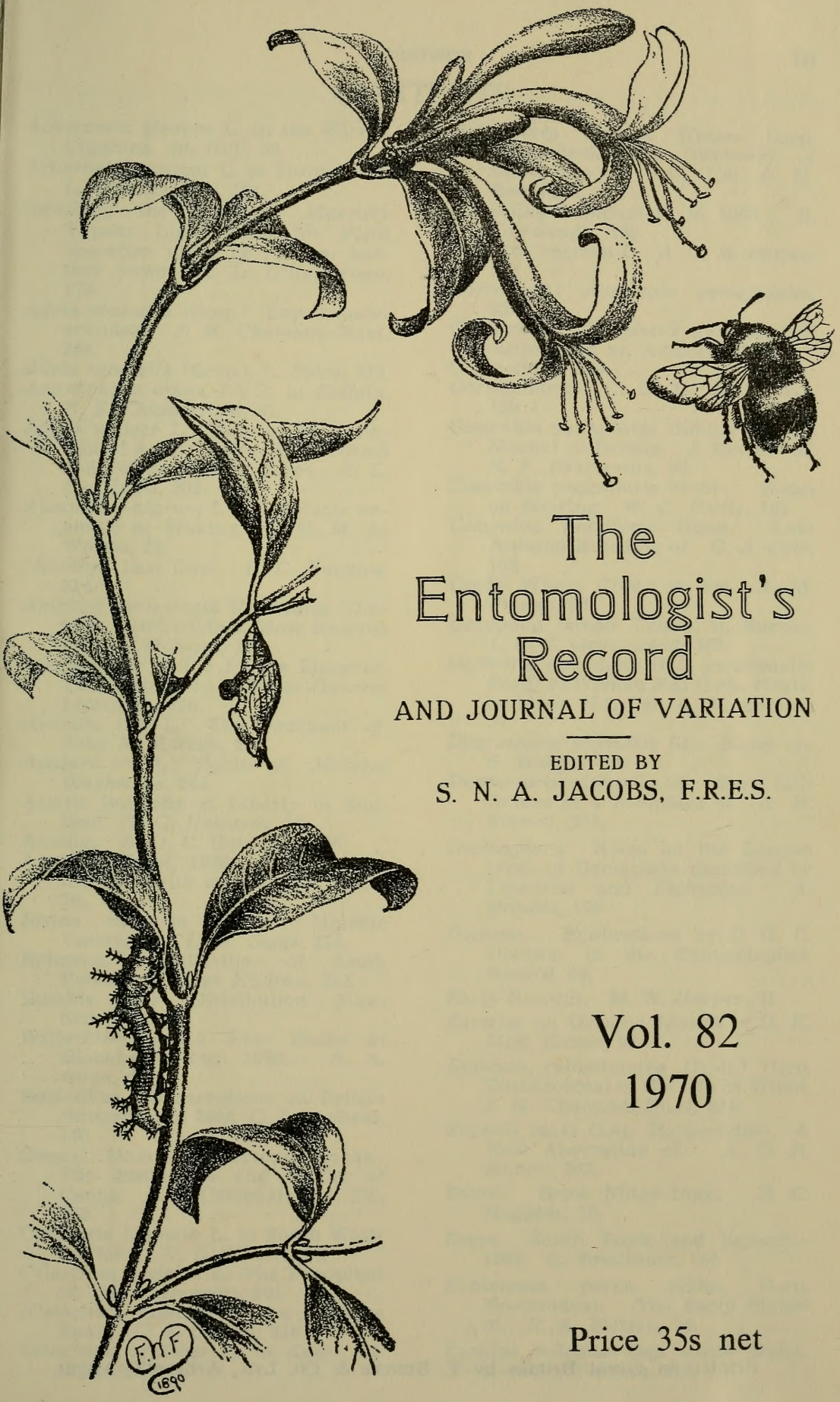

The Entomologist's Record

AND JOURNAL OF VARIATION

EDITED BY

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

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VOL. 82 No. 1 JANUARY 1970

THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

Edited by S. N. A. JACOBS, F.R.E.S.
with the assistance of

A. A. ALLEN, B.S.C., A.R.C.S.
NEVILLE BIRKETT, M.A., M.B.
J. M. CHALMERS-HUNT, F.R.E.S.
C. A. COLLINGWOOD, B.SC., F.R.E.S.
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Major A. E. COLLIER, M.C., F.R.E.S.
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The Discovery of the Larva of *Coleophora tamesis* Waters (Lep. Coleophoridae)

By Lieut. Col. A. M. Emmet, M.B.E., T.D., M.A.

Early in September 1968, while walking on the bog at Ballyconneely in West Galway, I noticed a quantity of *Juncus articulatus* growing by the margin of a shallow stream. I began to search the plants for the larval cases of *Coleophora taeniipennella* H.-S., though with little expectation of success as (in England at any rate) October is the time to look. However, I at once began to find *Coleophora* cases in considerable num-

bers. These were constructed from hollowed seedheads like those of *taeniipennella* but seemed noticeably larger, in particular with respect to the silken lining projecting behind the husks. This, as I was soon to discover, is a clear shining white and very conspicuous when first constructed, but turns in a few days' time to a muddy dark fuscous.

Feeling certain that these were not the cases of *taeniipennella*, I col-

lected a number, which I amplified when I found *Juncus articulatus*, equally well stocked with its *Coleophora* tenants, growing plentifully in damp spots in the coastal meadows and even in pockets amongst the rocks on the shore. I took in all about eighty cases—I am sure I could have found ten times this number—and on my return to England I distributed a dozen each to four of my friends, keeping some thirty myself.

I had the temerity to suggest that they were *tamesis* though I had absolutely no positive evidence to support this view, not having recorded the moth from West Galway, and my *hubris* was justly rewarded by spells of glum misgiving when I felt sure they were ordinary *taeniipennella* after all. These forebodings became virtual certainties at the end of the following June when, after a spate of parasites, the imagines began to emerge: the moth was too small to be anything but *taeniipennella*. But, as the emergence continued, the moths seemed to grow, and to warrant professional appraisal. Dr. J. D. Bradley kindly examined the genitalia and pronounced that they were indeed *Colephora tamesis* Waters, a species first named and described forty years ago though specimens had been taken as early at 1914. During the years that followed, the larvae had stubbornly resisted detection. Waters had hazarded that the foodplant was *Juncus compressus* or *Luzula campestris*, and the former may well prove to be an alternative (I have found *taeniipennella* on *Juncus subnodulosus* as well as *articulatus*). In Ireland *tamesis* was first taken near Dublin in 1939 and recently several specimens were taken in the Burren.

Only nine moths resulted from the eighty cases. Mr. J. M. Chalmers-Hunt bred two before spilling his chloroform bottle over the remainder of the pupae, and I bred seven, together with all those parasites; the other three entomologists who had larvae were unsuccessful with them. I put my own stock in a flower-pot topped with nylon as soon as I returned to England in mid-September, and there they remained out of doors and fully exposed to the weather until the middle of June; then I brought the pot indoors, but left its contents undisturbed. As is usual with the genus, the larvae crawled about for some time in the spring before settling down to pupate; most chose a stem of the foodplant for this purpose, though a few preferred the side of the flower-pot.

The larvae had to make do with the food-supply I brought back with them from Ireland. I have an adequate supply of *Juncus articulatus* growing locally, but it supports a vigorous colony of *taeniipennella*. This species which (to judge from my experience in 1968) comes some weeks later than *tamesis*, starts by feeding internally in the seedheads and is, of course, completely concealed at this stage. Consequently I was afraid of mixing Essex *taeniipennella* with my Irish stock, and the short commons they may have experienced as a result could have dwarfed my imagines slightly, which so worried me when emergence started. Three of my seven specimens are now in the British Museum (Natural History) collection.

I was earlier in my visit to Ireland in 1969, returning to this country on 4th of September, so I left my search for *tamesis* as late as possible, but even so I was too soon. The *Juncus* was, for the most part, still in flower, though I did manage to find a few cases in the more advanced plants. The year 1968 will be remembered in Ireland as having afforded the hottest and driest summer in living memory; nature was ahead that year. In 1969 the season was normal.

Labry Cottage, Victoria Gardens, Saffron Walden. 7.xii.1969

Stigmella (Nepticula) paradoxa Frey (*nitidella* Heinemann) (Lep. Nepticulidae) — a Species New to Britain

By Lieut. Col. A. M. Emmet, M.B.E., T.D., M.A.,

While collecting at Wicken Fen on the 11th of July 1969, I noticed a *Nepticula* mine, with which I was not familiar, in the leaves of hawthorn. The bushes which bore them were in the very heart of the fen, on the west side of Drainer's Dyke. Almost all the mines were already vacated,

though a few still contained larvae. I showed them to Mr. S. N. A. Jacobs, who agreed that they differed from those of our recognised hawthorn-feeding "neps". Accordingly he submitted them to Dr. Joseph Klimesch of Linz, Austria, who pronounced that they were the work of *Nepticula*

nitidella Hein., a species not previously recorded from the British Isles.

The question of nomenclature now arises. The earliest reference to this species (as far is known) is in *The Weekly Intelligencer* IV: 14 (1858), where Professor Frey described it as a continental species under the name *paradoxa*. Heinemann's name *nitidella* dates from 1862. Since it seemed that the prior name should be preferred, Dr. Klimesch was again consulted. He gave as his opinion that as the name *paradoxa* had not been used in zoological literature for fifty years, it should be registered as "*nomen oblitum*" with the Nomenclature Commission under Article 23b, and the name *nitidella* should continue to be used. However, our British authorities disagree, first because Article 23b is regarded as in abeyance as in its present form it is unoperational and is up for review at the next International Congress; and secondly, because it may well transpire that *paradoxa* has, after all, been used in literature in the last fifty years. Therefore, with great respect for Dr. Klimesch, I feel I must follow the advice of the entomologists at the British Museum (Natural History) and introduce this species to the British list under the name of *Stigmella paradoxa* Frey (*nitidella* Hein.).

No full description of the mine is needed, since its characters are admirably represented in Mr. Jacobs's drawing. The mine is invariably at the edge of the leaf, usually filling one of the lobes. The frass is concentrated in a mass making a dark spot, rather resembling that of *Dechtiria argentipedella* Zell. The egg is laid on the underside of the leaf, within half a millimeter of the margin.

On the continent *paradoxa* is single-brooded, and the indications are that the same is true in this country. The best time to collect the mines would probably be about the 1st of July—the 11th was clearly too late, and allowance must be made for the backwardness of the season in the first half of last summer. I have one or two cocoons, but hardly expect to breed any moths on this occasion: late stragglers are generally parasitised or ailing in some respect.

As sometimes happens, once one learns a new species and knows what to look for, one finds it in localities other than the first. This applies particularly to the *Nepticulidae* which leave their trade mark behind them until the leaves fall in the autumn. Besides Wicken Fen, I have found vacated mines at Cherry-Hinton and Maddingley in Cambridgeshire, at Benfleet in Essex and on Dartford Heath and Farningham Wood in Kent; in several of these localities Mr. J. M. Chalmers-Hunt was the first to notice evidence of *paradoxa's* feeding. Still more surprising was its fluke discovery in the Burren district of Co. Clare, Ireland. During August I was collecting there with five other entomologists, and we were moving in a convoy of cars from one locality to another. A male *Colias croceus* Fourc. loomed into view, and the convoy halted in the interests of establishing a new record for the Burren. During this brief stop I found the old mines of *paradoxa* in the roadside hawthorns. I was glad that there were professional entomologists in the party to vouch for the authenticity of the record, for who would credit an individual who claimed that he had found a species new to the British list breeding both in England and Ireland in the same season?

My guess is that *paradoxa* has long been present in the British Isles, but at a low degree of density; the year 1969 saw a population explosion which led to its discovery.

My thanks are due to Dr. Klimesch for his help in identifying the mine, to him and to Dr. J. D. Bradley for their assistance over the vexed question of nomenclature, and to Mr Jacobs for his excellent drawing of the mine which accompanies this article.

Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 2.xii.1969.

What is *Pieris dubiosa:* Warren?

By S. R. Bowden

In the course of his recent article (1969) on a Caucasian *Pieris*, Mr B. C. S. Warren criticises the conclusion of Riley and Bowden (1969) that the subspecific name of Corsican *Pieris napi* should be *meridionalis* Heyne and not *dubiosa* Röber; he agrees that south Italian *napi* is to be called *meridionalis*.

With the best intentions, Warren unfortunately fails to represent our position accurately. In my 1968 paper I stated unequivocally: "It is certain that disparities must exist between the populations of Italy and those of Corsica. Spain and Dalmatia . . . . But the relatively small differences at present known do not justify subspecific separation." I noted certain genetic features of doubtful significance and also mentioned: "These [south Italian summer] males did not show triangular discal spots, as the Corsicans occasionally did."

Warren however seems to claim that the "*dubiosa*" of Spain and Corsica can be distinguished by gross differences in markings, and that obstinate failure to recognise these vitiated our conclusions. He attaches great importance to the (male) notched apical patch illustrated by Röber (1907: fig. 20c) and by Riley and Bowden (1969: Plate IV). I have dealt with the structure of this form of apical patch (1966: 61), which is frequent in *Pieris napi* L. but much less usual in *P. bryoniae* Ochsenheimer. Another "*dubiosa*" character emphasised by Warren is the triangular discal spot which appears, if rather vaguely, in the Seitz figure.

This combination of characters can appear in several subspecies of *P. napi*. Since Warren's article was published I have compared a male from Tattone (Corsica), another from Kiental (Bernese Oberland) and one from Angus (Scotland). The first two of these were taken by Warren himself. All three uppersides are essentially identical, and close to Warren's Plate VI, fig. 11 (Castile), in respect of both apical patch and triangular discal spot. I could, I am sure, find many more British duplicates. Still more unfortunately for Warren's argument, this form of the apical patch is uncommon among summer-emergence males included in my four drawers of Corsicans, as well as among the Italians. On the contrary, the inner edge of the black apical patch tends to a smooth concave curve, as in *bryoniae*, in both populations. Nor is the triangular spot present at all constantly in the Corsican specimens; when it does occur among the sons of a particular female, others may have rounded spots or even none at all. Moreover, the Italians do usually have a discal spot, and not necessarily a small one.

The underside-forewing spotting is an equally untrustworthy guide, as are the female characters offered. Warren must have been deceived by small unrepresentative samples: he should look at many more from each population.

It cannot be agreed that "*dubiosa*" is significantly smaller than *meridionalis*: both in Corsica and in Italy summer males expand up to 61 mm or more (mean of 24 Calabrians 58·7 mm, of 23 Corsicans 58·6 mm).

As for wing-shape, I must repeat that valid comparisons required elaborate treatment, publication of which would have lengthened our 1969 paper considerably. In fact I measured Calabrian and Corsican summer males, and found the mean ratios of forewing-breadth to pin-apex distance to be 0·543 and 0·538 respectively, the difference being without statistical significance. The spring butterflies showed, of course, significantly lower ratios. Size and shape, as well as pigmentation and markings, are in *Pieris napi* strongly influenced by environmental conditions.

From a careful re-reading of all Warren's fascinating papers on *Pieris* scent-scales, I conclude that he probably does not claim to be able to distinguish Corsican from Italian androconia with any certainty. They are doubtless so close that it would be necessary to derive some measure to which significance tests could be applied. But the foregoing defence of Riley and Bowden is not to be taken as an attempt to devalue androconia in the study of nearly related *Pieris*. Without endorsing all Warren's conclusions, I must express admiration for his devoted work

Finally, a reminiscence may be in order. When I was a boy, birds'-nesting was still a prevalent activity, and one nest that we frequently found in Hertfordshire was that of the nettle-thrush. This bird (unfortunately in the adult indistinguishable from *Turdus ericetorum*) laid eggs immediately recognizable by having smaller black spots than those of the song-thrush. Perhaps myths easily arise in young and hopeful minds. However this may be, the nettle-thrush is still not on the British list.

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SUBSCRIPTIONS FOR 1970.

Readers are reminded that subscriptions for Vol. 82 are now due.

Mr P. N. Crow, who helped the Record so actively during the past year has now vacated the office which he served so well, and his place has been taken by Mrs M. A. Redgrave, of 2 Connaught Way, Tunbridge Wells, Kent, England, to whom subscriptions should now be sent.

We offer our sincere thanks to Mr Crow for the very efficient way in which he handled his office, and for the immense amount of work in other directions which he put in for the benefit of the magazine. We would at the same time like to offer our grateful thanks to Mrs Redgrave for having taken over the Treasurership.

Subscriptions already sent to Mr Crow will, of course, be forwarded without delay to the correct place, but it will save trouble if those about to pay their subscriptions will do so to Mrs Redgrave direct.—Ed.

A Month in Malaysia in the footsteps of Corbett and Pendlebury

FEBRUARY — MARCH, 1968

By A. G. M. BATTEN, F.R.E.S., and Mrs. A. M. BATTEN

We retired from a very active business life at the end of 1966 with the intention, as one of us is also a philatelist, of studying lepidoptera in those countries of Europe which illustrated their insects on their postage stamps with a view to placing side by side the actual insects and their pictorial reproductions. However, currency restrictions rendered this impossible and we have to think almost entirely in terms of sterling area countries. We have already visited Jamaica in January 1967 (*Entomologist's Record,* **80**: No. 1, January 1968) and have visited Canada twice (certainly no sterling area but we can stay with our son and his family there) in July and August 1967 and September 1968.

Early in 1968, as a winter holiday, we decided to go to Malaysia for a month with a short visit to India on the way. We had read our Corbet and Pendlebury and were sure that we should find a great deal to interest us.

On the 14th February we left London Airport via Qantas—Boeing 707—the temperature was 43°F.—and arrived at New Delhi the next morning—the temperature there, to our surprise was again, 43°F. We had thought, wrongly, that India was always a hot country except in the North. We then spent two days in and around Delhi during which time we did not see a single insect—not even a fly or a mosquito. On the 17th we went 120 miles south by train to Agra to see the Taj Mahal by day and by moonlight. The Taj is quite beyond description. At Agra we saw only three moths around a lamp at the entrance to the Taj (before the moon rose) and at Satehpur Sikri—a complete city built 200 years ago and deserted 15 years later because of the failure of the water supply—we saw one small blue. Both at Delhi and Agra gardens were filled with roses, dahlias, hollyhocks and all the other English summer flowers in profusion, but there were no insects.

Entomologically this was a disappointing start. On the 20th we flew on to Calcutta where it was certainly warmer and a few butterflies were about. On the 23rd we proceeded by car to a remote place called Dumkal about 125 miles north of Calcutta almost on the Pakistani border. Here we stayed in a 200 year old bungalow standing in some 10 acres, built originally for the Zemindar of the District and now privately owned. The gardens were moderately well maintained and contained many flowering trees of which we could not discover the names. There were a few butterflies about but not what one would have expected in a temperature of 85° to 90°F. We had taken with us a portable M.V. light, which we ran off a car battery in the garden, with almost negligible results.

After the weekend we returned to Calcutta where we looked for butterflies on the Golf Course with moderate success. A private garden nearby yielded rather better results. Since none of our captures in India were of any great importance we have not listed them.

On the 29th February we flew on to Bangkok to see the famous floating market on the Klongs (or canals). We were only there for one whole day. We saw four butterflies in the centre of the city in the small garden of the Oriental Hotel.

We arrived at Kuala Lumpur by air from Bangkok on the 2nd March. We had been there for three days the previous April and knew how promising this place could be. The next day we went out with Mr. (Mike) and Mrs. (Jill) Newman who lived in Kuala Lumpur and had built up a wonderful collection in the last few years. They began collecting to amuse the children but now take the matter seriously and are very knowledgeable. It is curious how many people collect butterflies in Malaysia yet how few make a study of the subject. We met very few entomologists, many more collectors and many with a real commercial approach. More about these when we refer to Cameron Highlands. On this occasion we had the use of a Jeep and went to a timber reserve at Sungei Langat, near Uln Langat some thirty miles south of Kuala Lumpur. Certainly no ordinary car could have reached this place. The track was almost non-existent and very difficult even for the Jeep. However, we arrived at a small clearing —right in the middle of the jungle alongside a small stream at about 2000 feet. Here, bait in the form of rotting prawns and pineapple was laid on the rocks with considerable success.

We saw many of the commoner butterflies of the Malaysian Jungle at this place and have included what we saw in our list at the end of this story.

Incidentally, we saw two specimens of that splendid insect the Great Orange Tip (*Hebomoia glaucippe aturia*, Fruhstorfer) but they were too speedy for us. The tuans (husbands) pressed on up a jungle track and saw many species, many of which were strong and high flyers, difficult to identify. About a mile from the Jeep we heard something in the reeds beside the stream. A little later we came across tracks on the sand beside the stream which were undoubtedly tiger. We did not tell the 'mems' (wives) until later but we discouraged movement in that direction.

Among the butterflies we took there were the Malayan Sunbeam (*Curetis santana malayica*, C. & R. Felder); the Tawny Rajah (*Charaxes polyxena crepax*, Fruhstorfer), the only common *Charaxes* in Malaysia and we saw only one; the Chocolate Albatross (*Appias lyncida vasava*, Fruhstorfer); the Orange Albatross (*Appias nero figulina*, Butler); the Malay Lacewing (*Cethosia hypse hypsina*, C. & R. Felder); the Rustic (*Cupha erymanthis lotis*, Sulzer); the Fivebar Swordtail (*Graphium antiphates itamputi*, Butler); the Common Bluebottle (*Graphium sarpedon luctatius*, Fruhstorfer); the Malayan Jezebel (*Delias minus minus*, Wallace); the Red Helen (*Papilio helenus helenus*, L.); the Common Birdwing (*Troides helena cerberus*, C. & R. Felder) and the Burmese Lascar (*Neptis heliodor dorelia*, Butler).

On the 5th we went to another spot, well in the jungle (entrance at the 13th milestone on the Bentong Road out of Kuala Lumpur) where again there was a rocky stream overhung with trees through which the sun could penetrate Here we had what, to us, was one of our more exciting experiences since we each captured a Raja Brooke's Birdwing (males) (*Trogonoptera brookiana albescens*, Rothschild). 'Mem' caught the first one—one of the highlights of her life. We deal with this spectacular insect in more detail later. Many of the insects seen included, of course, some of those already mentioned. We also took examples of the Common Grass Yellow (*Eurema hecabe contubernalis*, Moore) — said to be the commonest butterfly in the Eastern tropics (and of interest to us since we had collected *Euremas* in Jamaica) and the somewhat similar *E. simulatrix*

tecmessa, Niceville, which is distinguished by the large reddish brown apical spot on the underside of the forewing. This we found to be relatively scarce—indeed, we only took five specimens in Malaysia in a whole month.

We also took the Common Three Ring (*Ypthima pandocus corticaria* Butler) at this spot and, indeed, subsequently saw it almost everywhere we went.

At this particular situation we saw considerable concentrations of the Malaysian Albatross (*Saletara liberia distanti,* Butler) sitting on the sand at the edge of the stream, 60 to 70 in number. In other situations we saw similar numbers of the Chocolate Albatross (*Appias lyncida vasava,* Fruhstorfer) congregating. Presumably the attraction was urine, probably tiger, although due to recent rains, possibly, no paw marks were visible. In the slightest wind all the insects were facing into the wind ready for take-off. This alignment—all the same—was not noticeable in the absence of wind. Frequently these congregations of a single species would be joined by occasional other and usually similarly coloured species. The hind wings of *A. lyncida* are sulphur yellow. Those which joined the pack were usually *Euremas*—also yellow, and sometimes *Graphium antiphates itamputi,* Butler, also of generally yellow appearance. The only others seen in these congregations were occasional *G. sarpedon luctatius,* Fruhstorfer and sometimes *A. nero figulina,* Butler — a copper coloured insect above and silver below.

We also saw here the Malay Lacewing *Cethosia hypsea hypsina* C. & R. Felder) quite one of the most beautiful of the Malayan butterflies, especially on its underside. Everywhere we went there were hundreds of tiny blues some very deep blue, others almost the Cambridge shade. Most of them were quick in flight and very difficult to capture.

Here, as elsewhere, we saw the various examples of the *Euploea;* the Malayan Crow (*E. redtenbacheri malayica,* Butler); less frequently the Spotted Black Crow (*E. crameri bremeri,* C. & R. Felder); the Striped Black Crow (*E. eyndhovii gardineri,* Fruhstorfer); the Striped Blue Crow (*E. mulciber mulciber,* Cramer); the Blue-branded King Crow (*E. leucostictos leucogonis,* Butler) and the Magpie Crow (*E. diocletianus,* Fabricius). The last mentioned we found in great numbers everywhere. We noted the extrusion of the pair of yellow hair pencils which, as mentioned by Corbet, appear when the insect is handled.

On the 6th March we went to stay for a week in the rarely visited Malayan National Park in the State of Pahang with out friends the Newmans. We went by car from Kuala Lumpur to Kuala Lippis, some 125 miles. Here we waited some 3 hours with several hundred Malays and Chinese, for a train, in a temperature near 100°F. ("When will the train come?" "We do not know"--"Can we take return tickets to Tembeling?" "No." "Why not?" "The train might be derailed and then you would want a refund"). Eventually, however, we reached Tembeling after spending 1½ hours in the train. Fortunately we had a whole coach to ourselves since everyone else went third class together with such items as bookcases and fruit. We then had a bus journey (the bus was meant to seat 12 but had been known to take 43 persons at once) for two or three miles to Kuala Tembeling where we joined a flat bottomed jungle river boat to take us, in some 3 hours to the rest house at Kuala Tahan, the Park Headquarters. This journey in a boat, about 30 feet long and about 3

ft. wide, was most exciting due to the rapids which had to be negotiated *upwards*. Sometimes we had to get out and walk on the bank while the crew pushed. Very clever work by the crew of three ensured, however, that we arrived at the Park safely in near darkness after nearly 12 hours, in all, on the way. Conditions of near drought prevailed at the time of our visit and militated against us entomologically. The rivers were at the lowest level within living memory and since there are no roads, and only very few jungle tracks, the rivers were the only means of movement. Most, however, were too low to be negotiated at all and we were largely confined to within 3-4 miles from the Rest House in consequence. The four of us were the only Europeans in the area.

The Park exceeds 1,600 square miles in area and has no roads whatever through it. The altitude of the Rest House is about 200 ft. There are mountain peaks in the Park above 7000 feet.

We enquired as to tigers—seemingly a sensible precaution—and were told that it is estimated that there are 300 pairs in the Park "but our tigers are not man-eaters". To reassure us it was explained that there was only, mathematically, one pair of tigers to each 5 square miles. In the event we did not see any, or even their spoor.

We took with us a Robinson moth trap with a 125 watt M.V. lamp. The voltage generated on the spot is 240 A.C. In the event although we had the lamp working each night we obtained very little due both to the dry weather and to the full moon. We have only one Sphingid to record *Daphnis nerii* Linnaeus. A portable 12 v. M.V. lamp, which also we took with us, produced nothing at all. Most spectacular, however, were the small flies which invaded the light area immediately over the large lamp as soon as darkness fell. These insects, we are not quite sure why, gave the impression of tracer ammunition weaving to and fro over the light.

As for butterflies, they were not as numerous as we had expected but we were able to record a substantial number.

Probably the most exciting of our experiences arose out of our desire to obtain specimens of certain of the Amathusiidae and in particular the Dark Blue Jungle Glory (*Thaumantis klugius lucipor*, Westwood) which is not often seen but is particularly beautiful. It is found in the primary jungle (jungle not disturbed for at least 300 years) and by forcing one's way through the near impenetrable undergrowth one may, if one is lucky, stir one from its resting place, often in very dense foliage, almost at ground level, when it flies a few yards to take refuge in a similar inaccessible situation. Even when one can get near the object the problem is how to use the net. However, with much exertion in nearly 95°F., suitably clothed in jungle trousers and snake boots, we did obtain three or four examples.

It is not permitted to go into the jungle without guides. We had two, and sometimes three, to look after us. One of them had served under J. A. Hislop (known to Corbet) when he was Superintendent of the Park and was helpful in obtaining specimens. One afternoon the two 'tuans' decided to go into the deep jungle without the 'mems'. Two guides came with us. We sent them into the jungle to look for Amathusiids while we went half a mile along the track to do the same. We entered the jungle and in a short time became completely lost. The sun went, a tropical downpour followed and two very damp entomologists had to shout in

unison for help. By then the guides had become worried since they could not find us. Eventually they heard our shouts and were able to lead us out. It was a hazardous and, probably, a stupid thing to have done. We heard afterwards of a number of people who have done just this and have never been seen again, alive or dead. Perhaps those tigers after all . . . .

Another hazard was elephants—there were some in the neighbourhood and, more surprisingly, herds of animals known as seladang (*Bos gaurus*, Smith). These are among the largest cattle in the world, standing six feet high to the shoulder, and are said to be highly ferocious.

We have included in our list the principal insects we saw or caught in the Park. Many of the ravines in the jungle (often 30-40 feet deep) are crossed by walking, perhaps 60-70 feet, on single tree trunks dropped across them. The only support *may be* a hand wire which may or may not be securely attached to upright posts. Mostly not! However, the 'tuan' managed to catch a Common Birdwing (*Troides helena cerberus*, C. & R. Felder) on the wing while standing on the middle of one of these bridges.

Shortly before we left the Park the Newmans went off in a boat to explore while we visited a site across the river, with negative results. The Newmans were more fortunate and they came across more than one hundred Malayan Coppers (*Parthenos sylvia lilacinus*, Butler) flying around what was obviously their food plant. They took about 10 with difficulty. They are magnificent creatures. Corbet describes them as rare other than in Kedawi to the west of the peninsular. Those the Newmans saw were well to the east.

After our week in the Park we returned to Kuala Lumpur. We had a long wait at Tembeling Station and in a short interval of sunshine there caught three species we had not seen before, including the Lime Butterfly (*Papilio demoleus malayanus*, Wallace).

We made another morning excursion from Kuala Lumpur to the 13th milestone on the Bentong Road. No sooner had we reached the chosen spot than we saw a *brookiana* which we took. Within minutes we saw four more sitting on the sand (had the tiger been there?) and took all four in the net at once. One escaped. We decided to ration ourselves, however, to six sound specimens although the males, at any rate, are by no means rare. There were many blues about which, again, we found most elusive.

At Kuala Lumpur the 'tuan' was unwell, temporarily. A doctor came to see him at 9.15 a.m. on the 16th March and by 9.30 a.m. due to his ministrations we were able to proceed by car to Cameron Highlands (which had been one of Corbet's favourite collecting grounds). Knowing of his success there we had expected great things from this area but were disappointed, largely by reason of the long drought, and, while we were there, overcast skies. The streams were almost dry and the waterfalls almost non-existent. However, while we were there the 'mem' saw a female *brookiana*, the only one we saw in flight. On that same day we saw little else other than the Common *Euremas* and *Appias lyncida vasava*, Fruhstorfer.

We were accommodated, by courtesy of the Hong Kong Bank in their staff bungalow. We had this to ourselves and were able to run the 125 watt M.V. lamp each night. At the beginning of our stay the moon did not help but the later nights were often quite sensational. The bungalow is on an eminence at 5000 feet and we were able to set up the trap with a ten mile stretch of country, largely jungle, below. As soon as it was dark,

insects came by the hundred. Among the visitors were many large insects which we now know to be moths (although we doubted this at the time), which cried almost like children when trodden on (*Xyleutes strix* Linnaeus). Large beetles, many with large horns, came as well as smaller insects with which we were not familiar. Eeverything became completely mixed up inside the trap and we then resorted to a sheet, on which hundreds of creatures settled. We took what we could but the difficulty was to despatch them as they were taken. However, we succeeded in taking quite a number which we have listed. As many as nine sphingids at a time were seen on the sheet.

At one stage an Atlas Moth (*Attacus atlas* Linnaeus) lumbered towards the light. We took it but then had quite a problem to deal with it since it was all of ten inches across. Finally, having no killing bottle of suitable dimensions we had to resort to the use of an insect spray from the house to kill it. It was a messy business and we decided not to take any more, should they come. They didn't, fortunately.

We also saw a number of the large moth *Lyssidia docile*, Butler. at light. We had previously seen these by the dozen at Kuala Lumpur Airport, which, set almost in the jungle, has fluorescent lighting.

In the same situation we also ran the 12 v. portable M.V. light but with little success. This is difficult to explain since in Jamaica we used only the portable with great success. We had had nothing at all come to it the year before in Hong Kong, and Kuala Lumpur, hardly any in West Bengal and a negligible number in Canada in what would seem to us to have been, in each case, ideal situations and weather.

We have already referred to the commercial approach to entomology in the Peninsular. At Cameron Highlands—a relatively cool resort at 3000-5000 feet, practically every shop had cases of insects in its windows and dozens more inside. The approach to this town is from Tapah (Notice —Narrow roads and bends for the next twenty miles!). Along this road is the Half Way Tea House, miles from any other habitation, run by two Chinese. They themselves catch thousands of insects a year, set them, and then sell them as singles or as collections. The setting is beautifully done on setting boards four feet long. Wherever we went along this road we met professional catchers, usually well supplied with bait and taking everything that came. There was also a contingent from the British Army doing much the same so that they could take home to England, to adorn some wall "Malaysian Butterflies I caught myself".

We have referred to the drought conditions prevailing while we were at Cameron Highlands, which accounted for our disappointing results, but the visit to the Half Way Tea House certainly demonstrated what could be found in this area. Many of the insects seen there were, in fact, given their correct scientific names—certainly the Chinese knew quite a lot about them. There were also a number of aberrations, caught locally, for sale, including a female Rajah Brooke's Birdwing (*Trogonoptera brookiana albescens*, Rothschild) which had a most unusual amount of white on its wings.

(to be continued)

Fig. 1. The specimen at rest on an elm leaf in Bedfordshire.
Fig. 2. A specimen of the same brood.

An Asiatic Butterfly at liberty in England

By T. G. Howarth
[Dept. of Entomology, Brit. Mus. (Nat. Hist.)]

There must be very few records of Lepidoptera being released and then recaptured or seen many miles away from the point of release and they are not usually identifiable with certainty unless marked in some way so that the following rather extraordinary incident may be worth recording.

Last September Mr Richard Hudson of Newton Blossomville, Bedfordshire wrote to the Department of Entomology of the Natural History Museum asking for information concerning a very large dark blue or black butterfly with a wingspan of about five inches he had seen and photographed in his garden at about 1 p.m. on 2nd July. He enclosed a 2″ x 2″ colour slide which was, unfortunately, slightly out of focus and under-exposed, but which, undoubtedly, depicted a male specimen of the *memnon* group of Asiatic *Papilionidae*.

When attempting to determine the species by comparison with the museum collection, it became apparent that it matched nothing there but was intermediate in character between *Papilio memnon* Linnaeus from Asia and *Papilio polymnestor* Cramer from India and Ceylon and therefore might very well be a hybrid between these two species.

The author, being acquainted with the pioneer work on the hybridization of species of *Papilionidae* by the geneticists Professors C. A. Clarke and P. M. Sheppard, and cognizant, in particular, of their treatise* on the genetics of *P. memnon*, wrote to Professor Clarke of Liverpool University enclosing the slide to see if he recognized the specimen and if perchance he had liberated a specimen prior to the 2nd July.

It was extremely interesting and gratifying when Professor Clarke confirmed that the specimen was, without doubt, one of his multiple hybrids—a *Papilio polymnestor parinda* Moore × a hybrid *memnon agenor* L. × *memnon anceus* Cramer—which he had released either on 22nd or 24th June, when he liberated two males on each date at Caldy, Cheshire.

The meteorological station at Bidston, Cheshire, very kindly supplied Prof. Clarke with the following information on the wind speeds and directions between 22.vi. and 2.vii.1969.

Date	*Wind speed*	*Wind direction*
22.vi.1969	Gentle breeze	S.S.E.
23.vi.1969	Light to gentle breeze	S.E. backing N.W. to N.
24.vi.1969	Moderate breeze	Westerly
25.vi.1969	„ „	W.N.W.
26.vi.1969	Gentle breeze	S.E. veering to W.
27.vi.1969	Moderate breeze	Westerly
28.vi.1969	Gentle breeze	Westerly veering N.W.
29.vi.1969	„ „	Southerly veering N.W.
30.vi.1969	„ „	S.W. veering W.N.W.
1.vii.1969	„ „	S.W.
2.vii.1969	Gentle to moderate breeze	S.W. veering N.W.

It is of interest, but probably of no significance, that, apart from the first day mentioned, there was a westerly influence noted during some part of each day during the period.

The author wishes to acknowledge his indebtedness to Professor C. A. Clarke for his help and information concerning the subject of this article and to Bidston Observatory for furnishing the meteorological details quoted.

*Clarke, C. A., Sheppard, P. M. & Thornton, I. W. B. 1968. The genetics of the mimetic butterfly *Papilio memnon* L. *Phil. Trans. R. Soc.* Ser. B. No. 791, **254**: 37-89.

Notes on *Depressaria ultimella* Stainton

By S. Wakely

On the 11th August 1968, Col. A. M. Emmet and I were on our way to Dungeness and, passing through Appledore, I suggested that we should look for the larvae of *Depressaria ultimella* which I had previously taken in this locality. On arriving at the place where in 1963 I had found the larvae in fair numbers feeding in the stems of its foodplant, *Oenanthe aquatica* (L.) (Fine-leaved Water Dropwort) I was disappointed to find that the plants had been destroyed by the local farmer, owing no doubt to their reputation of being poisonous to cattle. A mile or two further on we saw a few plants growing in a ditch by the roadside, but on a closer look we could see that even these had been sprayed and were wilted and dying. However, we were able to examine one or two plants by getting them on to the bank. One larva of *ultimella* was then found. Looking round for more plants to search I noticed a tall umbellifer growing in the ditch. It had white flower clusters and the leaves were lobed and they had serrated edges, very different to the foliage of the *O. aquatica* which has finely-cut leaves reminding me of *Conium maculatum* (Hemlock). On splitting open one of the stems we found a larva feeding in the same way as the one in the *aquatica* stem. Both larvae unfortunately died on the way home, probably owing to damage occasioned when they were extracted, or possibly the one in the wilted *aquatica* stem was poisoned. Although all the English books on lepidoptera which I have read give only the one foodplant I felt sure that on the Continent another foodplant was mentioned by A. Spuler. Sure enough, a plant called *Sium latifolium* L. (Water Parsnip) is given in his book and on checking with a recently-published botanical book I recognised from the description that this was the plant we saw at Appledore.

The discovery of another foodplant besides *aquatica* for *ultimella* is of great interest, particularly as its main foodplant is being so persistently wiped out in some of its old haunts.

Sium latifolium is quite a rare plant in Britain but is said to be more common in the fens of Norfolk and Suffolk. It is, in fact, much more uncommon than *O. aquatica.*

Although Meyrick gives the distribution of *ultimella* as "England to York, common", this does not mean that he considered it to be a generally distributed insect as, in the introduction to his Handbook, he states that the word "common" means that the moth is to be found where the foodplant is plentiful.

