eggs were laid the day after, or at most the second day after, pairing. The exceptions were the common English Vanessids, which like Mr. Short's and Mr. Wykes' specimens, delayed oviposition for a time.—But my experience of breeding butterflies is negligible: I do not think I have reared more than twelve or fourteen, and only once with each species.

Probably it has been the experience of most breeders of British Lepidoptera that when these insects are reared in optimum conditions they do not always behave as they do in conditions which vary from bad to 'not so bad'. The fact that the Large Tortoiseshell has been found, in England, on several occasions to pair in the autumn in the wild suggests that, like

*Mr. Short writes: "I fully accept your argument that the decline of *polychloros* probably had a climatic cause; but nevertheless there was something odd about its disappearance from the Stour valley . . . For 5-6 years in succession I used to make expeditions with Mr. A. D. Blaxill of Colchester to see this species in this area. From 1951-3 it was quite common in several woods in the area and one could see a number of specimens on a warm day in late April or early May. Several times we captured ♀♀ and obtained eggs, and on each occasion I released there a number of the resulting offspring. In the spring of 1954, however, all we saw were two specimens; both were caught and found to be ♂♂. In 1955 not one was seen, nor have I been able to find first hand evidence that one has been seen there since. The point I am making is that its decline (in this area at least) was very rapid."

most animals, it has a fairly wide power of adaptation. Mr. Short writes (*in lit.*) "Incidentally, the ♂♂ are more difficult to bring through the winter than ♀♀." This again seems to me to point—so far as England is concerned—to the gradual resumption of an ancestral habit, the males formerly dying after they had fertilised the females in the autumn. In the south of France and in Italy *polychloros* is double-brooded (? the beginning of an evolutionary development or is it merely the continuation of an ancestral habit?). It would be interesting to know the mean winter temperature in the most northerly place where it is regularly double-brooded.

An interesting note by Miss Vere Temple appeared in *Entomologist* in 1943 (vol. 76, p. 30). She had been watching *polychloros* on the wing in the Stour valley "during the spring and late summer both of 1941 and 1942 . . . The butterflies appeared first in April . . . in company with Small Tortoiseshells. *Polychloros* and *urticae* played together, turning aerial somersaults and flying to and fro in figure-of-eight patterns. A male *polychloros* was apparently trying to copulate with a female *urticae*, creeping over her and fanning his wings in quick motion. She awaited him with the tip of her body upturned.* The male then left her and did not return, so that I did not see the upshot of this strange courtship."

This observation, taken together with the actual pairing of these two species recorded by G. H. Raynor (*Ent. Rec.*, 79: 187) and the experience of J. A. Towell (*ibid.*) suggests that the ♂ *polychloros* is, at least sometimes, not averse from pairing with a ♀ *urticae* and that certain *urticae* ♀♀ are not averse from such a proceeding.

* * * *

Mr. G. B. Prior has kindly sent me an interesting note about another English tortoiseshell butterfly, the Comma (*Polygonia c-album* L.), relating an experience which he had with a hibernating female (or females) of this species. In September 1934 he received three live males and two females of this species from Hampshire. The males were set as specimens; the females he thought had "most probably paired", so he put them in a cage and fed them on sugar and honey placed upon various garden flowers. They continued feeding until early October, when he placed them in a breeding cage and covered them with a cloth, where they settled down for the winter. "Early the following April", he continues, "I uncovered the cage and found them both dormant. Being a nice sunny morning I placed them indoors and fed them again with some sugar and honey on flowers as before. The next day they appeared quite active, and I gathered some young stinging-nettle sprays and placed them with the flowers. On the fourth day after they had awakened from hibernation I was delighted to see several eggs upon the nettle leaves, eventually getting quite a number. These eggs hatched, and I have in my cabinet some nine pairs of var. *hutchinsoni* selected from the broods. The butterflies emerged between the 1st and 21st July 1935".

With regard to my remark (*Ent. Rec.*, 79: 155) about female butterflies pairing while their wings were still limp and even unexpanded, Mr. Prior writes: "Mr. Allan in his collecting days must have seen the males of *L.*

*Mr. Short writes *in litt.* "In my experience, when a ♀ ostentatiously turns up her body on the approach of a ♂ this is a sign that she had paired already and will have none of him, and the ♂ usually takes the hint".

coridon (Chalkhill Blue) searching for the females, and have seen many times males in cop, with the females with quite limp and unexpanded wings, which would point to copulation on emergence being general with *coridon*."

Holiday at Thorpeness, Suffolk, 1968

By S. WAKELY

Once again my wife and I decided to have a fortnight's holiday at Thorpeness. This made the fourth holiday at the same bungalow since our first visit in 1964, but this time we chose July (13th to 27th).

Mr Raymond Uffen accompanied us and we were met at Saxmundham Station by Mr. H. E. Chipperfield who took us in his car to Thorpeness. He also brought along my Robinson moth trap which had been left at his house at Walberswick a few weeks previously by Capt. John Ellerton in readiness for our holiday. Both Capt. Ellerton and Col. A. M. Emmet joined us at the end of the first week.

About 60 different species (including micros) were in the trap the morning following our arrival, and their number fluctuated between this and 80 practically every night during our stay. The species that amazed us for the numbers in which it appeared was *Synaphe punctalis* F. One night we estimated there were over 300 in the trap—all males. In spite of a casual look around the beach after dark I never saw a female during our stay.

Every morning the trap was taken into the garage and a log of the species present was kept. Those we wanted were boxed and the others released. Some of the moths flew to the garage window and were examined but others possibly escaped before they could be checked.

The best macro taken was undoubtedly the *Celama trituberculana* Bosc which was found at rest on the window frame of the garage on the 14th. As this was at the commencement of our holiday we quite expected others to be taken later, but no more were seen. In 1964 we took five specimens of this rarity here. (*Ent. Rec.* 76: 274).

Over 270 different species of lepidoptera were taken at our M.V. lights during the fortnight. For the second week we had the added benefit of Capt. Ellerton's light which was worked the land side of the bungalow as well as my light overlooking the sea in a porch or verandah.

The most noteworthy species at light were as follows: *Hyloicus pinastri* L. (one), *Agrotis clavis* Hufn. (one), *Euschesis interjecta* Hubn. (several in good condition), *Heliothis peltigera* Schiff. (one on 23rd), *Polia nitens* Haw. (one on 16th), *Hadena compta* Schiff. (one), *Helio-phobus albicolon* Hubn. (one on 18th), *Leucania straminea* Treits., *L. litoralis* Curt., *Arenostola elymi* Treits. (a few only), *Apamea oblonga* Haw. (one on 21st), *Cucullia asteris* Schiff., *Earias clorana* L., *Schrankia costaestrigalis* Steph., *Zanclognatha cribrumalis* Hubn., *Geometra papilionaria* L., *Sterrha ochrata* Scop. (common), *Euphyia unangulata* Haw., *Cidaria fulvata* Forst., *Chesias rufata* F. (several), *Witlesia pallida* Steph., *Evergestis extimalis* Scop. (one on 16th), *Aglossa pinguinalis* L. (one), *Anerastia lotella* Hubn. (a few only), *Dioryctria abietella* Schiff. (one), *Epischnia boisduvaliella* Guen. (a few only), *Nyctegretis achatin-*

ella Hubn. (not uncommon), *Euzophera cinerosella* Zell. (one), *Mellisoblaptes zelleri* Joan. (twelve), *Pediasia fascelinellus* Hubn. (several), *Phalonia cnicana* Westw., *Lozotaeniodes formosana* Frol. (one), *Epagoge grotiana* F. (a rarity for Suffolk, reported by Raymond), *Cnephasia communana* (a late date but genitalia checked), *Collicularia microgrammana* Guen. (a few), *Pammene fasciana* L. (one), *Aristotelia palustrella* Dougl. (several), *Bryotropha politella* Staint. (several), *Chionodes fumatella* Dougl., *Caryocolum alsinellum* Zell., *Sophronia semicostella* Hübner. (several), *Oegoconia deauratella* H.-S., *Brachmia gerronella* Zell. (common), *Blastobasis decolorella* Wollaston (a few), *Batia lambdella* Don. (several), *Caloptilia stigmatella* F. and *Opostega salaciella* Treits.