R. L. E. Ford took numbers of larvae in the Penvensey Marshes near Eastbourne years ago, but I have only met with it in the Romney Marshes. In 1957 I managed to breed six moths from larvae collected at Midley, near Lydd, Kent, but subsequent visits to the area failed to find any of the foodplant surviving. In 1963 I bred nine moths from larvae found at Appledore. J. M. Chalmers-Hunt was with me on that occasion. H. M. Michaelis reported the capture of the moth at Delamere, Cheshire, in 1953 and 1956, and comemnted that the foodplant had not been observed in the area.

C. Morley records *ultimella* from Homersfield, Suffolk (taken by the Rev. Cruttwell before 1890).

Stainton gives a good description of the larvae in his *Insecta Britannica* and mentions that it occurs at Lewes, Sussex, and at Folkestone, Kent.

Records of *D. ultimella* are few and far between in the entomological journals and I should be interested to hear from anyone who has met with it in recent years or who knows of old records. Possibly there are references to it in local entomological journals. In my experience it is a most difficult species to acquire, and few of my friends have found it.

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26 Finsen Road, London, S.E.5.

Some Notes from Essex

By H. C. Huggins, F.R.E.S.

Vanessa atalanta L. On October 19th my son and daughter-in-law witnessed what was apparently a return migration of *atalanta*. They were fishing on the middle ground, about one and a half miles from the Essex shore, and for a couple of hours *atalanta*, mostly singly, came past their boat in a straight southerly direction towards the Kentish shore from Essex.

This has been a remarkable autumn for Vanessids. On November 3rd during a short walk I saw two *V. cardui* L. and several *atalanta*, and as late as November 20th I saw *Aglais urticae* L. on the wing.

The darkening of local insects continues apace. Quite half the specimens of *Polyploca ridens* Fabr. of which I heard in 1969 were melanic. I had never heard of this form in Essex five years ago.

On October 8th my friend Dennis Smith brought me a live female *Aporophyla australis* Boisd., which had been taken the previous day at Colne Point, near St. Osyth. This was found sitting in the daytime, it is rather a small specimen, and much darker than the average one at

Dungeness. So far as I can trace, the only other Essex record is Harwood's in the V.C.H.: "once bred from a larva found on the St. Osyth coast." The moth is probably common at Colne Point, the ground is quite suitable, and my late friend W. S. Gilles and myself found the larvae of *Agrotis ripae* Hübn. quite common there nearly forty years ago. My insect has laid a good batch of eggs and the resultant larvae are feeding well in my linen cupboard. I wish to force them as I hope to spend the summer again in Ireland. Gilles and I never worked after dark at Colne Point in the autumn.

Baron de Worms (Ent. Rec. **81**: 281) in recording *Eremobia ochroleuca* Schiff at Woking, refers to it as an insect closely associated with downland. In my experience it may turn up anywhere, although it prefers a light chalky soil. Whenever I have run my mercury vapour light in the garden here, on heavy London clay, at the right time of year I have nearly always seen one or two *ochroleuca*, and I have found the larva on the edge of the marshes at Canewdon.

In the days of my boyhood it was very common on the chalky soil about Gravesend, 1902 was the year in which I remember it commonest. In that year I could go out with a dozen boxes in the morning to a neglected cart track a couple of miles from the town and fill them all with *ochroleuca* without difficulty. The moths used to sit under the seed-heads of *Centaurea scabiosa*, very occasionally one would be sitting on the top, but most were closely pressed to the underside.

Mr Waddington and others seem to have been having difficulty in finding *Mormo maura* L. lately. Although not common, it occurs regularly at mercury vapour light in my garden here, say two or three in a season. Just after my return from Ireland this year (1969) we had a very hot stuffy night (September 15th), so I got out and set the mercury vapour trap, and amongst others took a female *maura*. As can be imagined, it was rather tattered and of course released. I have never killed any from the garden except one I gave to the late David More. I think *maura* is thinly spread throughout South Essex. It occurred most nights when I went round the sugar with C. R. N. Burrows at Mucking Vicarage over sixty years ago, and was not uncommon at Lower Dunton Hall in the early 1900s when my uncle by marriage, the late Harry Squier, farmed there. Dunton and Bulvan were in those days some of the wildest places I have ever known; to-day, of course, all are "developed". Fords have even got a permit for a factory in the "green belt" at Dunton.

Amongst other insects at the mercury vapour light on the hot night of September 15th which I have already mentioned was a rather small perfect, and apparently newly emerged *Ectropis biundulata* de Vill. The usual time for the second brood of this species in the district is in the first two weeks of July, so I can only suppose that this moth is from a partial third brood, caused by the unusually hot summer. I have since heard of other specimens at the same time in Mid-Essex.

I think the most unusual capture reported to me this season was a specimen of *Abraxas sylvata* Scop. taken at mercury light by Dennis Smith in his garden at Hadleigh, near the Nature Reserve. Before the war, the late Dr. Stovin and I worked this wood regularly, and never saw *sylvata*. It is of course found in some of the woods at Langdon Hills, where I first saw it in 1902, and I am glad to say it still survives, but it does not seem a likely insect to migrate nearly twenty miles. Another

curious thing about the occurrence is that usually where *sylvata* is found it is abundant over a restricted area, sometimes one tree. I have again heard of a single specimen turning up in Mid-Essex.

On November 20th, a hot sunny day, I saw three *Cacoecia pronubana* Hübn. on the wing, one in my garden here, and two about a mile away. It looks as if this moth also had a third brood this year.

Notes on the Microlepidoptera

By H. C. Huggins, F.R.E.S.

Scoparia ambigualis Treits.: On June 20th, I took in the Brandon range, Co. Kerry, at a height of 2600 ft. a further specimen of this moth. It was of the same form as the one I took last year, but even more extreme, almost as black as *Eudoria resinea* Haw., and like last year's was very large, slightly bigger than the ground level ones. It is very curious that these Brandon insects are so large and bright, so different from the Scottish high ground ssp. *atomalis* Dbld.

Pempelia dilutella Hübn. I had three more specimens of this moth in my mercury vapour light trap at Dingle, thereby increasing my perplexity. On July 7th, 1961, Mr E. S. A. Baynes kindly took me at night to the top of Slea Head, Dingle, where we worked his pressure lamp and sheet. We took two *dilutella*, both very large and dark crimson with brilliant white markings. The following night there was another of the same form in his mercury vapour trap at the hotel. I saw no more *dilutella* there, although I worked my m.v. light at the hotel every year except 1965, until 1967, when I took two which were exactly like the small rather dull brown sparsely marked insects found on most chalk downs in Kent, Surrey and Hampshire. This year (1969) I had three more, all again of the small ordinary kind!

In the Burren *dilutella* is very large, most specimens being as large as, or even larger than *P. ornatella* Schiff. They are heavily marked with white, and the ground tint is of the same brown as *ornatella*, for which indeed, I mistook the first one I saw. This form is, so far as I know, the only Burren one, I have found it at Ballynalacken, and Mr. Baynes has done so as far away as Killinaboy.

One final point is of interest, I have never seen these Irish *dilutella* except at light. As all southern collectors know, it flies freely on the chalk downs in the late afternoon and early evening. As I very greatly admire the lovely Slea Head insect, I have on several occasions worked the thyme banks round the place where Mr. Baynes and I caught the two at light, without result, and at Ballynalachan I worked the slope where I took it at m.v. light, at all hours of the day for a fortnight without seeing one.

Homoeosoma nebulella Hübn. I am glad to record that I took a second specimen of this insect at mercury vapour light at Dingle in June 1969. This, with the earlier one which I took there in 1962, constitute the only two definitely authenticated Irish examples. Beirne (A List of the Microlepidoptera of Ireland, 1941, p. 64) only quotes Birchall's records "Wicklow coast, and Malahide and Howth 1866", and comments that they are probably correct, but confirmation is desirable. Unfortunately the specimens on which Birchall based his record. cannot be traced.

I am not doubting them for, like Beirne himself, I have a much higher opinion of Birchall than Donovan had. His chief fault appears to have been relying too much on memory, and sometimes hearsay.

Argyroploce capraeana Hübn. I took a specimen of this moth at Dingle in July 1969. The only record in Beirne (*loc. cit.*: 96) is of that I bred at Glengarriff fifty years ago. Shortly after the last war I took one at Glengarriff sitting in the hall of my hotel. I fancy others have been recorded since, but it is interesting to find it at Dingle some fifty miles away. It was, however, quite a likely insect to occur, as there is quite a lot of sallow near the garden, and both *Eucosma nisella* Clerck and *E. semifuscana* Steph. are regular visitors.

Eucosma mercuriana Hübn. One of the objects of my search in 1969 was the larva of this moth, of which I saw several and brought home two in 1968. However, when I reached Dingle and penetrated to the Brandon range in mid June, it was so misty I did not risk straying from the path to the right place. When eventually I got there in mid July I found that the big plant of *vaccinium*, around which the moths were flying in 1968, had been eaten to the root in the winter by sheep. I visited the spot twice at the end of July to see if I would find more insects fluttering round some other plant, but conditions were so bad, I saw none. I checked, however, that there is certainly no *Dryas octopetala* in the district.

Hazards of Moth Collecting.—In reply to the Rev. Guy Ford (Ent. Rec. **81**: 306) on the hazards of moth collecting it would be easy to make up various tall stories. However, from an experience of twenty years of making myself conspicuous by the use of lights on the roadside and other places, my recollections of outside interference are remarkably few. The first occurred before the mercury vapour era when I was dusking round the bushes on the downs near Shoreham, using the lamp from my bicycle. It was a great shock to have a heavy hand descend upon my shoulder without warning. The constable who owned the hand was distinctly disappointed to find that I was not a poacher, especially as he had had to cycle up a steep hill from the main road to make his capture. I have encountered only one other irate officer of the law, and that was many miles further north, where the mercury vapour was put up on a rough ragwort-dotted field on Warton Crag. He was accompanied by a civilian, and though in this case I was able to observe their approach, it was obviously too purposeful to be for a friendly visit. I was accused of trespassing, the other man being introduced as the owner. He failed to back up the law by admitting that he did not mind my being in the field. The constable thereupon changed his tactics, affirming that I was a danger to shipping at Heysham and Fleetwood, whose lights were just visible many miles to the south across Morecambe Bay. I had to move.

I recalled this navigation menace a year or two later when an officer on Portland spent some time talking, oblivious of any danger to the channel shipping from my light part way down the cliffs. This has been my usual memory of the police, many of whom have called in to have a few friendly words.

One happening I regretted at the time, rightly feeling sorry for the

men, took place in the Kennet Valley, where a friend and I spread our sheets on a farm track by a marshy area. About 1.30 a.m. we were astounded to see a vast vehicle approaching cautiously along the track. The driver and his mate had been aroused by a call to the Electricity Board about blue flashes of light which it was thought were coming from a nearby transformer station. They had driven up and down the A4 trying to find us for a long time. It was no wonder that they were cross about the unintentional hoax, but they became fascinated by the vast numbers of moths, retiring apparently placated by a hawk moth stuffed into a cigarette carton to be passed on to a junior.

It is usual to have people approach the sheet, often diffidently to enquire what is going on. Sometimes the question can take a surprising form such as that from a gentleman who enquired if we were recording the nightingales. But as opposed to the polite visitors, there are odd instances of unpleasant types piling out of their cars. These constitute an increasing hazard in the present day, roadside working being no longer recommended despite the increasing difficulty in finding sites off the road due to the growth of fencing off open woodlands.—R. FAIRCLOUGH, Blencathra, Deanoak Lane, Leigh, Surrey. 3.xii.1969.

Notes on some British Staphylinidae (Col.) 3. Amendments to the list of *Oxypoda* Mannh.

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

(No. 1 of this series appeared in *The Entomologist's Monthly Magazine* for July-September 1968, vol. 104, pp. 198-207; No. 2 is still in press.)

Canon Fowler in 1888 (p. 25) referred to *Oxypoda* as "one of the most difficult of all the genera of Coleoptera". Now, some 80 years later, that estimate may no longer be strictly true; progress has been made, as so often, by use of the genitalia—in this case, of both sexes—in ascertaining the limits of species and thus, indirectly, often showing how much diagnostic value may safely be put upon a given external character. Strand & Vik (1966) figure these organs for all the Nordic species, which include the great majority of those known as British, and their work is indispensable to any serious student of our fauna. For those able to read Danish, much help will be obtained also from Victor Hansen's key and descriptions (1954) in the excellent *Danmarks Fauna* series.

There remain, however, problems of identity, synonymy, etc., whose solution must await a fundamental revision. All I can do here is to indicate such corrections in our list (Kloet & Hincks, 1945) as appear to be necessary or desirable, having regard to present-day Continental usage. Moreover, it was only to be expected that some of the species added by Donisthorpe in the 1930s would have to be dropped; and it is rather curious, in view of the many species found in the neighbouring parts of Europe but not yet in Britain, that only one—*nigricornis* Mots.—has been added to the list since then, and that very recently (1968)[1]. Even so, further species probably remain to be discovered in this country.

[1]It is true that *O. planipennis* Thoms. was introduced as British in 1955, but it has since been transferred outside the genus—see below.

In the revised check-list concluding this paper, the number of species is reduced from 36 to 27. As in the original, subgenera are not given, their limits often being poorly defined; species-groups are perhaps preferable. In the notes preceding it, and now following, the names heading each are those used in Kloet & Hincks—retaining their order for convenience; the few items enclosed wholly within brackets relate to species not listed by them for one reason or another, but which call for some remark here.

(*O. humidula* Kr.—Not in the *Check List*, but its inclusion in Joy's key (1932:30) has puzzled some, and I have seen *induta* Muls. mistaken for it through use of the latter work. *Humidula* was introduced as British on a specimen taken by B. S. Williams at Welwyn, Herts. (1925, *Ent. mon. Mag.*, **61**: 154-5). The following year Williams recorded his capture of a second example at Otford, Kent (*ibid.*, **62**: 140). In 1928, however (*ibid.*, **64**: 139), Williams withdrew the species from our list, his two specimens having been named by Ste Claire Deville as *induta*. Deville sent both species for comparison, and Williams expressed himself quite satisfied with the determination. Joy must evidently have overlooked the latter's note, hence the presence of the species in his key. *O. humidula*, now known as *O. vicina* Kr., is only one of a number of species any of which might be expected to be found some day in Britain.)

O. induta Muls.[2] and *O. pectita* Sharp.—Kloet & Hincks make these separate species, probably following Donisthorpe (1932c:51) who wrote: "Recently Colonel J. Sainte Claire Deville kindly sent me examples of *O. induta* Rey; these I compared with Sharp's type of *O. pectita*, and they proved to be quite different species". However, despite (if not in ignorance of) this emphatic statement, most authors have either continued to regard them as synonymous or used the name *induta* for our insect, which, of course, is in any case definitely Sharp's species. Continental authors appear to be unanimous in their use of the former name for it; Drs. Strand and Hansen, for instance, have both seen our *pectita* and tell me it is what is considered to be *induta*. Doubtless therefore it will be best to adopt this course, at least provisionally, and seeing that the description seems to fit; Deville's *induta* may possibly have been incorrect (see, however, under *O. humidula*), or more likely Donisthorpe may have erred in his judgment. As the species is often thought to be rather scarce in Britain, I may mention that in this district it is not uncommon, almost replacing its close ally *O. umbrata* Gyll.; whilst further out from London the reverse is generally the case.

O. sericea Heer and *O. nigrina* Wat.—Here again these are placed as distinct species in the 1945 *Check List*, Donisthorpe (1905: 67-8) having recorded a single specimen form Dulwich Wood (17.vi.04) named for him by Fauvel as *O. sericea*, on the strength of which he stated that the latter was "quite distinct from *O. nigrina* Wat., with which it is confused by several continental authorities"—*nigrina*, of course, being long known as a not uncommon British species. (See also Fowler & Donisthorpe, pp. 41-2). They were still kept separate in Hudson Beare (1930:9) and Tottenham (1949:441), but not in Joy (1932:33), who places *nigrina* as a synonym of *sericea*. That the situation is confused is shown by the fact that the

[2]The author of *induta* is often given as Rey. I here follow Kloet & Hincks in ascribing the species to Mulsant.

species is recorded sometimes under one name, sometimes the other. Actually there can be no doubt any longer that our familiar *O. nigrina* Wat. is the same as the earlier described *sericea* Heer, as that is understood on the Continent. Dr. G. A. Lohse has confirmed their identity, and I have seen an example labelled *sericea* from Herkulesbad (Winkler, coll. A. Strand) which is clearly our species. Donisthorpe's statement above cannot therefore be correct; the reason for it will appear from what follows.

What then is the Dulwich insect, supposed to be *sericea* as distinct from *nigrina*? Its identity is indeed a puzzle. A cursory inspection shows that it cannot be the latter species, the antennae being longer and differently formed; nor does it appear to fit any allied species. At my request the beetle was submitted to Dr. Lohse; he, too, found it problematic, and suggested it might be an abnormal individual of some *umbrata*-group species. It shows signs of distortion and perhaps of immaturity; the pronotal sides, for instance, are more than normally contracted inwards. Otherwise it must be a new species, but if so we must await the discovery of further material. Fowler & Donisthorpe in the same note give four Surrey records of *sericea* on G. C. Champion's authority. Champion's collection shows these examples to be ordinary *sericea* (=*nigrina*), not the enigmatic species.

O. exoleta Er., *perplexa* Muls. & Rey, and *lurida* Woll.—These three names represent a pair of species, over which there has been almost inextricable confusion as to the correct names to be applied to them, and especially in our own literature. In the 1945 *Check List* the two valid names, *exoleta* and *lurida*, are widely separated; but they should be placed consecutively, *lurida* taking the place of *perplexa*, which is the same as what is now considered as *exoleta*. The two species in question differ chiefly in that one—now agreed on the Continent to be that of Erichson—has maxillary palpi of normal length, whilst in the other—certainly Wollaston's species—their third joint is unusually elongate (as in the non-British *O. praecox* Er.); this second species is also slightly larger and more tapering, with rather longer antennae, etc.

The confusion seems to have begun in 1874 with Mulsant and Rey, who gave the name *exoleta* Er. to what we now call *lurida*, and their own name *perplexa* (1860) to the other. Their interpretation was followed by Ganglbauer (1895), Reitter (1909), and other foremost authorities, as well as by the majority of British authors (e.g. Sharp, Fowler, Donisthorpe, Joy) as regards *exoleta* at least. Bernhauer, however (1902), adopted a different view, calling the species with short palpi *exoleta* and the other *lurida* (described from Madeira in 1857), and it is this interpretation that has determined present Continental usage. Newbery (1910) drew the attention of British authors to it, and it was restated in 1937 by Cameron (the last British writer on the subject). Sharp had in 1871 described the short-palped species as new under the name *verecunda*, his *exoleta* being, of course, the other species; and *verecunda* is rightly synonymized in the *Check List* with *exoleta*.

The name *perplexa* (seldom can a name have been more apt!) introduced further complications; though in fact its sense should have been clear, for Mulsant and Rey's figure of the palpus, and their location of it in their subgenus *Podoxya* founded on this very character, leaves no room for doubt—*exoleta* in their sense, as we have seen, being placed by them

in Thomson's subgenus *Baeoglena* with the long palpi (and thus being *lurida*). Joy in 1908 made confusion worse confounded by bringing forward *perplexa* as a new British species without seeing that it was really both *verecunda* Shp. (which he does not mention) and the 'true' *exoleta*; and still more, by misinterpreting it, as appears from his paper and a sample of his material I have seen. Thus, *perplexa* sensu Joy is *lurida* Woll.—a name unknown in our literature until introduced by Newbery two years later—though the description he gives of it, translated from Ganglbauer, applies to the true *perplexa* (=*exoleta*). There seems to have been an accidental transposition. In the key in his 1932 *Handbook*, however, Joy makes *perplexa* identical with *exoleta*, but clearly intends by these names the species with long palpi; thus, his 1932 synonymy is correct, but not its application. To make matters worse, Winkler (1925) and Bernhauer (1926) had in their catalogues wrongly used the name *perplexa* for what the latter had earlier, and correctly, called *lurida;* and Fowler & Donisthorpe (1913:40-1) unfortunately follow Joy's muddled interpretation of 1908 instead of Newbery's correct one, leaving the issue confused. In Kloet & Hincks *perplexa* appears as a separate species; but Tottenham (1949:441) gives the correct synonymy.

Some light was shed on the problem by Donisthorpe (1932[b]:5-8), who re-introduced the name *lurida* Woll. long forgotten by British authors. His paper has value as a historical review, pointing out much of the confusion of past usage, and giving important information on some types from which certain conclusions can be drawn. Thus it seems clear that Erichson's syn-types of *exoleta* comprise both species. For his interpretation of *exoleta*, however, Donisthorpe was content to follow British usage (incorrect according to recent ideas); moreover, he regarded *lurida*—the type of which he figures—as different from it, so that in his view there were *two* similar (but distinct) species *with long palpi*. Nevertheless, everything points to there being only one, as Cameron found five years later; Donisthorpe habitually attached too much significance to individual variation. But he quite rightly stressed that—whatever the true *exoleta* might be—*perplexa*, at all events, could not possibly be a long-palped species; and thus opened the way for a better understanding.

It is, I think, clearly desirable that the name *exoleta* should be fixed in the sense in which it is now accepted generally, and is (or will be) used in important contemporary works by leading European authors; and that to this end some future worker on the genus will set up a lectotype accordingly.

Regarding the incidence of the two species in Britain, *exoleta* (auct. Europ.) seems much the commoner, and I know of it from many localities; it is often found in sandy places, but also in compost, flood- or tidal refuse, etc. Its numerous synonyms bear witness to its comparative frequency. *Lurida* on the other hand I have seen much fewer of, and have met with only a single specimen — Windsor Park, by sweeping. This latter species is southern and western on the Continent, whereas the other is general.

O. salictaria Donis.—Described in the paper cited above (pp. 4-5) on an example from the willow-swamp at Windsor, and another without locality in the British Museum. I took a precisely similar specimen in the same place as the first in July 1937, and more recently two more (Westerham. Windsor Park). From a careful examination of all these, including

the genitalia of mine, I have no doubt that *O. salictaria* is to be referred to *O. brachyptera* Steph. as, at most, one of the forms assumed by that variable species; and from examples submitted to him, Dr. A. Strand agrees. Compared with the typical form occurring in drier, usually sandy, places, the present one has the elytra scarcely so short or narrow in proportion, and is rather stouter overall, etc.; but there is no really crucial difference. Yet Donisthorpe does not compare it with *brachyptera*, or indeed any other species. The form appears to be associated with damp and marshy habitats.

O. exigua Er.—It is rather curious that this still figures as an *Oxypoda* in the lists of Kloet & Hincks and of Tottenham (in the latter coming between *sericea* and *nigrina*!) although Joy (1932:60) had correctly transferred it to the genus *Atheta*, sg. *Acrotona*, where it is now always located. The species is considered rare with us, but in fact occurs at times in large numbers; as at Poole, Dorset (P. Harwood) and Newborough Warren, Anglesey (G. Loxton). Admittedly, however, it is taken by odd specimens as a rule.

(*O. planipennis* Thoms.—Added to our list by the late G. H. Ashe (1955:248) from Nethy Bridge, Inv., and since taken rarely in the same district by the late P. Harwood. This species too, however, is now classed as an *Atheta* (*Acrotona*), but with a further change of name, becoming *A. silvicola* Kr. (nec Fuss.)).

O. filiformis Redtb.—A somewhat rare species of central Europe, recorded as British by Donisthorpe (1934:55) on specimens taken from straw in a deer pen in Windsor Park. I have taken exactly similar ones in the identical spot; but long since came to the conclusion that all must be referred to *O. exoleta*—no material differences being discoverable. The latter species (as distinct from *lurida*) varies considerably in colour and slightly in other respects, and some of these Windsor specimens are unusually dark and so may have given the late Dr. Cameron, who named them, the idea of a different species; others, however, occurring with them are quite typical. The true *filiformis* should be near to, and still smaller than, *haemorrhoa* Man.—if Reitter (1909) is correct.

O. waterhousei Rye.—This species was renamed thus by Rye in 1869, its earlier name *nigrofusca* Wat. being a homonym of *nigrofusca* Steph. (=*longiuscula* auct., *elongatula* Aubé). It is reckoned scarce and little known, and abroad has been equated (tentatively, perhaps) with *O. amoena* Fairm. though never so in this country. The species had long puzzled me as I was unable to distinguish specimens purporting to belong to it in the Power, Sharp, Champion and other collections from what is now agreed as being *exoleta* Er.; yet it is placed in a different group from that species (sg. *Demosoma* Thoms., *Sedomoma* Tott.)—by Fowler next to *amoena* Frm., by Joy next to *recondita* Kr.

Last year, however, I was able to examine the type series in the Waterhouse collection and thus, I believe, to solve the problem. There are five insects standing as *nigrofusca*, in good to excellent condition; they appear to agree in all respects with *exoleta*, including the genitalia of both sexes. The first in the row alone has a label '*nigrofusca* Wat.' and, being in fine condition, is thus to be regarded as the type. The locality is Richmond Park, 1857, that of the others Hammersmith Marshes, Hampstead, and Leith Sands (all 1857). The name *waterhousei* therefore sinks as yet another synonym of *exoleta*.

It is a little hard to guess what species Fowler had before him under the present name, his '*waterhousei*' being only 'vix 2 mm.' beside 2½ mm. for *verecunda* which should be the same species; but when we remember that the latter (i.e. *exoleta*) is slightly more linear in form than its nearest allies in *Podoxya*, and thus more like a *Demosoma*, the position accorded to *waterhousei*—as well as the error concerning *filiformis*—is natural enough.

O. maritima Donis.—Another of the species brought forward by Donisthorpe (1932[a]) as new, based on four examples from shingle at Slapton Ley, S. Devon; a good many more were taken subsequently, and I myself captured one at Hallsands, a few miles further along the coast, in a like situation. This insect seems to me, however (like the same author's *O. salictaria*), specifically inseparable from *O. brachyptera*, of which it constitutes, perhaps, another local or habitat form, peculiar to the above conditions. It is, as a rule, smaller and darker, and may appear more strongly punctured; but, again, there is no real and constant difference—even in the genitalia. *O. brachyptera* is considered by Strand also as a very variable species.

O. collinsi Donis.—Like the last, this belongs to the subgenus *Bessopora* Thoms. and was regarded by its author as nearest to *brachyptera* Steph. (Donisthorpe, 1932[c]); founded on six specimens from moss on a river bank near Oxford (1911) in the collection of the late Jos. Collins of that city, and now in Manchester Museum. Recently I was able to see four of them, and a detailed inspection revealed nothing to distinguish them from the not very uncommon species *ferruginea* Er. (=*misella* Kr.), with which I conclude they are identical. The long and thorough description of *collinsi* seems to fit the above species, and it is strange indeed that it never occurred to Donisthorpe even to compare it with *O. ferruginea*, but only with the obviously different *O. brachyptera*.

O. tarda Sharp.—This is, in my opinion, yet another of the habitat forms of the variable (or perhaps more accurately, polymorphous) *O. brachyptera* Steph., from which it appears to differ only very slightly—to judge from inspection of the type material. Sharp himself (1871:192) admitted that it was 'closely allied' to the last-named, and Fowler (p. 38) felt grave doubts concerning its distinctness, remarking that "it hardly appears to be more than a variety of *O. brachyptera*". The differences—such as they are—are given by both writers, and consist in the rather larger size and longer elytra, rather shorter antennae, and darker body. It is a saltmarsh insect, seemingly recorded only from Dumfries (Sharp) and Cumberland (Britten). Joy (1932) is so careless as to give *tarda* both as a variety of *brachyptera* (p. 31) and as a good species (p. 33)!

Revised Check-List

1 *spectabilis* Maerkel 1844
2 *longipes* Mulsant 1861
3 *vittata* Maerkel 1842
4 *lividipennis* Mannerheim 1831
5 *opaca* (Gravenhorst 1802)
6 *nigricornis* Motschulsky 1860
=*verecunda* Sharp 1871
=*filiformis* sensu Donisthorpe 1934
16 *lurida* Wollaston 1857
=*exoleta* auct. partim
=*perplexa* auct. partim, *nec* Mulsant & Rey

7 *longiuscula* Erichson 1837[3]
=*elongatula* Aubé 1850
8 *procerula* Mannerheim 1831
=*obscura* Kraatz 1856
9 *nigrocincta* Mulsant 1874
10 *tirolensis* Gredl 1863
=*rupicola* Rye 1866
11 *lentula* Erichson 1837
12 *induta* Mulsant 1861
=*pectita* Sharp 1871
13 *umbrata* (Gyllenhal 1810)
14 *sericea* Heer 1838/42
=*nigrina* Waterhouse, G. R. 1859
15 *exoleta* Erichson 1839/40
=*perplexa* Mulsant & Rey 1860
=*waterhousei* Rye 1869
17 *rugulosa* Kraatz 1856
=*mutata* Sharp 1871
18 *recondita* Kraatz 1856
19 *alternans* (Gravenhorst 1802)
20 *islandica* Kraatz 1857
=*edinensis* Sharp 1871
21 *haemorrhoa* Mannerheim 1831
22 *formiceticola* Maerkel 1841
23 *amoena* Fairmaire 1854
24 *soror* Thomson 1855
25 *annularis* Mannerheim 1831
26 *ferruginea* Erichson 1839/40
=*misella* Kraatz 1856
=*collinsi* Donisthorpe 1932
27 *brachyptera* Stephens 1832
=*tarda* Sharp 1871
=*maritima* Donisthorpe 1932
=*salictaria* Donisthorpe 1932

[3]For the nomenclature of this species I follow Tottenham (1949: 440) and certain other authors. Kloet & Hincks adopt *longiuscula* but attribute it to Gravenhorst (1802), as does Fowler; whilst all recent Continental authors use *elongatula* Aubé (1850) for the valid name, as do Beare (1930) and Joy (1932). The reason for rejecting the earlier name is scarcely apparent, and I must leave the question of which is correct to others more versed in the niceties of nomenclature.

Acknowledgments

I am indebted to the following persons for their kind and ready assistance:—Mr. J. W. McHardy, Edinburgh University, for making available to me the types of *O. waterhousei;* Mr. Colin Johnson, Manchester Museum, for the loan of *O. collinsi,* and of *O. 'exoleta'* and *'perplexa'* (*sensu* Joy) *ex coll.* H. Britten; Mr. P. M. Hammond, British Museum (Nat. Hist.), for his unfailing help in various ways; Dr. V. Hansen, Copenhagen, for examples of certain species from Denmark; and to him, Dr. A. Strand, Oslo, and Dr. G. A. Lohse, Hamburg, for their papers, much helpful information, and for examining and reporting on specimens submitted to them.

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63 Blackheath Park, London, S.E.3. 10.xii.69.

Hover-flies in a Glamorgan Garden

By R. M. Payne

From January 1967 to July 1969 we lived in Glamorgan, where we had a comparatively large garden of a quarter of an acre at Dinas Powis, only three miles from the centre of Cardiff. In addition to the normal conventional features of a garden, we enjoyed natural outcrops of Carboniferous Limestone and the crowning glory—to a naturalist—of a sprawling unkempt hedge-bank facing south-east and extending for some thirty yards. This comprised Sycamore, Hawthorn, Hazel and Dogwood, through which scrambled the native *Clematis vitalba*, with an undergrowth mainly of Wild Rose, Bramble, Dog's Mercury, Cow Parsley and Primroses. Daffodils had also been planted extensively at the foot of the bank.

As a life-long collector and dedicated insect-watcher, I derived much pleasure from browsing up and down this hedge on sunny mornings, net and notebook in hand. One of the groups I kept a particular look-out for, here and elsewhere in the garden, was the Hover-flies (Diptera: Syrphidae), and whilst I cannot claim to have taken any outstanding rarities, nevertheless so little entomology from South Wales gets into the journals that the following account may be worth recording.

Incidentally, it intrigued me that in comparison with my former very small Essex garden at Loughton the crane-flies (Tipulidae) were relatively scarce both in numbers and in variety of species in wet Glamorgan, while hover-flies were more numerous there, at least in species, than in hot dry Essex. Perhaps the south-facing hedge and the generally more natural and varied habitat account for the latter phenomenon, whilst the better drained soil and the absence of a pond may have inhibited some damp-loving Tipulids.

Another noticeable fact was the number of Syrphid species which I only saw once or twice during the three summers we spent at Dinas Powis—marked with an asterisk in the list below. This would seem to imply not only that many of the larger hover-flies are wanderers, but also that the length of a local list may depend to a great extent on the period of time embraced.

Despite what I have just written, I think it worth drawing attention to the apparent *absence* of certain species, which in gardens in the London area are so common that they could not possibly be overlooked in three seasons.

The complete list of the 45 species observed is as follows:—

Baccha obscuripennis Mg.
Platychirus scutatus Mg.
P. albimanus F.
P. clypeatus F.
Melanostoma scalare F.
M. mellinum L.
Leucozona lucorum L.
**Scaeva selenitica* Mg.
Syrphus ribesii L.
S. albostriatus Fln.
S. eligans Harris
S. venustus Mg.
S. lunulatus Mg.
S. corollae F.
S. luniger Mg.
S. balteatus Degeer
S. auricollis Mg.
S. cinctellus Zett.
**Chrysotoxum bicinctum* L.
**C. cautum* Harris
Rhingia campestris Mg.
**Ferdinandea cuprea* Scop.
**Brachyopa scutellaris* Desv.
Neoascia podagrica F.
Pipiza austriaca Mg.
**P. ? quadrimaculata* Panzer
P. noctiluca L.
**Pipizella varipes* Mg.
Cheilosia variabilis Panzer
**C. impressa* Loew
C. paganus Mg.
C. albitarsis Mg.
C. proxima Zett.
Volucella pellucens L.
V. bombylans L.
**Sericomyia silentis* Harris
Eristalis pertinax Scop.
E. tenax L.
E. arbustorum L.
Merodon equestris F.
Helophilus pendulus L.
Xylota segnis L.
**Criorhina berberina* F.
Syritta pipiens L.
Eumerus tuberculatus Rond.

Considering that I only collected Syrphids sporadically over three seasons, this list compares favourably with Verrall's classic "Species in Horto Meo," where in twenty years in a plot covering an acre he recorded 47 species.

Platychirus albimanus I found much the commonest species of this genus (as it was in Verrall's garden 60 years ago).

Melanostoma scalare was more plentiful than *M. mellinum*. On 24th May 1969, a dull wet day, I caught all the small Syrphids I could find, and of 17 specimens there were 12 *M. scalare*, equally divided between males and females. The other species were *P. albimanus*, *P. scutatus* and *Neoascia podagrica*.

Sphaerophoria was a genus I never saw at Dinas Powis, though in my two gardens in different parts of Essex the very conspicuous *S. scripta* L. has been one of the most numerous hover-flies.

Scaeva selenitica is in my experience much more rarely seen than *S. pyrastri*, but though I saw it only once, on 28th July 1968, I never saw *pyrastri* at all.

Syrphus ribesii was common in the garden, but I have no positive records of the superficially similar *S. vitripennis*, another usual garden species. It is so alike, however, that it may well have occurred (and so, indeed, may the other species of the trio, *S. torvus*).

Syrphus balteatus was perhaps the most numerous *Syrphus*, my records extending from 14th March to 12th November.

Chrysotoxum cautum, an unmistakeable and very conspicuous insect, was not seen in 1967 or 1968, yet in 1969 I took two females, on 21st and 24th May.

The species of *Brachyopa* are remarkably unlike typical hover-flies, so although I took *B. scutellaris* only on 7th May 1967 I may easily have overlooked it on other occasions.

Pipiza is a puzzling genus, not at all satisfactorily identified from Coe's Key in the R.E.S. *Handbooks* series. On 4th May 1968 I caught a large male (wing-length 8 mm.) which runs down to *quadrimaculata* Panzer both in Verrall and in the more recent continental books. This species is not mentioned by Coe. My specimen has two large yellow spots on tergite 2, and two smaller reddish ones on tergite 4; in this it tallies with Verrall's description. It also has the broad abdomen referred to by Lundbeck. On the other hand, the antennae are not noticeably short compared with *noctiluca*, which both Verrall and Lundbeck regard as diagnostic. The abdominal pubescence is mainly black, but whitish at the margins of segment 4. The wings are clear.

Coe's Key is deficient in synonymy, but Mr Allan Brindle (in litt.) and Mr P. J. Chandler in his excellent paper The Hover-flies of Kent in the *Kent Field Club Transactions*, 1969, both tend to regard records of British "*quadrimaculta*" as proper to *fenestrata* Mg. The Dinas Powis specimen, however, does not agree with Coe's description of *fenetsrata* in that its face is markedly parallel-sided, whereas he depicts the face of male *fenestrata* as distinctly widening below the antennae.

There is no doubt that *Pipiza* is a genus which requires critical attention.

Pipizella varipes occurred to me only once, by sweeping long grass in in the evening of 1st June 1967.

Cheilosia variabilis and *C. albitarsis* were the most frequently taken species of this genus, many of which are superficially alike. *C. variabllis* occurred mainly on leaves in the hedge, and *albitarsis* in Buttercup flowers in May and June.

Volucella pellucens and *V. bombylans* are two very conspicuous flies. but neither was noticed in 1967 or 1968, though both were quite common in 1969.

Eristalis tenax is one of the few British hover-flies known to hibernate, and a female was disturbed from sacks hanging in our garage on 21st January 1967.

Criorhina berberina is a local species I had not previously seen. I took a female in the garden on 25th May 1969, and a male on 7th June, both at rest on leaves at the foot of the hedge.

Eumerus tuberculatus is a fly I have only found in gardens. Mr Chandler (*op. cit.*) confirms this preference. It was plentiful in late May and June, particularly amongst Strawberry plants (though the larvae are known to feed in bulbs).

49 Galton Road, Westcliff-on-Sea, Essex.

It is with the greatest regret that we have to announce the death of Harold Symes, who was the Honorary Secretary to the Governors of the *Record*, on which panel he served actively.

His enlightening articles on breeding lepidoptera will be missed by all readers, and those who knew him personally will miss a good friend.

A suitable obituary notice will be published as soon as possible.

Notes and Observations

HELIOTHIS ARMIGERA HUBN. AT VIRGINIA WATER, SURREY.—On the night of October 10th, 1969, I ran my mercury vapour light in my sister's garden at Virginia Water, but conditions were far from favourable and only some dozen insects appeared on the sheet by 10 p.m. when I started to pack up. I suddenly noticed a moth in one of the folds, and when I had boxed it, I was puzzled as to its identity until I had a view of its underside, when I at once realised it was a perfect specimen of the scarce bordered straw, a female. I am not aware of any other record of this well-known migrant from this part of Surrey. Apparently several others were taken about the same period, denoting probably quite a large immigration.—C. G. M. de WORMS, Three Oaks, Woking. 17.xi.69.

AMATHES C-NIGRUM L.: A MELANIC EXAMPLE AT WOKING.—Among the hundreds of this common moth that visit mercury vapour traps, it is most unusual to find one that deviates at all from the normal pattern. However, on September 4th, 1969, I noticed a dark insect which seemed unfamiliar. On close scrutiny, I had no hesitation in designating it as a true melanic of the setaceous Hebrew character. The forewings were completely suffused with black tint, which almost entirely obscured the pale costal mark which is the chief characteristic of this moth. The hindwings too, were deep grey instead of creamy and the specimen is probably referable to ab. *nigrescens*, a very rare form.—C. G. M. DE WORMS, Three Oaks, Woking. 17.xi.1969.

LAPHYGMA EXIGUA HUBN. AND NYCTEROSEA OBSTIPATA FAB. AT WOKING AND ELSEWHERE.—A small mottled willow appeared in my mercury vapour trap here on October 18th, 1969, and a gem on August 27th. I also took the latter insect at Portland on August 30th and saw it at Swanage on October 11th. Both species have apparently been especially common throughout the south of England during the latter part of the year.—C. G. M. DE WORMS, Three Oaks, Woking. 17.xi.1969.

EUPITHECIA PHOENICEATA RAMBUR IN SOUTH DEVON.—Whilst staying at Budleigh Salterton for the week-end September 6th-7th last, I had half a dozen specimens of *E. phoeniceata* at light, which seems to show that this species is spreading along the South Coast from Cornwall, where it was originally discovered a few years ago.—C. S. H. BLATHWAYT, 27 South Road, Weston-super-Mare. 13.xi.1969.

TRISATELES EMORTUALIS SCHIFF. IN SUSSEX.—It may be of interest to report the capture of a specimen of *T. emortualis* at light near Haywards Heath in Sussex on the 26th July last, as this is rather a long way from its Buckinghamshire habitat.—C. S. H. BLATHWAYT, 27 South Road, Weston-super-Mare. 13.xi.1969.

HELIOTHIS ARMIGERA HUBN. AND HERSE CONVOLVULI L. AT WESTON-SUPER-MARE IN OCTOBER.—I had a specimen of *H. armigera* in my moth trap in my garden at Weston-super-Mare on the 22nd October last, and a specimen of *H. convolvuli* on the 10th October last.—C. S. BLATHWAIT, 27 South Road, Weston-super-Mare. 13.xi.1969.

URESIPHITA POLYGONALIS SCHIFF. IN WEST SOMERSET.—On the night of October 13th 1969 I found a specimen of *Uresiphita polygonalis* Schiff. in my moth trap at Selworthy, near Minehead. From the records it appears that the last occurrence of this migrant in Somerset was in 1895. This latest specimen was in exceptionally fine condition.—H. M. CHAPPEL, The Old Rectory, Selworthy, Minehead, Somerset. 27.xi.1969.

CATACLISTA LEMNATA L. IN SOUTH WESTMORLAND.—Meyrick, in his revised handbook of British Lepidoptera, p. 418, gives the distribution of *C. lemnata* as "Britain to the Clyde, Ireland, common." My little experience of this species does not substantiate this. On 5th September 1969 I visited part of the disused Lancaster to Kendal canal at Stainton, in South Westmorland, to collect some pond specimens for a friend. As I was working along the bank I noticed some small white moths which I disturbed. Not having a suitable net with me I stalked these and eventually managed to box a male *C. lemnata*. A further visit to the same locality a few days later did not produce any further specimens.

I have no records of this species occurring in north Lancashire, Westmorland or Cumberland, and I should welcome a note from anyone who has taken this species in this district.—Dr. NEVILLE L. BIRKETT, Kendal Wood, New Hutton, Kendal. 29.xi.1969.

A LATE PIERID IN WESTMORLAND.—This year butterflies seem to have been more plentiful than usual in this district. In particular there have been large numbers of both broods of *Pieris brassicae* L., *P. rapae* L. and *P. napi* L. Larvae resulting from second brood females have caused considerable damage to cabbages and nasturtium in the garden. I was pleased to find that among many *P. brassicae* larvae pupating on the side of my house, a high proportion was parasitised.

On the afternoon of the 26th October I saw a small white flying across my garden. By the time I got outside the house it had flown into a nearby field, where I was unable to follow it, though I could see it flying across the field and settling from time to time. I could not be sure whether it was *P. napi* or *P. rapae*, though I think the latter. The latest date I can find for *P. rapae* in this district is 11th October 1921 when a specimen was seen at Arnside by the late J. David Ward of Grange over Sands. It should also be noted that my observation was made at just over 600 ft. altitude, where the climate is distinctly less congenial than at sea-level.—Dr. NEVILLE L. BIRKETT, Kendal Wood, New Hutton, near Kendal. 27.xi.1969.

Migrant Lepidoptera.—Here is my list for 1969:—*Laphygma exigua* Hübn, Cardiganshire, 24th May; Leigh, Surrey, 17th September, 6th and 21st October. *Nycterosea obstipata* Fabr. Leigh, Surrey, 16th August, 12th, 16th, 19th, 24th September, 16th, 21st (2), 22nd October; Lanivet, Cornwall, 31st August (5), 2nd September; Monks Wood, Hunts, 11th October (2); Brockham, Surrey, 16th October; Loxwood, Sussex, 19th October. *Leucania albipuncta* Schiff., Leigh, Surrey, 14th September. At no time was *Plusia gamma* L. very common here, though *Nomophila noctuella* Schiff. was constantly present. — R. Fairclough, Blencathra, Deanoak Lane, Leigh, Surrey. 3.xii.1969.

Early Records.—On the 20th October 1969, a male specimen of *Orthosia stabilis* Schiff. appeared at light in Ledbury. The specimen was in excellent condition. With the extremely warm summer weather this year, it is difficult to know whether this is an early emergence or a freak second generation. Curiously, the following night *Poecilocampa populi* L. appeared at light, which is also early for this species in the wild.—M. W. Harper, Cotham, Upperfields, Ledbury, Herefordshire. 12.xi.1969.

Scopula rubiginata Hufn. A Possible Migrant Species.—A specimen of *Scopula rubiginata* Hufn., which was in poor condition, appeared at light on 7th August 1969 in Studland village, Dorset. This is far from the normal breeding station of this species, which is the breckland district of East Anglia. At the exhibition of the British Entomological and Natural History Society this autumn, I was interested to see that Mr. T. W. Harman exhibited a single example of the same species, which he took only two nights later on 9th August 1969 at Sandwich, Kent. Casual specimens have been recorded in past years from Kent, Sussex and South Devon, along the South Coast. I feel that it is possible that all these casual south coast records were migrants from the Continent.—M. W. Harper, Cotham, Upperfields, Ledbury, Herefordshire. 30.xi.1969.

Lycaena dispar batavus L. (Large Copper) in Ireland.—An Explanation.—The female large copper seen recently by your correspondent, J. E. Lyne (*Ent. Rec.*, **81**: 305), was probably one of two specimens which I released in my garden here in August 1969. It is certainly surprising that it should have travelled about 130 miles from the point of release. I have been interested in introductions of this species for some years, but my information through the local "grapevine' gives me no reason to believe that there is a breeding colony of *dispar* anywhere in Ireland at the present time. Neither of the females I released had paired and no males were released.—H. G. Heal, 5 The Green, Dunmurry, Belfast. 4.xii.1969.

Orgyia antiqua L. at Light.—I was prompted by the note from J. A. C. Greenwood (*Ent. Rec.*, **81**: 308) to look at the 1968 index. There on p. 327 (not p. 325 as stated in the index) Baron de Worms asks if others have taken this insect at light. I did so on 17th September this year. It is interesting that this insect, which does not readily come to light, should have been taken recently in three moth traps within a two mile radius.—A. G. M. Batten, Littledale, Cedar Road, Hook Heath, Woking, Surrey. 5.xii.1969.

ONCOMERA FEMORATA FABR. (COL. OEDEMERIDAE) AT IVY BLOOM IN DORSET. —Between 30 and 40 specimens of *Oncomera femorata* Fabr. were observed on ivy bloom at Durlston Head near Swanage on the night of 8th October 1969. The following evening, whilst examining a large amount of ivy bloom on the outskirts of Swanage, not a single specimen was to be seen, which would seem to indicate the species is very local. My experience of this beetle in the past is restricted to two occasions when single specimens were taken. A female specimen was attracted to light at Tintern, Monmouth, on 14th June 1964, and one was found under a stone on the lower slopes of the Great Orme, Llandudno, Caernarvon, in April 1967.—M. J. LEECH, 6 Craig View, Rhos-on-Sea, Colwyn Bay, Denbighshire. 17.xi.1969.

1969 MIGRANTS.—On October 13th 1969, a mercury vapour light trap in my garden at Usk yielded a single specimen of *Uresiphita polygonalis* Hübn. As far as I am aware, this species has not hitherto been recorded from Monmouthshire, and as this county is now included in Wales one wonders whether this might not be a first record for the Principality.

Among other migrants that came to my trap in Usk this year were one *Laphygma exigua* Hübn. on October 3rd and *Nycterosea obstipata* Fab. which occurred singly on several occasions (July 21st and 26th, September 6th and October 27th). A friend, Lieut.-Col. R. B. Humphreys, who ran a trap at Usk on October 21st, took six specimens of the latter species.

Nomophilia noctuella Schiff. and *Udea ferruginalis* Hübn. (*martialis* Guen.) have both been very plentiful at Usk this year but not in the numbers I encountered in Pembrokeshire, where on the night of October 18th-19th at Saundersfoot, out of a total of 175 moths, my mercury vapour light trap produced 17 specimens of *N. noctuella* and 54 of *U. ferruginalis*.—Dr. G. A. NEIL HORTON, Plas Newydd, Usk, Monmouthshire. 13.xi.1969.

Current Literature

Supplement to Vol. 11, Insects of Hawaii, by **Joann M. Tenorio.** This is a supplement to the earlier main volume on Dolichopodidae (Diptera), published in 1964. Several new species in two genera are described, and revised keys to the Hawaiian species of these genera are provided.

The genus *Campsicnemus* is particularly highly developed in Hawaii, while *Eurynogaster* is known only from the Hawaiian group of islands. As the two genera are thought to be closely related, it is surprising that while the genitalia afford good diagnostic characters in *Eurynogaster*, in *Campsicnemus* we are told that genitalic differences are of little use in distinguishing species. In fact in both genera the keys included in this supplement are based largely on male leg characters.

The few illustrations are beautifully clear and well reproduced. —R.M.P

CORRECTION.—*Acrolepia perlepidella* Stainton (Lep.: Plutellidae) (*Ent. Rec.* **81**: 188). In bottom line of footnote; for 1925 read 1955.) —J.M.C.-H.

EXCHANGES AND WANTS

For Sale or Exchange.—Butterflies and Moths. Many species from Africa, Madagascar, India, Formosa, South America and other countries. Also species from Europe and U.S.S.R. Sometimes livestock. List on request by sending International Postal Coupon for 1/-.—*Robert Keiser*, Frederik van Eeden Plein 3, Antwerp 1, Belgium.

For Sale. — Formosan butterflies, beetles, moths, dragonflies, cicadas, praying mantis, wasps and other dried Formosan insect specimens, living cocoons of Saturnidae, etc., prepared for collection, educational programmes, gift packings, premiums and art work in millions of specimens. —*Taiwan Novelty Co.*, P.O. Box 860 Taipei, Formosa (Taiwan).

Wanted.—For temperature experiments in 1970 larvae of *Maniola jurtina.* —Please write in advance to *George Thomson*, 98 George Street, Dunblane, Perthshire.

Wanted to Purchase.—Entomologist's Monthly Magazine. A run of this periodical including the first thirty volumes.—*J. M. Chalmers-Hunt*, 1 Hardcourts Close, West Wickham, Kent.

Wanted.—Parts 1 and 6 of Volume 78, or alternatively the whole volume. State price required to Box No. 116.

Wanted.—Entomologist Volumes 2 and 4; Entomologist's Record, Vol. 41, Parts 7 and 8, 11 and 12. Vol. 45, Parts 3, 5 and 12 or complete volumes if bound. Top Prices offered.—*B. Skinner*, 85 Elder Road, London. S.E. 27.

For Sale.—Chorehorse Portable Generator for M.V. Light. Battery starter reliable. £20 or near offer.—*J. A. C. Greenwood*, The Thatches, Forest Road, Pyrford, Woking, Surrey.

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.

CONTENTS, Vol. 82, Part 1

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION

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

TO OUR CONTRIBUTORS

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THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

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Dispersal of *Pachythelia* Species (Lep. Psychidae)

By The Rt. Rev. Skat Hoffmeyer, D.D., C.D., D.M.

In The Entomologist's Record for December 1969, p. 323-23, Mr E. A. Sadler wonders how *Pachythelia villosella* Ochs. is able to extend its territory, the females being legless and wingless, and not leaving their cases. Mr Sadler mentions, as a possibility, that newly-hatched larvae may become wind-borne.

Indeed they may—if not exactly in the way of young spiders. In his introduction to The Psychids, the late Professor A. Seitz tells that in the pampus of Uruguay, in a terrible storm, he found branches of trees which the wind had carried to a district where there was not any woodland for many miles. On the branches were Psychid cases, and the young larvae at once started feeding.

But there is a still more fascinating possibility, and indeed, experience. In the Danish periodical Flora og Fauna 1954, p. 122-26, my late friend P. L. Joergensen, M.A., published some observations on *villosella's* relative *Pachythelia opacella* H.-S. (on the continent we call the species *Acanthopsyche atra* L.) From the English summary I quote him verbatim:

> "It was observed that the females leave their sacs a few days after pairing. They drop to the ground, where they are easily discovered by birds. Eleven of these fertilized females were fed to a captive robin (*Erithacus rubecula*). Its droppings from the following 24 hours were placed in a special cage. Once in a while they were sprinkled with water, and a fortnight later the first larvae were hatched from the droppings. 30-40 larvae in all were hatched, not a very big number, but enough to show that the species may be dispersed by birds in the way described."

In his Guide to the Smaller British Lepidoptera 1949, p. 40, Mr L. T. Ford says that the fertilized ova of *villosella* are retained in the abdomen, the female not leaving the case, and of *opacella*: "ova are laid in the pupa skin in the larval case". Nor has Mr Sadler seen his *villosella* females leave their cases.

Well, in this country they certainly do, at least sometimes, a few days after pairing. Mr Jorgensen's experience with *opacella* is indisputable, and as for *villosella*, I have seen the females wriggle themselves out of their cases and drop, but I have—I am sorry to say—never had a robin at hand.

It should be noted that the small *opacella* caterpillars immediately started spinning cases from material to be had; there was an old newspaper in the cage, and there were the droppings! Three of the cases were drawn by Mr H. Bülow-Hansen, and published with the Flora og Fauna article, greatly enlarged.

Again, this block was used in the second edition of my book De danske Spindere (i.e. Bombyces etc.—on the Continent, the Psychids are Macrolepidoptera!) p. 231. On p. 233 a copy of a photograph of a *villosella* male after copulation is shown. The abdomen is so much elongated that Mr Sadler may see "just how pairing can take place in such peculiar circumstances".

I think that Mr P. L. Joergensen was the first to prove that insects' eggs can be spread, like plants' seeds, by passing through a bird's stomach. After fifteen years I think it is due time that it was known in the United Kingdom.

Højbjerg, Denmark. 8.i.1970.

Collecting near Mombasa, October 1969

By C. G. M. de Worms, M.A., Ph.D., F.R.E.S.

I paid my third visit to Kenya in late September 1969 after attending the Third Pan-African Ornithological Congress at Pretoriuskop in the Kruger Park with a subsequent week in Cape Town. Mr. D. Sevastopulo had given me a long-standing and most cordial invitation to stay with him at Mombasa and the opportunity presented itself on this occasion. I reached Nairobi on September 27th and found everything very dried up as the long rains had not arrived and it was quite an event to see any butterflies. The same can be said of Nanyuki where I stayed with Mr D. Palmer, but very little was on the wing except the most commonplace Pierids. I left this township which is virtually on the Equator on the afternoon of 3rd October and by fast taxi which only cost 25/- for the 125 miles, I was back in Nairobi in 2½ hours, well in time to catch the night train to the coast which leaves at 6.30 p.m. The 320-mile journey to Mombasa was most comfortable with an excellent meal and sleeping arrangements. We pulled in exactly at 8 a.m. and I was met by Mr Sevastopulo who conducted me to his very well-appointed residence on the outskirts of the town where he told me our venue for the day would be the Sekoke Forest some fifty miles up the coast to the north and just south of Malindi. We reached this very attractive area of thick forest soon after 10 a.m. and my host immediately hung up his seven bait traps at varying distances along a wide path which entered the forest at right angles to the main road. These collapsible traps consisted of cylindrical black netting with a wooden platform base on which was spread a lavish quantity of a very aromatic mixture of fermenting banana and pineapple. I had been warned to expect excessive heat in this region but the atmosphere was cooled by one or two heavy showers which were apparently out of season, though the wet conditions encouraged the emergence of the lepidoptera which soon appeared after our entering the forest. As usual the pierids were much in evidence, in particular the large *Belenois thysa* with yellow male and white female, also *Appias epaphia* with white male and piebald female. We also saw *Colotis ione* with its purple tips to the forewings and the fast-flying *Eronia cleodora* with the delicate little *Leptosia alcesta*, akin to our Wood White. In spite of the rainy conditions the traps were soon patronised, though not in quantity. The first one to attract anything of note provided the first Charaxes which turned out to be a perfect male of the small *Charaxes guderiana*, a very handsome insect, black with purple markings. It was on our second round of the traps that we found that bigger game had patronised them with females of *Charaxes cithaeron*, *C. lasti* and *C. protoclea azota*, a huge insect with orange and white markings. The Satyrids were the other chief visitors, mostly *Mycalesis safitza* and *M. subapicalis*. The only two Papilios seen were males of *P. dardanus* and *P. kirbyi*. There were some most attractive members of the Nymphalidae on the wing, in particular *Eurypheura achlys* looking like a blue fritillary with its black spots on an ultramarine background. Flying with it was *Euryphene chriemilda* with similar black markings on a bright scarlet field. Those brilliant shade-loving species the *Euphaedras* were represented by *E. neophron*, very difficult to follow and catch as it weaved its way among the low bushes. The only *Hypolimnas* we saw was the large black and white *H. deceptor*, but the blues were virtually absent

except for the tiny *Zizula gaika*, while the only skipper was *Achada biseriatus*. However, a most charming little moth that flitted about proved to be *Rhodo-metra sevastopuloi*, like a small edition of our *R. sacraria* which also occurs there. Incidentally we came upon signs of fairly recent activities of an elephant in the region. After an alfresco lunch, partially in the rain, we returned by the same route to Mombasa at 3 p.m.

The morning of the 5th loomed very ominously cloudy when we set out for the well-known Shimba Hills which lie to the south of Mombasa. We were on the road by 8 a.m. and reached our destination less than an hour later. We halted where the main road southwards runs through a short stretch of the Makadara Forest. But soon after our arrival a heavy rain-storm broke which soaked the traps that my host had set up at intervals along the road. However, as soon as the rain ceased, butterflies appeared in plenty, many floating about quite lazily. One of the most prominent was the black and white Danaid *Amauris ochlea* with its larger, but close mimic *Hypolimnas deceptor* and its much bigger relative *Amauris niavius*. *Euphaedra neophrom* was about and we caught sight of *E. orientalis*. *Papilio dardanus* males were well to the fore with its dimorphic female forms. Other papilios seen were *P. leonidas*, black with white spots and the huge black and yellow *P. ophidicephalus*. Among the many Pierids were lots of *Belenois thysa, Appias lasti, Catopsilia florella* and a few *Terias hecabe*. Many *Acraeas* mixed with the big throng in the forest glades. Among the commonest were *Acraea esebria, A. insignis* and *A. oncaea*. The rain had unfortunately damped the bait in the traps which were only rather sparsely patronised mainly by the Satyrids of the genus Mycalesis, but also by a few Charaxes which included a couple of perfect male *C. lasti* and a large female *C. candiope*. We also saw a female of *C. cithaeron* on the wing. Several Neptis were sailing round bushes, chiefly *N. saclava* and *N. alta*, while other attractive Nymphalines included *Catacroptera cloanthe, Lachnoptera ayresii* and *Salamis parhassus* together with *S. cacta* the Mother-of-Pearl species. *Precis clelia* and *P. terea* were also flying. Not many Lycaenids were on the move. One of the most local was *Pentila mombasae*. A very fast flier was *Hemiolaus caeculus*. Very few Hesperid species were to be seen, mostly *Pardaleodes incerts*. In all during our three hour stay in this rich locality we recorded just over fifty species of the local butterflies out of a total of just 220 which Mr Sevastopulo had compiled to date from this region.

We returned to Mombasa in the early afternoon and I caught the night sleeper train to Nairobi which I reached at 8 a.m. on 6th October and flew back to England that night after what made a very profitable and delightful ending to my most enjoyable month on the African Continent.

I have thought of interest to give as complete a list as possible of all the species of butterflies we saw in the two localities as enumerated by my host. In this list SF indicates Sekoke Forest and SH Shimba Hills.

PAPILIONIDAE

Papilio dardanus Brown SF, SH
Papilio nireus L. f. *lyaeus* Doubleday SH
Papilio demodocus Esp. SH
Papilio ophidicephalus Oberthür SH
Papilio leonidas Fab. SH
Papilio kirbyi Hewitson SF
Papilio antheus Cramer SH
Papilio colona Ward SH

PIERIDAE

Appias epaphia Cr. SF, SH
Appias lasti Grose-Smith SH
Anaphaeois creona Cr. SH
Belenois thysa Hopffer SF, SH
Leptosia alcesta Stoll SF, SH
Pinacopteryx lacteipennis Butler SF
Colotis ione Godart SH
Colotis hetaera Gaerstäcker SH
Colotis evippe L. SF
Colotis eris Klug SF
Eronia cleodora Hübner f. *dilatata* Butler SF
Catopsilia florella Fab. SF, SH
Terias brigitta Cramer SF
Terias hecabe L. SH

NYMPHALIDAE

Charaxes protoclea Feisth. f. *azota* Hewitson SF
Charaxes cithaeron Felder f. *kennethi* Poulton SF, SH
Charaxes guderiana Dewitz f. *rabaiensis* Poulton SF
Charaxes candiope Godart SH
Charaxes lasti Grose Smith SF, SH
Euryphura achlys Hopffer SF
Euryphene chriemhilda Staudinger SF
Euphaedra neophron Hopffer SF, SH
Euphaedra orientalis Rothsch. SH
Aterica galene Brown f. *theophane* Hopffer SH
Neptis saclava Boisd. f. *marpessa* Hopffer SH
Neptis alta SH
Neptis kiriakoffi SF, SH
Byblia ilythyria Drury SH
Neptidopsis fulgurata Boisd. f. *platyptera* R. & Jordan SH
Hypolimnas deceptor Trimen SF, SH
Salamis parhassus Drury f. *aethiops* de Beauvais SH
Salamis cacta Fab. f. *amaniensis* Vosseler SH
Catacroptera cloanthe Cramer SH
Precis terea Drury f. *elgiva* Hewitson SH, SF, SH
Precis clelia Cramer SH
Lachnoptera ayresii Trimen SH
Phalanta columbina Cramer SH

ACRAEINAE

Acraea satis Ward SH
Acraea insignis Distant SH
Acreae oncaea Hopffer SH
Acraea eponina Cramer SH
Acraea esebria Hewitson SH

DANAIDAE

Amauris niavius L. f. *dominicanus* Trimen SH
Amauris ochlea Boisd SH

SATRYRIDAE

Gnophodes parmeno Doubleday f. *diversa* Butler SH
Phyocaenura leda Gerstäcker *campina* Aur. f. SF
Mycalesis subapicalis Aur. SF, SH
Mycalesis safitza Westwood SF SH
Ypthima asterope Klug SH

LYCAENIDAE

Pentila mombasae Klug SH
Hemiolaus caeculus Hopffer SH
Anthene lasti S. & K. SH
Axiocerses harpax Fab. SH
Zizeeria lysimon Hübn. SF
Zizula gaika Trimen SF

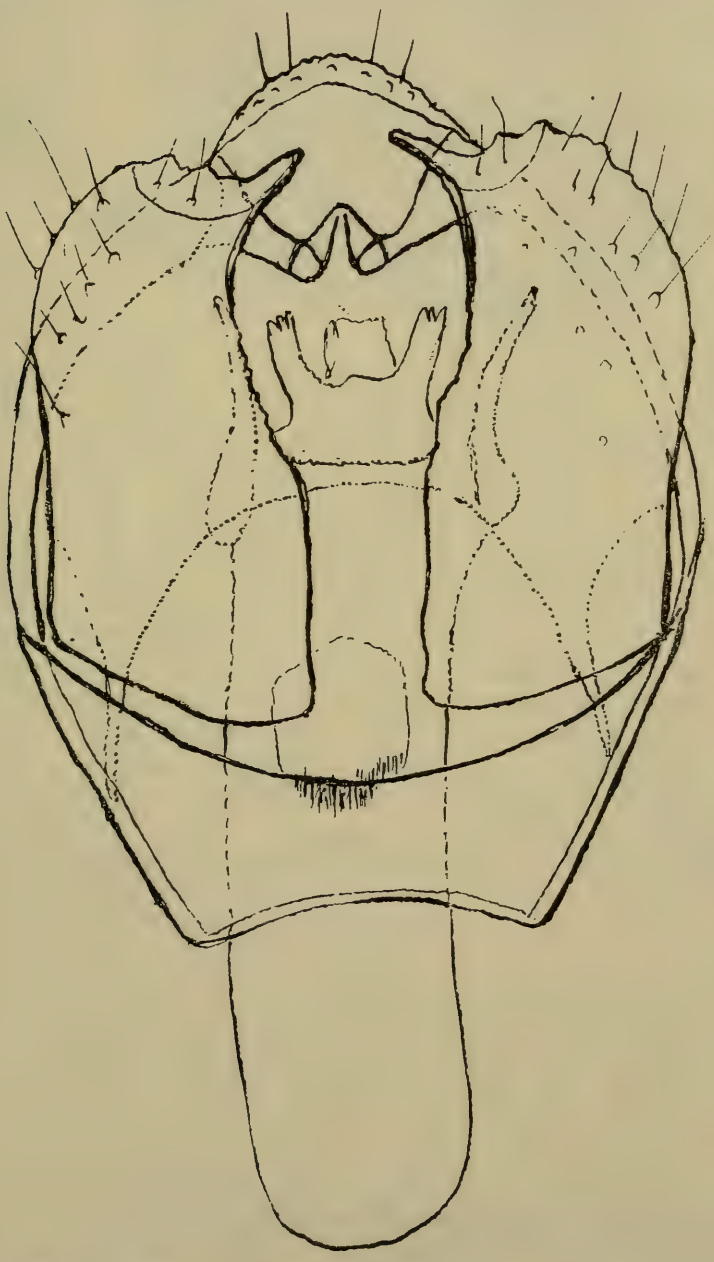
HESPERIDAE

Spialia diomus Hopffer SH
Baoris lugens Hopffer SH
Pardaleodes incerta Sneller SH
Acada biseriatus Mabille SF

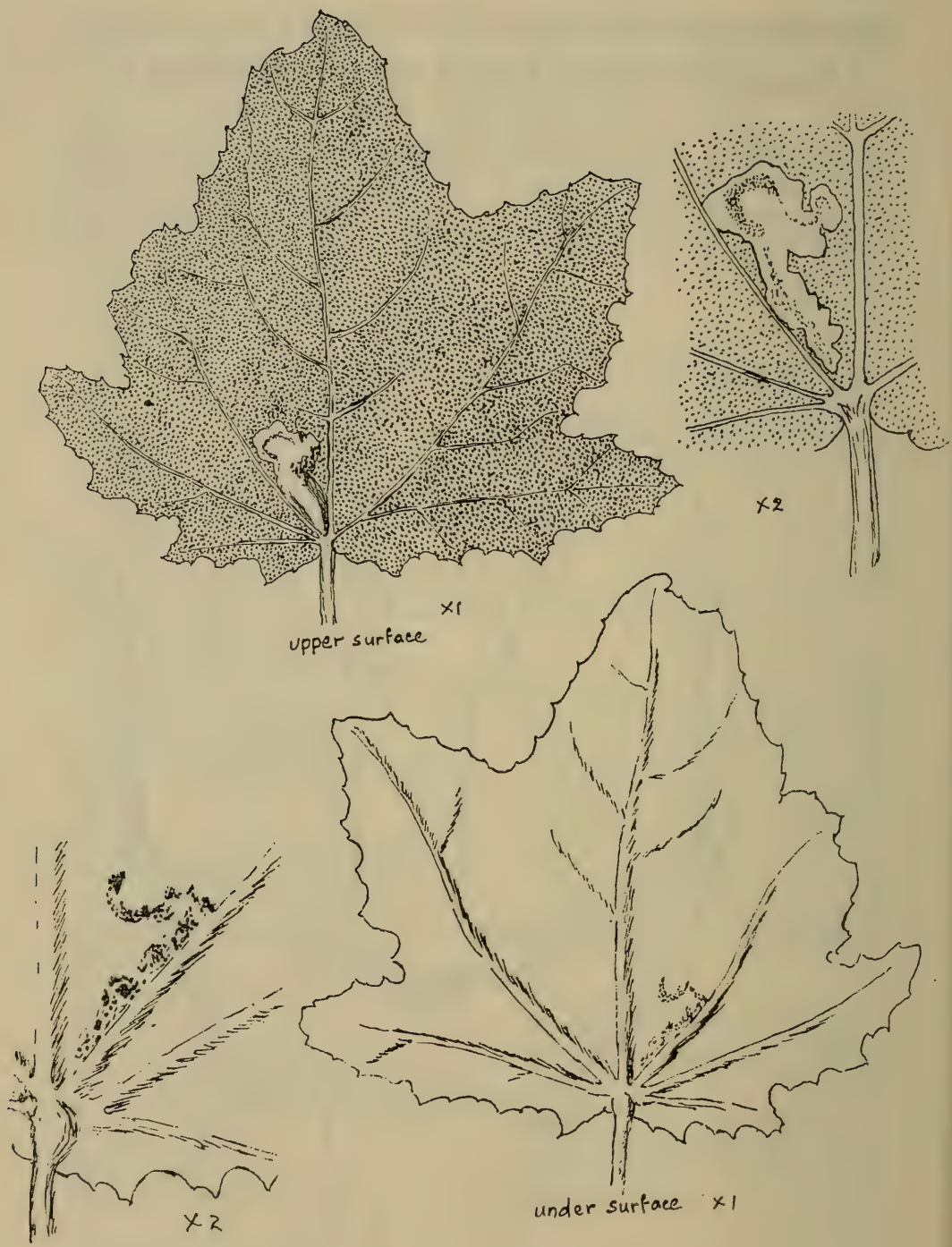
Dechtiria turbidella Herrich-Schaffer (*marionella* Ford) at Wicken Fen (Lep. Nepticulidae)

By Lieut. Col. A. M. Emmet, M.B.E., T.D., M.A.

On the 28th of May 1969, while examining the trunks of some alders growing on Wicken Poors' Fen, I took four specimens of a *Nepticula* species which I could not identify. A further visit on the 2nd of June provided twelve more examples, mostly at rest on the alders, though



Dechtiria
Turbidella ♂



Gypsonoma oppressana Treitschke (early feeding) S.N.A.J. 8.XII.1969
Populus alba: Wicken Fen. X.1963.
A.M.Emmet. leg.

one or two were on some adjacent white poplars. Since Mr. S. N. A. Jacobs was also uncertain of the determination, we posted a male to Dr. Joseph Klimesch in Austria, who, after examination of the genitalia pronounced that the moth was *Dechtiria turbidella* H.-S.

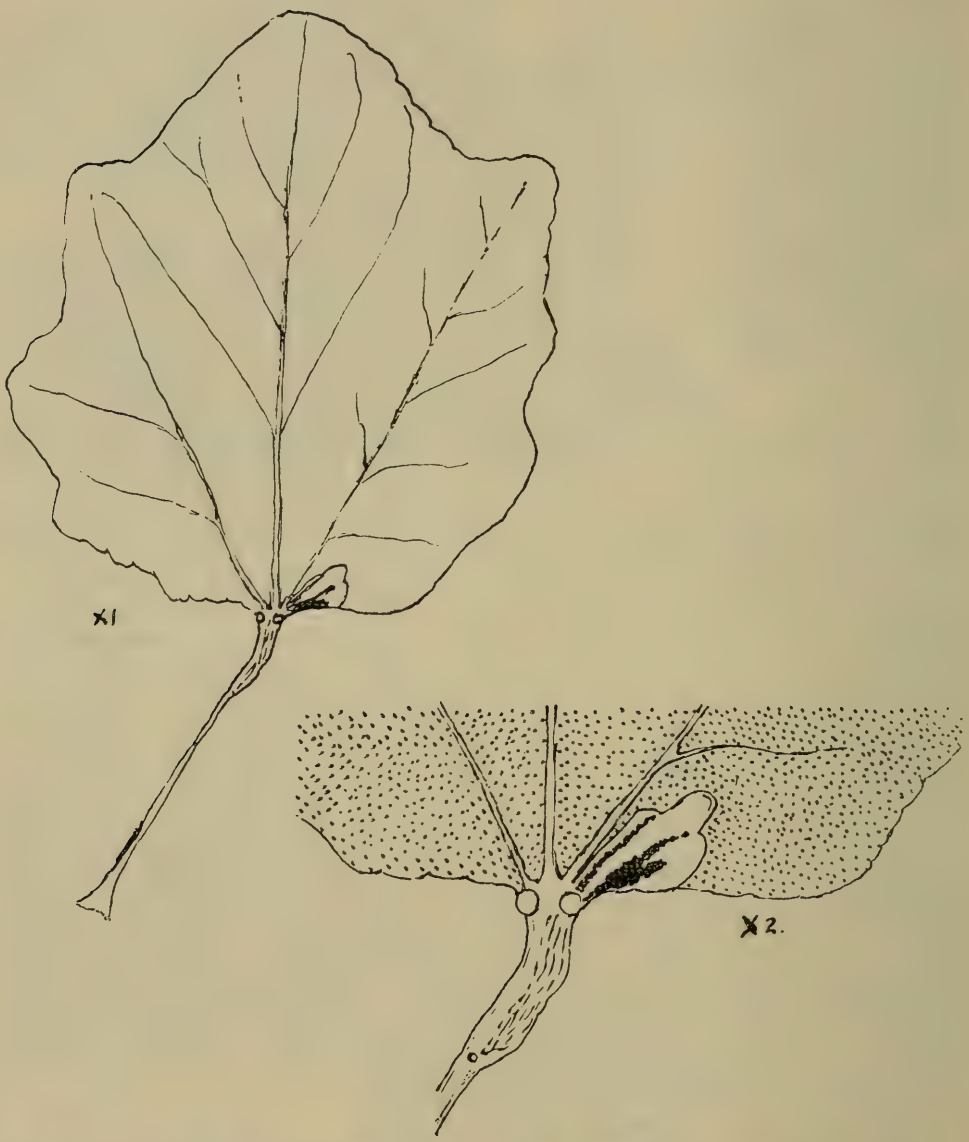
This species was first found in this country by the late L. T. Ford at Stanmore Common, Middlesex, in 1949. Believing it to be new to science, he named it *marionella*. His specimens, like mine, were found resting on the boles of trees, in his case, on mountain ash (Ent. Gaz. **1**: 39). Subsequently the moth was found to be conspecific with the European species *D. turbidella* H.-S. As far as I am aware, Stanmore has hitherto been the only known British locality.

On the continent the larva mines the leaves of white poplar (*Populus alba* L.). There are several well grown examples of this tree on Wicken Poors' Fen, as well as some saplings. I visited the fen in late October to look for the mines. The leaves of the big trees were all out of reach, but I found several workings, one still containing a larva, on the saplings and in fallen leaves. These mines were small blotches near the midrib, and in most instances, near the base of the leaf, rather like those of *D. argyropeza* Zell., a close relative of *turbidella*, an unusual feature being that the frass tended to protrude through the cottony down on the underside of the leaf. Thinking it probable that these were the mines of *turbidella*, I submitted a few to Mr. Jacobs. He suggested checking their identity by reference to the collection of leaf-mines put together by the late Professor Hering, and made available to the British Museum (Natural History) on advantageous terms by his widow, at her husband's wish. The Wicken mines were thereby shown to be the autumn feeding of the larvae of *Gypsonoma oppressella* Treits.; this is of interest, since the English text books refer only to the spring habits of the larvae. Meyrick states that they feed in the leaf buds of black poplar, while Lhomme writes: "Chenille sur *Populus alba* L., *P. nigra* L., *P. italica* Duroi, dans les bourgeons—IV, V." I had already recorded *Gypsonoma minutana* Hübn. from Wicken Poors' Fen by the capture of a single specimen there on the 8th of August last summer; and I hope also to find *oppressana* there in due season. Both, in my experience, are local and rather uncertain moths. A third member of the genus, *G. aceriana* Dup., is common in the same locality. Mr. Jacobs has very kindly made drawings of the mines of both *turbidella* from a leaf in the Hering herbarium and *oppressana* from the Wicken material. I have asked him to use both to illustrate this article.

Let me return now to *Dechtiria turbidella*.

The moths are variable in their wing markings. Basically they are white with the tips of the scales darkened, giving a rough appearance. In the palest specimens this darkening is almost entirely confined to the terminal area, with the merest sprinkling on the disc. In the darker examples there are ill-defined pale spots on the middle of the dorsum, on the costa opposite and on the costa nearer the base. Most specimens are lighter coloured than *argyropeza*, which normally lacks the inner costal spot. The head is a paler yellow than that of *argyropeza*. The fact that most of my moths came from the alders may well be explained by this coloration, which would give excellent camouflage to specimens resting on the black-spotted pale bark of the white polars; on the alders they were relatively conspicuous. If microlepidopterists searched the trunks of trees growing close to white poplars at the end

of May, they might well find that this little moth has a much wider distribution than is at present realised.



Dechtiria turbidella Zeller on Populus alba
Berlin Botanical Garden, M. Hering leg.
A. G. Carolsfeld Krausé det.
S.N.A.J. 13.i.1970

Mr. Jacob's drawing clearly shows the unusual features of the mine. The egg is laid on the petiole. The young larva mines the leaf stalk causing a gall-like swelling to develop. The final phase consists of a very small blotch at the base of the leaf. Apparently the larva retires from the blotch into the chamber in the petiole if it is alarmed or threatened by a predator; this is why the frass is deposited at the sides of the blotch leaving a clear runway in the centre. The method of feeding is

very similar to that of *Dechtiria argyropeza* Zell. on aspen, but the peculiar characters are more pronounced, i.e., the chamber in the petiole is relatively larger ,and the blotch in the leaf smaller.

The figure of the male genitalia of *D. turbidella* was drawn by Dr. Joseph Klimesch from the specimen I sent to him for determination; I am most grateful to him for the drawing and for permission to reproduce it.

Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 7.xii.69.