A species I was particularly pleased to take was *Mellisoblaptes zelleri*, a specimen of which I took on a visit to Thorpeness in 1961. On the 16th a specimen was taken on the wall of the porch, but it was not until the 22nd that we saw it again. That was the best night we had, in spite of rain. It was very warm and several *zelleri* were boxed from the walls of the porch. One was seen in the trap and extricated with difficulty as it was getting wet and was surrounded by a mass of gnats, etc., in the well of the trap. We quite expected to find others in the trap in the morning, but this apparently is one of those species which prefers to rest nearby—a habit not by any means confined to this moth. Over a dozen specimens were taken and shared amongst us. No more were seen and even a walk with the light the next night produced none at rest on herbage.

A very local Crambid occurring on the East Coast is *Pediasia fascelinellus* and it came to the trap in small numbers.

Larvae of *Depressaria chaerophylli* Zell. were found on *Chaerophyllum temulentum* by the roadside at Thorpeness and duly photographed by Raymond in spite of the passing cars. A bag of seeds of *Silene inflata* collected on the beach at Thorpeness yielded larvae of *Eupithecia venosata* F. as well as some Noctuid and dipterous larvae. Several larval cases of *Coleophora nutantella* Muhl. appeared several weeks later on the seeds. On the 21st Mr. Chipperfield invited us over to Walberswick and took us to some boggy ground where we all caught some imagines of *Eustrotia uncula* Clerck, over a dozen being netted. One *Hydrelia flammeolaria* Hufn. was also taken as well as *Crambus uliginosellus* Zell. and *Elachista rhynchospora* Staint, both local moths occurring on boggy ground. Larvae of *Agonopterix umbellana* Steph. were quite common here on the gorse and fine series were bred out later. After we all had tea with Mr. and Mrs. Chipperfield we had a look at the contents of the moth trap by the house and were told to help ourselves. There were several *Lozotaeniodes formosana* there which were soon boxed by my friends. Before we left we were shown a piece of the trunk of an old apple tree which he had brought from Stowmarket, Suffolk, and which still had the extruded pupal cases of *Aegeria myopaeformis* Borkh. *in situ* on the bark. One live moth was also passed on to us, together with a dozen set imagines. Several score of moths had emerged from the tree from which the bough had been cut.

It was decided to use a light on the local Thorpeness fen one night and Capt. Ellerton had brought with him a portable light which was run with batteries. Several species were taken at his light which we

had not seen in the trap. These included *Nonagria neurica* Hübn. (three), *Chilodes maritima* Tausch. (several), and *Schoenobus gigantellus* Schiff.

During the daytime several searches were made along the beach for the larvae of *E. boisduvaliella* which were to be found in all sizes feeding in the pods of the Sea Pea (*Lathyrus japonicus*) which grew on the shingle in profusion. Col. Emmet reported that one of his emerged on the 28th August.

A trip to Southwold produced a single larva of *Euxoa cursoria* Hufn. after a lot of work searching in the sand round the plants of *Ononis*. The moth emerged on the 27th August.

A few days before the end of our holiday it was decided to visit the area round Great Yarmouth in Norfolk. We first stopped at Hemsby and searched the Sea Buckthorn which grows so freely by the holiday camp. We were too late in the season for some of the good species that occur there and went on to the dunes at Winterton, where a few common micros were found. Remembering a visit I had paid to Martham Broad in 1951 (*Ent. Rec.*, 64: 113-5) I suggested we look for Swallow-tail larvae, and as none of the others had taken this species, I led the way to where I had found the ova of *Papilio machaon* L. and seen the butterfly on the wing 17 years previously. Rather to my surprise the area looked exactly the same as I remembered. Re-visiting a place after a lapse of years can often be a shock with houses where one used to collect. On crossing some barbed wire into the Fen we found a plant of *Peucedanum palustre* almost at once and at the same time had the thrill of seeing a small larva at rest on the foliage. It was brownish in colour with a white middle. Within seconds another was seen and then another. Raymond soon had his camera ready and we left him while we searched for other plants. We were told later that yet a fourth larvae was found on the same plant. Weaving our way among the reeds we found five more larvae on other plants before we decided to return. My companions were delighted to have seen these interesting larvae for the first time. Several of the larvae were quite large and were greatly admired in their more adult colours. It was late when we left and we did not get back to Thorpeness until 10 o'clock feeling very pleased with the trip.

In conclusion I should like to express my thanks to Mr. Chipperfield for all the help he gave to make our holiday so enjoyable.

To avoid complications, as so many names have been changed in the last few years, the nomenclature is as published in Heslop's *Revised Indexed Check-List of the British Lepidoptera*, 1964.

26 Finsen Road, London, S.E.5.

As from 1st January 1969, Mr. P. N. Crow has kindly agreed to accept the office of Treasurer. Subscriptions paid before that date should be sent to Mr. F. W. Byers, but if paid after January 1st, they should be addressed to P. M. CROW, Esq., 12 HARVEY HOUSE, WESTCOTE ROAD, READING, BERKS.

It is hoped that readers will give the new Treasurer a good start by paying their subscriptions early; this will also save considerable postal expense, an important matter, having regard to the non-profit status of this magazine.—Ed.

"Innisfallen" Fare Thee Well!

By H. C. HUGGINS, F.R.E.S.

As usual I spent the summer in Ireland, in the Dingle peninsula. I did not cross over until June 11th as I wished to avoid the Whitsun rush, and went as usual on my favourite Fishguard-Cork route. I was rather disappointed to hear that this is the last year "Innisfallen" will be on the route, for at the end of the year, she is to make way for a car-ferry. My wife and I returned from Cork in her on her maiden voyage in 1948, and except for 1953 and 1961, when we used the Holyhead route to meet Mr. Baynes at Glenageary, I have been a passenger on her whenever I have crossed since; I have even been to the Burren from Cork, by 'bus to Limerick and then another 'bus to Lisdoonvarna.

In the course of my crossings I have become familiar with most of the personnel of the vessel, not only pleasant, but at times advantageous. When I arrived at Cork in 1964 there was a dockers' strike and no one could come on board to carry my luggage. However, my cabin steward got hold of the heavy items and carried them to the office door and whistled a taxi, so regulations were not technically broken, and I caught my train to Tralee.

The weather in 1968 was phenomenal for Southern Ireland; and I only had one rainy week in three months, and was able to do some good work on the higher slopes of the Brandon range which are usually covered in mist.

Immigrants were generally scarce, from the last week in July until I left (trap last set on the night of September 7/8) a very few *Plusia gamma* L. and *Nomophila noctuella* Schiff. turned up fairly regularly, together with two only of *Udea ferrugalis* Hb. (*martialis* Guenee). On July 18th there was a very worn *Laphygma exigua* Hübn. and on September 8, a very large *Plusia ni* Hübn. in bred condition.

I fancy that the *ni* was locally bred; I have a long bred series, reared in the linen cupboard, and also a male taken at mercury vapour light in this garden in August 1958. This was the first year *ni* was taken in Essex, my friend Mr. A. J. Dewick also took several at Bradwell on Sea. All my bred specimens and the one caught in 1958 are appreciably lighter than my Dingle one, and I have noticed that our autumn *gamma* and *Heliothis peltigera* Schiff. are almost invariably darker than immigrants.