Inverness-shire in 1969

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

The welcome signs of improvement in the numbers of Scottish Lepidoptera flying in 1968 as indicated by my 1968 m.v. light-trap figures are also evident in my 1969 trap total of 4244 moths, in spite of this total being disappointingly lower by over 1000. I think however that one factor is mainly responsible this time; the Summer of 1969, although pleasant and dry was abnormally windy night and day with an unusually high proportion of cold Easterlies. The effect was to reduce the numbers caught by the m.v. trap, especially of Geometrids. On only one night in the whole year did the catch exceed 100 moths! The contrast of these meagre figures with those of my friend Dr. J. L. Campbell of Canna (*Ent. Rec.*, **81**: 12—) is amazing! Several Badenoch species which had been scarce or apparently absent for several years appeared again, so the only safe conclusion to reach would seem to be wary of trusting statistics!

The winter 1968-9 was again a very open one in Badenoch, with small snowfalls. A mild spell in mid-January caused the usual early emergence of *Phigalia pedaria* Fab. on my local wooden electricity posts, and the last specimen of this species I took at Aviemore was a superb rural melanic male on 4th April. This late date and also of other spring species usually appearing in March was caused by an abnormally prolonged spell of severe frosts and East winds throughout all February and the first three weeks of March.

Early April also had a few sunny days sufficient to tempt into flight an occasional *Aglais urticae* L. and *Brephos parthenias* L. while considerable numbers of *Achlyia flavicornis* L. and *Brachionycha nubeculosa* Esp. were secured by visiting friends from the South. Late in the month it was also a great pleasure to record a considerable increase in the numbers of *Endromis versicolora* L. on Granish moor showing that it continues to hold its own there. Hazel catkins were abundant, but very late, as also was Sallow blossom, which did not appear until the last few days of the month, the latest I have ever known it. On 18th April, whilst changing a book at the county library in Inverness the Director of the library presented me with a living specimen of a most beautiful metallic green and golden Coleopteron which was kindly determined for me by Mr E. C. Pelham-Clinton of the Royal Scottish Natural History Museum in Edinburgh as *Buprestis aureolata* L., an imported North American timber boring species. Mr Pelham-Clinton tells me that *B. aureolata* has an

extraordinarily long life cycle exceeding twenty years, and since this period approximates to the age of Mr Anderson's (the librarian's) house, and since the latter told me he found it walking over his bed the inference is strong that the insect came from his imported roof timbers! I have presented it to the Museum in Edinburgh.

May began with a very cold week of East winds and frosts, but an improvement set in on 12th with *Odontosia carmelita* Esp. in my m.v. trap, and the other usual Spring species following rather tardily, the Daffodils in full bloom, and the birches beginning to show green at last. The first butterflies also were appearing, *Thecla rubi* L. on 21st, *Pieris napi* L. the next day, and *Anthocaris cardamines* L. on 27th.

The first week of June was similar to that of May, afflicted with cold North-Easterly winds and night frosts. The ground vegetation on my favourite "butterfly" hillside was very backward, plants such as wood-sage and dog's mercury being only two or three inches high, while bracken and other ferns showed no signs of fronds above ground. However, on the sunny afternoon of 4th I saw the first *Brenthis euphrosyne* L. and *Pseudopanthera macularia* L. on this ground. Our now usual June summer spell of glorious sunshine began the next week, when these and other species reached their peak, being more abundant than for some years including *Erynnis tages* L. and it was a particular pleasure to see the return of a few Spring brood *Lycaena phlaeas* L., and to watch the numerous *P. napi* L. and *A. cardamines* L. females ovipositing in several marshes in the Spey valley. The weather deteriorated to normal stormy cold type on 20th but not before another welcome improvement was noted in the occurrence of a few *Lasiocampa quercus callunae* L. after an apparent absence for several years. Its greatest predator, the Black-headed Gull, has recently declined simultaneously on our moorlands, and I hope this will continue.

In July the prevalence of cool South-Easterly winds together with showers continued to cause small m.v. trap catches. On 3rd I was joined by my son Dr. M. W. Harper, and we spent a pleasant but entomologically unprofitable few days in western Argyll. Our chief objective was to sample the Scottish Zygaenids, in which we were totally unsuccessful, not seeing a single Burnet of any species! On 7th we found a small very fresh colony of the bright and large Scottish form of *Pararge aegeria* L., and *Satyrus semele* L., *Maniola jurtina* L., *Coenonympha pamphilus* L., and *Argynnis aglaia* L. were also on the wing though moths were scarce. Larvae were plentiful but very heavily parasitized, especially *Orthosia gracilis* Schf. on *Myrica gale* and *Eupithecia venosata* Fab. on *Silene maritima*, together with *Hadena conspersa* Schf. and, most surprisingly, *Hadena caesia* Schf. I do not know of any record of this species this century from the United Kingdom mainland, put I am aware of the 1899 record from Cumberland quoted by South, vol. I. Whilst returning to Badenoch on 9th, we found a most unusual rock plant in full blossom of a carmine colour. It was growing all over the sides of an old "General Wade" bridge on one of his famous military roads near Foyers in Inverness-shire, making a most beautiful sight in its obviously very suitable habitat. This plant was later most kindly determined for us at Birmingham University by Mr F. A. Noble as a member of the Scrophulariaceae, *Erinus alpinus*, best known perhaps on Hadrian's Wall!

Back in Badenoch, on 12th, I saw a family of Redwings in my garden, two adults feeding two chicks. Local Ornithologists informed me that this record was the first breeding one in Scotland for 1969. The month continued fairly warm but cloudy and windy, with the usual Summer moths appearing in good numbers, including *Apamea assimilis* Dbld. on 15th, while on 24th near Inverness I found a fine colony new to me so far North and West as this of *Itame brunneata* Thun. both sexes being slightly worn. Nearby in an Oak wood, *Alcis jubata* Thun. were emerging on tree trunks. The last week of the month saw large emergences of *Erebia aethiops* Esp. in several colonies, but Lycaenids were rather scarce. Many species of both Butterflies and Moths, as well as plants, were noticeably smaller than usual, and I think this was caused by the very dry and windy year; the recorded annual rainfall at Kingussie for 1969 being only 25 inches compared with an average of over 30 inches over the previous five years.

August produced a mixed bag of weather, little sunshine, a number of thunder-storms, and ground frost on 24th! Ever present seemed the chilly Northerly to Easterly winds. The first immigrant, a worn *Nomophila noctuella* Schf. came to my m.v. trap on 2nd, and a *Plusia gamma* L. on 27th, while on 30th a fair number of badly worn *Pieris brassicae* L. and *P. rapae* L., the latter usually rare here, appeared. I feel sure that these were immigrants from the South of the double-brooded races, not noted by me in earlier years; our normal annual Pierid immigrants are single-brooded (proved by breeding) which are to be seen arriving from the Moray Firth in late June and July.

Early September saw two species appear in considerable numbers. *Amathes agathina* Dup. became almost the commonest species at m.v. light. Mr Noble on a visit from the Midlands was most successful in finding cocoons of *Orgyia antiqua* L. on fence posts in a variety of localities embracing Foyers and Loch Ness-side, the lower Spey and Findhorn valleys. He was also most successful in assembling males to his bred females in all these localities; but when together and separately we tried to assemble in my Badenoch area we both failed to find the species. It must have had a very good season this year, but remains still to be added to my local list! The equinoctial gales arrived in great force, 100 knots, and duration of more than a week, ended the month with frosts and snow.

After the severe ending of September, October produced some very lovely Autumn weather, though denudation of the tree leaves by the gales rather spoilt the colours. A good crop of immigrants also appeared; a South-bound *Vanessa atalanta* L. on 6th in the village street, on 10th two more *N. noctuella* Schf. and *Agrotis ipsilon* Hufn. and a few *P. gamma* L. and a single *Pyrausta martialis* Guen. all in the m.v. trap on 14th and 20th. The best and most pleasing surprise however was a large brown Noctuid in one of the egg cartons of my m.v. trap on 18th. I thought at first that this was an aberrant *Agrochola circellaris* Hufn., but as I tipped it into a box a splendid flash of black and white revealed its true nature, a nice *Heliothis armigera* Hb. The same day in warm sunshine large numbers of *P. gamma* L. were flying in my garden, and I feel sure they all arrived the same night in a mass migration; they all had disappeared the next day.

By the 4th November on my return from London I was greeted by snow and ice, and the season ended virtually on that date with an early onset of winter. A pleasant but not very exciting year in the Scottish Highlands. Neadaich, Newtonmore, Inverness-shire. 12.i.70.

A Month in Malaysia in the footsteps of Corbett and Pendlebury

FEBRUARY — MARCH, 1968

By A. G. M. BATTEN, F.R.E.S., and Mrs. A. M. BATTEN

(concluded from p. 12)

We talked to the Chinese about *T. brookiana* since the female, of which the Tea House and local shops had many, is very much less frequently seen than the male. Indeed, we ourselves only saw one during our month's visit. The Chinese told us that in order to obtain them they had to climb very high trees and took them, with nets, from certain climbing plants, probably the climbing species of *Aristolochiaceae* mentioned by Corbet.

We had heard anxiety expressed at a recent meeting of the British Entomological & Natural History Society as to the effect of this commercialism as practised in Formosa where butterflies are caught and mounted in quantity in various ways.

We have come to the conclusion that this commercialism, at any rate in Malaysia, can have little effect. It is true that many insects are caught —birds and other predators would have many of them in any case—but the areas in which they live and breed are so vast—literally thousands of square miles with none other than a few aboriginal inhabitants and often no roads, only jungle tracks—that the vast majority of insects are not only not seen by man but are so remote from any civilisation that this commercialism on a very restricted area is unlikely to make any material difference.

Nowhere else in Malaysia did we come across this commercial collecting except, of course, by small boys notably at Fraser's Hill.

Returning for one moment to *T. brookiana*, Corbet says (The Butterflies of the Malay Peninsular, Second Edition, 1956) that 'the life history of this remarkable butterfly is still unknown'. As one reads the book one is surprised that this lack of knowledge of life histories is a recurring theme applied to many well known species. Nevertheless, when one visits the area and sees the vastness and often remoteness of much of it one can understand more clearly the reasons for this state of affairs. Incidentally, in the whole of the four weeks we ourselves did not come across anything likely to add significantly to what is known about life histories.

On the 21st we went by car to Penang where, from reports received, we had hoped to do well. Unfortunately there had been, most exceptionally, a three months' complete drought. Most unusually, the grass was completely brown and bush fires had caused havoc in what is generally regarded as an island of perpetual green. We saw very few butterflies in country which is normally noted for them.

We were unable to run the moth trap at the seashore hotel at Penang at which we stayed. However, we met the Penang water engineer at dinner one evening and, with no thought of entomology, he took us to the main

reservoir at 500 feet above the City. As it generates its own electricity the Water Authority had plenty to spare and had installed fluorescent lights in glass panels along the front of the reservoir overlooking the City. We had no chance to collect but we saw many species on these panels including three sphingids we had not seen elsewhere.

On the 27th we returned again to Kuala Lumpur prior to our journey home. We were able to have one more morning seeking butterflies at the 13th mile post on the Bentong Road. At this point there is a Youth Hostel which seemed complete but for the roof which had completely disappeared since last we had seen it a year before—probably since stolen and probably now roofing animals on some farm. Beyond the hostel building there is is a path into the jungle leading to what we took to be a watercress farm with a wonderful, if elementary, irrigation system. Two streams, one either side of the path, lead down from this farm. We saw many species here and took, among others, several Straight-Line Mapwings (*Cyrestis nivea nivalis*, C. & R. Felder). We also took for the first time the Straight Pierrot (*Castalius roxus pothus*, Fruhstorfer). The farm mentioned used a dreadful smelling fertiliser—probably prawn dust, much favoured in Malaysian farms—and this attracted large numbers of the Chocolate and Orange Albatrosses (*Appias nero figulina*, Butler and *A. lyncida vasava*, Fruhstorfer), respectively, as well as many *Euploea*. Our final capture was one more *brookiana* taken by the 'mem' to complete our self-imposed limit of six perfect specimens.

The reader will probably be surprised at the almost omission of members of the *Hesperiidae* from these notes, especially since there are more than 200 species to be found in the Malay Peninsular. We had expected to see and to obtain many. In fact, although we were on the look out for them we saw very few indeed. The majority of those we did see were so fast as to elude us in the jungle. The Lycaenidae we have found it difficult to identify sufficiently accurately to include them. We did, however, take some fifteen species.

On the 29th March at 10.35 p.m. we left Kuala Lumpur by B.O.A.C. Boeing 707 for home. After a journey of 22 hours from door to door we arrived home with some 600 specimens to set and identify.

This Malaysian visit was of outstanding interest in every way and included a fair measure of excitement. The country certainly offers a great deal to the entomologist and we, for our part, are rather sad that we seem unlikely to be able to go there again.

We have included the common English names because they are so well known to so many people in Malaysia and their use may well add to their understanding and enjoyment of these notes. In any case, Corbet uses them so we felt that we might do so too.

Since our return we have been in touch with the British Museum over some of the insects we were unable to identify. To our delight we found that the Museum has, intact, the original collection made by Corbet and Pendlebury on the basis of which their book was written. We were very interested to find how many of the butterflies recorded by these writers we, too, had seen. We have arranged our list, which follows, on the same lines as those adopted in this valuable book.

Among the butterflies taken were:—

PAPILIONIDAE

Raja Brooke's Birdwing *Trogonoptera brookiana albescens* Rothschild
The Common Birdwing *Troides helena cerberus* C. & R. Felder
The Malayan Batwing *Atrophaneura nox erebus* Wallace
The Common Clubtail *Atrophaneura coon Doubleday* Wallace
The Common Rose *Atrophaneura aristolochiae* Rothschild
The Common Mime *Chilasa clytia clytia* Linnaeus
The Great Blue Mime *Chilasa paradoxa aenigma* Wallace
The Lime Butterfly *Papilia demoleus malayanus* Wallace
The Banded Swallowtail *Papilio demolion demolion* Cramer
The Black and White Helen *Papilio nephelus sunatus* Corbet
The Red Helen *Papilio helenus helenus* Linnaeus
The Common Mormon *Papilio polytes romulus* Cramer
The Great Mormon *Papilio memnon agenor* Linnaeus
The Firebar Swordtail *Graphium antiphates itamputi* Butler
Grapium agetes iponus Fruhstorfer
The Common Bluebottle *Graphium sarpedon luctatius* Fruhstorfer
The Common Jay *Graphium doson evemonides* Honrath
The Tailed Jay *Graphium agamemnon agamemnon* Linnaeus
The Malayan Zebra *Graphium delessertii delessertii* Guérin-Menéville
Pendlebury's Zebra *Graphium ramaceus pendleburyi* Corbet
The Green Dragontail *Lamproptera meges virescens* Butler

PIERIDAE

The Psyche *Leptosia nina malayana* Fruhstorfer
The Painted Jezebel *Delias hyparete metarete* Butler
The Malayan Jezebel *Delias ninus ninus* Wallace
The Redspot Sawtooth *Prioneris philonome themana* Fruhstorfer
The Forest White *Phrissura aegis cynis* Hewitson
The Chocolate Albatross *Appias lyncida vasava* Fruhstorfer
The Orange Albatross *Appias nero figulina* Butler
The Plain Puffin *Appias indra plana* Butler
The Malayan Albatross *Saletara liberia distanti* Butler
The Great Orange Tip *Hebomoia glaucippe aturia* Fruhstorfer
The Wanderer *Valeria valeria lutescens* Butler
Dercas verhuelli herodorus Fruhstorfer
The Lemon Emigrant *Catopsilia pomona pomona* Fabricius
The Common Grass Yellow *Eurema hecabe contubernalis* Moore
The Tree Yellow *Gandaca harina distanti* Moore

DANAIDAE

The Plain Tiger *Danaus chrysippius alcippoides* Moore
The Common Tiger *Danaus genutia intermedia* Moore
The Yellow Glossy Tiger *Danaus aspasia aspasia* Fabricius
The Chocolate Tiger *Danaus melaneus sinopion* Fruhstorfer
The Malayan Crow *Euploea redtenbacheri malayica* Butler
The Spotted Black Crow *Euploea crameri bremeri* C. & R. Felder
The Striped Black Crow *Euploea eyndhovii gardineri* Fruhstorfer
The Striped Blue Crow *Euploea mulciber mulciber* Cramer
The Blue Spotted Crow *Euploea midamus chloe* Guérin-Menéville
The Blue Branded King Crow *Euploea leucostictos leucogonis* Butler
The Magpie Crow *Euploea diocletianus diocletianus* Fabricius

SATYRIDAE

The Common Three Ring *Ypthima pandocus corticaria* Butler
The Malayan Owl *Neorina lowii neophyta* Fruhstorfer
The Nigger *Orsotriaena medus cinerea* Butler
The Common Evening Brown *Melanitis leda leda* Linnaeus
The Common Palmfly *Elymnias hypermnesta beatrice* Fruhstorfer

AMATHUSIIDAE

Faunis gracilis Butler
Melanocyma faunula faunula Westwood
Xanthotaenia busiris busiris Westwood
The Palm King *Amathusia phidippus chersias* Fruhstorfer
The Faded Palm King *Amathusia gunneryi* Corbet & Pendlebury
The Saturn *Zeuxidia amethystus amethystus* Butler
The Dark Jungle Glory *Thaumantis noureddin noureddin* Westwood
Thaumantis odana Godart

NYMPHALIDAE

The Angled Castor *Ariadne ariadne ariadne* Linnaeus
The Rustic *Cupha erymanthis lotis* Sulzer
The Small Leopard *Phalanta alcippe alcesta* Corbet
The Vagrant *Vagrans egista macromalayana* Fruhstorfer
The Cruiser *Vindula arsinoe erotella* Butler
The Malay Yeoman *Cirrochroa emalea emalea* Guérin-Menéville
The Malay Lacewing *Cethosia hypsea hypsina* C. & R. Felder
The Chocolate Soldier *Precis iphita horsfieldi* Moore
The Peacock Pansy *Precis almana javana* C. Felder
The Autumn Leaf *Doleschallia bisaltide pratipa* C. & R. Felder
The Indian Leaf *Kallima paralekta amplirufa* Fruhstorfer
The Straight Lime Map-wing *Cyrestis nivea nivalis* C. & R. Felder
The Common Lascar *Neptis hordonia hordonia* Stoll
The Common Sailor *Neptis hylas mamaja* Butler
The Burmese Lascar *Neptis heliodore dorelia* Butler
The Common Sergeant *Parathyma perius perius* Linnaeus
The Commander *Moduza procris milonia* Fruhstorfer
The Clipper *Parthenos sylvia lilacinus* Butler
The Malay Viscount *Tanaecia pelea pelea* Fabricius
Horsfield's Baron *Euthalis iapsis puseda* Moore
The Malay Baron *Euthalia monina monina* Fabricius
The Common Nawab *Polyura athamas samatha* Moore
Polyura hebe chersonesus Fruhstorfer
The Tawny Rajah *Charaxes polyxena crepax* Fruhstorfer
The Royal Assyrian *Terinos terpander robertsia* Butler
Terinos clarisso Fruhstorfer

Among the moths we took were:—
Lymantria mathura (taken by the British Museum)
Xylentes strix Linnaeus
Oxyanbulyx pryeri Dist
Gangarides rosea Walker
Stauropus viridescens Walker
Psilogramma menephron Cramer
Amblychia sp. (taken by the British Museum)

Pareumelia hortensiata Guenee (taken by the British Museum)
Erebus ephesperis Hübner
Ommatophora luminosa Cramer
Anomis commoda Butler
Daphnusa ocellaris Walker
Sitvia denudata Walker
Odontodes pallidifimbia Warren
Gadirtha inexacta Walker
Oxyodes scrobiculata Fabricus
Lagoptera inversa Walker
Khadira aurantia Moore
Hulodes caranea Cramer
Asota caricae Fabricius
Atlas attacus Linnaeus
Agarista endoleuca Guérin-Menéville

Queries about "Collecting in Spain, 1969"

Dr. R. G. Ainley

Lieut.Col. W. B. L. Manley (1969, *Ent. Rec.*, **81**: 334) has, I am glad to say, questioned some dubious points in my account of collecting in Spain in May and June 1969, published in the October issue of *The Record.*

Firstly, *Euchloe tagis* Hbn. Mr H. G. Allcard and I concluded that the specimens I had obtained were *tagis* after comparing them with *tagis* and *ausonia* in Mr Allcard's magnificent collection, and cross-checking with the illustrations in Seitz. Since my account appeared in *The Record*, Mr Allcard has shown one of the specimens to Lieut-Col. Manley, and I gather these gentlemen now consider that the species is, in fact, *ausonia* Hbn. This certainly makes more sense in view of the known flight-times and distribution of the two species in Spain, and I am glad that the record has now been corrected.

As regards *Colias hyale* L., I plead guilty to gross negligence. I am unable to distinguish reliably between the imagines of *hyale* and *australis* Vty. even with the aid of lists of the differences which have been published from time to time. (I believe I am not unique in this respect). It was inexcusable of me not to make this clear, and I apologise if I have misled anyone by not doing so. *C. australis* Vty. they must have been. (I wish I had seen them as larvae!)

In reply to Lieut-Col. Manley's last point I can only say "I know; is it important?" I am sure the compiler of the A.E.S. "Label List of Butterflies" (1966) knew it as well.

"Earlsway", 98 Birkenhead Road, Hoylake, Wirral, Cheshire.

Late Appearance of Vanessa atalanta L.:—On November 22nd, a particularly warm sunny day, I was pheasant shooting at Eilestoke on the northern side of Salisbury Plain. On three occasions, and in widely separated places, I saw a red admiral flying strongly over rough ground. I had a good view of each of the butterflies which seemed very fresh, so much so that I am inclined to think they must have been part of a very late emergence.—Major General C. G. Lipscomb, Crockerton House, Warminster, Wilts. 21.xii.1969.

Publications by C. G. C. Dickson in *The Entomologist's Record*

As heretofore the serial numbers of Mr Dickson's papers have been omitted from the titles, we give below a list of the articles on South African butterflies already published.

1. A new subspecies of *Pseudonympha trimenii* Butler (Lep. Satyridae) from the Eastern Cape Province. (**78**: 85-87 (Apr., 1966).)
2. A new species of *Poecilmitis* Butler (Lepidoptera: Lycaenidae) from the Great Karroo. (**78**: 109-110 (May, 1966).)
3. A Cape Coastal *Poecilmitis* Butler (Lepidoptera: Lycaenidae) previously unknown. (**78**: 81-82 (July-August, 1966).)
4. A new species of *Lepidochrysops* Hedicke (Lepidoptera: Lycaenidae) from the Western Cape Province. (**78**: 189-192 (Sept. 1966).)
5. Revisional notes on the Cape Lycaenid *Poecilmitis brooksi* Riley, with the description of a recently-recognised race of this species. (**78**: 217-219 (Oct., 1966).)
6. A recently-discovered *Poecilmitis* Butler (Lepidoptera: Lycaenidae) from the Western Cape. (**78**: 241-243 (Nov., 1966).)
7. *A new subspecies of *Pseudonympha trimenii* Butler (Lepidoptera: Satyridae) from the Great Karroo. (**78**: 273-275 (Dec. 1966).)
8. A new subspecies of the Cape Lycaenid *Poecilmitis felthami* (Trimen). (**79**: 65-66 (Mar. 1967).)

9.-10. Two new subspecies of *Pseudonympha southeyi* (Pennington) (Lepidoptera: Satyridae) from the Western Cape Province. (**79**: 93-96 (Apr., 1967).)

11. Observations on the Cape Lycaenid *Phasis malagrida* (Wallengren), with the description of a new race. (**79**: 123-125 (May, 1967).)
12. Notes on the Cape Satyrid butterfly *Torynesis mintha* (Geyer) with a description of a new race. (**79**: 160-162 (June 1967).).
13. Some observations on *Poecilmitis turneri* Riley (Lepidoptera: Lycaenidae), with a description of a new race. (**79**: 209-211 (Sept. 1967).)
14. Some comments on the *Phasis wallengrenii* (Trimen) group (Lepidoptera: Lycaenidae), with a description of a new species. (**79**: 267-270 (Nov. 1967).)
15. A further new species of the *Phasis wallengrenii* (Trimen) complex (Lepidoptera: Lycaenidae) (**80**: 89-92 (Apr. 1968).)
16. Some observations on the *Phasis thero* (L.) group (Lepidoptera: Lycaenidae) with a description of a new species. (**80**: 267-270). (Nov., 1968).)
17. A new species of *Lepidochrysops* Hedicke (Lepidoptera: Lycaenidae) from the North Western Cape. (**81**: 97-100 (Apr., 1969).)
18. A new species of *Tarsocera* Butler (Lepidoptera: Satyridae) from the Cape Province. (**81**: 153-155 (June 1969).)

3a-5a. Descriptions of the Neallotypes of two Cape *Poecilmitis* Butler (Lepidoptera: Lycaenidae). (**81**: 185-187 (July-Aug. 1969).)

19. An additional new member of the *Phasis wallengrenii* (Trimen) group (Lepidoptera: Lycaenidae). (**81**: 285-286 (Nov. 1969).)
20. On the status of *Phasis sardonyx* ab. *peringueyi* Aurivillius (Lepidoptera: Lycaenidae), and the selection of a Neallotype female. (**81**: 313-314).)

*This is the correct title: there was a slip in the original text.

Dancing over Water by Male Craneflies, *Nephrotoma flavipalpis* Mg. (Dipt.: Tipulidae)

By Alan E. Stubbs

The term "dancing" is perhaps inapt, but the behaviour of the craneflies in question is difficult to define in one word. Male craneflies may frequently be found swarming in groups and their bobbing up and down and weaving or circling flight may be described as dancing, and this behaviour can be shown by solitary males. Another form of action I have observed with craneflies has been with the female of *N. crocata* L. which was performing a bouncing up and down flight whilst dipping its abdomen vertically at loose bare sand on a path, presumably ovipositing. The male *N. flavipalpis* were superficially behaving rather, like the female *N. crocata*, but bouncing up and down in hovering flight so that they repeatedly touched the surface of a stream. This behaviour seems so unlikely and difficult to explain, that the episode is placed on record.

It was an evening trip to Snelsmore Common, near Newbury, Berkshire, on 30th July 1969 that produced a most interesting series of observations in a small wooded ravine, starting with finding a number of *Tipula yerburyi* Edw., which is a very uncommon fly, and finishing with a young fox running about over bare ground and coming to within 15 ft. from where I was standing before noticing me. The day had been warm, still and sunny following two days of rain after a long hot spell. In the ravine the sun was already out of sight and the light getting a little poor as at about 7.15 p.m. I was working along a stream shaded by dense beech canopy. As the stream widened into a stretch about 20 ft. wide choked with dead leaves under a young beech, and with bramble growing adjacent in a small glade, a yellowish tipulid was netted as it flew about a foot above the wet leaves. The insect was readily identified as a female *N. flavipalpis*, the first of the genus seen that evening. Having released the specimen, an almost identical looking tipulid was instantly spotted only five yards away, bobbing up and down over part of the stream in a fashion which immediately brought to mind the *N. crocata*. In the few seconds the performance lasted, most of my effort was devoted to stalking within netting range, but the insect flew up in the trees much too soon. Despite my distance, the reflected light off the water appeared to give a clear view and the fly seemed to be only dipping the tip of the abdomen into the water; however, in view of later observations, allowance must be made that, having just caught a female, my mind was prejudiced in what it expected to see.

The episode was quite extraordinary since my previous experience with *N. flavipalpis* would suggest that this species is not directly associated with water. There was plenty of soil ranging from dry to wet mud so it seemed most unlikely that it would be dropping its eggs in water; in fact the stream disappeared down a swallow-hole only 30 ft. away. After a few minutes waiting it seemed too optimistic that the cranefly would return to this or neighbouring parts of the choked stream, so another branch of the stream was followed to its swallow hole. Perhaps it should be mentioned that the streams are draining acid boggy ground on Tertiary sands and enter swallow holes when they reach the

Chalk.

On returning after ten minutes to the point of original observation, only half a minute had been spent watching for *Nephrotoma* when one flew low over the stream from under the young beech and in uncanny fashion chose exactly the same spot to begin its dance. A sweep with the net at the top of about the sixth bounce secured a male *N. flavipalpis*, but it escaped before it could be tubed to double check at home. Having scared this individual off, the chances of another appearing seemed remote, but two minutes later another flew in along the same flight path and began its dance in exactly the same spot. The specimen was quickly netted and proved to be a male *N. flavipalpis* which this time was firmly tubed.

The next ten minutes was spent looking more closely at the habitat and during this time no *Nephrotoma* were in evidence. The shaded leaf-choked stream has already been mentioned. The dancing occurred over a small sub-section of stream 4 ft. long and 18 ins. wide and up to 4 ins. deep with the bottom showing a patchwork of about 75 per cent. dead leaves and twigs and 25 per cent. sand. The water was seen to be flowing quite rapidly at either end, though most of the surface was flowing only gently. This pool lay at about the transition between the densely shaded portion and the glade area where brambles overhung small parts of the stream. Most of the available pools were smaller and generally completely lined with dead leaves, but they offered a wide range of degree of shade or light and water speed.

After ten minutes another *Nephrotoma* approached the spot in the same manner as its predecessors. Unfortunately in altering my stance shortly before, some muddy water had flowed into the downstream third of the pool. Whether this affected behaviour or not is uncertain, but the fly chose a smaller pool only 15 ins. square with similar sandy patchwork bottom adjacent and immediately upstream of the other pool. The surface water was flowing rather faster. I decided to observe rather than catch specimens, and this fly performed ten vigorous bounces on the water, indeed distinct disturbance rings were formed on the surface. Each bounce rose 4-6 ins. above the water and the fly apparently hit the surface flat with legs outspread. However, these movements were so rapid that it was difficult to decide exactly how it made contact with the water. Having originally hovered slowly in before choosing a spot for the dance, the insect flew almost straight up with a slow hovering flight into the foliage of the beech tree and was lost sight of about 10 ft. up. A minute later another fly repeated the performance in almost identical manner except that it made twelve bounces.

In order to get a different perspective and better angle to reflected light off the water surface my view point was changed, and by this time the muddy water had cleared. My view was now identical to that of the first observations when I thought the *Nephrotoma* was only dipping its tail. Within two minutes a *Nephrotoma* was over the original spot, having sneaked in unnoticed whilst I was trying to keep an eye on the whole stream at once. It performed sixteen bounces, certainly not of a tail bobbing type and apparently flat, as was believed to be the case with the two previous individuals. At the finish, the fly hovered straight up into the tree. Being satisfied that the behaviour pattern was constant

and beyond clear deducement of the way the fly bounced on the surface, the observations were concluded.

This behaviour must surely be atypical and cannot be a normal feature of the everyday life of *Nephrotoma flavipalpis*, otherwise it should have been observed before in this common species. Neither the adult nor the early stages would appear to be directly related to water; the larval habitat is said to be damp soil in woods (Brindle, 1960a). A few tipulids such as *Hexatoma* are believed to lay eggs over streams (Brindle, 1960b), but there would appear to be no biological reason for males to dip at water. The strangest feature is that no other tipulid species were taking part in the activity, so it seems unlikely that one species should find this activity essential to survival. In this respect, the behaviour was unlikely to have been brought on by drought condition, particularly after two days' rain and with wet vegetation in some parts.

There would seem to be a plausible explantion, though not altogether positive. The factors which appear to hold the key are that the direction and attiude of approach was similar, only two discrete spots were chosen despite observation over perhaps 40 sq. yds., the spots chosen differed in their substrata from other adjacent pools, the two adjacent pools together gave a relatively large surface area, the muddying of water at one spot apparently resulted in the choice of another essentially similar spot, the spots lay at the transition between dense shade and glade conditions, the approach and departure were slow but the dancing was vigorous, the course of departure was always straight up into the tree and no *Nephrotoma* were observed except when following this behaviour pattern.

These facts can be interpreted as implying that the adults at this time of day were concentrated within the dense shade of the beech. The position of the pools at the transition between light and shade, their large surface area relative to adjacent pools and and the partially pale sandy bottom, may have resulted in reflected light having a quality which acted as a lure rather as with a light trap. The path of approach was direct and slow, which may result from the surrounding degree of illumination. Once over the pools the males may have reacted to their own reflected image, vigorously 'attacked' and were repelled by the water, so that there was a rapid series of attacks. It may well be that the female would react in a manner suggesting, or actually producing, oviposition behaviour. On breaking off the engagement, the insects flew up into tree foliage, a frequent escape reaction of larger craneflies when disturbed. That no other craneflies took part in this episode may reflect upon *N. flavipalpis* being the only large cranefly to have chosen a certain part of the beech to rest in. That this behaviour is not known to be more widespread suggests that there were unusual conditions of lighting relative to the physical layout of the situation. The only support that can be provided is that craneflies, including *Nephrotoma*, do assemble to light traps.

Having written the above account, further obseravtions on *N. flavipalpis* were made on 17th August at Thornden Wood, near Whitstable, Kent, which suggest that dancing on water is but one aspect of a broader range of types of behaviour. At 7 p.m. a muddy ride between chestnut coppice and conifer plantation was followed. At frequent intervals there were water-filled ruts and several male *N. flavipalpis* flew past. The first

flew along a rut with occasional dispersed bounces on the water and three others performed one bounce or a half-hearted bounce. Where shade was denser and the ride more broadly flooded, a male was found circling in a vertical plane with a high point five inches above the water and a low point only on inch from the water surface without touching it. Two individuals were seen performing a bounce without touching the surface of some wet mud, and several more flew over partially shaded ruts without showing any special behaviour. Two females were observed bouncing several inches over bare soil under conifers apparently hitting the ground rather flat and presumably ovipositing; the sites of these operations were damp but well clear of standing water or wet mud and seemed unlikely to flood even in winter. These observations appear to confirm that the larval habitat is not associated with water and suggest that the presence of males over water is fortuitous. However, it is very strange that only one species is drawn into this behaviour if glare off water were the sole explanation, and why should only the males take part? The settings at the two localities had much in common but behaviour was more flexible at Thornden Wood suggesting that local variables of environment bear a strong influence.

The further observations made at Thornden Wood indicate that a broader interpretation than that given for Snelsmore is required. An explanation may be found in the swarming habits of Tipulids where in some species the males perform dancing-like flight in a compact area, apparently related to environmental markers, this activity being designed to asist the female in locating a mate. Although some species dance in large groups, I have observed several species dancing in compact fashion singly and in groups of two males (e.g. *Epiphragma ocellaris* over bramble in woodland), apparently certain features of vegetation pattern and lighting enabling them to retain their position. Such behaviour is apparently restricted to males, though Downes (1958), who has discussed the swarming habits of biting Nematocera in detail, has found immature females to perform similar activity in a few species of these slightly related families. Dancing behaviour is generally restricted to evening light among the tipulids.

One may review reaction to water by males of *N. flavipalpis* as resulting from local lighting and pattern of reflection which triggers the stimulus to perform the dancing flight. The reflection in the water would give a false perspective, and it is perhaps noteworthy that the male at Thornden Wood which was dancing without touching the surface of the water was showing no signs of abandoning its position, whereas those which touched the surface at Snelsmore quickly gave up, having met a barrier they were presumably not expecting. A distinct lure in reflections off water is suggested by the fact that the males were only seen associating with water (or wet mud), at Snelsmore it was only pools with pale bottoms which were attractive, and the males flying along the ruts at Thornden were only mildly attracted. It may be a light coloured patch on the ground which acts as the assembling stimulus, as Downes showed with some species of biting Nematocera. It would be possible for an unmated female to assemble to the same stimulus which results in male dancing.

During the periods of observation on *N, flavipalpis,* no groups of

swarming males were found, and it is perhaps a characteristic of the species that its dancing display is solitary, if indeed such a display is normal to the species at all—I have never observed any members of the sub-family Tipulinae dancing under normal circumstances. That no other species were reacting to water at the same time may be explained by reference to the fact that one does not find, as far as I am aware, mixed species swarms of males, but that for any given time of day and lighting conditions, each species has separate swarming points triggered by local stimuli.

Possibly strange behaviour patterns of this type are not rare, but simply left unrecorded. It would be interesting to hear of further episodes of this type, perhaps concerning other insects.

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91 Clitherow Avenue, Hanwell, W.7.

Butterflies in Greece, May 1969

By J. V. Dacie, M.D., Margaret K. V. Dacie and Philip Grammaticos, M.D.

The following account describes the result of a combined entomological and archeological tour of Greece undertaken between the 8th and 26th May, 1969. It includes visits to localities well known to lepidopterists as well as to some relatively out of the way places. A brief account of the itinerary follows, and is illustrated by the accompanying map. In all 71 species of butterflies were seen or taken.

On the 8th May we visited Edessa, a small town 89 km. west of Thessaloniki and only a short distance from the mountains which form the border with Yugoslavia. The weather was relatively cold and there was little sunshine. However, 15 species of butterflies were identified including a single hibernated *Libythea celtis* Fuessli, a species not seen elsewhere. On the 10th May we travelled from Thessaloniki to Ouranoupolis, a village at the beginning of the Mount Athos peninsula. Rain and thunderstorms occurred during the journey across the Cholomon mountains, but the weather cleared up by the time we had reached our destination at sea level. Thereafter we were fortunate enough to have almost continuous sunshine for the rest of the trip. *Zerynthia polyxena* Schiff. was caught on the mountains at about 600 m. and also near sea level near Ierissos about 20 km. from Ouranoupolis. Our most notable capture in the area was *Iolana Iolas* Ochs. which flew rapidly and restlessly over rocky but scrub-covered low cliffs in a very restricted locality.

On the 13th May we stopped in the region of Derveni about 10 km. north of Thessaloniki where the main road passes through flower-covered limestone hills. Butterflies were present in profusion, and the catch included *Pyrgus sidae* Esp. and *Cupido osiris* Meigen. At our destination, Amphipolis, a single *Allancastria cerisyi* Bdv. was caught, the only one seen, as well as two *Heodes ottomanus* Lef. On our return to Thessaloniki

we stopped briefly in a rocky gorge near Rentina and took *Carcharodus orientalis* Rev.

On the 14th May we visited grass-covered cliffs south of Thessaloniki. *Maniola jurtina* L. was just emerging (males only); their underhindwings were conspicuously spotted with two and occasionally three spots.

On the 16th May we left Thessaloniki for Athens via Delphi and Olympia. We stopped briefly near Litochoron on the slopes of Mount Olympus taking about 20 species, including *Scolitantides orion* Pall. and *Philotes baton schiffermuelleri* Hemming. We stayed overnight at Platamon, about 20 km. further south, and collected by the roadside there, and also in the Vale of Tembi, and at several other places by the roadside in the mountainous area between Larissa and Lamia. In these areas we

noted 25 species, including a single specimen of *Heodes ottomanus* Lef. (in the Vale of Tembi). Roadside collecting was continued in several places between Lamia and Delphi. The most productive spot was a rocky ravine about 17 km. east of Delphi. Here *Anthocharis gruneri* H.-S., *Anthocharis damone* Bdv., *Pieris krueperi* Stdgr., *Pieris manii* Mayer and *Pieris ergane* G.-H. were all flying together. Two days were spent in or near Delphi, during which time 42 species were identified including *Erynnis marloyi* Bdv. and a single specimen of *Freyeria trochylus* Freyer. *Papilio alexenor* Esp. was flying around the ruins of Delphi (and also at Olympia) but we did not see the species elsewhere.