This makes the fourth occasion when *ni* has turned up in Ireland: Miss Donovan netted eleven at Ummerra in 1931, Mr. Baynes took one at mercury vapour light at Glenageary in 1956, and Baron de Worms one, also at mercury vapour light, at Inch in 1966. Miss Donovan's catch was divided into two batches, four worn in June and seven perfect in September, whence Donovan assumed the latter catch to have been locally bred.

The mercury vapour light has certainly revolutionised the status of *exigua* and *ni* in Ireland; Donovan gives only two records for *exigua*, which Mr. Baynes and myself take almost every year at Glenageary and Dingle respectively, and he also has only the one record of *ni*. I have no doubt that *ni* is often passed over unless in a trap; on a hot day in early July 1929 I was walking with another collector in Denny Bog in

the New Forest. There were heaps of *gamma* about and the other man amused himself by catching them, and after releasing about a dozen, he caught a *ni*. Needless to say we both worked very hard the rest of the afternoon, and also, as may be guessed, with no results.

In late August and early September, there were also *Pyrameis atalanta* L. and *P. cardui* L. about in small numbers. On August 27 there was a *Pararge aegeria* L. in the trap, and on the 28th an *Aglais urticae* L. I never light the trap until dark, and neither insect was common in the garden, though *aegeria* was in dozens everywhere in August, even in the shopping streets.

On July 28 I witnessed an extraordinary movement of *Pieris brassicae* L. I had been working the higher slopes of the Brandon range on the left of the Connor, and about 12 noon sat down on a rock about 2,500 feet above sea level to eat my lunch. The rock was exactly on the top of the ridge at this point; on one side the whole valley to Dingle was visible, and on the other Brandon Bay and Tralee Bay. Almost immediately I saw a male *brassicae* come up slowly from the Dingle side and go over to the Tralee valley. A few seconds later it was followed by another, and this kept on for over an hour; it was still continuing when I left. The butterflies, which were both male and female, flew slowly and directly; they came over singly at from three to five a minute, and all were on a passage not more than fifty yards wide.

I stayed at The Strand Hotel, Inch, from June 12-30 and at Benners at Dingle from June 30-September 9.

Other insects of interest which I noted are as follows:—
INCH.

Deilephila porcellus L. Usually not common in the Dingle peninsula; I expect one or two a year in Dingle town. At Inch it swarmed; on June 14 there were 37 in the trap as well as a few on the grass. During my stay I must have seen between two and three hundred, undoubtedly from the sandhills, where the lady's bedstraw grows in profusion.

D. elpenor L. Almost equally common; on June 15 there were 41 in the trap, though its numbers were not quite so regular as those of *porcellus*.

Agrotis cinerea Hübn. On the morning of June 13, there was a good male of this species in the trap. Unfortunately I was boxing a rather nice grey *Heliophobus albicolon* Hübn. when I saw it, and just as I was getting out a box to take it, it buzzed off. I have noticed at Dungeness that this moth is very quick off the mark on sunny mornings. It undoubtedly came from the sandhills, and as the wind blew fiercely up the bay for several days afterwards, we had few sandhill moths across except *porcellus*. It was of the pale grey form found at Dungeness, not the pale drab I used to take at Wye. There are only two previous Irish records, one by Green at Cookstown and three in Antrim by Captain Wright.

Hadena suasa Schiff. One in poor condition on June 16, the second Kerry record, I took one last year at Dingle.

H. bombycina Hufn. A very bad one on June 13. Rare in coastal Kerry.

H. caesia Borkh. One of the blackish form found in Kerry on June 28. I have never taken this moth more than fifty yards from its food-plant, of which I could find none at all at Inch.

H. conspersa Esp. Nine in all; usually a rare moth in Kerry. Rather small and clear black and white as in Kent.

Heliofobus albicolon Hübn. I should think not uncommon. I saw about a dozen in my trap and all had to cross from the sandhills in the teeth of the wind. Much more variable than in the Brecks or on the Kent and Essex coasts, varying from pale grey to rather dark brown. One medium coloured specimen had a very dark brown central band, quite new to me.

Rusina tenebrosa Hübn. Common. All of the nearly black *obscura* Tutt.

Plusia festucae L. First appeared at Inch on June 14 and continued almost every day there and at Dingle until September 8. I saw no *P. gracilis* Lempke though I examined every specimen.

Dyscia fagaria Thunb. Three males, all rather smaller and paler than I used to see in the New Forest.

Gonodontis bidentata Clerck. Very common as usual, but there is both at Inch and Dingle, an occasional cream specimen with almost black markings which I have never seen elsewhere.

Hepialus fusconebulosa Deg. The males were very large and several heavily marked on an almost red ground.

H. lupulina L. Very common in the trap both at Inch and Dingle. I have never seen the usual evening flight of this moth in Ireland, though I three times saw it in numbers at about 3.30 p.m. in the Burren.

DINGLE.

Cryphia muralis Forst. Not quite so scarce as last year, but if anything, more difficult to get. The moth usually sticks to a few buildings in the town, but this year these were nearly deserted and odd specimens cropped up almost anywhere. I took a very large ab. *nigra* Huggins, and one with the fore-wings uniform deep emerald green without markings of any sort.

Tryphaena comes Hübn. I took a couple with very deep red upper-wings. I saw no more with black upper-wings as last year.

Hadena lepida s.sp. *capsophila* Dup. Three or four grey ones like the Howth type. I have never seen this colour before in the south west except for five I bred from Adrigole in 1948-50, but these were among over 100 *suffusa* Tutt.

Luperina nickerlii s.sp. *knilli* Bourgin. Two more in Dingle town, August 9 and 10. These two and one last year were as black as *Aporophyla nigra* Haw. I have never seen any of these black ones at Inch or Anascaul.

Apamea furva Hübn. One on August 3; the only other record I can trace is of one taken by Donovan at the Connor, Dingle. Connor by the way, means "pass" so "Connor Pass" is redundant.

A. epomidion Haw. Two, July 8 and 28. Otherwise only recorded in Kerry from Killarney.

Celaena leucostigma Hübn. I took a set at last, probably because of the hot weather. These included both the type and ab. *fibrosa*, all darker than English ones except one *fibrosa*, which had a pale brick red ground colour.

Stibia anomala Haw. A fresh male on August 23, my first in Dingle town.

Calocalpe undulata L. One, worn, on August 21. Only previously recorded in Kerry from Killarney.

Xanthorhoe ferrugata Clerck. The form with a bright purple band is not uncommon at Dingle and Inch. I have only once found it in England and it is local in Ireland. Greer used to go thirty miles from his home to Lough Fea to catch it. Why did Clerck call a moth which is never ferruginous "ferrugata"? Or has the name been changed because of an alleged type?

X. montanata Borkh. The fine mountain form was a little easier to get owing to the hot weather. I took one that was all liver and white bands. When I first saw it sitting on a heather clump I thought it was *Euclidimera mi* Clerck.

Entephria caesiata Schiff. A very dark one, unfortunately badly chipped, in the trap. I have never seen this moth in the hills as about Glengarriff and Killarney.

Calostygia didymata L. On the Brandon range at about 2,500 feet this was black and grey; one which I took was almost all black. Donovan describes these insects as "very dark brownish black"; I think he must have been working from old specimens. There is not a trace of brown in those I took. I regarded them as one of the best catches of the trip.

Ecliptopera silaceata Schiff. Several in the trap. All I have seen in Ireland, at Glengarriff, Killarney, Dingle and the Burren, have had the central band unbroken. In Kent and Essex I have found this form rare, say one in ten.

Crambus pascuellus L. Several flying round a wet piece of ground over 2,500 feet above sea level. Quite typical.

C. geniculeus Haw. A beautiful aberration suffused with red, on August 31.

Platyptillia calodactyla Hübn. Common this year in its restricted haunts; I refrained from taking any.