On the 19th May we took the car ferry from Itea to Eghion and drove to Olympia via Pyrgos. Specimens of a large bright form of *Melitaea didyma* Esp. was caught between Patras and Pyrgos. We stayed overnight at Olympia and after visiting the ruins and museum crossed the the mountainous centre of Peloponnese bound for Nafplion. We collected en route and caught or identified 33 species including a single specimen of *Charaxes jasius* L. We stayed overnight near Vytina at about 1300 m. where worn *Zerynthia polyxena* Schiff. were flying, and drove to Nafplion, 28 species being taken or identified. *Nordmannia ilicis* Esp. were noted to be flying in large numbers by the roadside halfway down the steep descent to the sea from the Menalon Mountains. *Melanargia larissa* Geyer were flying in waste ground adjacent to the hotel we stayed in at Nafplion.

On the 25th May we visited the Temple at Sounion, 70 km. south-east of Athens. Many *Satyrus ferula* L. and *Melanargia larissa* Geyer were flying over the limestone cliffs along the coast road. In all about 12 species were identified, including a single specimen of *Gegenes pumilio* Cyr. The locality was revisited on the 28th May when a single specimen of *Hyponephele lupina* Costa was caught.

In the following list we have attempted to give some indication as to the distriblution and frequency of species. It must be remembered, however, that we collected first in the north of Macedonia, just at the commencement of summer, while by the time we reached Athens in the south, the countryside was parched and summer was well advanced. This explains how some species, e.g., *Melanargia larissa* Geyer, were caught in the south although not seen in Macedonia at the time we were collecting.

It is interesting to compare the above series of 71 species with the recently published list of 140 species caught by Coutsis (1969) in Northern and Central Greece and on Mt. Taygetus in Peloponnese in the years 1960-69. The present series includes in fact three species, *Allancastria cerisyi* Bdv., *Heodes ottomanus* Lef. and *Pyrgus sidae* Esp. not recorded by him. At Delphi we saw or caught 42 species in a two-day period, three more than the number recorded by de Worms approximately one month earlier in 1963. de Worms, however noted the presence of *Gonopteryx farinosa* Zell., *Aglais urticae* L., *Nymphalis polychlorus* L., *Celastrina argiolus* L., and *Cupido minimus* Fuessli, which were not noted by us.

The nomenclature we have followed is that which will be adhered to in *The Field Guide of the Butterflies of Europe* by L. G. Higgins and N. D. Riley, to be published shortly by Collins. I am indebted, too, to Dr. Higgins for most helpful discussions on the identity of some of the more difficult species, particularly those of the genus *Pyrgus*.

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PAPILIONIDAE

Papilio machaon L.	Lamia, Delphi and Vytina, not common
Papilio alexanor Esp.	Delphi and Olympia, not common
Iphiclides podalirius L.	Widespread and quite common

Zerynthia polyxena Schiff.	Cholomon Mts. and Nr. Ierissos, in colonies; Delphi and Vytina, single worn specimens
Allancastria cerisyi Bdv.	Amphipolis, 1 only

PIERIDAE

Pieris brassicae L.	Delphi, Vytina and Nafplion, quite common
Pieris rapae L.	Widespread and common
Pieris mannii Mayer	Widespread, but not common
Pieris ergane Geyer	Delphi and Vytina
Pieris krueperi Stdgr.	Delphi, 2 specimens only
Pontia daplidice L.	Widespread and quite common
Aporia crataegi L.	Widespread and quite common
Euchloe ausonia esperi Kirby	Widespread and generally common; specimens of both broods caught
Anthocharis cardamines L.	Widespread
Anthocharis damone Bdv.	Delphi, one worn specimen only
Anthocharis gruneri H.-S.	Widespread but scarce
Colias crocea Fourc.	Widespread and quite common
Gonepteryx rhamni L.	Platamon, Delphi and Vytina; worn hibernated specimens
Gonepteryx cleopatra L.	Tembi, Delphi and Vytina; worn hibernated specimens
Leptidea sinapis L.	Widespread and often common

LIBYTHEIDAE

Libythea celtis Fuessli	Edessa, one only

NYMPHALIDAE

Charaxes jasius L.	Vytina, one only
Limenitis reducta Stgr.	Widespread
Nymphalis antiopa L.	Vytina, one seen
Vanessa atalanta L.	Widespread, but not common
Vanessa cardui L.	Widespread and common
Polygonia egea Cramer	Lamia and Delphi, not common
Issoria lathonia L.	Ouranoupolis, not common
Clossiana dia L.	Cholomon Mts., a single colony
Melitaea cinxia L.	Widespread, and the commonest fritillary
Melitaea phoebe Schiff.	Widespread, but not common
Melitaea didyma Esp.	Delphi, Pyrgos and Vytina, in colonies
Melitaea trivia Schiff.	Widespread, in colonies

SATYRIDAE

Melanargia larissa Geyer	Nafplion, Mycaenae and Nr. Athens, common in colonies
Satyrus ferula Fab.	Nr. Athens, in large colonies
Maniola jurtina L.	Widespread, Thessaloniki southwards
Hyponephele lupina Costa	Nr. Athens, one only

Coenonympha pamphilus L.	Widespread and common
Pararge aegeria L.	Widespread and quite common
Lasiommata megera L.	Widespread and quite common
Lasiommata maera L.	Platamon and Delphi, in colonies

LYCAENIDAE

Nordmannia ilicis Esp.	Lamia, Nr. Nafplion and Nr. Athens, in colonies
Strymonidia spini Schiff.	Mycaenae, one only
Callophrys rubi L.	Widespread and quite common
Lycaena phlaeas L.	Widespread and quite common
Heodes ottomanus Lef.	Amphipolis and Tembi, 3 specimens only
Heodes tityrus Poda	Widespread but not common
Cupido osiris Meigen	Derveni, 2 specimens only
Glaucopsyche alexis Poda	Widespread and quite common
Iolana iolas Ochs.	Ouranoupolis, not common, in a very restricted locality
Philotes baton schiffermuelleri Hemming	Slopes of Mt. Olympus and Lamia
Scolitantides orion Pall.	Slopes of Mt. Olympus, not common
Freyeria trochlyus Freyer	Delphi, one only
Plebejus argus L.	Nr. Ouranoupolis, one only
Aricia agestis Schiff.	Widespread and quite common
Plebicula dorylas Schiff.	Delphi and Vytina
Plebicula amanda Scheven	Delphi and Vytina
Plebicula thersites Cant.	Vytina, not common
Lysandra bellargus Rott.	Slopes of Mt. Olympus, one only
Polyommatus icarus Rott.	Widespread and common

HESPERIIDAE

Pyrgus malvae L.	Edessa, Cholomon Mts., Ouranoupolis and Vytina, not common
Pyrgus armoricanus Obth.	Edessa and Derveni, not common
Pyrgus sidae Esp.	Derveni and Tembi, scarce
Spialia sertorius orbifer Hb.	Widespread and common
Carcharodus alceae Esp.	Widespread, but not common
Carcharodus orientalis Rev.	Widespread, but not common
Erynnis tages L.	Widespread, but not common
Erynnis marloyi Bdv.	Delphi and Vytina, scarce
Thymelicus acteon Rott.	Vytina, Nafplion and Nr. Athens, in colonies
Thymelicus sylvestris Poda	Widespread
Gegenes pumilio Cyr.	Nr. Athens, one only

ACHERONTIA ATROPOS L. IN THE WIRRAL CHESHIRE.—I have had brought to me a good specimen of *Acherontia atropos* L. (the death's head hawk moth.) This specimen was found by Mr K. R. Tinsley at his home in Upton, on the outskirts of Birkenhead, on the 5th October 1969.—M. HULL, Windcliffe, Alvanley Road, Helsby, via Warrington, Lancs. 1.i.1970.

Obituary

CAPTAIN REGINALD ANDREW JACKSON, C.B.E., R.N.

On September 16th 1969, Capt. Reginald Jackson passed away quite unexpectedly at his home at Codford St. Mary. He was one of the most ardent field lepidopterists of his day and all who knew him, must deeply feel and mourn his loss. He well belied his 79 years and was indefatigable to the very end, even picking apples the day before a stroke carried him off immediately without any suffering, as he would have wished.

Rex Jackson, as he was known to all his friends, was born in Dublin in 1890, the son of a Surgeon Captain in the Navy and at an early age followed the family tradition by entering the Senior Service. It was as a cadet at Osborne that he originally took up the net in the first years of the present century and his keenness for our lepidoptera never left him. He kept a meticulous account of his activities in the field without interruption for nearly seventy years. But his naval duties naturally curtailed his early collecting. He served with distinction with the battle cruisers based on Scapa Flow in the 1914-18 war and afterwards mainly in the Middle East where he was engaged on torpedo development. It was in 1930 that he accompanied the Duke of Gloucester as his A.D.C. to Addis Ababa to attend the Coronation of the present Emperor of Ethiopia.

Soon after his marriage he settled at Bishop's Waltham where he was able to study the local fauna since it was a rich region for lepidoptera, harbouring such local species as *Acosmetia caliginosa* and a very strong colony of *Nola albula.* He used to tell amusing stories of his varied adventures in the field. On one occasion after spending the day in a vain search for the larvae of *Cucullia gnaphalii* in the vicinity of his Hampshire home, he spotted one crawling up his trouser leg as he was about to get into his car. Only once, in that phenomenal summer for migrants, 1945, was he nearly caught off his guard. He was relaxing near Plymouth after a naval inspection when he suddenly espied a Bath White alight on a flower in front of him. Without a moment's hesitation he whisked off his naval headgear and adroitly landed the prize in it.

The second World War saw him at the Admiralty in charge of electrical development and on his retirement in 1948 he was awarded the C.B.E. for his signal services. In that year he moved to Codford in Wiltshire where he devoted himself to tending his large kitchen garden and threw himself wholeheartedly into Civil Defence training in his district. He now had more opportunity of casting his net further afield and during the next twenty years used to pay annual visits to most of the well-known collecting resorts, though he never revisited the land of his birth, Ireland. In this way he built up a very comprehensive collection of most of the more *recherché* species. He was often accompanied by his wife whom he lost in 1959. Even as late as 1968 he motored twice to Wales in spring and summer in search of the newly-discovered *Coenophila subrosea* there, while only a few weeks before his death he was in Suffolk where he was delighted to find *Nonagria neurica* quite abundant. The butterflies and moths of Wiltshire engaged his special attention, in particular the Blues of which he obtained some striking aberrations, but his real home were the local downs where he discovered a very flourishing colony of *Procris globulariae.* He also concentrated on breeding the clearwings.

Rex Jackson became a Fellow of the Royal Entomological Society in 1941, serving on the Council from 1946 to 1948 and also on its Protection Committee for several years. But it was to the welfare of the then South London Entomological and Natural History Society that he devoted much of his time and energy. He joined it in 1940 and was elected its President in 1945 when it was in rather low water at the end of the War. During his tenure of office he helped to swell its numbers to nearly double and was mainly instrumental in securing the fine rooms of the Royal Society in Burlington House as a meeting place of the "South London" for the next ten years. He is the only member of that society in recent times to be re-elected President for a second year. He never failed to attend its annual Exhibition. He was also closely identified with various bodies for the preservation of lepidoptera, notably in Wiltshire and the New Forest about which he participated in 1963 in a broadcast with the writer and others.

His cheery disposition coupled with a somewhat jaunty air and his famous monocle helped to bring him many entomological friends whom he was always ready to welcome and assist in their collecting exploits. Many of them will indeed miss his happy company both at home and in the field with his unflagging enthusiasm for the chase. Their sympathy goes out to his only son, his family and grandchildren, in their untimely bereavement. C. G. M. de W.

Notes and Observations

Some Late Broods and Dates for 1969.—The exceptionally fine spell of weather during October helped to cause a number of late appearances among which I think the following are worth recording: at Swanage on October 12th *Campaea margaritata* L.; at Winterborne Stickland near Blandford on October 13th *Calothysanis amata* L. The following were seen at my mercury vapour light trap at Three Oaks, Horsell: on October 22nd *Pachycnemia hippocastanaria* Hübn.; on October 23rd *Notodonta dromedarius* L.; on October 28th *Caradrina morpheus* Hufn.; on November 1st *Pheosia gnoma* Fabr.; on November 18th *Plusia gamma* L and on November 23rd *Agrotis ypsilon* Hufn.—C. G. M. de Worms, Three Oaks, Horsell.—10.xii.1969.

Insect Photography.—Having read Mr. Oldroyd's letter, I feel my experiences may also be of interest to those considering taking up this "pursuit".

I commenced with the photography of flowers, at the time possessing a Contina 1A camera, the closest range of which (in common with most 35 mm. cameras) is 3 feet. However, the purchase of two supplementary lenses (at about 5/- each) and holders (about 7/- each) enabled me to take photographs at a range of 20 inches down to 9½ inches, and for most purposes a range of about 10 or 11 inches proves ideal. Using these lenses reduces the depth of field, and so accurate measurement is necessary (to within ¼ inch) and a tripod therefore essential to hold the camera firmly while all appropriate adjustments are made, and apart from the time consuming nature of this operation, the results are very satisfactory. Flash may be used if needed.

After a while I began attempting photographs of butterflies. Clearly, no butterfly, except perhaps at rest for the night, will remain patiently whilst all the preparations are made, so I was forced to hold the camera (supplementary lens attached) in my hand, and take a photograph at an estimated range of, usually, 9§ inches. In good light, with the aperture at f11 or f16 the depth of focus is sufficient for this procedure to be fairly successful, provided one has become familiar with the range required by photography of flowers beforehand, and is able to estimate it reasonably. Anyone wishing, for financial reasons to use this method could get better results by using a faster film (High-speed Ektachrome) to increase the depth of focus (I always use Kodachrome II) and by making some form of wire distance guide which could be clipped to the camera.

Later, whilst abroad, I obtained a Minolta SR 7, and this or any other similar single lens reflex makes photography childs play, since one sees through the camera lens (not the viewfinder) exactly what is being taken, focuses on it (from a range of 2 feet, and with a narrower field of vision than with the Contina) and providing the prey has not flown away, then takes the photograph. A telephoto lens can be used if the insect is too far away to reach, or too restless to approach to within 2 feet. For ordinary butterfly photographs I have never found it necessary to use flash, though for woodland flowers it is essential. A wood is a darker place than most people realise.

Finally, I would confirm that this is a fascinating way of studying insects, without the need to kill them. Slide boxes, too, are cheaper than insect cabinets.—A. J. Showler, 12 Wedgwood Drive, Hughenden Valley, High Wycombe, Bucks.

Butterflies and a Few Moths at Blackheath, etc., 1969.—Although the year just ended has, from all accounts, been unusually good for butterflies by present standards, few species not seen regularly were noticed here—partly, no doubt, because after midsummer I was kept busier indoors than I could have wished. However, there are a few things to note.

Celastrina argiolus L. was an almost total failure. After the small but distinct signs of recovery shown the previous August (*Ent. Rec.*, **81**: 149) I was surprised at seeing no more than two of the first brood (13 & 16.v) and none at all of the second; and Mr D. Collins tells me he saw none in the Carshalton district. By way of compensation, however, my small mint patch and its precincts were visited for a few days in early August by several *Lycaena phlaeas* L. and *Polyommatus icarus* Rott. (The former had failed to appear in 1968, and is at best erratic in the garden; of the latter, no more than occasional stragglers had been noted up to last year). Both sexes of the two butterflies were to be seen feeding at mint and thistle flowers whenever the weather was suitable, but only between the 7th and 10th of the month; after which they disappeared, except for several more *phlaeas* between 19.ix and 13.x—a very unusual thing here. One of these (20.ix) was found with the wings rather limp and on one side somewhat buckled, and incapable of proper flight; it must have emerged on or near the spot (under a privet hedge skirting a rough uncut 'lawn' where the foodplant abounds). As for *icarus*, those seen from time to time probably come from an inaccessible but not far distant railway cutting; small patches of its foodplant come up most years in the garden, but soon get choked out by coarse grass, etc. The railway

bank may also be the source of the few Burnet moths that turn up in the garden—*Z. filipendulae* L. by odd specimens in August of most years (but not last), favouring thistle and knapweed heads; *Z. lonicerae* Schev. only twice so far, in July. (On a part of Mitcham Common, Surrey, 1.viii.69, *filipendulae* was in the greatest profusion that I have ever seen, and I secured one tolerably good, though thinly scaled, confluent form).

Of the Satyrids, *Pararge megera* L. seems to be staging a gradual comeback here, having had a better season than any for long past; but, as in 1968, only the second brood showed itself. *P. aegeria* was not noted this time, though probably not quite absent. The three common *Pieris* spp. were frequent, especially the second broods. But it was, of course, the Vanessids that provided the spectacular feature; not only were *Vanessa atalanta L.* and *Aglais urticae* L. almost common in the autumn, but *V. cardui* L. put in a welcome, if sparing, appearance. In fact I had witnessed nothing like it here since the 1920s (though there must have been similar years in the '40s and '50s). My neighbour's michaelmas daisies, far finer than mine, were particularly attractive to the Red Admirals—all apparently perfect—during the sunny autumn days; the end clump of the row (nearest the house) being, for some reason, especially favoured. On it I counted 5 species of butterflies on one occasion (29.ix): *atalanta, urticae, c-album* (2 or 3), *cardui* (1) and *rapae* (1). *Polygonia c-album* L. remained scarce, but one or two were present on the 19th also. *Nymphalis io* L., which might have been expected along with the others, failed to show up; but one was seen in a Blackheath garden during August, on buddleia.

My latest date for *atalanta* here was 24.x.—at least two flying about apple trees. Rotting apples, with which the ground under these trees was often plentifully strewn, seemed never to attract them. On 17th October my friend Mr G. Shephard took, by hand, an aberration with the hindwing borders of a dull orange, shading outwardly to a lighter yellowish tint (all else being normal), at St Margaret's Bay, E. Kent.

Finally I may mention a sighting of *Colias croceus* Fourc. by Mr Collins on Banstead Downs, Surrey (22.vii), and two notable captures here at m.v. light: *Euproctis chrysorrhoea* L., ♂ (15-16.vii.), and *Pyrrhia umbra* Hufn. (4-5.vii).—A. A. Allen, 63 Blackheath Park, London S.E.3. 8.i.70.

A Wartime Episode.—Mr Guy Ford's letter of November conjures up memories of an encounter with the police in 1940.

Many years collecting had provided me with representatives of all the Quaker family bar the Twin spot-*munda*, and my old friend, the late H. W. Head informed me it occurred sparingly in Raincliffe Woods near Scarborough, so in March 1940 I decided to have a go at sugaring for it.

This meant staying the night in the car which had to be prepared for the job, so I took the passenger seat out and for a few shillings I obtained a clean bench seat from the wreckers, which propped up, made a nice comfortable bed.

A kapok mattress and blankets completed the outfit, so having completed my domestic arrangements and obtained the freedom of the city, I set off on March 24th.

The well-known Lady Edith's Drive traverses Raincliffe Woods, and on arrival there I looked for a suitable place to spend the night; a nearby farmhouse seemed to provide a solution, and I readily got permission

from the farm woman to park the car for the night.

As dusk fell, I sugared several trees along the road, and then retired to the car to prepare the makeshift bed.

Sallying forth with a masked torch I was surprised at the number of moths on the various patches; every one had two or three Sword Grass-*exoleta* while there were dozens of Small Quaker, *pulverulenta*, Clouded Drab, *incerta*. Common Quaker, *stabilis* Chestnut, *vaccinii* and Satellite, *satellitia* but I only managed to get ten Twin Spot Quaker, *munda*.

However I was well satisfied with the night's haul and decided to call it a night, so as it was getting decidedly chilly, I had my supper of sandwiches and hot coffee and got ready to turn in.

The Standard 9 was a bit cramped to divest oneself of clothing, but at last I was snug between the blankets and soon fell asleep.

About midnight I was awakened by a torch flashing in my face, and the voice of the police sergeant behind it asked me what I was doing there.

I explained I was exercising my entomological proclivities—but not in those words—but he retaliated by saying he had received a report of a highly suspicious character from the farm woman and had to investigate it, as it was wartime and rumours were rife regarding German paratroops.

I assured him I was aware of this and had taken the precaution to come armed and had a ·32 automatic in the glove box. This staggered him and called for production of identity documents which were forthcoming.

Did I know anyone who could confirm my identity? I asked him where he had come from and he replied 'Burniston'; this solved the difficulty as I referred him to Mr Head, and the sergeant then became solicitous for my health, saying it was very cold and I might catch a chill sitting up in bed, advising me to lie down and get a good night's sleep.

I told him I was sorry I was the cause of having him dragged out on a night like this, but he protested he had quite enjoyed the outing and the conversation and with a cheery 'Good Night' he bid me farewell.

Altogether a memorable occasion even if I failed to 'bag' a paratrooper.—L. G. F. WADDINGTON.

NYMPHALIS ANTIOPA IN WESTMORLAND.—Enlarging on her sighting of *Nymphalis antiopa* L. (Camberwell beauty) in her South Westmorland garden, which was reported in the "Daily Telegraph" of 14th October 1969, Mrs Melvyn Slade writes as follows: "As I keep a diary in which on most days I jot down what the weather has been, I can more or less tell you what it was like for some days before seeing the Camberwell Beauty on October 10th—not really very good, which surprised me that the butterfly should have arrived. September 26th, a perfectly horrible day—strong winds and gusty showers. 27th, a much nicer sunny day. 28th a wild, wet day of gales. 29th, sunny day, but chilly. 30th, a wet stormy day. October 1st, sunny but chilly. 2nd, cloudy and raining by afternoon. 3rd, dull and drizzly. 4th, a nice still day with bits of sunshine. 5th, a lovely autumn day. 6th, another nice day, but heavy rain in the night. 7th, heavy rain all morning. 9th, a lovely day. 10th, another perfect day, hotter than yesterday. The wind is not mentioned, only on September 14th, a cold north-east wind, and it seems difficult to deduce anything from the weather.

I went into the garden about 3 in the afternoon and caught sight of something flying amongst the fruit trees. My first thought was that it could not be a bird as its flight was all wrong. Then it flew away but soon came back and settled on a path near our garden pond, where it stayed for about a quarter of an hour, and I was frightened a bird would get it. It really took my breath away, it was so beautiful, with its almost glowing purple wings and *white* border. I rushed into the house to see if it was amongst an old collection of Player's cigarette cards and fortunately, I soon found it. The only difference was that in the illustration the border was cream, and no mention was made that it is sometimes white, so that I am very interested in your query.

I had plenty of time, too, to get a ruler and measure the wing span, which I made just a shade over 3″.

My first reaction on seeing the Camberwell Beauty was great regret that my husband was not at home to take a photograph and that he had used up the last of his colour film some weeks previously on all the other butterflies which were seen in the garden.

The address I gave in the "Daily Telegraph" was not the *correct* postal address, but I thought it more informative to give the true location—"Lancashire", to people in the south of England means something very different from "Westmorland". — E. Harryman Slade, Clawthorpe House, Burton, via Carnforth, Lancs. 11.xii.1969.

Current Literature

A short History of the Brown-Tail Moth (1782) by **William Curtis** (fascimile edition) 13pp+one coloured plate 4to. E. W. Classey Ltd. £3 15/- (3·75).

This edition of 1000 copies has been beautifully printed by the Curwen Press, the coloured copper plate having been particularly well reproduced. William Curtis's text, well known, of course, to many entomologists, although almost 200 years old, gives a remarkably good account of the insect from the ecological angle, with a good description of the life history and also practical information on the control of the larvae.

The fascimile is augmented by 12 pp. of an introduction by William T. Stearn, giving a biological study of Curtis and a bibliography giving further sources of information. This is followed by six pages of entomological notes on the brown-tail moth and some related species also of economic importance, by D. S. Fletcher giving notes of its historic infestations, and with 15 references to papers on this insect. These three papers are bound together in green buckram, and are well printed on good paper, Curtis's actual paper being printed on an unbleached paper, to retain similarity with the original. The book will be sought after by many lepidopterists for their libraries, both its scientific and its artistic value making it a desirable item.—S.N.A.J.

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.

EXCHANGES AND WANTS

For Sale or Exchange.—Butterflies and Moths. Many species from Africa, Madagascar, India, Formosa, South America and other countries. Also species from Europe and U.S.S.R. Sometimes livestock. List on request by sending International Postal Coupon for 1/-.—*Robert Keiser*, Frederik van Eeden Plein 3, Antwerp 1, Belgium.

For Sale. — Formosan butterflies, beetles, moths, dragonflies, cicadas, praying mantis, wasps and other dried Formosan insect specimens, living cocoons of Saturnidae, etc., prepared for collection, educational programmes, gift packings, premiums and art work in millions of specimens. —*Taiwan Novelty Co.*, P.O. Box 860 Taipei, Formosa (Taiwan).

Wanted.—For temperature experiments in 1970 larvae of *Maniola jurtina.* —Please write in advance to *George Thomson*, 98 George Street, Dunblane, Perthshire.

Wanted to Purchase.—Entomologist's Monthly Magazine. A run of this periodical including the first thirty volumes.—*J. M. Chalmers-Hunt*, 1 Hardcourts Close, West Wickham, Kent.

Wanted.—Parts 1 and 6 of Volume 78, or alternatively the whole volume. State price required to Box No. 116.

Wanted.—Entomologist Volumes 2 and 4; Entomologist's Record, Vol. 41, Parts 7 and 8, 11 and 12. Vol. 45, Parts 3, 5 and 12 or complete volumes if bound. Top Prices offered.—*B. Skinner*, 85 Elder Road, London. S.E. 27.

For Sale.—Solid Mahogany 20 Drawer Butterfly Cabinet, outside measurements 48 ins. high, 20½ ins. wide, 18½ ins. deep. Glass Doors, and lift off Glass Lids. Inside measurements 18 ins. × 15 ins. £40 or nearest offer.— Reply *H. E. Chipperfield*, The Shieling, Palmer's Lane, Walberswick, Southwold, Suffolk.

House to Let.—Good collecting area. Sea's edge, every convenience, very comfortable, sleeps five. August 22 to September 5 only.—Write *Heslop*, Belfield, Burnham-on-Sea, Somerset.

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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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A Postscript to some recent views on *Pieris dubiosa* Röber

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

The effort to replace the name *dubiosa* Röber by *meridionalis* Heyne has not only caused uncertainty to those unfamiliar with the insect, but also raises an obstacle to the study of the other *Pieris* races of the Mediterranean zone which have to be distinguished from both *meridionalis* and *dubiosa*.

Mr. Bowden's latest article (*Ent. Rec.*, Jan. 1970) does little to clarify the position, so it unfortunately becomes necessary for me to give some further data which I should have done in my last notes on the matter (*Ent. Rec.* 1969, pp. 225-231).

Mr. Bowden and I have coresponded about the question on many occasions in the past, in the course of which it became evident to me that he is strangely reluctant to accept the results of his own work, in spite of the patience and skill he devotes to it. He has lately stressed the variability of *dubiosa* in a manner which gives a rather misleading impression of the insect (*Ent. Rec.*, Jan. 1970). I may have been responsible for this by my habit of referring to Röber's figure of *dubiosa* in Seitz as "typical"; it had not occurred to me that as the specimen must have been selected by Röber himself one could do anything else. My description of that figure is exact, but I was not so ignorant of the race as a whole as Mr. Bowden has assumed. In my detailed acccunt of *dubiosa*. written when I first discovered that the insect was of hybrid origin, I called attention to the fact that the typical form was not the only one. As Mr. Bowden ignores what I then wrote it seems best to quote it again here. The paragraph is as follows:—

> "Concerning the superficial markings of *dubiosa* it should be noted that the black apical markings on the upperside of the fore-wings have two quite different appearnces. In one the inner edge of the black forms an even curve, in the other it is irregular and angled. The former is the most frequent and is the type of marking characteristic of *bryoniae*; the other (which is that shown in the figure in Seitz, pl. 20, row C) is frequent in *napi*. These markings appear in all generations and all localities. They are a visible sign of the nature of the race." (*Ent. Rec.* 1966, pp. 63 and 64.)

The recognition of both types is of importance when considering the hybrid nature of the insect. But the recognition of the features of Röber's own specimen is even more important when considering what insect he gave the name to.

EXPLANATION OF PLATE II

1. × *Pieris meridionalis*, male with strong discoidal spot. Calabria.
2. **Hybrid** Corsican × Calabrian, male. (Bred Bowden.)
3, 4 and 5. × *Pieris meridionalis*, female. Calabria.
6. × *Pieris dubiosa*, female (small). Greece.
7. **Hybrid** Corsican × Calabrian, male. (Bred Bowden.)
8, 9 and 10. **Hybrids**, female, Corsican × Calabrian. (Bred Bowden.)

All exactly natural size.

No specimen on this plate was used on Pl. VI, Vol. 81.

The great preponderance of the *bryoniae* type in Mr. Bowden's specimens is probably the result of a long series bred from parents of this type; it does not alter the fact that the form I described (*Ent. Rec.* 1969) as typical, is the most completely developed one as well as corresponding with Röber's specimen. However, as I am satisfied that the race, taking male and female together is unmistakable, and that, which is equally important, the characteristics of *meridionalis* are equally obvious and constant (compare the accompanying plate and pl. VI, *Ent. Rec.*, Sept. 1969), I am chiefly concerned here with the physiological data I previously omitted, which separate the two insects in an unmistakable manner.

Mr. Bowden has often stressed the point (i.e.) that no real understanding of these races could be obtained until they had been bred. He has however bred long series of pure *meridionalis* and crossed these with Corsican specimens. With his usual generosity he gave me specimens from both series, some of which I illustrate on the accompanying plate.

It will be seen that there is a distinct difference in size between the pure *meridionalis* and the hybrids; the *meridionalis* being larger. I drew Mr. Bowden's attention to this point but he considered it to be unworthy of consideration. Yet I find small differences are often instructive; and the difference is very obvious to the eye.

In the hybrids, in spite fo the reduction in size, the discoidal spots in the females are as large, or larger, than in the *meridionalis*, but not quite equal to the dimensions normal in *dubiosa*, except in the small Greek female of the latter (fig. 7). Even in it the spots surpass those in two of the hybrids. The male *meridionalis* is mostly without the discoidal spot upperside fore-wing, in the 2nd generation. When this spot does appear it is mostly very small, or merely just a few black scales. In fig. 1, on the plate, this spot is exceptionally large for this insect, but it does not equal the spot in the hybrids, which in turn do not attain the triangular form characteristic of the fully developed spot in *dubiosa* (as fig. 11, pl. VI, 1969). But it is noteworthy that in the hybrids the spot tends to be angular, as is often the case in *dubiosa* when the spot is much reduced in size. In the females illustrated I have selected three grades of development of this spot; large, medium and small, in both hybrids and *meridionalis*. In each case the hybrids retain their heavier type of development. The same can be said of all the black markings. It must be appreciated that the hybrids are transitional between *meridionalis* and *dubiosa* in every respect.

Such specimens as the hybrids could not be bred from the union of *meridionalis* × *meridionalis*. There can be no question that the small size and heavy type of spots and markings of all kinds in both sexes of the hybrids can only have been inherited from the Corsican parent, and therefore in it such characteristics must be elemental, even if variable. Whatever the Corsican insect may be, these hybrids are a visible, incontrovertible proof that it is impossible that it can be *meridionalis*. It follows that any argument dependent on the assumption that the Corsican and Calabrian insects are one and the same race is without foundation, and cannot be taken seriously, nor will the equally fanciful claim that *dubiosa* is a "myth" help to validate it.

In face of these facts it is surely futile trying to shut one's eyes to the existence of this south-western race any longer, or to try and obliterate it by calling it *meridionalis* or even *"mythica"*!

Two Weeks in Orkney, July-August 1969

By C. G. M. de Worms, M.A., Ph.D., F.R.E.S.

I paid two visits to Shetland, in 1938 and again twenty years later in 1958. I had heard a great deal about the lepidoptera of the Orkney group of islands which lie some sixty miles south of Shetland and just north of the Scottish mainland and how the lepidopterous fauna of these two island aggregates differed. The opportunity came in the summer of 1969 when Mr Ian Lorimer and his wife kindly invited me to stay at their summer residence on the island known as Mainland. The period I chose was when most of the late summer noctuids were likely to be at their climax, at the end of July and in early August.

Accordingly I set out from Surrey quite early on July 30th. By a quick flight from Heathrow with stops at Glasgow and Inverness, I was at the very picturesque airport and town of Kirkwall by midday where I was met by my host. We at once motored the twelve miles to the west to the very nice and spacious manse which the Lorimers had taken over a few years before and which had become their regular summer resort for the main holiday period. It was situated near Orphir at the base of the Scorradale Pass after which it was named and overlooked the vast expanse of the famous Scapa Flow.

I have considered it best to give separate accounts of our activities by day and night and will begin with the former. The afternoon of my arrival on the 30th we returned to Kirkwall and then motored southwards some fifteen miles to the island of Burray which is linked to the mainland by a series of causeways known as the Churchill barrages constructed in the last war. We then made for a large extent of sandhills which was alive with butterflies in the clear and warm sunshine. It was indeed remarkable to see so many on the wing so far north in Britain. By far the most numerous was the large and very brilliant local form of *Polyommatus icarus* Rott. which was flitting about everywhere among the dunes and settling on the marrams. The females were especially spectacular with variations in the orange spots and blue coloration. Many of the very dusky form of *Argynnis aglaia* L. were careering about, the females being very heavily-marked. This grand insect was only quite recently recognised as an inhabitant of Orkney. There were also a few *Maniola jurtina* L. of which we also saw a number beside the main road on one of the intervening small islands. This race too is quite small with bright markings near f. *splendida* and also had been discovered on the Mainland of Orkney by Mr. Lorimer.

Quite a number of moths were to be seen affecting the marram and the profusion of ragwort in the bright sunshine. The most numerous was *Cerapteryx graminis* L. with a good many *Procus fasciuncula* Haworth in a very variegated form with an occasional example of the small and very dark *Diarsia festiva* Schiff. similar to f. *thulei* of Shetland. The geometers were mainly represented by *Euphyia bilineata* L. in a very strongly-marked form with an occasional *Xanthorhoë munitata* Hübn. flushed from the herbage. On our return to Scorradale we went out on the adjoining moors in the early evening and saw *Dysstroma truncata* Hufn., *Entephria caesiata* Schiff. with heavy cross-banding and *Xanthorhoë montanata* Schiff.

The last day of July opened much duller with little sun. After a morning visit to Kirkwall I accompanied Ian Lorimer, his younger son and Mrs Margaret Mere, widow of Robin Mere, to the west coast of the island to a wild region called Yescanaby where in a small bog we saw several *Coenonympha tullia* Müll, while the plateau above the sheer cliff was almost a carpet of the delightful tiny *Primula scotica*, peculiar to our northern shores. Continuing our daytime activities August opened with a dull and misty day with a morning spent in the attractive small town of Stromness with its narrow paved streets. We went on to the famous prehistoric village site at Skara Brae where *P. icarus* was fairly common. That afternoon we did a reconnoitre of Hobbister moor half way between Orphir and Kirkwall which was to be the venue of our night's operations to be described later and I had the thrill of seeing some hen harriers and short-eared owls. Mr. Lorimer swept a number of larvae of *Eupithecia satyrata* Hübn. of the form *callunaria*. The chief collecting on the 2nd was after lunch on a stretch of cliff on the north side of Scapa Flow known as the Breck. Here again *P. icarus* was in fair plenty with a lot of *Colostygia didymata* L. We also saw a *Vanessa cardui* L. August 3rd (Sunday) was the worst day of my stay with heavy mist all day which prevented any daytime collecting. The next day was spent near Scorradale where a rough area adjoining the road to Stromness proved very productive, especially for the Blues with a few Meadow Browns. We also saw at least two *A. aglaia* which my host had not noted previously so near his residence. The 5th turned out a very sunny day which we spent first again at Yescanaby where we took several *C. tullia* and had a grand view of the Old Man of Hoy, the well-known stack on the western coast of that very rugged and mountainous island of that name. *P. icarus* was as usual quite prevalent in this spot which harboured a lot of sea campion in the rocky coves. Mr. Lorimer collected this plant which was well patronised by larvae of *Hadena conspersa* Schiff. obtained in other localities. We moved on to the north-western area of Mainland to a large expanse known as Glims Moss where we again saw *C. tullia* and took some still fresh females. Several *Pieris brassicae* L. were on the wing with the first of the summer brood of *Pieris napi* L. That afternoon we revisited the Burray sandhills which were still alive with Blues, fresh Fritillaries and a few Meadow Browns and nearly all the same noctuids and geometers as we had seen a week before.

It was once more fine and sunny when we motored on the morning of August 6th to a very attractive moorland area known as the Chair of Lyde where the road goes over a pass with high ground on either side and large stretches of heather. Here again *P. icarus* was well to the fore accompanied by a good many *A. aglaia* and one or two worn *C. tullia*. Larvae of *Saturnia pavonia* L., many nearly full-fed, were plentiful among meadow sweet which also yielded a lot of *E. satyrata* larvae. The venue for that fine afternoon was Linne Dale near Orphir where *P. napi* appeared in both sexes with some of the females having a distinctly deep cream ground colour. The Blues were abundant in this spot with an occasional large Fritillary. Among the geometrid moths flushed from the heath were *Anaitis plagiata* L., *Lygris populata* L., *Xanthorhoë munitata* Hübn. and *Colostygia didymata* L. The next day, the 7th, proved rather dull and windy. The first part of it my host

drove me to the north of Mainland to the Brough of Birsay where there was some large patches of butterbur among the sandhills overlooking some of the northerly islands, especially the large Rousay. No collecting was possible that afernoon. The next two days were also less propitious for day work, except in the morning of the 8th when *P. napi* and the Blues were well in evidence in Linne Dale, while Meadow Browns were on the wing in Waulkmill Bay on the shores of Scapa Flow. Both the 9th and 10th of August were very misty in the mornings. However, the sun appeared after lunch which attracted my host and myself to try a small heath near Kirbister Loch which proved to harbour the fine local form of *Dysstroma citrata* L. in plenty. They were easily flushed from heather and meadow sweet. This outing made a fitting final occasion before my departure on the afternoon of August 11th, flying south to London by the same route as I took coming north.

Night activities were on the whole quite productive, starting with outings with portable equipment of which we made only four expeditions, the first of these was on August 1st to Hobbister Moor a few miles to the east of Orphir in the direction of Kirkwall. Accompanied by my host and his elder son we ran our two large mercury vapour lights on the open moor with a Heath trap placed a little way off among the heather, but between 10 p.m. and midnight we only accounted for some 20 species, mainly geometers that we had seen by day such as *C. didymata, L. populata, E. caesiata, X. munitata,* as well as *Lygris testata* L. and *Epirrhoë alternata* L. The chief noctuids were *Cerapteryx graminis* L., *Diarsia festiva* Schiff., *Lycophotia varia* Vill. and *Plusia pulchrina* Haworth. However, conditions were not conducive to our venturing forth by night again till the 7th when I was once more with Ian Lorimer and this time both his sons. Our venue was the Burrays sandhills which we had sampled by day, but it was far too windy for much to patronise our m.v. lights and we found most of our captures on the ragwort heads which produced several *Euxoa tritici* L. and *Agrotis vestigialis* Hufn., in a very pale form, together with many *Leucania impura* Hübn. with smoky hindwings. *O. chenopodiata* and *E. bilineata* were once more much in evidence. The night of the 8th saw my host and myself on the moors above Scorradale where the sugaring of a length of fence running high up proved a blank. However, the searching of the heather revealed quite a spate of geometers, chiefly *E. caesiata, X. munitata, L. populata* and *C. didymata* with an occasional *Stilbia anomala* Haworth. Our last nocturnal outing on the 10th was to the small cliffs of the Breck which overlook the sea. Again scanning the herbage with torches provided a host of *Hydriomena furcata* Thunb. in innumerable forms with a few *S. anomala* and single specimens of *Apamea furva* Schiff. and *Celaena haworthii* Curtis.