The collared dove has now taken up quarters at the back of Benners and is evidently breeding there. I heard its note every morning when I went to look at the trap. The Kerry County Council has placed a large litter trough on the edge of the car park at the Connor—anyone going there before 8 a.m. will see a pair of ravens and two or three pairs of choughs routing out crusts and sandwich ends, the choughs may be photographed with a little caution, the ravens are much more wary.

Two Additions to the British Species of *Atomaria* Steph. (Col., Cryptophagidae), with notes on others of the genus in Britain

By A. A. ALLEN, B.Sc., A.R.C.S.

Atomaria reitteri Lövendal (1892, *Ent. Medd.*, 3: 252).

An exceptionally distinctive species by reason of its shape, which is more suggestive of (e.g.) *Corticaria crenulata* Gyll. than an *Atomaria*; pitchy-brown to black, elytra not or hardly lighter behind; antennal club, base of femora, tibiae except base, and onychium, all darkened. Antennae

moderate. Pronotum broad, greatest breadth before middle, whence the sides converge straightly and strongly to base; hind angles obtuse; basal margin straight. Elytra very elongate, *hardly broader than pronotum*, broadest before middle, sides very little rounded. Puncturation strong and moderately close. Length 1.5-1.7 mm.

As far as our fauna is concerned, this species, though nearest to *A. rhenana* Kr., differs from all others of the subgenus *Anchicera* in its longer and narrower form with pronotum very nearly as wide as elytra; these points give it more of the aspect of an *Atomaria* s.str., from any of which the quite different pronotal shape will at once separate it. The figure in Lohse (1967: 147) shows the elytra considerably too wide and rounded. That author (*l.c.*) records it as sparsely distributed and rare in the north of mid-Europe in marsh litter and on pond margins; it occurs also in Scandinavia.

A specimen which I obtained many years ago from the late W. H. Janson with the data 'near Cambridge, Dr. Crotch,' purporting to be *A. atra* Hbst. but lately found to agree with the descriptions of *A. reitteri*, was kindly confirmed by Dr. A. Strand (Oslo) as that species. I have since found two examples in the late Philip Harwood's collection at the Hope Department, Oxford University Museum, from Wicken Fen, Cambs. (10.xi.12, iv.25)—also doing duty as *A. atra*. Further, I have just learnt from Mr. Colin Johnson that he has found one or more specimens of *reitteri*—once again placed as *atra*!—in the H. Britten collection at Manchester, taken by the late Joseph Collins in a marshy place (famous for rare Coleoptera) at Yarnton, Oxon. This interesting addition to our list has, no doubt, been hitherto passed over partly through its rarity, and partly through having been mistaken by some for the much misunderstood *A. atra*.

Atomaria scutellaris Motschulsky (1849, *Bull. Mosc.*, **22** (3): 88).

Allied to both *A. fuscata* Schön. and *A. atricapilla* Steph., resembling the former in general build and the rather strongly, often angularly dilated sides of pronotum and broad, laterally well rounded elytra; and the latter in its often predominantly testaceous colour (rare in *fuscata*, unless immature). From *atricapilla*, and the allied *berolinensis* Kr., it differs in its much more ample form, much more transverse pronotum widest before instead of at middle, and elytra relatively wider; and from both (and more especially *fuscata*) by having the pronotum and basal half of elytra *similarly* rather finely and not thickly punctate—the punctures separated on an average by more than their diameter. Antennae long and slender, last segment twice as long as broad ($1\frac{1}{2}$ times in the species named above).

Typically, *A. scutellaris* further differs not only from these but from all other British Atomariae in coloration, being reddish-yellow with a broad band across the elytra darker (brown or blackish), leaving a large spot at each shoulder rather plainly, and the apical region more indeterminate, of the ground colour. The distinctness of the dark band, however, varies, and sometimes there is scarcely a trace of it; such specimens may be known from smallish *A. zetterstedtii* Zett. by the straight anterior tibiae, different puncturation, etc.

This is a south and west European species (Mediterranean and Atlantic), not known from the central parts of the continent except in the south-east, where, according to Lohse (1967: 146) it is rare on dry slopes; it probably lives in decaying vegetation. It occurs freely in the Canary Islands and

is perhaps the commonest *Atomaria* there (*teste* C. Johnson).

Recently in overhauling the genus in the Power collection at the British Museum (Nat. Hist.), it was seen that three specimens over the label *rhenana* Kr. clearly had nothing to do with that species and appeared to belong to one not known as British. Mr. Colin Johnson, to whom I pointed them out when we were both at the Museum a few days ago, was fortunately able to recognize them at once as *scutellaris* Motsch.—a species with which he was thoroughly conversant from foreign material. They were taken in the Scilly Islands by the late Dr. K. G. Blair (two bear the date vii.32). This locality, it will be noted, is fully in harmony with the known distribution of the species, and in fact Mr. Johnson was hoping to obtain evidence of its presence in the west of our area. It is—though not altogether unexpected—an interesting addition to the short list of 'specialities' of the Scillies, where most likely it is truly indigenous, and to the British fauna as a whole.

In the notes that follow I shall not be dealing with the genitalia, even though in critical cases they can have great diagnostic value—especially the male structures. They will doubtless be treated in the forthcoming Identification Handbook, which will, of course, give a revised key. The object of these notes is to point out and bring together the changes that have become necessary in our list since Kloet & Hincks' Check List (1945), and add anything that seems noteworthy, e.g. certain records, and in some cases a few details to facilitate recognition. On the taxonomic side, the recent ground-works are a paper by the late Dr. Oscar Sjöberg (1947), and a section by Dr. G. A. Lohse (1967) in the lately-commenced work on the beetles of mid-Europe. Mr. Colin Johnson (1966, 1967) has also made valuable contributions to the knowledge of our species, and the present notes owe not a little to helpful discussion with him. He has already (1967) dealt with part of the subgenus *Atomaria* s.str., so the bulk of my remarks will be concerned with the other subgenus, *Anchicera* Thoms.

A. (Anchicera) rhenana Kr.—This must be restored to our list as a good species, following Lohse (p. 147), and no longer placed as a variety of *A. gutta* Steph. as in our later literature. Though, as remarked by Fowler as long ago as 1889 (p. 341), the identity with Kraatz's insect is not proved (v. Sjöberg, p. 113-4), it certainly appears very likely. Should it be disproved, however, the species will take the name *godarti* Guillebeau (1885) which is definitely the present one, as also is *elevata* Allen (1938). It is somewhat variable in externals, especially in coloration, but may usually be recognized by its pronotum being strongly dilated in the middle, in conjunction with its rather highly arched elytra whose greatest width and height is well forward, relatively small size, and short antennae compared with such species as *basalis*, *fuscata*, or *berolinensis* (shorter also than in *gutta*, to which it is nearest in shape). The antennal club is said by both Sjöberg and Lohse to be sometimes darkened, but I have not seen this in British material. The elytra are generally paler in the apical half or more, but the whole insect may be pale. Fowler's remarks on the species appear justified, except that the thorax is only sometimes rufous (cf. also his key, p. 337); it is in fact more often black or dark.

While not common and perhaps very local, *A. rhenana* is by no means as rare as has been thought. It is chiefly associated with marshy places on or near the coast, or the banks of tidal rivers; it occurs too under cast-up

seaweed. I have it from Kent, Sussex, Isle of Wight and Dorset, and have seen it from Montgomery (flood refuse, A. M. Easton). No less than seven records, not all published, are for Sussex. There is a Norfolk record, and like some other largely maritime insects it appears to have occurred in the fens. In the series of the common *A. atricapilla* Steph. in the Power collection (British Museum) are four examples taken by him at Gravesend, which are light-coloured *rhenana*.

A. atra Hbst.—A little-known species which has been the subject of some confusion (see above under *A. reitteri*). Sjöberg (p. 112) considered that it might well be only a dark form of *rhenana*, but all he had seen were two females. However, Lohse (p. 148) describes and figures as *atra* a species which must be distinct and appears to agree with our British examples, and, like them, differs plainly from *rhenana*. The body is virtually all black, the pronotum relatively narrower or, at least, the sides only weakly dilated—and very convex behind, basal margin rather distinctly raised or reflexed in middle; from the species of the *apicalis/ruficornis* group, some of which it can resemble superficially, it may be known by the more convex pronotum slightly narrowed behind and with deeper basal channel, and by the short antennae having a slightly infuscated club.

A. atra, a marsh-dweller like the next three to be noticed, seems very rare on the Continent but rather less so in Britain if the records can be trusted. Some of them, however, not improbably relate to other species, such as dark forms of the last and the next two; and it should be noted that the series over this name in the Power collection consists of *A. borealis* Sjöb. (= *analis* auct. Brit.), except for three specimens of the true *atra*: one from Wollaston with no data, the others from Cowley and Notting Hill. Fowler (p. 339) records one as taken by Waterhouse in Hammersmith Marshes—actually the same locality as the last-mentioned. A specimen sent by me (with other species) to Dr. Sjöberg, taken out of flood refuse from the river Wye at Hereford (ii.48), was returned by him as *A. atra*; and I have seen a similar one captured by Dr. A. M. Easton in a marsh at Lurgashall, Sussex. Further records are Wolvercote (J. J. Walker), Yarnton (J. Collins), both in Oxon. (*teste* C. J., coll. Manch. Mus.)

A. gutta Steph. and *A. mesomela* Hbst.* are so distinct in their typical state as to need no remark, but entirely black or dark forms can occur and then the small but constant diagnostic characters become critical. Both have longer antennae than the last two species. *Gutta* is shaped more like *rhenana* (a further distinction from *atra*), but, besides the more elongate antennae, their clubs are always well darkened; it is usually larger, more shining and often more diffusely punctured; the pronotum similarly broad as a rule but less bulging at sides, elytra less arched near base. *Mesomela* has several distinctive features beyond that of sharply bi-coloured elytra. The form is less convex than any of the preceding, the pronotum (strongly

*The name of this species has given much trouble; four versions are or have been current, in order of frequency *mesomelaena*, *mesomelas*, *mesomela*, and even *mesomelina*. The first would have been correct had Hebst written (*Dermestes*) *mesomelas*, but what he in fact wrote was the barbarism *D. mesomelus*. Unless, therefore, this be treated as a *lapsus* and corrected to *-melas* (fem. *-melaena*), it should be taken at its face value—hence *A. mesomela*, as in Kloet & Hincks, and adopted here.

bulging at sides) has its basal border plainly visible throughout and at least traces (often much more) of alutaceous ground-sculpture at base or near hind angles; antennae still longer than in *gutta*, the clubs only slightly if at all infuscata—often only towards apex—and the apical tarsal segment plainly darkened above, this being very characteristic.

A. basalis Er. (= *nitidula* auct., nec Heer).—This species requires notice on both synonymic and taxonomic grounds. As to the first, it now appears to be agreed that *nitidula* Heer—the prior and recently current name—is really a different insect (cf. Horton, 1951: 299); whereas there is no doubt concerning Erichson's name, much used in the earlier literature. As to the second, Sjöberg (p. 114) did not accept the species, failing to find any structural difference from *A. mesomela*. It appears very questionable, however, whether he can have had before him, in reaching that conclusion, the species known here under one or other of the above names, which is clearly the *basalis* Er. of Lohse—and the more so, because an example I sent to him was returned as *A. gutta* Steph., which certainly cannot be correct. Our British *basalis* resembles *mesomela* in a general way; but the boundary between the two colours on the elytra is not sharp, the form is rather longer, the pronotum (though broad) less strongly rounded, quite without alutaceous sculpture behind, and the basal border more developed medially than laterally; antennae rather stouter, they and the tarsi quite undarkened, but the femora appreciably browned towards the base. It is our largest species in the group, and one of our larger Atomariae. It varies less than *mesomela* and I do not know of an all-black form. Personally I have never met with the species, so it may be very local although widespread.

A. impressa Er.—This large and distinctive species is very scarce with us, the few published records being old; they are for the north of England (notably Scarborough where a number were taken by R. Lawson), but one was found by Dr. D. Sharp at Lee, Kent. Of more recent captures I can add one for Scotland: Nethy Bridge, Inv., viii.29, B. S. Williams, I ex. in coll. Harwood; and another for S. England: Foulness, in litter, ix.63 (C.M.J.), from a MS. list of Essex beetles by Mr. P. Hammond.

A. morio Kol.—Recorded in Britain from Windsor Forest only, where two specimens (apparently not several, as stated in *Ent. mon. Mag.*, 1929, p. 30) were taken in a jackdaw's nest in a fallen beech, 22.xi.28. It is of interest therefore that it was recaptured this year in a second locality: Monks Wood, Hunts., by Dr. Colin Welch (record published, but not at present available to me). The nidicolous habit would seem to be characteristic of the species. Kloet & Hincks give *versicolor* Er. as a questionable synonym, but according to Lohse it is another species — not however *versicolor* of British authors (see below under *A. gibbula*). The record just mentioned is now to hand: 1 at sap of cut stump, 1 in leaf litter at base of hollow ash, 1.iii.65 (Welch, 1968).—A.A.A., 24.xi.68.

A. lewisi Reitt.—This interesting colonist from the Far East, of which the first known European examples were taken in the writer's garden in 1937, is probably now spread over the whole of England and Scotland—if not Ireland too, though I have seen no Irish record. It has spread widely on the Continent also. Mr. Johnson has lately seen it from Brazil, etc.

A. zetterstedti Zett.—Besides the Oxford district, where it was first taken in Britain, this species, which is one of those with a restricted habitat (sallow catkins), has occurred further at Sunbury Island, Middx.

(Donisthorpe, Bedwell), Windsor (Donisthorpe), and Play Hatch near Reading (the writer). Collectors should note that the common and closely allied *A. fuscata* Schon. can occur with it, since pale specimens of the latter could easily pass as the present species. Apart from other small and comparative differences, *zetterstedti* can be known by the incurved front tibiae, these in *fuscata* being straight. The former, although perhaps very local, most likely occurs all along the Thames Valley between London and Oxford.

A. clavigera Gang.—Discovered recently by Mr. Colin Johnson at Carrington Moss, Cheshire, and introduced by him as British in 1966. It is much like a large, broad and dark *fuscata*, the elytral puncturation similarly fine, but that of the pronotum strong and close; the legs and antennal club black or dark. The latter (as the name implies) is very marked, with the two penultimate segments plainly transverse, the whole antenna shorter and stouter than in *fuscata*. I am grateful to my friend Mr. Johnson for a fine specimen of this interesting addition to our list.

A. berolinensis Kr.—As Sjöberg points out (p. 114-5), we must revert to this name—in use for many years—for the species which appears as *bicolor* Er. in our later literature, Wagner (1943) having studied Erichson's type of the latter and found it identical with *acutifrons* Gang. (non-British). In cases of doubtful separation from *atricapilla* Steph., which occasionally arise, it may be helpful to note that in *berolinensis* the lateral pronotal borders are visible (from directly above) only near the posterior angles instead of the whole basal half. Further, the species is brachypterous.

A. hislopi Woll.—The large deep-black Atomaria found rarely under grouse dung, etc., in northern localities, and hitherto known here as *gibbula* Er., must now take this name (given by Fowler as a synonym), since, as pointed out below, the true *gibbula* is another species. All the British records appear to be for Scotland except two—one of which, Scarborough (Lawson), is given by Fowler (p. 342). It is not generally known, however, that *hislopi* has occurred in Wales: mountains near Aberconway, Caerns. (W. E. Sharp, 1899). This record was omitted from the Supplement to Fowler's work (vol. 6).