Almost every night during my stay my host put the Heath static trap in a propitious location, mostly on the moorland just above the Scorradale pass. He used to collect it early each morning and carefully scrutinise the contents of the receptacle which often harboured some choice insects. In fact the very first night of July 30th it contained three examples of the small and very dark form of *Rhyacia simulans* Hufn. with fresh *Apamea furva* Schiff. as well as many of the very variable dark *D. festiva.* The night of August 5th was notable in that the Heath light in this location produced the only example of *Apamea*

exulis Lef. that appeared during my visit. It was of the small dark form near to f. *assimilis* Doubl. which is prevalent on the Scottish mainland and very different from the large and bright race of this species on Shetland. Further *R. simulans* in this moorland spot appeared on August 8th. But the only *Amathes baja* Schiff. and *Euschesis janthina* Schiff. that we saw came on the 4th to this trap in the garden of Binscarth, a large house to the north-west of Kirkwall and some fifteen miles from Orphir. The night of the 9th brought some 200 visitors to the Heath trap in its usual site on the moors overlooking Scorradale, but the assortment of species was mostly the geometers which we had seen at dusk on the heath such as *X. munitata, E. caesiata* and the first *D. citrata* with a few *S. anomala, C. clavipalpis* and *Amathes xanthographa* Schiff.

Finally it was the large m.v. trap which was run nightly at Scorradale which was the main source of our captures at night, as this was most effective on several occasions, placed as it was on an eminence with the moorland to the north and the sloping grass and cultivated ground on the southern and sea side. The first night of my visit on July 30th there were some 200 visitors of which the commonest species seemed to be *Plusia pulchrina* Haw. and *Unca tripartita* Hufn., but only a single *Plusia gamma* L. Other species included many *Diarsia festiva, D. rubi,* a few *Apamea furva, A. gemina,* black *A. monoglypha, Cerapteryx graminis,* very dark *A. xanthographa,* pale *A. crenata* Hufn. and the inevitable *Triphaena pronuba* L. The most numerous geometer was *X. munitata* on this occasion. The same pattern of insects appeared in the trap the following two nights with the addition of *Plusia chrysitis* L. and *P. festucae* L. as well as *Petilampa minima* Haw. and *Procus fasciuncula* Haw. on August 1st. The night of the 2nd-3rd was indeed a remarkable and very memorable one for the big trap. Not a great flow of insects was apparent during the first hours, but the next morning it was a most fantastic sight with the container alive with a host of *Plusia gamma* L. of which it was estimated there were at least four hundred. It was almost among the last egg cartons we looked at that we got a great surprise and thrill to spot *Plusia confusa* Stephens, never known in such northerly latitudes of our Islands, as already recorded in this Journal (**81**: 282)

Among the some two hundred other moths in the trap was a single very dark *R. simulans,* many *D. festiva,* several *Agrotis ypsilon* Hufn., doubtless also migrants, the usual black *A. monoglypha,* some very dark *A. xanthographa,* some *Diarsia brunnea* Schiff., pale *Apamea crenata, Scotogramma trifolii* Hufn., *Hadena bicruris* Hufn., *Ochropleura plecta* L., *Apamea furva* Schiff., *Plusia pulchrina* Haw., very pale *Hypena proboscidalis* L. The chief geometers comprised *Xanthorhoë montanata* Schiff., *X. munitata* Hübn. and *Lygris populata* L. A most interesting and unexpected visitor was the large Pyrale with translucent wings, *Sylepta ruralis* Scop., apparently not previously recorded for Orkney and another probable migrant. The pattern of species in the trap kept fairly constant for the subsequent nights with most of the common noctuids and geometers already enumerated. Additional species on August 5th were *Plusia iota* L. and *Anaitis plagiata* L., while on 8th surprise arrivals were *Agrotis vestigialis* Hufn. and *Calothysanis amata* L. The former had not been observed away from sandhills, while the latter was a

newcomer to the Orkney list. Other species not noted in the trap before during my visit were *Arctia caja* L., *Amathes castanea* Esp. and *Stilbia anomala* Haw. The following night another unlikely insect for the trap was *Carsia sororiata* Hübn. (*paludata* Thunb.), more often flushed from moorland by day. The last night of my stay, the 10th, brought several *Plusia festucae* and *Caradrina clavipalpis*. A few nights after I left saw the first *Amathes glareosa* Esp. with its melanic form f. *edda* together with *Aporophyla luneburgensis* Frever.

A number of articles have appeared from time to time on the lepidoptera of Sheltand in the general literature, but apparently comparatively little on that of the Orkney group, I have therefore considered it of interest to enumerate as fully as possible all the species that were noted during my stay from July 30th to August 11th so that a check can be kept on the indigenous lepidoptera of these islands.

BUTTERFLIES

Pieris brassicae L. Plentiful in most areas of the mainland that were inhabited. Some specimens were slightly smoky in appearance.

Pieris napi L. Becoming increasingly numerous during the first week of August. Some of the females of the second brood with a distinctly yellowish tinge.

Maniola jurtina L. Both sexes small, the females approaching f. *splendida*. Fairly common on grassy verges and sandhills.

Coenonympha tullia Müller. Occurs on most mosses in the islands in a very pale and spotless form. Seen on Yescanaby and Glims Mosses.

Vanessa atalanta L. Several seen in garden at Scorradale and elsewhere.

Vanessa cardui L. A few observed in various parts of the Mainland including Scorradale. Dr. Guthrie reported having seen thirty on Rousay.

Argynnis aglaia L. Common on Burray Sandhills sporadic on moors; females very suffused.

Polyommatus icarus Rott. Abundant both on moorland and most sandhills in a very large and bright form with some very blue females.

MOTHS. SATURNIIDAE

Saturnia pavonia L. Nearly full-fed larvae plentiful mainly among meadow sweet on most moorlands.

ARCTIIDAE

Arctia caja. Only one late specimen of this Tiger in the trap on August 8th.

NOCTUIDAE

Euxoa tritici L. A few examples in a bright form on Burray sandhills.

Agrotis vestigialis Hufn. A very pale sandy form at Burray and one in trap at Scorradale.

Agrotis ipsilon Hufn. A number in the trap at Scorradale on August 2nd.

Lycophotia varia Vill. Quite numerous at light in rather a large form

Rhyacia simulans Hufn. All nine examples seen were of the very dark and small form, obtained in the vicinity of Scorradale.

Diarsia brunnea Schiff. A few in the light trap at Scorradale in a small form.

Diarsia mendica F. (*festiva* Schiff.). Very plentiful on sandhills and in all traps. This small form appears in most instances to be much more melanic than *f. thulei* on Shetland.

Diarsia rubi Veiw. Common in the traps in a large and bright form.

Ochropleura plecta L. A few almost nightly in the traps.

Amathes castanea Esp. Only a single dark example in the big trap at Scorradale on August 9th.

Amathes baja L. Only obtained in Heath trap in garden of Binscarth near Kirkwall.

Amathes c-nigrum L. A few at light in rather a large form.

Amathes xanthographa Schiff. Plentiful at light with some very melanic examples.

Euschesis janthina Schiff. Only one specimen in Heath trap at Binscarth.

Noctua pronuba L. Plentiful most nights in the traps.

Scotogramma trifolii Hufn. Only one example in Scorradale trap.

Hadena conspersa Schiff. Larvae numerous in sea campion with imagines less dark than Shetland.

Hadena bicruris Hufn. Several at light at Scorradale.

Cerapteryx graminis L. One of the commonest visitors to light and to ragwort in most variable forms, some of which were very striking.

Leucania impura Hübn. Only seen on Burray. All specimens had melanic hindwings.

Stilbia anomala Haworth. Both sexes fairly common in a small form in the traps and on heather bloom.

Caradrina clavipalpis Scop. Several examples in the traps, somewhat large.

Apamea monoglypha Hufn. Both the black and the brown forms equally common.

Apamea crenata Hufn. A few at light with very pale markings.

Apamea furva Schiff. A number in fresh condition in traps, though not plentiful.

Apamea remissa Hübn. (*obscura* Haworth) Fairly common in trap in rather a pale form.

Apamea secalis L. Fairly numerous on most nights and very variable.

Apamea exulis Lef. Only one small example taken near Scorradale on August 5th. A very dark and obscure form near f. *assimilis*, and very different from the large and bright Shetland race.

Procus fasciuncula Haworth Common at light and on ragwort both by day and night in a bright form.

Phlogophora meticulosa L. A few in the trap at Orphir.

Peti-lampa minima Haworth Fairly common and seen most nights at light.

Celaena haworthii Curtis One specimen seen on flowers near the Breck on August 10th.

Plusia chrysitis L. Very numerous in the traps nightly.

Plusia festucae L. About a dozen seen at light during the period in a very bright form.

Plusia iota L. Only one specimen in trap at Scorradale, apparently rare on Orkney.

Plusia pulchrina Haworth One of the commonest visitors to the traps, a large and brilliant form.

Plusia confusa Stephens The appearance of a male of this species in the trap at Scorradale on the night of August 2nd-3rd made entomological history, as this species had never been recorded in Scotland There are possibly six previous records for the British Isles.

Plusia gamma L. Seen on most nights in the trap at Scorradale with some 400 on August 2nd, evidently part of a huge migration.

Unca tripartita Hufn. Very common in the traps almost nightly in rather a pale form.

Hypena proboscidalis L. Several at light in a large form with very pale ochreous ground colour.

GEOMETRIDAE

Calothysanis amata L. This was a surprise visitor to the Scorradale trap on August 9th, as it was not on the Orkney list.

Xanthorhoë spadicearia Schiff. A few seen at light and on the moorlands.

Xanthorhoë montanata Schiff. A few at light and at heather in a small form.

Xanthorhoë munitata Hübn. Very common in the traps and on heather and ragwort and much less ochreous than the Shetland race.

Colostygia didymata Haworth Abundant on moorlands by day and common in the traps in a small dark form.

Colostygia pectinataria Knoch A few seen at the Chair of Lyde.

Perizoma alchemillata L. Only one specimen in the trap at Scorradale on August 9th.

Euphyia bilineata L. Mainly seen by day and night on the Burray sandhills with a few in the trap at Scorradale, a well-banded form.

Lygris populata L. Common at light and by day on moors in varying forms, some deep brown.

Dysstroma truncata Hufn. A few at light, mostly somewhat worn.

Dysstroma citrata L. Began to appear the second week in August in a very well-patterned and mottled form both in the traps and and flushed by day from heather and meadow sweet.

Hydriomena furcata Thunb. Abundant after dark on heather and other herbage mainly along the coast at Breck.

Epirrhoë alternata L. A few in trap at Scorradale and on the adjoining heath, much smaller and duller than the Highland race.

Carsia sororiata Hübn. (*paludata* Thunb.) Only a single specimen in the trap at Scorradale on August 9th, though found locally on the moorland.

Ortholitha chenopodiata L. Common at light and by day in most localities.

Eupithecia venosata F. Larvae numerous in sea campion, a paler form of the moth than in Shetland.

Eupithecia satyrata Hübn. Larvae plentiful, chiefly in meadow sweet. The imagines approach f. *curzoni*.

Ematurga atomaria L. A few late specimens seen on the moors, a small dark form.

PYRALIDAE

Sylepta ruralis Scop. A few in the trap at Scorradale on the night of August 2nd-3rd, a newcomer to the Orkney list and a probable migrant.

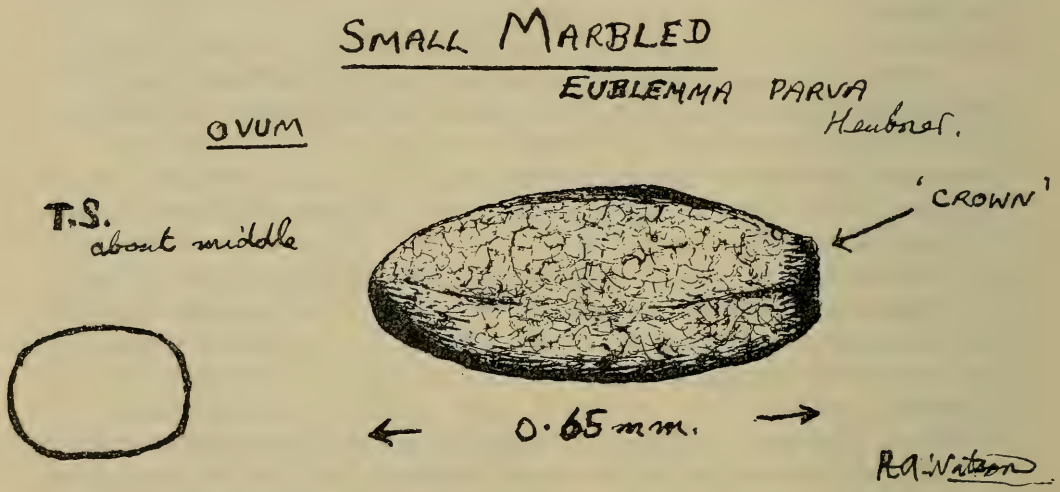
As will be noted, surprise absentees from the above list are the Hydraecias (Ear Moths), none of which appeared at light or on flowers.

From the foregoing account it will be appreciated what a most delightful part of the world the Orkney Islands have proved not only for collecting lepidoptera, but also for scenery and for studying other branches of natural history. For my own part this was all the easier and more enjoyable through the kindness and hospitality of my hosts, the Lorimers, to whom I owe a great debt of gratitude.

The Early Stages of *Eublemma parva* Hübner (Lep. Noctuoidea)

By R. A. Watson

On the night of the 13th July 1968, I captured a specimen of *Eublemma parva* Hübn. (the small marbled), at light. After a hasty determination of the sex as male, it was put into the killing jar, but I then saw it was



female, and removed it and attempted to revive it in vain. One ovum, however, had been laid. The female specimen is now in my collection. The ovum was kept and eventually produced an adult. The following is adapted from my notes written at the time:—

The ovum is very pale straw colour. It remains this colour until one day prior to hatching, when the "crown" end becomes blackish, the rest brown. The ovum is 0·65 mm. long (to the nearest 0·05 mm.). In transverse section about its middle it is of the shape of the space enclosed by an 'o' of the print of this journal. One end is rounded, the other is squarish with an uneven, crown-like edge.

The ovum hatched on 21st July 1968. The newly hatched larva is slow moving, the body is very pale pinkish ochre with a slightly darker dorsal stripe. The head is shining black. There is a black-brown prothoracic plate and a paler brown anal plate. The larva was supplied with picked flower heads of *Pulicaria dysenterica* L. (common fleabane). The flowers were far from flowering at this time, being still quite green. The larva disappeared, but on the 28th July the flower heads were picked to pieces carefully, and the larva discovered, quite large, having, in my estimation, passed two ecdyses. It is rather maggot-like, pale cream with a pinkish tinge, the head shining black, the prothoracic plate still present, but no anal plate, and no hairs noted. The larva continues to feed on

fleabane flowers. It feeds below the florets, taking the ovaries, except their extreme base, also the lower part of the corolla including the nectary.

Description of larva on the 12th August 1968, in its final stage before pupation is as follows:—1) uses silk, and moves out of one flower into a fresh one. 2) The body colour is pale yellowish ochre with a greeny blue tinge. Longitudinal lines are purple tinged brownish red; outlining the dorsal line, which is of the body colour, fading inter-segmentally; the lateral lines absent intersegmentally, the spiracular line only present mid-segmentally around the spiracles, which are black. There are small shiny black warts arranged in three longitudinal pairs of lines, one wart per segment, one line just below dorsal, one above and one below the spiracular line. Each wart bears a few hairs, short black and longer white ones. The head is black and shiny with a notched crown. There is a black shiny pro-thoracic plate divided posteriorly. The thoracic limbs are shiny black.

3) Its shape is tapering slightly from about segment 7 posteriorly, and in the thoracic segments. Only two pairs of prolegs plus a pair of anal claspers. Length 9·5 mm. on the 12th August. Total length attained 11 mm. The cocoon is spun beneath the ray florets of a flower with the florets curled down over it. It is tough, though thin, and incorporates pieces of florets. The pupa is pale orange brown, darker dorsally in mid-segment; the eyes, wings, head and thorax are tinged green. It has a smooth, rounded appearance. The spiracles are black. Length 6·5 mm. The anal end is flat with a stubby point, two longer slender ones either side and four pairs of smaller slender ones between. The imago emerged at mid morning on the 25th of September 1968.

The specimen is a male and is now in my collection; it is unusual in its coloration the whole insect being very much darker than usual (and its parent) the shading anterior to the inner line, and from the apex to the tornus is very dark brown. The central band is dull purplish grey. The four dots, discal, apical, tornal and "basal" are still represented by black scales. The hindwings are grey, cilia are paler with two darker lines. The insect, during rearing, was kept very closely to normal outdoor temperatures.

On the 13th of August, a young *Eublemma parva* larva was discovered in a collected flower head, and on the 15th I returned to the place where I had gathered this flower and discovered another four larvae over an area of about 5 sq. metres. This group of flowers is about 500 metres from my house, where the female was captured. None were found in any other flowers in the district, nearer or further from the house.

The 15th was a calm, warm sunny day; the following was observed on this day and on the captive specimens about their method of feeding which helps to decide which flowers have been attacked by the larvae:—1) grey-black line of dead florets from the outer edge to the middle indicates a young larva. If larva is placed in the centre of a flower head it moves to the edge to begin feeding, pushing down between the ray and disc florets. 2) Slightly raised florets, which when picked out have their ovaries missing, on a straight line indicate an older larva. 3) Raised florets, florets dropping out, or missing if windy, (a) around the edges where only these have opened, or (b) all over the flower if opened indicate a full fed larva (possibly a pupa in the flower head.) It is

realised that similar symptoms may be caused by other organisms. When searching, I found dead centre florets produced a very small maggot (which I did not identify).

Three larvae pupated all close to the flowers, one actually in the flower head, all incorporating pieces of florets with their cocoons.

On the 25th August whilst visiting the Severn Wildfowl Trust at Slimbridge I noticed large areas covered by fleabane, and searched many patches, and discovered two patches with evidence or larval feeding, and one larva, which, however, unfortunately died.

Three imagines emerged from the collected larvae, 29th September a female now in the Gloucester Museum, with similar coloration to that of the specimen reared above: 3rd October a male specimen released: dark coloration, but not as dark as the above-mentioned. 5th October a female again released, similarly dark but less so than the preceding.

A male specimen of *Eublemma parva* was captured on 8th July 1968, previous to the capture of the female, and is now in the Gloucester Museum.

Vine Tree Cottage, Northwood Green,
Westbury on Severn, Glos. GL14 1NB. 1.i.1970

Collecting in the Austrian Tyrol, 1968

By G. Prior and Mrs B. Prior

My reason for writing the account of yet another collecting trip on the continent is to show that an enjoyable holiday and a rewarding collecting expedition can be had on one of the package tours run by one of the popular travel firms. It is necessary to pick a reliable travel firm, and to choose the time and locality with care. Austria, Switzerland and Italy are good and well served by the travel firms. These tours have certain advantages, moderate price, no worries about organisation; one has only to provide oneself with a British passport and pay the travel agent; trains, ship, and hotel are taken care of and one can concentrate on the main purpose of the exercise, collecting. There is the further advantage that the 'V' Form deduction is quite small, in our case £19, thus leaving you with a good deal of spending money on one trip, or, bearing in mind the sterling that one may take, two holidays.

My wife and I chose a tour to Tarrenze in the Austrian Tyrol, run by Cosmos Tours Ltd., from June 22nd to July 6th., travelling by sea to Ostend and then by coach all the way to the destination, via Luxembourg and Germany.

We presented ourselves at Victoria Station at 7.30 a.m. and were ushered to our seats on the train, we crossed the channel from Folkestone and arrived at Ostend at about 2.30 p.m. After a little delay we embussed and drove to Brussels for a tea stop and then on through the Ardennes to Marche for dinner. In the previous years on this kind of tour we had travelled by day only, this year we chose one with night travel, to save time and the dreary German Autobahn. I confess that I was apprehensive at the thought of driving through the night, but I need not have worried. It remained light till 10.0 p.m. and when we stopped for a coffee break at Pforzheim at 3.30 a.m. it was already growing light, and we drove through Ulm at 6.0 a.m. in bright sunshine. Stopping for

breakfast at Memmingham, we crossed into Austria at Fussen, and on to Tarranz via the Fern Pass, arriving there about 11.30 a.m. having been delayed by a religious festival at Nassereith. After being installed in the Hotel Lamm, a 15th century building, we lunched and then lost no time in setting forth on our first collecting foray.

We walked in the hot sunshine towards the Schloss Starkenburg but I was disappointed to see that many of the meadows had been cut and not a great many butterflies were on the wing. These were mostly, *A. hyperantus* L., *L. sinapis* L., *A. cardamines* L. and of the blues, *L. coridon* Poda. and *P. icarus* Rott.

Tarrenz is a tiny village in the valley of the Gurgl at about 2,800 ft. above sea level. The floor of the valley which runs east and west is quite flat and fairly wide at this point. The northern side slopes fairly gently upwards with meadows and woods, but the southern flank is much more precipitous densly covered with pine and almost unclimbable.

Monday commenced dull, and we walked in the direction of Strad but again we found the meadows partly cut and not too many insects in evidence. *P. hippothoe* Rott. we saw for the first time and *C. australis* Vty. was flying together with *L. sinapsis* L. and *L. bellargus* Rott. but by far the greatest number of insects out were *O. atrata* L. The Chimney Sweeper, was swarming everywhere and throughout the whole of our stay we found him almost an "Aurelians Pest". Quite a number of Zygaenidae were sitting on the flower heads. We collected some of these and these were determined much later after our return to England by Mr Tremewan, to be *Z. lonicerae* Esp., *Z. loti* Esp. and a third *Z. purpuralis* Brünn. In the afternoon we walked to Imst but again the butterflies were disappointing in number and variety. *A. hyperantus* L. and *M. jurtina* L. predominating.

On Tuesday we went for the first of the three sightseeing tours that are included in the cost of the holiday, to Innsbruck, where we spent the day visiting some of the interesting parts of this ancient city. We saw a few *C. australis* flying in the town, and visiting the Olmypic ski run, I took an *O. venata* Bret Gray. on the base of the statue of Andreas Hofer. The next day being hot and sunny we worked the northern slopes of the valley towards Obtarrenz, with better luck. Here we found respectable numbers of *Ceononympha iphis* W.V. and *Coenonympha arcania* L. flying together with *Coenonympha pamphilus* L. we also found our first fritillaries, *Melitaea athalia* Rott. was fairly frequent, and we took for the first time *Brenthis ino* Rott. The Pierid butterflies, *brassicae, napi* and *rapae* were flying in company with *C. australis, L. sinapis* and *A. cardamines* L. *P. icarus* together with *L. coridon* and *L. bellargus* were flying in company in the yet uncut meadows. On the steeper slopes we found for the first time *Dira maera* L. which was not uncommon and *D. petropolitana* which was. It was on the whole a fairly successful day and did much to restore my confidence after seeing so many of the cut meadows.

Thursday was spent in another of the sightseeing tours. This time we journeyed into Bavaria to visit Oberammergau. Visiting the famous Passion Play Theatre and the beautiful churches and shops took up the whole of the day and nothing was seen of butterflies. In the evening one of the ladies on the tour whose son happened to be an entomologist, and who had watched with interest, my wife and I setting out each morning

with our nets told us that she had seen a large Hawkmoth in the ladies' toilets in the basement, and that if I would give her a box she would secure it for me. So gathering some boxes we all trooped down to the basement. My wife and the lady reported that though the Hawkmoth had gone, there were a great number of other moths on the ceiling and walls, also that the place was empty. So whilst the good lady kept sentry on the door to explain my presence, my wife and I spent the next ten minutes boxing every thing that we could reach. We took fourteen moths on this occasion and thereafter the two of us crept downstairs very early each morning to collect in this somewhat unusual 'trap'. We rarely took less than twenty specimens and they were of a great variety of species both micro and macro. The Burnished Brass and the Small Magpie were the commonest species, but we also took the micro *Crambus silvelus* Hübn.

On Friday morning we again worked the slopes to Obtarrenz, and though the butterflies were quite plentiful nothing new was seen except the fritillary *Melitaea diamina* Lang. and a fine *V. cardui* L. and two or three *A. urticae* L. These were about the only *Venessids* that we saw. In the afternoon we walked to beyond the Schloss Starkenburg through fields and pine woods. We were fortunate in finding a large uncut meadow surrounded by woods which was a blaze of alpine flowers. Over this lovely spot the butterflies and moths were flying freely. *Colias hyale* L. as well as *C. australis* Verity, were here, the blues *icarus* and *bellargus* as well as *P. hippothoe* L., several skippers were also present, these were *A. lineola* Ochs. and *O. venata* Br. et. Gr. On returning to the hotel through the pine woods we found large numbers of geometers easily disturbed from the bushes, these were of the carpet and wave families.

The hotel providing us with packed lunches when we desired them we decided to spend the whole day working the south slopes of the valley above Obtarrenz, for our Saturday expedition.

The morning began rather dull and very little appeared on the wing, but the sun shining brightly after lunch we had better luck. In the centre of some cut meadows a strip of about six feet and about a hundred yards long had been left and this was teeming with insect life. Here my wife took the only *Issoria lathonia* L., which we saw on the trip, and we encountered that lovely butterfly the Black Veined White, *A. crataegi* L., several blues were flying in this little patch mostly *L. bellargus*, but also one or two *Glaucopsyche alexis* Poda. Continuing higher up into the pine stands, we encountered further of the fritillaries, *B. ino* Rott.. and *M. diamina* Lang. were there as well as *A. euphrosyne* L. *L. sinapis* L. was quite common with a few *C. australis* Vty. Apart from the lepidoptera encountered we came across quite remarkable numbers of beetles. The hedgerow trees and bushes at the sides of the track leading up the hill and which consisted chiefly of Elder, Sambucus nigra, Wayfaring tree, *Viburnum lantana*, and Dog Rose. *Rosa canina* seemed to be covered with beetles. These were the large creatures that the locals call Der Goldener Kafer and is *Cetonia aurata* L., also others unidentified. Sunday was very hot and sunny and we walked to Strad, and it was on the way to this small habitation that we struck the proverbial oil. At the edge of the northern slopes of the valley, by a small lake we came on an area of rough ground, the kind of location described in so many descriptions of alpine valleys. Butterflies and moths were swarming everywhere, the

three larger fritillaries *Argynnis cydippe* L. *A. aglaia* L. and *Fabriciana niobe* L. were flying freely, the smaller ones *B. ino, A. euphrosyne, M. athalia* and *M. diamina* were everywhere, *A. crataegi* was fairly common in company with the other whites. A good many *P. napi* were about and these were so well marked as to be almost intermediate with *bryoniae*. The Lycaenidae were well represented with *P. hippothoe, L. bellargus* both common and we also came across *Cyaniris semiargus* Rott. and a specimen of *Maculinea arion* L. for the first time. Whilst my wife concentrated on the level ground I climbed with some great difficulty the wooded slopes. I managed to capture the only *P. bryoniae* I saw this time but was a great deal luckier with the great many geometers that seemed to swarm in these woods on the slopes. We returned in the afternoon and paused only to refresh ourselves occasionally at the local bierhaus.

On Monday we went on the third of our excursions, this time a trip to Bolzano in Italy. We went via the Brenner and Vipiteno through the Dolomites, and though the scenery was beautiful Bolzano proved to be a most uninteresting town. The only lepidoptera seen were the inevitable *O. atrata,* when we stopped to view the Europa bridge.

On Tuesday we took the Post Bus, that most excellent system of transport that operates in Austria and went to Nassereith. Taking heed of a notice which said "Zum Alpenrose", we followed a track across the meadows, to where a strip of rough ground and trees and bushes ran at the foot of the steep hillside. Here again we found that profusion of butterflies and moths that we had found on Sunday at Strad. We noted at least twenty-five different species and among these were *Erebia ligea* L. which was flying among the Alpen Roses on the hillside. *A. crataegi* was quite common, and it was an interesting sight to see a pair of them in cop on a scabious head whilst a second male was awaiting his turn on an adjacent head.

Wednesday was spent visiting Innsbruck to see over the palace of Maria Theresa and the churches and museums.

Thursday as our last collecting day, we decided to go to Imst and from there climbing the hill to the point of departure for the chair lift. From here we were taken by chair to a point about 4,800 feet above sea level.

On the way up to the chair lift it was surprising to see so many *L. coridon* flying by the side of the road in company with various fritillaries. At the top of the chair lift we found it much colder and the vegetation much sparser. We also found considerably fewer insects but among the butterflies flying in any numbers were the Erebias, *E. ligea* L., *E. euryale* Esp., and *E. oeme* Hubn. A few *C. australis* flew along very fast and *D. maera* was also in evidence as were a few blues. Returning in the afternoon via a magnificent gorge to sample the fine scenery we were caught in a storm of truly Hollywood dimensions and were drenched to the skin in a few minutes. Sheltering in a barn we were discovered by the kindly Austrian household, who insisted on our entering the house and drying ourselves and even provided us with some dry clothing, so that we arrived back at our hotel only a little damp.

On Friday morning we started off for the return home, this being through the Vorarlberg via the Arlberg pass. Then into Switzerland skirting Lake Constance and halting at Arbon for lunch. Then into Ger-

many via Schaffenhausen, and on through Donauseschingen to the marvellous Rhine Falls. Here we stayed a while, before going through the Black Forest to leave Germany by crossing the Rhine at Strassbourg. Crossing a very uninteresting part of France we entered Luxembourg, and finally arrived at last in Ostend in time for breakfast and so home. In 1969 we did a similar tour to the Italian Riviera but found that we were a little too early for the best collecting. In 1970 we plan to go again to Tarrenz but later to see if we can perhaps see the later emergers.

The following butterflies were recorded. In addition some sixty species of moths were noted.

Leptidaea sinapis L. Common everywhere.
Anthocaria cardamines L. Common.
Pieris brassicae L. Fairly frequent.
P. napi. Common.
P. rapae. Fairly common.
P. bryoniae Ochs. One only worn.
Aporia crataegi L. Common in a few localities.
Gonepteryx rhamni L. One only worn.
Colias hyale L. Two or three.
C. australis Verity. Frequent.
Melocia athalia Rott. Common.
Melitaea diamina Lang. Very common.
Issoria lathonia L. One only worn.
Brenthis ino. Rott. Quite common.
Argynnis euphrosyne L. Quite common.
A. niobe. In one locality only.
A. aglaia L. One locality only.
A. cydippe L. Two localities only.
Vanessa cardui L. Two or three only.
Inachis io. L. One only worn.
Aglais urticae. Very few seen.
Dira maera L. Common.
Maniola jurtina L. Very common.
Aphantopus hyperantus L. Very common.
Pararge petropolitana F. Scarce.
P. aegeria L. Scarce.
Erebia euryale Esp. Fairly common one locality.
E. ligea L. Fairly common two localities.
E. oeme Hbn. Scarce.
Coenonympha pamphilus L. Common.
C. iphis W.V. Common.
C. arcania. Common.
Palaeochrysophanus hippothoe L. Common.
Maculinaea arion L. Scarce.
Lysandra coridon Poda. Common.
L. bellargus Rott. Vary common.
Polyommatus icarus Rott. Very common.
Cyaniris semiargus Rott. Very scarce.
Glaucopsiche alexis Poda. Very scarce.
Ochlodes venata Brat Gr. A few.
Thymelicus lineola Ochs. Quite common.

Stigmella betulicola nanivora (Pet. 1927) (Lep. Stigmellidae) in Britain

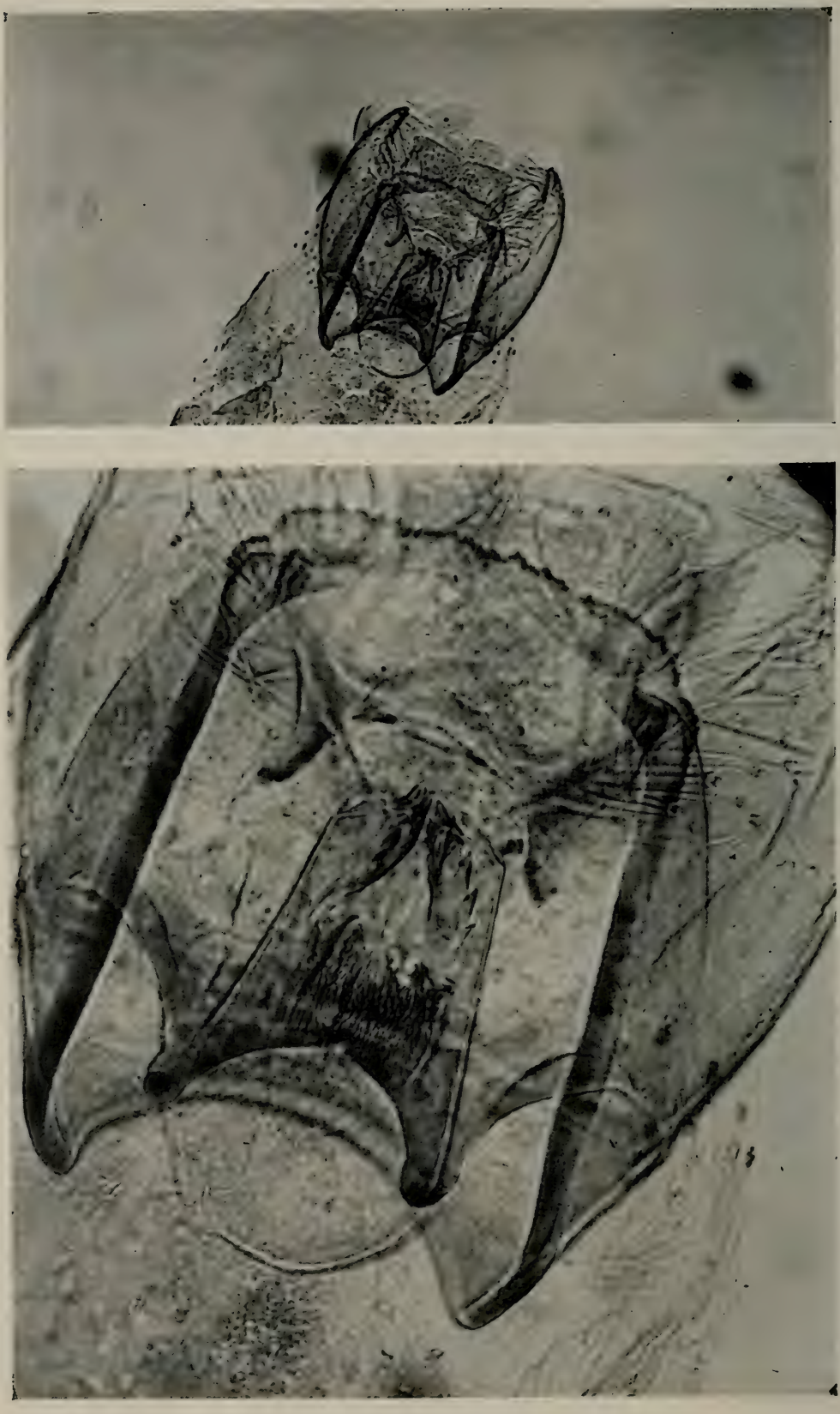
By S. C. S. Brown

This species ranks with *Stigmella acetosae* (Stt.) as being the smallest known Lepidopteron, having a wing expanse of only 3 mm. As far as Britain is concerned it is of special interest, as it is one of the few truly alpine species, being attached to *Betula nana*. It has been known for over a hundred years that a species of Nepticulid mined the leaves of *B. nana* in the larval stage. In the Stainton collection, now in the British Museum (Nat. Hist.), there are several bred by F. Buchanan White from *Betula nana* with dates from August 1856 to May 1870. They are in the series under the label *betulicola* Stt. In the E. R. Bankes collection, which is also in the British Museum, is a long series of a Nepticulid placed apart from *betulicola* with a data ticket below stating that they were bred in 1895 from mines on *B. nana* supplied by W. Salvage from Perthshire. In his diary No. 3, p. 61, dated May 31st, 1895, Bankes has made the following entry: "Nep. *betulicola* bred from cocoons received from W. Salvage on Nov. 12th, 1894, who found the larvae swarming in leaves of *Betula nana*, among mountains in Perthshire on Sept. 15-16, 1894. The heads are darker than in typical specimens, and in some individuals they are black." Tutt, in his *British Lepidoptera*, 1899, Vol. I, under *Nepticula betulicola* Stt. quotes W. H. B. Fletcher: "The moths that I bred in September, 1894, from larvae feeding in leaves of *Betula nana*, and sent to me from Rannoch, by Salvage, may be this species, but they are smaller, have black heads in both sexes, and the fascia is distinctly more silvery and less golden, and the apical cilia have more whitish scales, especially near the costa, than those bred from *B. alba* and obtained in Tilgate Forest and Abbott's Wood. I am by no means convinced that the northern insect is identical with our southern *N. betulicola*." According to Tutt, the other localilties in Perthshire where this Nepticulid has been found on *B. nana* are Ben Chearan and Strathglass. No further development was to take place until 1926, when Petersen reared a considerable number of a Nepticulid from *B. nana* found on boggy moors at a high elevation in Estonia. His conclusions as to the identity and status of this species are expressed in some considerable details in his *Die blattminierer-Gattungen Lithocolletis und Nepticula* 1930. He pointed out differences in the mine when compared with that of *betulicola*. He could only find the mines in September, and concluded that it was single-brooded. He considered that it was not strictly attached to *Betula nana* but could occur on hybrids between that and other species of birch. He could find no difference between the imago of *nanivora* and that of *betulicola*, nor could any distinguishing characters be detected between the genitalia. His conclusions were that it was a biological species very closely attached to *betulicola* and hence named it var. *nanivora*. He figured the male genitalia of *betulicola*.