A. gibbula Er. (*nec auct. Brit.*).—This is the *A. versicolor* Er. of our collections, the true species of that name being now recognised as a different one, not known from Britain (Lohse, p. 149). The former is rare or at least seldom recorded in this country, but might turn up more freely if its special biotope were more often examined. A specimen which I took from partly dry cow-dung in Windsor Park (iv.38) was returned as this species by Dr. Sjöberg, and Fowler (p. 344) gives for it a similar habitat. *A. gibbula* is readily known, in its group, by the unusually diffuse and not very fine puncturation; the humeral callosity is absent, the wings being undeveloped. I cannot, from the examples I have seen, agree with Fowler (*l.c.*) that it is larger than *apicalis* Er. It is near to *rubricollis* Bris., but the colouring is different and more uniform, the puncturation less fine, the pronotal pubescence longer and the elytra more convex. (Since this paper was written, Mr. Johnson's researches have thrown doubt on the identity of both *A. gibbula* Er. and *A. rhenana* Kr., which may invalidate current usage. The matter is under investigation by him.—A.A.A., 24.xi.68.)

A. rubricollis Bris.—A species with pronotum and (usually) humeri clear red, thus normally at once recognisable in the group with pronotum

scarcely contracted behind; in shape and size like a short *ruficornis* Marsh. According to the keys, the present species should have the pronotum alutaceous near the hind angles or more widely, but I can see no trace of it in my specimen—named for me by Dr. Sjöberg.* (In this portion of Sjöberg's key (p. 101) there appear to be one or two mistakes: under couplet 55, 2nd part, "Flügeldecken stärker als der Halsschild punktiert" and under 57 (*A. rubricollis*) "Halsschild . . . dicht punktiert" can hardly be right. Compare Lohse (p. 151) under the latter species: "Hsch. und Fld. weiträumig, Fld. manchmal . . . feiner punktiert" (my italics), which certainly seems correct. I mention these points partly to show how, in a difficult genus such as this, authorities often contradict one another!)

If the next species is not synonymous, the sole British record of *rubricollis* has remained up to now as published by me in 1952 for Windsor Forest—a single specimen off oak, 16.v.37. Recently, however, I detected one in the Power collection (set apart from the rest of the genus) labelled as taken by W. Lawson at Scarborough, Yorks.; it agrees precisely with the Windsor example.

A. divisa Rye.—Some years ago I was able to examine the unique type of this insect in Rye's collection (British, but locality unknown), without, unfortunately, being able to come to a definite conclusion about it. I was inclined to accept the current synonymy with *A. rubricollis* as probably correct; yet, if so, *divisa* is certainly based on a quite abnormal specimen. The differences of shape, stressed in the description, were evident—thorax broader, elytra less acuminate—but those said to exist in colour and puncturation were hardly noticeable. The problem, it seems, cannot be solved without a study of genitalia; or, should that prove inconclusive, a knowledge of the full range of variation in *A. rubricollis*.

A. borealis Sjöb. (= *analis* auct. Brit.).—Holdhaus in 1903 found that the *A. analis* of authors was divisible into a north and a south European race on aedeagal differences. This was confirmed by Sjöberg, who found a further constant character in the colour of the legs, which in the northern race—to which our insect belongs—are darkened, at least the femora and usually the tibiae also. The two forms are now treated as good species (e.g. by Lohse, p. 152), though regarded as subspecies by Sjöberg (p. 115).

A. (Atomaria s.str.) diluta Er.—This very rare northern species, at once recognisable within the subgenus by its peculiarly long and thick antennae, testaceous colour, and rectangular hind pronotal angles, is (without the slightest justification) omitted by Joy from his 'Practical Handbook' (1932)—though the equally scarce and restricted *A. procerula* Er. is included. Probably fewer than a dozen examples of *diluta* have occurred here, singly, most in Yorkshire and the Scottish Lowlands; and there is an Irish record. By far the latest capture known to me is of one (which I have seen) by Mr. E. Aubrook at Storthes Hall, Huddersfield, 13.iv.48.

A. wollastoni Sharp.—Likewise omitted by Joy and for no better reason. There are only a few British records, two being for northern Ireland; at least one is southern, but two specimens I once saw from the New Forest (J. J. Walker), supposed to be this species, were only *fuscicollis* Man.; they had been vouched for, I believe, by Champion. Consequently Walker's

*Mr. Johnson tells me that this criterion is of doubtful value, but that the micropterous condition is characteristic.

record of *wollastoni* for Marston, Oxon. (1921) appears suspect, particularly as the specimen was not to be found in his collection. It is probably another of the rare northern species with us, more frequent in Norway (v. Johnson, 1967: 43); its presence in central Europe is doubtful. I can add a new record for Scotland (the second only?): Balmuto, Fifeshire (Power, *ex* Janson); one example, 1870; in my collection. The *wollastoni* in Power's collection is a paratype of Sharp's, and the above specimen must have passed for something else; it was purchased with a pair of *umbrina* Gyll. from the same source. (Power's series of the latter from Balmuto proves to be half that species and half *fuscicollis*.)

It may be as well to mention the chief differences between the last-named species and *A. wollastoni*. Besides the most obvious one—basal pronotal groove not bounded by folds—the present species has a stouter funiculus but less marked club, much finer puncturation, very much finer and more decumbent pubescence (in *fuscicollis* rather coarse and raised, about as in *nigriventris* Steph.), almost parallel-sided pronotum with hind margin little longer than front, and no small reflexed humeral tooth.

A. fimetarii Hbst.—Of this fine species, the late H. Donisthorpe and I each swept a specimen on waste ground at Lampton, Middx., the date of mine being 30.v.47; and I have seen one taken several years ago in the Portsmouth district by Mr N. Holford. Both may be new county records.

A. barani Bris.—A very local species of which there are no additional records in Fowler & Donisthorpe (1913), that for Yarnton, Oxon. (J. Collins) having been passed over. Recent captures appear very few indeed, but my friend Dr. A. M. Easton took one in a *Typha* marsh (the usual British habitat) at Lurgashall, Sussex, a few years back. I have seen one record for the west of England, or perhaps Wales, but cannot at the moment trace its source. It is curious that the species seems to have a different habitat on the Continent, at least in some parts. Palm (1959: 265), who writes of it as very rare, states not only that he once took an example by sweeping in an old beech wood in Sweden, but also that it occurs elsewhere in fungus-infested trees; so that one rather wonders whether our insect is really the same species.

A. strandi Johnson (1967: 39, 45-6).—Mr C. Johnson has recently discovered that the *A. alpina* (earlier *elongatula*) of our lists is a new species, which he describes and names as above, and which is nearer to the continental *A. atrata* Reitt. than to *alpina* Heer. He has seen this new species also from Norway, taken by Dr. A. Strand.

A. proluxa Er.—Johnson (*op. cit.*: 39, 44-5) shows that this species must replace both *A. affinis* Sahlb. (formerly *badia* Er.) and *A. pulchra* Er. in our list. *A. proluxa* is widespread and varies in habitat, minor structural points, and colour.

A. sahlbergi Sjöb. and *A. bella* Reitt.—Two new British species closely allied to the last (v. Johnson, *op. cit.*), found very rarely in the Scottish Highlands, where, like certain other of the subgenus, they are associated with conifers; they may be confused in some of our collections with the last species.

Since Joy's 'Handbook' (1932) is still widely used for identification, it may be as well to point out that some of his colour-indications in this genus err so much on the side of pallor as to be decidedly misleading. It

is hard to understand, for instance, why he should describe the elytra of *A. impressa* as 'yellowish' when they are pitchy like the fore parts; on the other hand I much doubt whether *A. zetterstedt* is ever 'pitchy'—this rather suggests *fuscata*. Among other species he makes too light in colour are *fimetarii*, *umbrina* and *barani*, 'affinis-pulchra' (i.e. *prolixa*), and *nigriventris*. All are mainly dark when mature (apart, of course, from exceptional or certain old and bleached individuals; exceptions are commonest in *A. prolixa*).