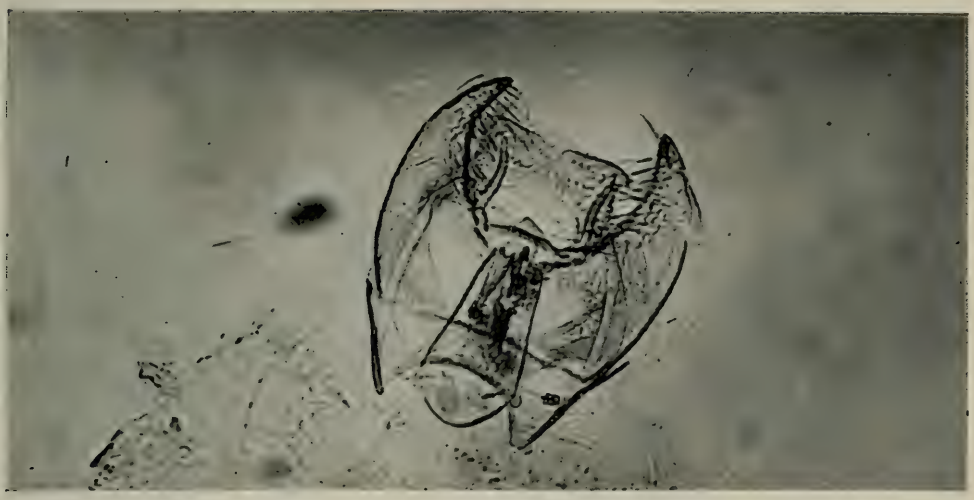
Hering, 1935, *Die Blatt-Minen Mittel-und Nord-Europas I* 105, gives it specific rank: *Nepticula nanivora* Pet.. For the distribution, Estland and Poland. Hering, 1951, *Biology of the Leaf Miners* writes: "It is conceivable that changes may occur in the choice of food-plant within a measurable space of time. Species which originally favoured monophagy

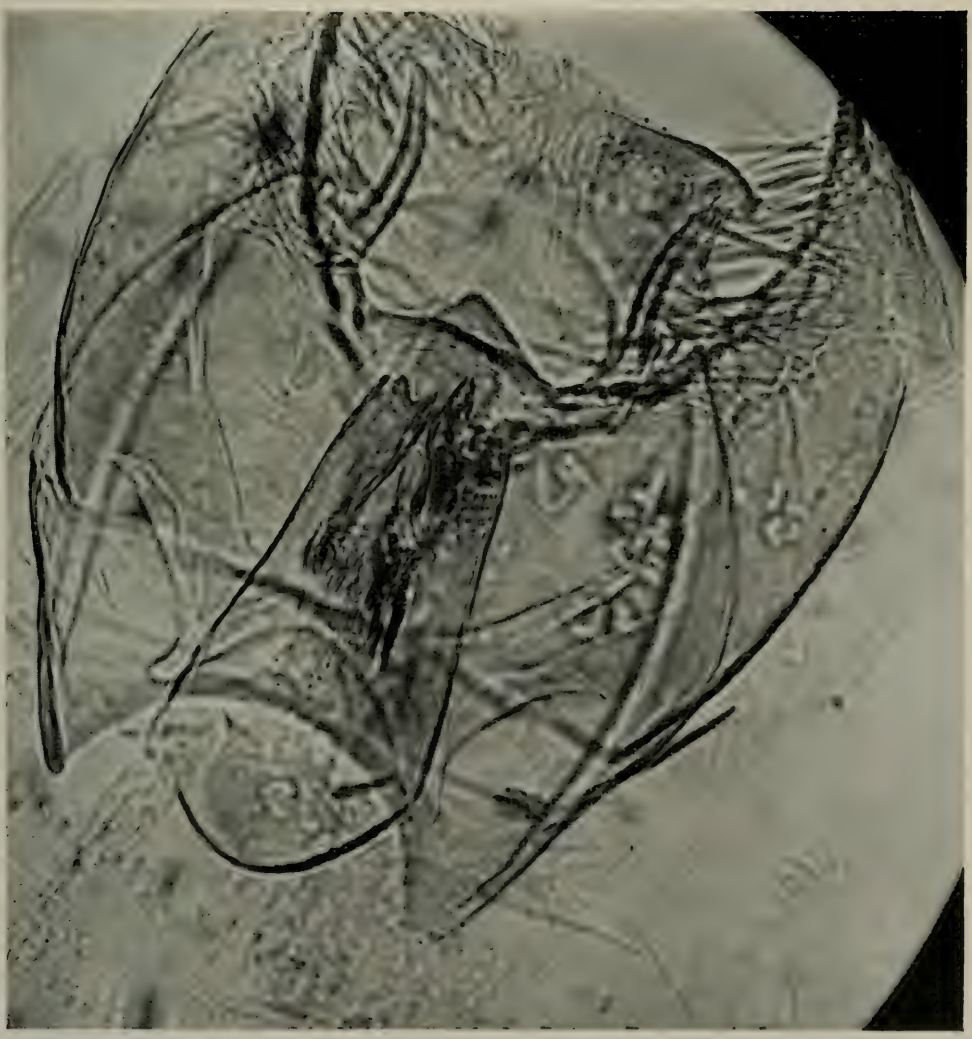
(first or second degree) may change over to monophagy (third degree). Bridging species may play a special role in facilitating this. Petersen, for instance, accepted that *Nepticula nanivora* Pet. which was restricted to *Betula nana* L. developed from *N. betulicola* Stt. mining *B. pendula* Roth. and *B. pubescens* × *nana* which was quite frequent in the localities of *N. nanivora* Pet. This supposition seems quite valid and might well be applied to the occurrence of *Lithocolletis* which are normally limited either to sallows or willows, on species of the other group. Presumably a species might well originate in this way, by the transfer of strictly monophagous species to other food-plants via hybrids between the two." Hering, 1957, *Bestimmungstabellen der Blattminen von Europa*, gives *nanivora* Pet. as a good species. He describes the mine and gives for its distribution the Baltic region, Central Europe, and Great Britain. In 1963 I was in correspondence with Carolsfield-Krausé of Denmark about the status of *nanivora* Petersen. His views were that although *nanivora* varies somewhat in the colour and breadth of the fascia, the imago cannot be differentiated from that of *betulicola* Stt. The genitalia, however, are quite distinct, both in the male and in the female. Recently I wanted to obtain his opinion on other problems relating to *nanivora*, but his death, which has been a great loss to the students of the Stigmellidae, has unfortunately prevented this. Dr. Klimesch, with whom I have been in correspondence on this matter, considers that *nanivora Petersen* is a biological variant of *S. betulicola* Stt. He points out that *Stigmella continuella, woolhopiella* and *argentipedella* also occur on *Betula nana*. Finally the opinion of Dr. A. Borkowski as expressed in his "Studien an Stigmelliden" 1969, *Polskie Pismo Entomologiczne*, is that *nanivora* is a sub-species of *betulicola*. Bryan P. Beirne, 1945, *The Male Genitalia of the British Stigmellidae*, did not figure the genitalia of *betulicola* Stt., as he did not have any material available, nor did he mention *nanivora* Pet.

I am indebted to the Trustees of the British Museum (Natural History) for permission to examine the genitalia and prepare slides of a number of specimens from the E. R. Bankes's Collection bred from *Betula nana*. I could not find any difference between the genitalia of these and those of *betulicola* Stt. bred from *Betula pubescens* from my own collection. In Britain *Betula nana* occurs very locally from 800 to 2800 ft. in Northumberland, Peebleshire, Perthshire and Argyll to Sutherland. It is unknown in Ireland. It has probably decreased during the last century due to fires, sheep, and the increase of the red deer. To judge from plant-remains which have been found in post-glacial deposits, *Betula nana* was widely spread over much of Britain during the Subarctic period of the late Palaeolithic, which dates from about 18,000 to 7,500 B.C. As the country became free of the ice-cap, which covered so much of the country, *Betula nana* would have advanced fairly rapidly northwards occupying the tundra-like terrain which was characteristic of this period. Other shrubs accompanying it would have been *salix lapponum* and *S. arbuscula*. Close behind would have followed *Betula pubescens*. As climatic changes took place, firstly into the Preboreal and then into the Sub-Boreal period, the lowland conditions would have become unsuitable for these plants, and they could have only existed on the mountain tops, situations where they are found at the present time.



♂ genitalia
"betulicola Stt." above × 100, below × 400.





♂ genitalia
"nanivora Pet." above × 100, below × 400.

My thanks are due to the Trustees of the British Museum (Natural History), Dr. M. Speight for taking the photographs, and to Mr. Sterman of Bournemouth for the translation of the relevant part of Petersen's work. I am grateful to Mr S. N. A. Jacobs for his drawings of the leaf-mines.

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CORRECTION. Title on p. 85: for Shetland read

Scotland

Notes on Spring Butterflies in North-east Shetland and Orkney

By Arthur M. Shapiro
Department of Entomology and Limnology, Cornell University, Ithaca, N.Y., U.S.A.

While participating in a field investigation with Dr H. B. D. Kettlewell in June 1969, I was able to do some general collecting in Sutherland (Spinningdale, Dornoch, Helmsdale) and Caithness (Lybster, Tofts, Keiss, Scrabster) and on Hoy (Orkney). Fine, warm weather at the beginning of the month brought out species which had been delayed by what was universally described as a cold, late spring. After the 14th it turned blustery and unsettled. Nonetheless, eleven species of butterflies were found, six on Hoy. The northern end of Hoy is mainly heather and sedge moor, with pockets of arable land at Rackwick Bay and near the Hoy post office. There is also extensive, but less mature, moor on the mid-east coast (e.g., at Muckle Rysa). The Hoy data tend to corroborate and supplement those for Orkney Mainland reported by De Worms (1969).

Coenonympha pamphilus L. Fresh male, Helmsdale harbour, 8 June. Rough ground below the cliffs.

Coenonympha tullia scotica. Beginning 22 June on Hoy, becoming common on the moors within a week: Rackwick, Berriedale, Muckle Rysa.

Brenthis euphrosyne L. Fresh male, Spinningdale, 4 June.

Nymphalis urticae L. After the Whites, the commonest butterfly in Sutherland and Caithness. Usually near dwellings, but one was taken in desolate country 2 miles north of Dornoch, 4 June; Lybster, abundant, 5 and 9 June, flying at 7.10 a.m. on the latter date, down the main street; and elsewhere. This species was not seen on Hoy, but was said by residents to occur there.

Vanessa atalanta L. Seen, Keiss harbour, 10 June; female, Lybster, 11 June; seen, Rackwick, 17 June. The Lybster specimen landed at my feet in front of my hotel.

Vanessa cardui L. A worn female, Rackwick, 22 June, evidently the adavnce guard of the large numbers seen by De Worms on Orkney Mainland five weeks later.

Lycaena phlaeas L. Common and fresh, Helmsdale harbour, 7-8 June, on rough ground below the cliffs, with *C. pamphilus* and *P. napi*. Not seen on Hoy, although *Rumex acetosa* was abundant.

Polyommatus icarus Rott. Female seen, Keiss, 10 June; Rackwick, first seen 17 June, abundant by 21 June; Muckle Rysa, soft and newly emerged, 23 June. Roadsides and sandy banks of streams, with flowering Birdsfoot Trefoil (*Lotus corniculatus*).

Pieris brassicae L. Not seen until 10 June, when it suddenly appeared in numbers at Lybster and Keiss; common, Scrabster harbour, 11 June, and already flying on Hoy the same day. Muckle Rysa, 12 and 23 June. A freshly emerged, crippled female was found on a doorstep on Hoy, 11 June, indicating that *P. brassicae* does overwinter there Almost exclusively seen around gardens, only once on the moors. All the ovi-

positions observed were on seedling cabbages and sprouting kale. This was the only butterfly seen visiting Red Campion, *Silene dioica*, for which it seemed to have a marked preference. Also seen at dandelion and Dame's Violet (*Hesperis matronalis*) by the post office. Two Hoy specimens have very clear beak-marks. None of the specimens was "smoky", as De Worms describes those from Orkney Mainland. I happened to have stock of the mutant "albinensis" and crossed it to a wild-type Hoy male. The F_1 was entirely wild-type; the "albinensis" phenotype was recovered in the F_2 as expected, but all the homozygous "albinensis" males were variably crippled. This tendency had been largely bred out of the Cambridge stock (Gardiner, 1962).

Pieris rapae L. The only example seen was a fresh male, Scrabster harbour, 11 June, flying with the other species.

Pieris napi L. By far the commonest butterfly everywhere. Numbers were already out at Spinningdale, 4 June, and it was seen in quantity every day afield thereafter. On 5 June it lined the ditches by the roads all the way to Thurso. Swarming at Lybster and Tofts, 9 June, with pairs *in copula* as early as 7.30 a.m. Already abundant on Hoy, 11 June, declining rapidly by the 23rd; Guy Howard found it common on Orkney Mainland, 19 June. A yellowish male was taken in poor condition on Hoy, 27 June, but it is phenotypically quite different from the "Irish" yellow *napi*. A buff-coloured, newly emerged female was taken *in cop.* with a normal male by Guy Howard on 16th June. Breeding from this stock is not yet completed, with many pupae in diapause. Everywhere associated with Cuckoo-Flower, *Cardamine pratensis*, in ditches, wet rushy pastures, gullies on the moors, and bogs. Oviposits freely on the rosettes and (less often) the cauline leaves and flower buds. At Lybster oviposited on Mustard, *Sinapsis arvensis*, and Wallflower, *Cheiranthus cheiranthi*, once each; on 28 June females were ovipositing freely on *S. arvensis* in a garden at Keiss. I reared Caithness larvae from the third instar on *Barbarea vulgaris* on Hoy, where there was a good colony of this plant. Newly hatched larvae, however, do poorly on this plant, particularly on the cauline leaves, and prefer Cuckoo-Flower. I saw no Hedge Garlic, *Alliaria officinalis*, north of Dingwall, but the Hoy stock I took back to Oxford fed up well on it and on *Sisymbrium officinale*. Adults of *P. napi* frequented blossoms of Cuckoo-Flower, which was the only thing in bloom in many of their localities, and also Dandelion, Pansy, Chickweed and Wallflower. They were not seen on blossoms of Butterwort, Buckbean or Tormentil even when these were present. The abundance of *P. napi* in the northeast should set to rest permanently South's assertion that its range does not extend "beyond Ross".

Plusia gamma L. First seen at Lybster, 9-10 June; arrived at Rackwick, 22 June; Muckle Rysa, 23 June. Common late in the month.

I thank Dr. Kettlewell, Dr. Guy Howard, and Mr David Lees for their help throughout my visit.

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Notes and Observations

ADOXOPHYES ORANA F.v.R. IN SUFFOLK.—During early August 1969 a number of reddish-brown tortrices appeared in the m.v. trap in my garden. As I was unable to identify them I referred them to Mr. S. Wakely who kindly determined them as specimens of this moth. In his note on this insect in the March 1962 number of the Record Mr. Wakely mentions that it was first recorded at East Malling Research Station in Kent in 1950. He tells me that the Walberswick, Suffolk, specimens are the furthest north the species has been found so far, but he is of the opinion that it has probably been overlooked and is spreading fast.—H. E. CHIPPERFIELD, The Shieling, Palmers Lane, Walberswick, Suffolk. 20.xii.1969.

MIGRANTS IN SUFFOLK IN 1969.—Although nothing of a very spectacular nature came my way, this part of Suffolk was visited by quite a large number of migrants. *Plusia gamma* Linn. was abundant from July until early November and *Nomophila noctuella* Schiff. was also common over a long period. Considering the large numbers of *Vanessa cardui* Linn., it was surprising that only two *Colias croceus* Fourc. were seen, both on the beach at Walberswick on 22nd July and 3rd August. On 14th August a specimen of *Papilio machaon* Linn. was observed flying along the road-side at Walberswick. Although I cannot be certain I got the impression that it was a continental example. From August onwards *Udea ferrugalis* Hübn. was qutie common and several *Nycterosea obstipata* Fabr. appeared in October. On the 7th October *Rhodometra sacraria* Linn. var. *sanguinaria* came to the m.v. trap whilst on the 20th of the month a male *Herse convolvuli* Linn. was found sitting on the ground beside the light trap.—H. E. CHIPPERFIELD, The Shieling, Walberswick, Suffolk. 12.i.1970.

CONISTRA VACCINII L.—During the very mild period this month I decided to run my mercury vapour light in case there should be anything about. Last night, the 20th January, I had one visitor, *C. vaccinii* L. Is this the earliest record for 1970?—A. G. M. BATTEN, Littledale, Cedar Road, Hook Heath, Woking, Surrey. 21.i.1970.

TWO LATE DATES FOR SPILOSOMA LUBRICIPEDA L.—I found a male *S. lubricipeda* in good condition, resting on a stone near my mercury vapour light trap on the morning of 8th September. A bigger surprise was to find another, also a fresh looking male, again near the mercury vapour light early on the morning of 21st October. On both occasions the number of species in the trap was above average.—J. BRIGGS, Frimley House, Beetham, Westmorland.

NYCTEROSEA OBSTIPATA FAB. IN NORTHAMPTONSHIRE.—On the 4th of November 1969 I had in my light trap at Wellingborough one *Nycterosea obstipata* Fab. I believe that this is the first time this species has been recorded from the county. I was prompted to send this note by the frequent mention of similar captures in other parts of the country, in the January Record.—P. J. GENT, 3 Irthlingborough Road, Wellingborough, Northants.

MOMPHA NODICOLELLA FUCHS, ETC., AT CAMBERWELL. — On the 11th September, 1969, I was looking over a fine plant of *Chamaenerion angustifolium* (Rose Bay) growing in the garden of a house close to where I live to see if it had any larvae of the Elephant Hawk-moth feeding on the leaves and spotted a pink gall among the flowers which I recognised as being caused by the larva of *Mompha nodicolella*. Unfortunately it had a small hole in the side of the gall showing the larva had already left for pupation. However, a fortnight later, I examined a smaller plant which was growing on some waste ground not far away. Here I found a very small gall which was picked and examined at home later. This was placed in a small plastic container and kept under observation. A few days later it had begun to shrivel and dry up so it was taken out and cut open when it was found to be full of fresh frass. On looking at the container the pink larva was seen and looked quite healthy. The problem now was how to feed it as I knew that the larva naturally would have fed on the pith inside a growing gall. It seemed hopeless, but I gave it some flowering shoots similar to those on which the gall had been found. A few days later I was pleased to see a tiny heap of frass in the container and could see some small holes in a leaf hiding the larva. Fresh food was given every few days and the larva fed freely on this for several days. An examination later showed that the larva had spun up in a cocoon among some tissue paper. However, it was found to have died later and seemed to have dried up. I have had a lot of experience in breeding this species in the past and am convinced of its identity. *Mompha nodicolella* was first found in Britain by me at Oxshott in 1950; an earlier record in 1915 was found to be due to a misidentification of three moths taken at Westerham, Kent, which proved to be *Mompha subbistrigella* Haw. (*Ent. Rec.* **63** (1951): 49, 81, 116, 274; **65** (1953): 6.)

Some Coleophorid larvae which were of interest to me were found on plants of *Atriplex* (probably *A. patula* (Common Orache)) growing on a patch of uncultivated ground near my house. The larval cases were light in colour, almost white in fact. They were very common locally on the small patch of foodplant available and I counted over fifty on a stem which I broke off. I hope, with the help of friends who took some as well, to get the species determined in due course. The cases were present all through September and up to the middle of October, and appeared to me personaliy to be distinct from any of the common darker cases often found locally on *Chenopodium*.

Several larvae of *Scrobipalpa obsoletella* F.R. were found feeding inside the stems of the *Atriplex*. These were found by the holes made by the larvae in the stems and could be found more readily by looking for the small heaps of frass ejected by the feeding larvae. This species is usually given as a coastal species.

Another species the larvae of which were fairly common locally on a railway bank nearby during September and October was *Bedellia somnulentella* where the larvae fed on *Convolvulus arvensis* (Lesser Bindweed). The small larvae start off as leaf miners and later feed externally on the leaves, pupation taking place on the underside of the leaves among a few fine strands of silk. All the species mentioned are quite local insects and require careful searching for.—S. WAKELY, 26, Finsen Road, London, S.E.5. 27.i.70.

LYCAENA? DISPAR BATAVUS L. (LARGE COPPER) IN IRELAND.—I read Mr. Lyne's note (*Ent. Rec.*, **81**: 305) about seeing this butterfly by the roadside near Allentown in the Bog of Allen, and waited for the correspondence to pour in. So far the only explantion has come from Mr. H. G. Heal (*antea*: 31) in which he states that he released the specimens, and presumes one of these must have flown 130 miles and was the insect seen by Mr. Lyne. I cannot accept this. I knew Captain E. B. Purefoy very well indeed, and we often talked about this butterfly; he told me a great deal about its habits. It was he, of course, who brought "the fire butterfly" back from Holland and established it in Wicken Fen from stock bred in his garden near Maidstone, where on many occasions I saw them feeding, and even emerging from the chrysalis. This is a very local butterfly and not given to wandering. Could it not be that what Mr. Lyne saw was in fact *Lycaena rutilus* Wernb. which Captain Purefoy established in Ireland some time in the twenties, I believe? I have no literature here now but I am sure some of your readers can look up the references, and we can start the ball rolling on a most interesting discussion.—L. HUGH NEWMAN, F.R.E.S., Betsoms, Westerham, Kent.

ONCOMERA FEMORATA FABR. (COL. OEDEMERIDAE) AT IVY BLOOM IN DORSET. —I was very interested in Mr. M. J. Leech's note under the above title in the January issue of the "Record." I happened to be in Swanage on 15th and 16th October 1969 and also noticed quite a number of these beetles on the ivy blossom at Durlston Head. In my small collection of British Coleoptera I have three specimens of *O. femorata*, one labelled Swanage 3/6/50 and the other two Torquay 8/10/55. I remember the species was quite common on the ivy blossom in the Torquay district in October 1955, so it seems to have a fairly wide distribution along the South Coast, although as Mr. Leech says it may be very local.—H. E. CHIPPERFIELD, The Shieling, Walberswick, Southwold, Suffolk. 2.ii.1970.

HELIOTHIS ARMIGERA HUBNER LARVAE IMPORTED IN TOMATOES.—I was interested to read the notes by C. G. M. de Worms and C. S. Blaithwaite on their captures of *Heliothis armigera* Hubn. (*Ent. Rec.*, **82**, No. 1). On two occasions towards the end of 1969, larvae of this species have been given to me. The first was found feeding on a tomato purchased in Cambridge by a colleague, Miss K. M. G. Bryan, during November. The second was also feeding inside a tomato and was purchased in London during mid-December by my brother, J. A. McLeod.

It is most probable that the infested tomatoes were imported from the Canary Islands where the species is a common pest of tomatoes. Considering the fact that two specimens came into my possession, one wonders how many larvae were inadvertently imported and how many successfully pupated.

Both of my specimens were raised to adults when maintained at a constant 70° F.

This species is of course one of the major lepidopterous pests of the world. Although termed the "scarce bordered straw" in England, it is more commonly referred to by its larval names of Cotton Bollworm and American Bollworm or ABW for short.

A large immigration may have occurred, as C. G. M. de Worms suggested, but it is also possible that the captured adults originated from imported larvae.—L. MCLEOD, 25 Sleford Close, Balsham, Cambridgeshire.

UNUSUAL EMERGENCES OF SATURNIA PAVONIA L. (EMPEROR MOTH).—Twenty-two third instar larvae were found feeding on wild raspberry at 1300 m. in Le Boréon valley (Alpes-Maritimes, France) towards the end of June, 1966. These were fed on domestic raspberry throughout July, and spun up in August of the same year. Emergence then took place as follows:

April-May 1967: 4 ♂♂, 1 ♀ (slightly deformed)
16.9.67: 1 ♀ (badly deformed)
April-May 1968: 7 ♂♂, 7 ♀♀
9.4.69: 1 ♀

The remaining cocoon was opened in January 1970 and found to contain a dried out, long since dead chrysalis.

The pupae had been kept indoors in an unheated room throughout this period, in a glass-topped corrugated cardboard box, and were occasionally sprayed with water.

The rough interior of the box makes it unlikely that the two cases of deformity noted were as a result of the insects falling from the sides of the box before having a chance to expand their wings. It was interesting to note that in this admittedly statistically insignificant sample, the second and third year imagines were apparently more capable of expanding their wings satisfactorily.

The imagines were all rather larger than is usual with English specimens (both wild and bred), but of comparable size with others which I possess from other sub-alpine localities. No differenes in size were noted among individuals emerging in different years.

I have never heard of *S. pavonia* overwintering a second (let alone a third) time, and nor have I heard of specimens emerging in the autumn. I should be interested to hear of any similar experiences.—M. R. SHAW, 44 Lovelace Avenue, Solihull, Warwicks.

EURRHYPARA HORTULATA L. EMERGED IN THE WINTER.—I got quite a surprise on a visit to my sister at Virginia Water on January 19th, 1970, to see a small magpie flying about in her kitchen. This very prevalent little Pyrale is abundant during the summer months, its larva hibernating full fed and only pupating in the spring. On reference to Barrett, however, he mentions (IX: 249) that occasionally the moth has been observed indoors in January and February, the assumption being that the larva has been brought inside with produce and its metamorphosis accelerated. Alternatively it often likes to pupate in wall crannies and may have crawled into the house, which would probably account for this unusually early emergence, brought about doubtless by the warm indoors.—C. G. M. DE WORMS, Three Oaks, Shore's Road, Woking, Surrey. 1.ii.1970.

TWO NEW SPECIES FOR WILTSHIRE.—On October 16th, 1969, a young friend, Mr. David Brotheridge, of Wroughton, near Swindon, telephoned me that he had taken a specimen of *Lithophane leauteri* Boisdv. in his mercury vapour light trap. I was rather sceptical, so he agreed to bring it over for me to check the next day; this he did, and not only was his *leauteri* confirmed, but he brought with him a fresh specimen of *Cosymbia puppillaria* Hübn. taken the following night. Two such remarkable prizes

taken in two successive nights is surely astonishing.—B. W. Weddell, 39 Victoria Road, Trowbridge, Wilts. 31.i.1970.

The British Status of Certain Scarabaeoidea (Col.): Supplementary Notes, and Corrections.—My paper on this subject (1967, *Ent. Rec.*, **79**. *passim*) prompted an interesting letter from Mr. C. MacKechnie Jarvis, which adds materially to the evidence presented for two species, and which I have his permission to use.

First as regards *Platycerus caraboides* L.—not, it is true, a doubtful case, but any further record is valuable—Mr. Jarvis writes that he possesses two carded (once pinned) specimens from the Adams collection, purchased long ago from the late A. Ford of Bournemouth and said by him to have been taken at Bristol. He believes that Ford derived this information from Adams's catalogue or diary, but cannot be sure. It will be observed that the locality is not new, having been given by Stephens; the latter's actual words, however, were "specimens have been taken by Mr. Waring of Bristol"—which is not quite explicit, though the locality is probably to be inferred. Adams was an early collector, and it seems distinctly possible that the above two specimens were actually taken by Waring, having survived passage through two or three (or even more) collections. In my notes (p. 203) on this extinct species I mentioned an old pair from Windsor as perhaps the only extant British specimens with a locality attached; so the existence of this Bristol pair—if the data can be assumed genuine—is of much interest, and tends to corroborate Stephens's record.

The second point concerns *Onthophagus taurus* Schreb., a species for which any extra particle of evidence is welcome. In my discussion of it I stated (p. 220), apropos of a rather implausible old record of a pair taken *in cop.* in the garden of Corpus Christi College, Oxford, by a Mr. Holme, that "nothing appears to be now known of the captor or his reliability." I fear it did not occur to me that this was in fact the Frederick Holme who was the first to investigate the beetles of the Scillies, and who discovered and described the Staphylinid *Remus sericeus*; and who, as it turns out, was a graduate and Fellow of Corpus Christi. (See Jarvis, 1969, *Ent. mon. Mag.*, **105**: 44-7 for biographical details.) Mr Jarvis points out that, though little known, and notwithstanding the doubts unjustly cast by Blair and others on his reliability, Holme's records appear on the contrary to be almost fully trustworthy, since such a high proportion of his captures in the Scillies have now been repeated. This fact, of course, puts a different complexion on the above record of *O. taurus* and, unlikely as it may seem, I think it must be unreservedly accepted.

Mr. Jarvis also writes that he has in his collection an example of *Polyphylla fullo* L. attributed to the same locality as mine (Sandgate, Kent), *ex coll.* Adams.

I take the opportunity of correcting the following misprints in my paper cited above:—Page 203, line 8: for "sceptism" read "scepticism"; p. 220, line 7 up: for "indigeous" read "indigenous"; p. 257, line 7 up: for "'Stephen's" read "Stephens's"; line 10 up: for "recieve" read "receive"; p. 259, lines 16-17 up: for "than less" read "less than."—A. A. Allen, 63 Blackheath Park, London, S.E.3. 3.ii.70.

EARWIGS ON OCEANIC ISLANDS.—In a recent interesting article by A. Brindle (1969 *Ent. Record,* **81**: 331-334) it is stated that only a single species of Dermaptera occurs on Easter Island. In addition to *Euborellia annulipes* (Lucas), the species mentioned by Brindle, another cosmopolitan species, *Anisolabis maritima* (Bonelli) has been found there (Kevan, D. K. McE., 1965 *Ent. Rec.*, **77**: 285). The five cosmopolitan species, mentioned but not named by Brindle as occurring in the Azores, are given by Kevan (1965, *Ent. Rec.*, **77**: 40-42).—D. K. McE. KEVAN, Dept. of Entomology, Macdonald College of McGill University, Ste Anne de Bellevue, P.Q. Canada.

CREDIT WHERE CREDIT IS DUE.—In a recent article ("discovery of the larva of *Ancylis paludana* Barrett": *Ent. Rec.*, **81**: 21), I claimed to have been the first to record the food plant and feeding habits of this larva. However, I have come across an article by W. Farren entitled "Tortrices taken near Cambridge" (*Entomologist* **19**: 107 (1886)) in which he states of *Ancylis paludana* "larvae on *Lathyrus palustris* between united leaves in September." This accurate description proves that he was familiar with the larva, but subsequent writers appear to have overlooked or discounted his statement.—A. M. EMMET, Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 29.xii.1969.

EVERGESTIS EXTIMALIS SCOP. IN ESSEX.—On a visit to the vast, mostly overgrown rubbish tip at Mucking, I disturbed over a dozen small moths which I recognised as being *Evergestis extimalis* Scop. They were not "Hiding by day amongst the food plant" as stated by Beirne (1952) in British Pyralid and Plume Moths, but were all disturbed from a large bed of fat-hen (*Chenopodium album* L.). I kept an eye on the little colony, and visited it finally on August 31st, and found several of the moth's distinctive larvae on wall rocket (*Diplotaxis tenuifolia* (L.) D.C.) which is common enough but scattered, not in large beds. This ties in with Mr. S. Wakely's ten years earlier (*Ent. Record,* **72**: 18) who also found that the food plant of *extimalis* larvae was wall rocket at Higham, Kent. In fact, the little *extimalis* colony is only just five miles "as the crow flies" from Higham station, so it is possible that the Mucking colony was originally furnished from the one at Higham which Mr. Wakely and his companions found, all of ten years ago. Incidentally, although I have recorded the moth's presence in Essex (*Ent. Record,* **81**: 233) I believe that this is the first time an actual bona fide colony as such has been discovered in this county.—R. TOMLINSON, 51 King Street, Stanford le Hope, Essex. 3.ii.1970.

X. ferrugata Clerck: Dark-barred Twin-spot Carpet.

Native. Woods, hedgebanks, waste places, etc.; foodplant unknown. Recorded from all divisions; few records for 15. "Generally common" (*V.C.H.*, 1908); but rather less frequent than *X. spadicearia*, at least in my experience (C.-H.).

The moth appears in two generations, May to early June and in late July to early September.

15. St. Mary-in-the-Marsh, several, July 31, 1948, August 1, 2, 5, 1948, at car lights (P. le Masurier). Dungeness, one, June 11, 1962, in m.v. trap (R. E. Scott). Lydd Town, August 1965 (D. W. H. ffennell).

VARIATION.—The vast majority of Kentish specimens that I have seen conform to ab. *unidentaria* Haw., and I have only one specimen that is referable to nymotypical *ferrugata* (gen. det. D. S. Fletcher), taken West Wickham, May 11, 1947 (C.-H.).

FIRST RECORD, 1831: Darenth Wood (Stephens, *Haust.*, **3**: 215).

X. quadrifasciata Clerck: Large Twin-spot Carpet.

Native. Woods, carr; [on hawthorn]

1. Bostall Wood, June 28, 1862; Erith, ♀, July 23, 1875, one, July 8, 1884; Bexley, ♀, June 13, 1885, one, June 25, 1886 (Fenn, *Diary*). Eltham; Sidcup (C. Fenn, in *Wool. Surv.*, 1909); may refer to the foregoing (C.-H.). Crayford, not uncommon (A. H. Jones, in *Wool. Surv.*, 1909). Sidcup, one, July 29, 1911, one at light, July 23, 1922 (A. R. Kidner). Chislehurst, one, 1880 (Pim, *Entomologist*, **14**: 70); one, 1914 (Rait-Smith, *Ent. Rec.*, **27**: 170); one in the garden, July 11, 1905 (S. F. P. Blyth). Bexley, one, July 16, 1899 (Carr, *Entomologist*, **33**: 130); Lee (Carr, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1899**: 109), may refer (C.-H.); (L. T. Ford). Joydens Wood, July 13, 15, 1969 (B. K. West).

2. Near Sheerness, one beaten out of thatch, 1871 (Walker, *Ent. mon. Mag.*, **8**: 184).

3. Perry Wood (Morris, *Br. Moths*, **2**: 20). Canterbury*, one, July 1904, two, 1907, in F. A. Small coll. (C.-H.). Ridgeway (A. J. L. Bowes). Herne Bay (D. G. Marsh). Den Grove, one, June 25, 1938; Broad Oak, one, July 11, 1946 (C.-H.). Kent*, one, 1861 (Cox, *et al.*, *Ent. week. Int.*, **10**: 124).

4. Ham Fen, one, 1935 (E. & Y., 1949); one, July 20, 1967 (T. W. Harman). Ickham, fairly numerous annually, 1954-59 (D. G. Marsh).

5. Halstead (R. E. Frampton coll.).

6. Greenhithe (Farn MS.). Upper Halling, one, July 8, 1904, H. Elgar; Birling, one, June 29, 1907, H. C. Huggins; both in Maidstone Mus. (C.-H.). Snodland, a few, July 20, 1908 (Ovenden, *Ent. Rec.*, **21**: 32). Birling, July 15, 1911 (F. T. Grant). Gravesend (H. C. Huggins). Fawkham; Green Street Green (E. J. Hare). Farningham Road, one, June 26, 1964 (R. G. Chatelain).

6a. Darenth Wood (see *First Record*); 1860 (Fenn, *Ent. week. Int.*, **9**: 59); one, July 27, 1874 (Fenn, *Diary*); larva spun up in honeysuckle leaf growing on hawthorn, May 16, imago emerged June 26, 1925, the larva appeared to have fed on the hawthorn (F. T. Grant); one, July 18, 1936, and two others (B. K. West). Cobham Wood (J. J. Walker, in Chaney, 1884-87); June 10, 1912, June 16, 1914, July 8, 1916 (F. T. Grant). High Halstow, July 12, 1958 (Gould, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1958**: 75).

7. Westwell, July 8, 1935 (A. J. L. Bowes); Scott (1936) probably refers

(C.-H.); July 8, 1946 (Bull, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1946-47**: 168); one, June 13, 1960 (M. Enfield); one, July 24, 1963 (C.-H.). Belmont (H. C. Huggins). Godmersham, one, July 9, 1946 (C.-H.). Bearsted, one in G. Law coll. (C.-H.). White Hill (Scott, 1950).

8. Deal* (Morris, *Br. Moths*, **2**: 20). Folkestone* (Ullyett, 1880). Brook* (C. A. W. Duffield). Temple Ewell, June 21, 1946, one (A. M. Morley in E. & Y., 1949). Betteshanger, four, July 6, 1957 (R. F. Bretherton). Dover, one, 1946 (Gardiner, *Ent. Gaz.*, **10**: 11). Bridge, one, July 12, 1953 (W. B. L. Manley).

10. Seal (Carrington, *Entomologist*, **13**: 76).

11. Nettlestead, five, July 1880 (Thornewill, *Entomologist*, **14**: 117). Wateringbury (*V.C.H.*, 1908); one, July 4, 1959 (C.-H.). Maidstone [West Malling] three in my coll. bred in 1905 by W. A. Cope from ova deposited by a captured ♀ (C.-H.). West Malling, July (2), August 4 (4), 1947 (W. A. Cope). Maidstone district* (Green, *Ent. Rec.*, **53**: 109). Maidstone, one, 1953, one, July 16, 1955 (E. Philp). Aylesford, 1950 (1); 1951 (1); June 14 (1), July 11 (2), 12 (1), 16 (1), 1955; July 18 (1), 26 (1) 1956; July 4 (1), 12 (1), 19 (1) 1957 (G. A. N. Davis).

12. Chartham, four, c. 1950 (P. B. Wacher). Ham Street, one, 1951 (G. A. N. Davis). Ashford Town, July 21, 1955 (P. Cue). Wye* (Scott, 1936). Willesborough, one, August 3, 1955, one, July 24, 1956 (W. L. Rudland); one, at light, July 1958 (M. Singleton). Wye, two. July 18-August 3, 1954, two August 2-10, 1955, five, July 22-August 10, 1956 (W. L. Rudland). West Ashford, one at light, 1959, one at light, June 13, 1960 (M. Enfield).

14. Sandhurst (G. V. Bull).

VARIATION.—The form with the central band velvety black, ab. *thedenii* Lampa is of fairly frequent occurrence, e.g., my three specimens from Den Grove, Godmersham and Wateringbury, are referable here; as are the Ham Street specimen and six of the Aylesford specimens taken by G. A. N. Davis (C.-H.).

In RCK are the following named abs.: *thedenii* Lampa, Bexley, one, 1895; *reduplicata* Heinrich, Ashford, two, 1892, Darenth, one, 1903; *tangens* Lempke, Chatham, one, 1908, Wateringbury, one, 1902, East Kent, one, 1934: *dissolutaria* Petersen, Ashford, one, 1902.

A. M. Morley's specimen from Temple Ewell conforms to ab. *dissolutaria* Petersen (E. & Y., 1949).

FIRST RECORD, 1831: "I have taken the insect several times at Darenth" (Stephens, *Haust.*, 3: 216).

X. montanata Denis & Schiffermuller: Silver-ground Carpet.

Native. Woods, copses, bushy places; on primrose. Recorded from all divisions except 2, 9, 15; few records for 4. "Generally abundant" (*V.C.H.*, 1908). This assessment is not supported by the records, for though the moth is often plentiful in deciduous woodland, it is markedly less so elsewhere in the county, and in some parts may be rare or absent.

The insect is normally single brooded with perhaps a partial second generation. Knaggs (1870) gives May and August for the times of appearance; on the other hand, Tutt (*Ent. Rec.*, **3**: 188) emphatically states that he never once encountered a second brood specimen.

Anderson (*Young Nat.*, **7**: 17) records collecting larvae at West Wickham on March 27, 1880, "from the undersides of primrose leaves"; and Fenn (*Diary*) bred a moth on May 21, 1861, from a larva that he took at

West Wickham on March 23 that year.