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63 Blackheath Park, London, S.E.3. 29.x.68.

Notes and Observations

MID-OCTOBER BUTTERFLIES IN SOUTH DEVON—After a very windy and wet start to a few days at Hope Cove near Salcombe the morning of October 14th 1968 broke with a wealth of warm sunshine. Mr. J. Messenger and myself drove over to the shingle beach at the eastern end of Slapton Ley where there is a fine growth of valerian beneath the undercliff. Here we were joined by Mr. Geoffrey Cole who now lives at Slapton. All the butterflies of the neighbourhood seemed to be congregating in this spot. On one bower of ivy bloom we counted at least ten *Pyrameis atalanta* L. with an occasional *P. cardui* L. or *Polygonia c-album* L. to share the feast. *Aglais urticae* L. was about in small numbers, but *Colias croceus* Fourc. was the most interesting visitor, as few have been observed anywhere this year. We noted about half a dozen comprising both sexes. *Pieris rapae* L. was well to the fore together with a single *P. brassicae* L. An occasional *Lycaena phlaeas* L. was observed flitting about on the shingle. Mr. Cole had seen some *Pararge aegeria* L. in his garden just before he met us which makes a total of nine species for this autumn

period. We also saw a single *Macroglossa stellatarum* L. hovering over the valerian.—C. G. M. DE WORMS, Three Oaks, Woking. 25.x.68.

ORGYIA ANTIQUA L. AT LIGHT—On October 19th 1968, a remarkably mild night, I ran my m.v. trap in some woods in the Chiddingfold area and was most surprised to see a Vapourer arrive on the sheet. Mr. R. F. Bretherton, who was with me, said he had seen it occasionally at light and so had Mr. Messenger. I wonder if anyone else has had a similar experience with this essentially day-flying insect.—C. G. M. DE WORMS, Three Oaks, Woking. 25.x.68.

LIGHT-TRAPPING AT CAP GRIS NEZ—Due to various reasons, the main one being adverse weather, I was only able to run my portable light trap on three nights during an eight-day visit in late September 1968. This part of France is the nearest to England and the light was run in a garden a quarter of a mile from the lighthouse, on the nights of September 24th, 26th and 27th.

The commonest species was *Eumichtis lichenea* Hübn. which accounted for nearly 60 per cent. of the total catch. Interesting captures were a *Luecania l-album* L. and a *Campana margaritata* L.; possibly the latter is double brooded here. The other common species were: *Phlogophora meticulosa* L., *Omphalosceles lunosa* Haw., *Polyplocia ridens* Fab., *Diarsia rubi* View. and *Agrochola lychnidis* Schiff. The following turned up in small numbers: *Luperina testacea* Schiff., *Amathes c-nigrum* L., *A. xanthographa* Schiff., *Amphipyra tragopogonis* Clerck, *Gortyna micacea* Esp., *Plusia gamma* L., *Dysstroma truncata* Hufn. and *Deuteronomos alniaria* L. *P. gamma* was evidently common judging by sightings of day and dusk flying moths. Larvae of *Macrothylacia rubi* L. were abundant in the grassy areas along the cliff top.—TREVOR B. SILCOCKS, 3 Kenmeade Close, Shipham, Winscombe, Somerset.

EUPHYDRAS AURINIA AT HOD HILL — Robert Watson, writing in the September Record (antea: 220), draws attention to the flourishing state of the colony of *Euphydryas aurinia* Rott. on Hod Hill in Dorset. Apart from his own contribution, this state of affairs is very largely due to the protective measures taken by the Dorset Naturalists' Trust, which, at considerable expense, has rented and fenced in two large areas of the vallum surrounding the top of the hill, and so prevented destruction of the larvae by grazing cattle in the winter.

As a member of the management committee I want to point out that collecting inside the preserved areas is now limited to those who have a written permit from the Trust secretary (Miss H. J. Brotherton, O.B.E., J.P., 58 Pearce Avenue, Parkstone, Poole, Dorset). The collection and removal of numbers of *aurinia* larvae is now never allowed. During critical times of the year, the Hill is warded by volunteers, and it is hoped that visiting entomologists will co-operate with the Trust, and do what they can to assist in the work of conservation.—Major General C. G. LIPSCOMB, C.B., D.S.O., Crockerton House, nr. Warminster, Wiltshire.

DEVON INVADED BY PLUSIA GAMMA (L.)—I arrived at Mortehoe in North Devon on September 13th, where I stayed at the Lundy House Hotel. Outside the hotel there is a level terrace, very suitable for a mercury

vapour light, with the gardens running down to a foot path leading along the cliffs to Morte Point, with plenty of good posts for sugaring.

When I went to put on the sugar before dinner, I noticed some *P. gamma* feeding on the fuchsia hedges, but had no idea of what was to come. My m.v. trap, which is mounted bulb upwards on a box about 15 inches in height, surrounded by egg cartons, was surrounded by an immense swarm of silver ys, which covered the sheet and the egg cartons. They must have numbered many thousands. The sugar was a complete failure with about six or seven common moths to about 40 posts, due, I think to a cold north easterly breeze which had got up; very different from 1956, when nearly every post was covered with moths. Back at the m.v. light it was quite impossible to pick out any insects on the sheet, but by midnight, activity had died down and the egg cartons were full to overflowing.

I determined to have a count, but this proved quite impossible, for the *gamma* were literally innumerable. Going through the catch, however, I was able to pick out two (♂ and ♀) *Tniti xanthomista* (Hübner), three very fresh *Antitype flavicincta* Schiff. and one *Heliothis peltigera* Schiff., all nestling amongst the *gamma*, but quite undamaged.

This ended my night's activity as a heavy thunderstorm and a deluge of rain broke out at midnight. On the 14th, the north east wind had increased, but luckily the terrace was sheltered so I was able to burn the lamp again. This time there were only two or three hundred *gamma* about, so the main body must have passed on.

Some years ago I remember that Mr. Dudley March described a similar experience in the Orlestone Woods in Kent.—R. A. JACKSON, Middle Farmhouse, Codford St. Mary, Warminster, Wiltshire.

PLUSIA GAMMA IN DEVONSHIRE—I give below details of migrations of *Plusia gamma* L. as recorded at Thurlestone, South Devon, between 1st May and 10th September, 1968, using a mercury vapour light moth trap.

First peak—2nd July, 63 moths (following thunderstorm with coloured rain, etc.).

Second peak—11th July, 258 moths (following violent thunderstorms with hail).

Third peak—22nd July, 51 moths.

Fourth peak—Between 27th July and 7th August numbers ranged from 53 (minimum) and maximum 178 on 31st July.

Fifth peak—24th August, 870 moths.

Sixth peak—8th, 9th and 10th September, with 543, 210 and 365 moths respectively.

No more observations were made after 10th September because I left for South Africa on the following day.—HILTON L. O'HEFFERNAN, 63 Keurboom Road, Newlands, C.P., South Africa. 2.xi.1968.

BUTTERFLIES AT BUDDLEIA 1968—Fourteen species were recorded at our garden buddleia in 1968, two of them not previously recorded. At times there were 100 butterflies at this one tree. The new species were *Thecla quercus* L., one on 23.viii, and a rather late and worn *Argynnis paphia* L. on 8 and 9.ix. Vanessids were rather scarce, a maximum of 4 *V. atalanta* L. and 2 *V. cardui* L. (both on 13.ix).

The other species (peak numbers in parentheses) were: *Pararge aegeria* L. (1. 24.viii and 7.ix), *P. megera* L. (1, 30.viii-6.ix), *Aglaia urticae* L.

(90+, 9 and 11.ix), *Nymphalis io* L. (4, 30.viii and 6.ix), *Polyommatus icarus* Rott. (1, 8.viii), *Lycaena phlaeas* L. (1, 24.viii), *Pieris napi* L. (1, 24.viii and 1.ix), *Gonepteryx rhamni* L. (3, 9.ix), and small numbers of *Pieris brassicae* L. and *P. rapae* L.—Mr. and Mrs. TREVOR B. SILCOCKS, 3 Kenmeade Close, Shipham, Winscombe, Somerset. 1.xi.1968.

POLYCHRISIA MONETA FAB. (THE GOLDEN PLUSIA) AT WOKING—On the 13th July 1968, a *Polychrisia moneta* ab. *maculata* Lempke came to my mercury vapour lamp. This is the first record of this aberration in this country. It is described, however, by Lempke in *Tijdschrift voor Entomologie* 90, 1949, p. 121, an example having been taken at Apeldoorn. My specimen was exhibited at the Annual Exhibition of the British Entomological and Natural History Society.—A. G. M. BATTEN, Littledale, Hook Heath, Woking, Surrey. 14.x.1968.

A NOTABLE VARIETY OF BISTON BETULARIA L.—On the 5th June 1967, I took at my mercury vapour light at Hook Heath, Woking, an unusual example of *Biston betularia* L. The forewings are almost entirely black, the *carbonaria* form and the hindwings are identical with the normal *betularia*.

This example has been examined by the British Museum, who have no similar form in their collection. The only other similar insect was bred by Dr. H. B. D. Kettlewell. No name has yet been given to this unusual aberration. A somewhat similar example was shown at the Annual Exhibition of the South London ent. and nat. Hist. Society on 30th October 1965, a photograph of which was reproduced on Plate 1 of their Proceedings in April 1966, but my example has much blacker forewings than the one referred to. My specimen also was exhibited at the Annual Exhibition of the British ent. and nat. Hist. Soc. on 2nd November 1968.—A. G. M. BATTEN, Hook Heath, Woking, Surrey. 30.x.1968.

ACHERONTIA ATROPOS L. AND HONEY—I was much interested in the article entitled "Atropos and the Bees" (antea; 243). I cannot answer any of the questions with which the O.M.H. concludes his notes, but I took *atropos* in rather unusual circumstances. My father-in-law kept many beehives and had been taking off honey and used an extractor in the kitchen preparatory to putting the honey into jars, which, for convenience were placed full of honey in a number of ordinary metal household washing baths. In the middle of the afternoon *atropos* came boldly in and settled down in one of the baths beside the honey jars. My mother-in-law, with great presence of mind, knowing that I was due to arrive that evening put a large glass over it. On arriving, I was able to take *atropos* which gave its characteristic squeak when touched. I still have the specimen—a splendid creature—together with a larva and a deceased pupa.

All this happened at St. Nicholas at Wade, near Birchington, Kent, where there were usually many acres under potato. School children, whose fathers were farm labourers, frequently brought specimens of larvae and pupae to the school, of which my father-in-law was the headmaster in 1929.—A. G. M. BATTEN, Hook Heath, Woking, Surrey. 25.x.1968.

HIPPOTION CELERIO L. IN THE FOLKESTONE AREA—At a quarter past four on the 7th November, I took a specimen of *Hippotion celerio* L. (the silver striped hawk) in the Cheriton district.—C. BIBB, 4 Geraldine Road, Folkestone, Kent.

Current Literature

Among interesting separates received from **N. P. Kristensen of Copenhagen** is a set of four articles from Entomlogiske Meddelelser dealing with the primitive families of Lepidoptera in the sub-order of Dacnonympa. The first, Vol. 35: 341-345 describes the new family of Agathiphagidae to accommodate the genus *Agathiphaga* and sets out the author's reasons for doing so in the light of the writings of Dumbleton 1950 and Hinton 1958. He includes a key to the families of the sub-orders of Zeugloptera and Dacnonympa, and a diagram suggesting the phylogenetic relationships of these families.

The second, Vol. 35: 346-348 (1967) is a note on *Chapmania kaltentbachi* Wood and shows this to be identical with *Eriocrania haworthi* Bradley (1966). The third, Vol. 36: 137-151 deals in detail with the skeletal anatomy of the heads of Mnesarchaeidae and Neopseustidae, while the fourth, Vol. 36: 239-315 deals with the head and alimentary canal of adult Eriocraniidae, and is well illustrated with line drawings and microphotographs.

From Vol. 34: 211-213 the author compares *Orthosia (Anacta) gothica* L. and *O. porosa* Eversmann, and concludes that the genitalia of the two species differ to such an extent that they should not be included in the same sub-genus. There is a halftone plate showing male genitalia and wing pattern.

Also from Vol. 34: 214-220 is a paper dealing with the addition to the Danish list of *Sterrha ochrata* Scop., this insect having been separated from the series of *S. serpentata* Hufn. in the Copenhagen Zoological Museum collection. Halftone plates show the two species with enlargements of the male antenna, and also the male and female genitalia.

From Flora of Fauna 72: 155-158. Mr. Kristensen deals with seasonal dimorphism in *Plusia chrysitis* L., which was noted while investigating the status of *P. tutti* Kostrowici, which is now included with *P. chrysitis*.

From Opuscula Entomologica XXXIII: 69-73 is a paper on the mouth parts of adult Lepidoptera, taking the studies of Eastham and Eassa on *Pieris brassicae* L. and of Hanneman on *Micropteryx calthella* L. as showing the two extremes of development.—S.N.A.J.

CORRIGENDA: In my article entitled "Notes on *Adela cuprella* Thunb." (*antea*: 270), due to a mistake in my typescript the word "record" is used instead of "reference" in the sixth line from the foot of the page. The sentence should read: "This is the earliest positive reference to the species in the British literature I can trace." (C.-H.). The paragraph refers to an article published by Stainton in 1849 and may relate to a specimen taken much earlier.—S. WAKELY, 26 Finsen Road, London, S.E.5.

With reference to the sighting of *Danaus plexippus* L. at Seaford, Sussex (*antea*: 296) I regret having erroneously stated that this specimen was sighted by Mr. A. H. Sperring. It was, in fact, Mr. W. H. Spreadbury who informed me of his sighting of the specimen. My apologies to both gentlemen concerned.—Ed.

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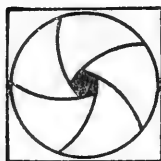
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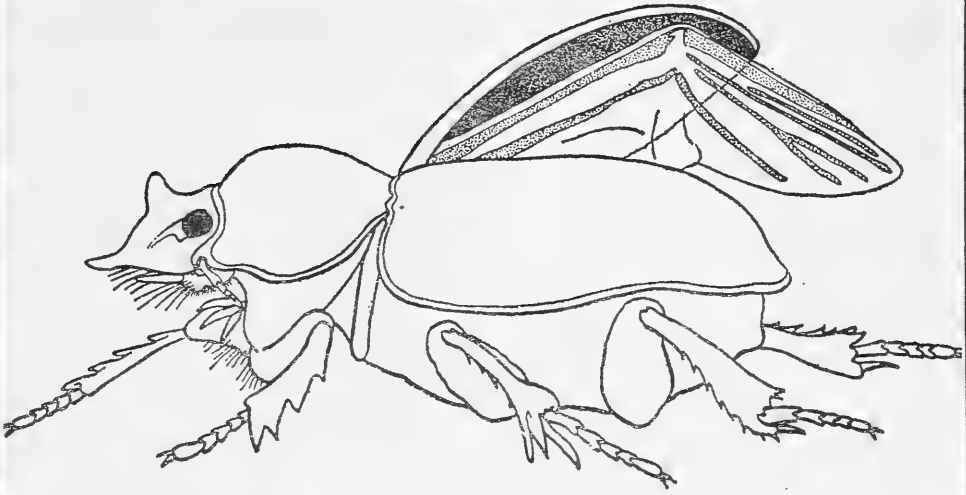
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