4. Stodmarsh, June 10, 1951 (W. D. Bowden). Ickham, not common, 1954-59 (D. G. Marsh).

VARIATION.—The following aberrations are in RCK:—*lutescens* Lempke, Chattenden, one, 1885; Westwell one, 1906, L. B. Prout; *continuata* Krulik, Chattenden, one, 1885; *approximata* Lempke, Westerham, one; *tangens* Lempke, Westerham, one; Chattenden, one; *pseudolapponica* Schawerda, Wye, one, 1912; *albomarginata* Lempke, Folkestone, one, 1905; Halstead, 1888; *degenerata* Prout + *approximata* Lempke, Bexley, one; Westwell, one, trans ad *candidata* Nitsche, Chattenden, three; *candidata* Nitsche, Chattenden, one; *reticulata* Cockayne, holotype ♀, "J. Juby/28.6/32/ Wrotham" (cf. Cockayne, *Ent. Rec.*, **65**: 162).

Ab. *fuscomarginata* Stgr. is common in Kent, and I have specimens from various localities; ab. *degenerata* Prout on the other hand, is relatively scarce, and I have only one example, taken Broad Oak, 1953. My series from Kent also contains three good ab. *nigrofasciata* Ostelder, each of which has the band abnormally broad (C.-H.).

FIRST RECORD, 1859: Greenhithe (Fenn, *Diary*, 31.v.1859).

X. fluctuata L.: Garden Carpet.

Native. Gardens, waste places, etc.; on *Alliaria petiolata*, "yellow alyssum". Frequent (particularly in suburban and town areas) and recorded from all divisions. "Generally abundant" (*V.C.H.*, 1908).

The moth appears to be normally double brooded, but a partial third generation may sometimes occur. At Sidcup, Kidner (*Diary*) noted it in 1921 as early as April 7; and in 1938 on April 10, from May 16-June 21, July 26, and then from August 29-September 26. In 1955, W. L. Rudland recorded seeing it at Willesborough as late as October 23.

Kidner (*Diary*) found larvae in his garden at Sidcup on September 30, 1925, July 9, 1926 (several), July 18, 1927, July 29, 1932 (2), but gave no record of the foodplant. D. R. M. Long, however, records having taken the larva at Bromley on Hedge Garlic (*A. petiolata*); and D. O'Keefe took six full-fed larvae in mid October 1968, on yellow alyssum in his garden at Bexley.

VARIATION.—The following are in RCK:—Abs. *fibulata* Hufn., Lewisham, one, May 1892; *abstersata* H.-S., Lewisham, one, 1891, one, 1901; *putridaria* H.-S., Lewisham, one, 1909, one, 1892, one, 1899; *undulata* Prout, Lewisham, one, 1908; *insolida* Prout, Lewisham, one, 1868; *albescens* Lempke, Faversham, one, 1908; *degenerata* Lempke, Lewisham, one, 1900, *approximata* Lempke, Lewisham, 1900; *costovata* Haw., Lewisham, one, 1907; *deleta* Ckll., "London S. E./H. J. Turner/1889"; *fumata* Cockayne, holotype, Bexley, bred L. W. Newman, 1911, ♂ (cf. *Ent. Rec.*, **65**: 162). Also, one somatic mosaic, "Lewisham, 26.6.99".

Roche (*Proc. S. Lond. ent. nat. Hist. Soc.*, **1948-49**: 18) exhibited ab. *costovata* Haw., from Kemsing; and Morley (*Proc. S. Lond. ent. nat. Hist. Soc.*, **1943-44**: 18) ab. *neapolisata* Mill., from Folkestone. Other abs. from Kent have been recorded by Buckstone (*Proc. S. Lond. ent. nat. Hist. Soc.*, **1925-26**: 59), Boutell (*Proc. S. Lond. ent. nat. Hist. Soc.*, **1890**: 40) and Stevens (*Ent. mon. Mag.*, **13**: 69).

FIRST RECORD, 1835: Kent (Wood, *Index Entomologicus*, 91).

Scotopteryx bipunctaria Denis & Schiffermueller ssp. **cretata** Prout: Chalk Carpet.

Native. Downs, railway banks, cliffs; on *Lotus corniculatus*. Chiefly on the chalk frequent and locally abundant in 5, 6, 7, 8; elsewhere probably mainly casual nowadays. "Generally abundant on the chalk" (*V.C.H.*, 1908).

Obs.—At Trottiscliffe (div. 6), I took a larva on *L. corniculatus*, April 20, 1961 (C.-H.).

1. Charlton sandpit (Bedell, *Zoologist*, 735). Near Sydenham* (Cox, *Ent. week. Int.*, **6**: 188). Grove Park, common 1885, 1887; Brown's Woods, Halfway Street, 1885 (Fenn, *Diary*). Sydenham (Sellon, *Ent. Rec.*, **2**: 164). Brockley (*Wool. Surv.*, 1909). Eltham (*V.C.H.*, 1908). Sidcup, one, at light, 1909; a few, July 19, 1925; one at light, July 29, 1927 (A. R. Kidner, *Diary*). Petts Wood, fairly frequent at light, very common in 1948 (E. Evans); 1950 (A. M. & F. A. Swain). Orpington, 1948-53 (L. W. Siggs). West Wickham, 1951 (E. Trundell).

2. Royal Oak, Sheppey, 1869 (J. J. Walker MS). Sheerness, abundant on the cliffs, 1871 (Walker, *Ent. mon. Mag.*, **8**: 185). Sheppey, one, 1900 (Fletcher, *Entomologist*, **34**: 371). Dartford (B. K. West).

3. Near Herne Bay* (Butler, *Ent. week Int.*, **6**: 180). Whitstable, one, 1935, two, 1937, one, 1942 (P. F. Harris).

4. Sandwich, one, September 18, 1954 (W. D. Bowden).

6a. Chattenden, one July 27, 1862 (A. H. Jones *teste* Fenn, *Diary*).

9. Ramsgate (Willson, *Entomologist*, **23**: 140); July 27, August 8, 14, 1910 (J. W. C. Hunt). Cliffs between Westgate and Birchington, three, July 19, 1919; Kingsgate, July 17, 1920; Hengrove, five, July 15, 1915 (H. G. Gomm, *Diary*). Margate, one, August, 11, 1932 (P. F. Harris).

11. East Malling, one, 1951; Aylesford, 1951 (1), 1952 (1), 1953 (1), August 10, 1955 (1) (G. A. N. Davis).

12. Wye, 1953 (2), 1954 (1) (W. L. Rudland).

13. Tunbridge Wells, common, 1891 (Beeching, *Ent. Rec.*, **2**: 229). Hobb's Hill (Given, 1946).

15. Dungeness, July 4, 1945 (A. M. Morley).

16. Folkestone Town (Morley, *Ent. Rec.*, **64**: 171); a few (A. M. Morley).

VARIATION.—In RCK are the following named abs.:—*fasciata* Prout, one, Charing, 1923; trans ad *fasciata* Prout, Greenhithe, 1913; *erichi* Schawd, Otford, 1913, Folkestone, 1913, 1915; *extrapunctata* Dann., Snodland, 1901, 1904; *strangulata* Hackray, Folkestone, 1923; *margaritata* Lempke, Dover, 1881, Snodland, 1905, Charing, 1923, Folkestone, 1905.

FIRST RECORD, 1831: "Abounds in the fields near Darenth-wood" (Stephens, *Haust.*, **3**: 212).

S. chenopodiata L.: **limitata** Scopoli: Shaded Broad-bar.

Native. Downs, waste places, etc.; foodplant unrecorded. Found in all divisions, but appears to show a preference for light soils and dry situations. "Generally common" (*V.C.H.*, 1908).

Gillett (*Diary*) states that he bred an imago on August 1, 1916 from a larva taken wild at Chevening, but does not specify the foodplant. Fletcher (*Entomologist*, **34**: 72) records that in 1900 he found the moth in Sheppey, "common amongst mallow".

VARIATION.—In RCK are the following named abs.:—*birgittae* Nordstrom, Deal, 1898, Herne Bay, 1904, Folkestone, 1923; *plurimelineata*

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AND JOURNAL OF VARIATION
(Founded by J. W. TUTT on 15th April 1890)

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Photo: *H. N. Wykeham.*

Poecilmitis thysbe beaufortia r.nov.

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

Figures 1·77 times natural size.

No.21

A New Race of the *Poecilmitis thysbe* (L.) Group (Lepidoptera: Lycaenidae) from the Roggeveld Mountains

By C. G. C. Dickson

The predominant member of the above group on the Roggeveld Escarpment in the vicinity of Sutherland, about 170 miles N.E. of Cape Town and some 5,000 ft. above sea-level, is an insect which is regarded as conspecific with *Poecilmitis beaufortia* (described by the present writer —from the Nieuwveld Mtns., approximately 110 miles E. of Sutherland— in Entomologist's Record, **78**: pp. 109-110, Pl. IV, 15th May, 1966). Individual male specimens from this region often bear a close resemblance to the two original males of *beaufortia*, as do female specimens to a female which was considered to be that of the originally-described butterfly. The Roggeveld males are, however, nearly always of noticeably greater size than the two earlier males. Specimens of this butterfly from the more immediate neighbourhood of Sutherland, the head of Verlaten Kloof and the top of the Komsberg Pass, vary appreciably as regards the degree of development of the dark markings and borders of the upperside and the distinctness of the underside markings as a whole, while still retaining the basic features which are characteristic of *P. beaufortia*.

Over a wide area of rather rugged mountainous country at Quagga Fontein, some 25 miles N.W. of Sutherland, a form of this butterfly was found on 22nd November, 1969, in which the orange of the forewing upperside is, in the male, largely obscured by the encroachment of the black marking—and which differs so much from the specimens of *beaufortia* on which the species was founded that it seems to deserve recognition as another race. While a parallel type of variation is known to occur in individual specimens of some other species of the *P. thysbe* group in which the markings are normally only moderately developed, no instance can be recalled of an entire and extremely large population diverging to the same extent in this direction—and with the same trend apparent in the females themselves. The males are rather reminiscent of the more heavily marked males of *P. pyramus* Pennington, from the Zwartberg. This butterfly is being described hereunder.

Poecilmitis beaufortia charlesi subsp. nov.

Male.

Larger than the original males of the nominate race and with the forewing upperside heavily marked with black.

Upperside.

Forewing. Costal black border and that of the distal-margin so much widened (some 2·5 mm. in width in the holotype) as to coalesce very largely with the black spots and greatly reduce the orange area. In many specimens, including the holotype, there is additional black scaling bordering the outer portion of the silvery-blue area.

Hindwing. In the holotype and some of the paratypes the black spotting (especially towards the costa) is better developed than in the

specimens of the nominate race—but this is not a constant feature, in the present race.

Underside.

Forewing. Submarginal dark streak and veining between this streak and the margin tend to be less distinct than in nominate race.

Hindwing. Wing-surface as a whole (like the subapical and submarginal areas of the forewing) of a rather duller tone than in nominate race.

Length of forewing: 14-17·25 mm. (16·5 mm., in holotype).

Female. Upperside.

Forewing. Basal blue dull (in some paratypes less so than in allotype), very limited in its area and merging only very gradually into the main orange portion of the wing—as in original female which was considered to be that of nominate *beaufortia*. The black spotting well developed, especially so in the allotype, but not always more so than in the original female. Black costal border widened and that of the distal-margin much widened (some 2 mm. in width in the allotype), and the borders in contact with or very close to at least part of the black spotting. (In the allotype, there is an additional, elongated black marking in the cell, below and basad of the discocellular marking.)

Hindwing. Basal blue covers a greater area than in forewing (to about same extent as in original female), but does not spread out parallel with costa more than in forewing. Spotting less heavy, as a whole, than in forewing and sometimes much as in original female—as is the broken black marginal edging.

Underside.

Remarks relating to the underside of all wings of the male apply equally well to those of the female, except that in some females the spotting of the forewing may be heavier and the submarginal black streak more prominent (as in the allotype).

Length of forewing: 15·75-18·5 mm. (17·25 mm., in allotype).

♂ Holotype, WESTERN CAPE PROVINCE: Quagga Fontein, approximately 25 miles N.W. of Sutherland, 22.xi.1969 (C.G.C.D.); British Museum Reg. No. Rh. 17168.

♀ Allotype, data as holotype; British Museum Reg. No. 17169. Paratypes in the author's collection, as holotype, 10 ♂♂, 2 ♀♀ (C.G.C.D.). Paratypes in Coll. C. W. Wykeham, as holotype, 26 ♂♂, 7 ♀♀ (C.W.W.).

Paratypes in Coll. Transvaal Museum, as holotype, 1 ♂, 1 ♀ (C.W.W.).

Some of the paratypes bear the name of Sneeuw Krantz, owing to captures having been made at various points in the area concerned.

This butterfly is partial to the higher parts of the mountainous ground on which it occurs but is not restricted to the very highest points. Its habits and flight are typical of those of the fast-flying members of the *P. thysbe* group. It is of interest that the usual Roggeveld form of *P. beaufortia* should have been found on a high mountain, Tafelberg, about 20 miles N.E. of Sutherland.

A very fine male specimen of *Poecilmitis psyche* Pennington was taken in the Quagga Fontein locality; while *P. turneri* Riley (some of the females of which were very large specimens) proved to be a wide-spread species

on the Roggeveld and Komsberg Escarpments. A capture of much interest was that of a male specimen of a *Poecilmitis* which agreed with *P. felthami dukei* (as described by the writer, from the Robertson Karroo, in Entomologist's Record, **79**: pp. 65-66, Pl. III, 15th Mar., 1967)—the greatly extended known range of this insect adding to the possibility of its being a distinct species.

Flowers were generally scarce at the time of year the Sutherland district was visited and, in places, apparently not numerous enough to provide butterflies with nectar. It was therefore most interesting to find at least one of the *Poecilmitis* which inhabitated that arid area (the more usual form of *beaufortia*) alighting, in the heat of the day, on certain small shrubs and imbibing minute beadlets of fluid which had exuded from the younger leaves and stems of these plants.

The remarkably beautiful insect which is described in this article is named after my nephew, Charles W. Wykeham, who captured so many of the specimens concerned.

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

A Review of *Cosymbia puppillaria* Huebner (Blairs's Mocha) in Britain

By R. F. Bretherton, C.B., M.A., F.R.E.S.

In 1969 more wild examples of *Cosymbia puppillaria* Huebner are known to have been seen in Britain than in any earlier year, except 1956, and the total since K. G. Blair first recorded it at Freshwater, Isle of Wight, on October 2nd, 1946, has now risen to over sixty. It therefore seems opportune to attempt a review of the status of the species in Britain —local resident, occasional settler, immigrant from overseas?

My own experience of it in 1969 was startling for a Surrey garden where the scarcer migratory species are seldom seen. On the morning of October 14th I was astonished to find among the 91 moths in my trap a slightly rubbed male and a large, fresh female *C. puppillaria*. The male was partly hidden under the rim of the trap, and I nearly disregarded it as a mere third brood specimen of *C. punctaria* L.; but the female was unmistakable. I had to leave home immediately afterwards, and I was away for the two following nights, so that the trap was not operated again until the night of October 16th/17th, when weather conditions were poor and the total attendance small. But on the morning of the 18th there were again two *C. puppillaria*, a worn and slightly damaged male and another perfect female, among the 97 moths in the trap. Further in the afternoon I belatedly noticed a third, which had had hidden itself in the handle on the outside of the trap. This one was, however, already restless in the rising temperature, and flew away briskly and jerkily over the hedge while I was fumbling for a box in which to secure it. Searching the walls and beating the bushes in the garden failed to reveal any more. No more were seen in the moth-trap, though total attendances remained fairly high on four out of the five succeeding nights. Other migratory species found in the trap at about this period were *Laphygma exigua* Huebner (one October 21st), *Nycterosea obstipata* F. (October 13th (1), 18th (3), 20th (1), 28th (1), *Peridroma porphyrea* Schiff. (19th (2), 20th, 21st (5), 23rd (1)), *Hapalia martialis* Guen. (11th, 12th, 13th (5), 16th, 17th

(9), 18th (5), 19th, 21st (6), 22nd (4), 23rd (3), 26th (2), and *Agrotis ipsilon* Rott., *Plusia gamma* L. ,*Nomophila noctuella* Schiff (nightly). But all these species had also appeared much earlier in the season, and some or all of the October examples may have been locally bred.

The second female *C. puppillaria* was kept for eggs, of which about thirty were laid on the edges of leaves of oak (*Quercus robur*) and Holm Oak (*Q. ilex*). The larvae hatched after ten days, but many refused to start feeding; and those which did gradually died off before reaching their second instar. This complete failure was probably due to our inability to find at this season leaves young and tender enough to nourish the larvae.

A summary of all the records of *Cosymbia puppillaria* in Britain which I have traced is given in the annexe, to a total of 63 (including three old specimens from Scilly which were not recognised until after Blair's record of it in the Isle of Wight in 1946). From then onwards it has been reported in 15 years out of 24, including all those from 1964 to 1969, with 1956 and 1969 as outstanding seasons. The geographical distribution is wide—all round the coast from Somerset to Norfolk, (except for Suffolk and, oddly enough, mainland Cornwall), and in the inland counties of Wilts, Berks, Bucks, Surrey and London. But Tresco in the Scilly islands and Devon account for nearly half the total, and there are no recurrent concentrations elsewhere. Outside Scilly, which is discussed separately below, half of the 46 records which can be dated were in October, with nine more in September and eight in August; but there are a few earlier records—one at Hockley, Essex on May 23rd 1956 and at Bishopsteignton, South Devon, on May 18th, 1966; one at Leigh, Surrey, on June 16th 1964; two at Dover, Kent, on June 21st and 25th 1966, and another at Bishopsteignton on July 3rd 1964. Nearly all refer to captures in light-traps or at other forms of light. One found on a rock near the lighthouse at Portland Bill probably also falls in to this category. The only reported exception is a male which was disturbed and boxed by a gardener at Tresco Abbey in September 1957. The sex distribution is therefore particularly interesting. Outside Scilly, of the 22 examples whose sex is reported, eight were males and 14 were females. This accords with my general experience of light-trapping that, though for locally resident species a large preponderance of males is the rule, for migratory species females are often equally or more numerous.

In the gardens of Tresco Abbey in the Scilly Isles, Mere and Richardson showed that *C. puppillaria* was breeding in 1957 by finding a last-instar larva on holm oak in September. Their conclusion that it was established there is supported by the pattern of their captures of adults—two in mid-September 1956, three in April, two in May, and one each in August and September 1957, and also by the sex-ratio of their captures—five males and three females (excluding the diurnal capture mentioned above). After taking account of the three probable Nineteenth Century examples they "thought it likely that *puppillaria* has been breeding continuously on Tresco for the last eighty years". But despite much search they failed to find it in any of its stages in 1958, and several other later visitors have been equally unsuccessful. Since 1964 visitations of Scilly have been more political than entomological, and this may have contributed to the absence of recent records of *C. puppillaria* there. But even so I am inclined to think that the experiences of 1956/57 indicated a temporary settlement after the big immigration of 1956, rather than per-

manent residence of the species on Tresco.

For the mainland of Britain, striking features are the bunching of the records, both in space and time, in the years when *C. puppillaria* was relatively numerous. Thus in 1956 six were taken at Eastbourne within a few days of August 15th, and three captures at Ashburton, Devon on September 23rd and 26th bracketted two single captures at Weston-super-Mare and Portland Bill on 24th and 25th September. In 1959, one was caught at Burghclere, Berks, on October 13th, and two more on the 16th at Kingsbury and Wimbledon in the London area. In 1969, all the 12 captures of which I know were made between October 12th and 24th—five at Bramley, Surrey, three at Slapton, south Devon, two at Cullompton, east Devon, and singles at Minstead, Hants and at Wroughton, near Swindon, Wilts. This narrow coincidence of timing suggests that all these insects were primary migrants which arrived nearly simultaneously from some distant source. If it seems surprising that no less than five primary migrants of a scarce species should land in an inland garden in Surrey, one can only say that similar occurrences in undoubtedly immigrant species are known, though the means by which such insects keep together in groups on long-distance flight remain unexplored.

Thanks to Mr R. A. French's admirable annual tabulations of migration records, which are available up to 1965, it is possible fairly closely to relate the arrivals *C. puppillaria* to those of other scarce migratory species, and even to trace some particular associations. In 1956 the six Eastbourne captures about August 15th coincided closely in time with records in the south east of *Lithosia quadra* L., *Leucania albipuncta* Schiff., and *Laphygma exigua;* and the September captures in the west were associated, in some cases in the same trap, with examples of *Nymphalis antiopa* L., *L. quadra, L. exigua, Heliothis peltigera* Schiff. and *H. armigera* Huebner, *Nycterosea obstipata, Palpita unionalis* Huebner, *Diasemia ramburialis* Dup. In 1959 the three records on October 13th/16th from mid-Berkshire and the London area fit closely with the appearance in south east England of *Colias hyale* L., *Lampides boeticus L., Leucania vitellina* Hubner, *H. armigera, N. obstipata, P. unionalis.* It is not yet possible to get a full picture of the association of *C. puppillaria* with other species in 1969, but some information is available. Besides the possible immigrants taken with it at Bramley, which have already been mentioned, two examples of *Lithophane leautieri* Boisd. were taken at about the same time by Mr Messenger at Wormley, five miles away, and another was captured actually with *C. puppillaria* at Wroughton, near Swindon. This species is now certainly well established as a resident on the south coast, and there must be some question whether these inland immigrants came from there or further afield. The appearance of *C. puppillaria* at Minstead in the New Forest on October 12th was followed four days later by that of *Plusia orichalchea* F. Mr G. A. Cole tells me that his second *C. puppillaria* at Slapton, south Devon on October 20th was also accompanied by *P. orichalcea,* and that he had *P. unionalis* on 19th and 23rd and *D. ramburialis* on 25th, besides examples of several migratory species which had occurred earlier in the season and could therefore have been locally bred.

There are, however, in the records slight indications of possible breeding of *C. puppillaria* on the mainland within a single season, and even of its survival from one year to another. In 1965 it appeared at Min-

stead, Hants, both on 27th August and 24th October; and at Bishopsteignton, south Devon in 1964 both on July 3rd and September 1st. The gaps between, 57 and 59 days respectively, are, on the basis of the evidence of rearing in captivity, consistent with those required for a full life cycle; and the dates of the second appearances do not coincide with records of *C. puppillaria* elsewhere or with any pronounced migratory wave of other species. Further, at Bishopsteignton *C. puppillaria* was recorded in 1962, 1964 and 1966 (in the last year in May), and at Brixham, only about ten miles away, in 1964, 1965 and 1968. As Mr G. A. Cole has suggested to me, there seems to be at least a possibility that the species may have effected at least a temporary settlement on this sheltered and sunny stretch of the coast of south Devon, even though most of the 16 records for the county almost certainly refer to primary immigrants.

C. puppillaria has been reared in Britain in captivity many times, first of all by Blair, who brought through a few larvae from his original capture at Freshwater, feeding them on *Myrtus*. Mere and Haggett (1959, *Ent. Gaz.*, **10**: 45-50) gave a full account of rearings from a Tresco female taken in May 1957, which were carried on for six generations until September 1958, producing many colour forms. This has been summarised again by Haggett (1968) as introduction to his beautiful coloured drawings of the larvae in various instars (*Proc. Brit. ent. nat. Hist. Soc.*, **1**: 84-86 and Plate 5). He found that these would feed on soft young leaves of various kinds of oak, though most successfully on the evergreen *Q. ilex*. There was, however, difficulty in finding sufficiently succulent leaves for them in the late autumn, and there also appeared to be diapause complications: together these made it very hard, though not quite impossible, to over-winter the species, either as larva or as pupa. My own failure in October/November 1969 has already been recounted; Mr G. A. Cole has described his rather more successful experience in a separate article Mr G. C. Stubbs tells me (*in lit.*) that he obtained 34 moths from 38 eggs in December 1967, from a female taken on 8th October, by feeding the larvae on young sprays of holm-oak from trees which had been trimmed, But he lost all the larvae of the next generation through inability to obtain young leaves after January. All the rearings suggest that the survival of *C. puppillaria* through an English winter, even in Scilly or south Devon, could only be very precarious and uncertain.

To sum up. We now have some 60 records of adult *C. puppillaria*, widely distributed over southern England, but with a heavy concentration in Tresco in the Scilly Isles and in south and east Devon. We also have one record of a wild larva, found feeding on the ever-green holm oak (*Q. ilex*); and much knowledge of alternative food plants and behaviour of the species in all stages in captivity. It has been shown to breed in Tresco in 1956/7, but successive failures to find it there in later years suggest that it was only temporarily established and not permanently resident. On the English mainland the pattern of the records shows clearly that the bulk of the adults captured—almost all at light—have been primary migrants, arriving along with other migratory species from the Mediterranean area or north Africa. Since 1946, records have been most numerous in 1956 and 1969, but lacking in 1948 to 1950, 1952 to 1954, 1960 and 1963. There are, however, indications that the species may have bred within the year in the New Forest and in south Devon, and may

even have been established for several years in the latter area; but these indications are far from conclusive.

I am much indebted to Mr R. A. French for letting me use a number of records from 1965 onwards which have not yet been published in his annual Migration Records. I should also like to thank Mr G. A. Cole for allowing me to draw on his experiences with *C. puppillaria* in 1969 and to use several south Devon records, in advance of his own publication of them. I am grateful to Mr G. C. Stubbs and several other gentlemen who have helped me to clear up points of doubt. The attached list of records of *C. puppillaria* in Britain may well be incomplete, especially for 1969. It would be most helpful if anyone who has additions to make would let me have them.

It should be noted that the dates given in these records refer as far as possible to the *evening* of the day mentioned; but, as light-traps are usually cleared in the morning, some may refer to the day *following* the night of capture. The difference can be important for tracing the movements of migratory insects. Recorders can help by making clear in each case which is meant.

RECORDS OF *COSYMBIA PUPPILLARIA* HUEBNER IN BRITAIN

Abreviations used: Entomologist: E.; Entomologist's Record and Journal of Variation: E.R.; Entomologist's Gazette: E.G.; Entomologist's Monthly Magazine: E.M.M.; Proceedings and Transactions of the South London (since 1968 British) Entomological and Natural History Society: S.L.

Before 1946

1878 Tresco, Scilly, viii: apparently several, recorded as *C. porata* L.; but as this is not known to occur in Scilly, Mere & Richardson think these were probably *C. puppillaria*. (F. Norgate, E.M.M., **16**: 182, Mere & Richardson, E.G., **9**: 120).

Before 1895

Scilly, probably Tresco, two labelled "*porata abs*" in Cockayne/ Kettlewell coll., ex Wheeler coll. (E. A. Cockayne, E.R., **59**: 55).

1946 to 1969

1946 Freshwater, I.o.W., female (ova) 2.x. (C. N. Hawkins for K. G. Blair, *Proc. Royal. Ent Soc.*, **11**: 37-38, E.M.M., **83**: 29).

1947 Swanage, Dorset, male at light 3.viii. (A. G. B. Russell, E. **81**: 225, S.L. 1947/8: 36).

1951 Babbicombe Downs, Torquay, Devon, one damaged 29.ix. (A. H. Dobson, E.G., **3**: 104, E., **85**: 156).

1955 Otford, Kent, male in light-trap, night of 22.viii. (W. B. L. Manley, E., **89**: 121, E. **89**: 176).

1956 Hockley, Essex, female in trap 23.v. (D. More, *pers. comm.*); Eastborne, Sussex, six about 15.viii. (R. E. Ellison, S.L., **1956**: 26, E., **90**: 235); Ashburton, Devon, female, female ab.*gyrata*, 23, 25, 26.ix. male, (A. Kennard, S.L., **1956**: 40, E. **90**: 235); Weston-s. Mare, Somerset, one 24.ix. (C. S. H. Blathwayt, S.L., **1956**: 19, E. **90**: 235).; Portland Bill, Dorset, female on a rock near the lighthouse 25.ix. (M. Bourne, E., **90**: 41, 235); Tresco, Scilly, one male, one female 15.ix. (A. Richardson, S.L., **1956**: 41, E.G., **9**: 120).

1957 Tresco, Scilly, three males iv, two females v, one male viii, all at light, one male ix disturbed and boxed by a gardener, one last instar larva on holm oak late ix (R. M. Mere & A. Richardson, S.L.,

1957: 37, E.G., **9**: 120); Chalfont St Peter, Bucks, fine female ab. *badiaria* Stgr. at light 25.ix.57 (Sir E. Ansorge, E.G., **9**: 44, E., **95**: 176—but there referred erroneously to 1959).

1958 None.

1959 Burghclere, Berks, 13.x. (Sir Robert Saundby, S.L., **1960**: 50, E., **95**: 176); Kingsbury, north west London, female 16.x. (A. A. Myers, S.L., **1960**: 3, E., **95**: 176); Wimbledon, south west London, 16.x. (J. V. Dacie, E., **95**: 176).

1960 None.

1961 Weston-s-Mare, Somerset, 5.x. (C. S. H. Blathwayt, E., **96**: 37).

1962 Bishopsteignton, Devon, 1.x. (H. L. Coleridge—G. A. Cole *in lit.*); Folkestone, Kent, male 3.x., in trap (A. M. Morley, S.L., **1962**: 42, E., **97**: 127).

1963 None.

1964 Leigh, Surrey, 16.vi.64 (R. Fairclough, E., **99**: 239); Bishopsteignton, Devon, 3.vii. and 1.ix. (C. W. Holcroft, E., **99**: 239 and G. A. Cole *in lit.*); Wroxham, Norfolk, female at light, no eggs obtained, night of 26.ix. (C. G. Bruce, E.R., **77**: 48, E., **99**: 239); Brixham, Devon, one, date not known (J. W. Phillips—G. A. Cole *in lit.*).

1965 Minstead, Hants, in trap 27.viii. and 24.x. (L. W. Siggs, S.L. Exhibition Report **1966**: 18, E.R., **78**: 66, E., **101**: 160); Brixham, Devon, 7.x. (J. W. Phillips, E., **101**: 160).

1966 Bishopsteignton, Devon, 18.v. (C. W. Holcroft—G .A. Cole *in lit.*); Dover, Kent, two males 21 and 25.vi. (G. H. Youden, E.R., **79**: 60).

1967 near Chichester, Sussex, male 30.ix., female 8.x. (ova) at light. (G. Stubbs—*in lit.*).

1968 Brixham, Devon, 22.x. (J. W. Phillips—R. A. French and G. A. Cole *in lit.*).

1969 Minstead, Hants, in trap 12.x. (L. W. Siggs, E.R., **81**: 335); Bramley, Surrey, male and female 13.x., male, female and one sex unknown, in trap (R. F. Bretherton); Slapton, Devon, three females 13, 21, 22.x., in trap (G. A. Cole *in lit.*); Wroughton, nr. Swindon, Wilts, 17.x., (D. Brotheridge, S.L. Exhibition **1969**); Cullompton, Devon, two 19 and 24.x. (A. H. Dobson—G. A. Cole *in lit.*); Weston-super-Mare, male in trap 18.x. (C. G. Stubbs *in lit.*)

SUMMARY OF MONTHS

April	3	August	11	
May	4	September	13	moths, 1 larva
June	3	October	23	
July	1	month unstated	3	

SUMMARY BY COUNTIES

Devon	16	Dorset	2
Cornwall (Scilly)	13	London	2
Sussex	8	Berks	1
Surrey	6	Bucks	1
Kent	4	Essex	1
Hants and Isle of Wight	4	Norfolk	1
Somerset	3	Wilts	1

Bramley, Surrey. 18.i.1970.

Notes on Rearing *Cosymbia puppillaria* Hubn.

By W. G. Kittle

Having just completed my first (1969) season of collecting Lepidoptera by forcing a fine series of Blair's mocha over Christmas, I have been asked to place an account of this on record, as I understand few collectors lucky enough to obtain this uncommon migrant care to risk breeding from it especially if a female is taken late in the autumn.

The parent, a female, in perfect condition, was taken by me at mercury vapour light on Watts Common, near Aldershot in Hampshire, on the evening of October 19th, and I tentatively identified it as *Drepana binaria* Hufn. which I decided to keep alive for ova.

At this time my young son was rearing a small brood of silk moths on holm oak (*Quercus ilex*), and borrowing a spare sprig of this, I enclosed it together with the female, in a plastic box. A few ova were noted the following day, and at her death on October 23rd, I found a total of sixty ova which had been laid on the *ilex* twigs and leaves. The dead female, still in good condition, I discarded in my rubbish box but, as I found out later, it fell instead on my shed floor.

Several days later while discussing lepidoptera with Mr. E. A. Sadler, of West Tisted, I mentioned my recently obtained ova and asked him whether *D. binaria* presented any rearing difficulties. He explained my female was unlikely to be *D. binaria*, and concluded with great interest that it could possibly be *puppillaria*. I returned home with instructions to rescue the female parent's body ,and a few days later returned with a small portion of one forewing—which was all that some unidentified vermin in my shed had left — to West Tisted. This was enough to convince Mr. Sadler that I had ova of *puppillaria*, which we also knew were fertile, since, just prior to this, on October 29th, the first larva hatched. It was a tiny black and white creature which fed on the *ilex* leaves readily.

A check was now made on all the literature we could locate to see how the rearing of this species should be carried out, but we found that the sparse information available was very hazy on winter rearing, though we were interested to see that *Q. ilex*, chosen quite accidentally by me, was a recommended pabulum. To our dismay, great play was made of the preference of the larva for young leaves: my local holm oak having taken several frosts, seemed to have only tough leaves, and most ordinary oaks had shed nearly all their leaves anyway.

We decided that leaves of both holm and common oak plus cultivated privet, should be provided. Larvae continued hatching until November 6th, when I found that all sixty were feeding mainly on the two oaks and eating only a little of the more succulent privet. We agreed that I should force these larvae on while food supplies were still available, and I reared them in two medium sized plastic boxes in a heated room with a temperature of 55°-60° F.

While searching for fresh food for them locally I unexpectedly found a young common oak, some 12 feet high, growing in a very sheltered position, which not only had green leaves on it, but also an abundance of young shoots, and this tree fed my rapidly growing larvae to pupation. As the larvae grew larger, two colour forms were observed, some being mainly green, others a light fawn colour, and these same colour forms

were carried on into the pupae. When disturbed the larvae would sit upright, holding on with only the anal claspers, and would commence waving their bodies about in unison.

Pupation started on November 24th and was completed by December 7th. Well before this latter date, frost had killed all foliage from my oak sapling, but I had prepared for this event by removing some branches earlier, keeping them in water in a cool place protected from frost. Fortunately these just held out until the last larva had pupated.

From the sixty larvae, all but one, which died at the change, pupated successfuly. Pupation sites were on leaves, stems, or sides of the plastic boxes.

At this stage I separated eleven pupae and am keeping them in an unheated room in an attempt to overwinter them and to obtain spring emergence and pairing. The main batch of 48 pupae was still kept at the rearing temperature, the wing cases darkening shortly before emergence, which commenced on December 23rd. By December 31st all four dozen had successfully emerged and equalled or exceeded in size pictures of the species available to me.

The above is probably a classic case of beginner's luck, and I have little doubt that had I not committed the initial blunder of mis-identification, the parent female would now repose alone in my collection with no attempt at hazarding such a rare specimen for breeding experiments in mid winter. Probably a case of "Fools rush in where angels fear to tread"!

38 Netley Street, Farnborough, Hants.

Late Autumn Breeding of *Cosymbia puppillaria* Hubn. (Blairs Mocha)

By G. A. Cole

During October 1969 I took three specimens of *C. puppillaria* Hübn. in my mercury vapour light trap at Slapton, near Kingsbridge, S. Devon. All of these were females in fresh condition. It is an active little moth, and capable of rapid flight. I base this observation on my boxing of two of these specimens and of my catching of the third by net: also on the behaviour of one of the few which I bred which escaped and crossed a big room without my seeing it before I noticed it flying vigourously on the inside of the nearest window.

The first one arrived on the night of 13/14th October and was kept for eggs. The second which came on the night of the 20/21st October, which also produced a good male *Plusia orichcalcea* Fab., was killed and set. The third, on the night of 21/22nd October was again kept for eggs.

This record is, in broad terms, one of failure, both in quality and qantity. The great problem is, of course, to provide the newly hatched and very tiny larvae with oak leaves sufficiently soft for them to commence feeding. In late October this is no easy matter. In November it becomes difficult to find leaves sufficiently soft even for the stronger and much more mature larvae.

I will deal first with the offspring of the first female kept. Twenty-one eggs were laid by the 19th October when the moth died. Kept at normal

room temperature (say 60° F.) two eggs hatched on the 22nd October. There were given young Holm Oak (*Quercus ilex*) leaves as soft as could be found and both died within 48 hours without commencing to feed. The remaining eggs, which had turned pink but showed no sign of going through the other colour changes, were then placed in the linen cupboard (temperature generally 75°F. but occasionally rising to 80°F.) with the result that nine more hatched on the 25th October. These larvae were given ordinary hedgerow oak (Quercus robur) leaves as young and soft as could be found. Feeding commenced and on the same type of oak at the same rather high temperature all nine larvae pupated between the 11th and 15th November. There were seven green and two brown pupae. The nine moths emerged between the 17th and 21st November, almost all shortly before midnight. Bred at this temperature the whole period from egg to perfect insect was therefore a little over four weeks.

The bred specimens are rather disappointing. They are only very slightly undersized, but putty coloured as against the brown of the female parent. There is a nice pink shading of the hindwings of several of them.

The history of the other female kept for eggs is soon told. Total eggs laid were forty. Twenty-one larvae hatched and all died within two days without commencing to feed, although they were given similar oak leaves to those on which the others were successfully reared. This must have been a very weak strain. It is of interest that in both cases roughly 50% of the eggs laid failed to hatch.

This is an interesting little moth, and one cannot avoid speculation as to its status in this country. Mr A. H. Dobson, the recorder of Lepidoptera for the county of Devon, has very kindly, at my request, sent me a list of the Devon County records. They are as follows:—

1951	one	Torquay	29th September	A. H. Dobson
1956	three	Ashburton	23rd, 26th and 28th September	H. A. Kennard
1962	one	Bishopsteignton	1st October	W. L. Coleridge
1964	three	Bishopsteignton	3rd July	
			20th September	C. W. Holcroft
Brixham		date not known		J. W. Phillips
1965	one	Brixham	7th October	J. W. Phillips
1966	one	Bishopsteignton	18th May	C. W. Holcroft
1968	one	Brixham	22nd October	J. W. Phillips
1969	five	Cullompton	19th October, 24th October	A. H. Dobson
Slapton		14th, 21st and	22nd October	G. A. Cole

It would be helpful if the records of the occurrence of this species in other parts of the country could be placed side by side with those quoted for this comparatively small portion of the County of Devon. Specimens taken in this country are regarded as migrants. There is a certain consistency in the autumn captures in Devon that suggests to me that they are likely to be home bred and the progeny of immigrants which arrived earlier in the season. I do not know sufficient about the life history of the insect in the Scillies or on the continent to express an opinion as to whether it could pass the winter here in any of its stages. But the winters in these parts are mostly kindly and the Holm Oak flourishes throughout the area. It is to be seen in most villages and towns. There are par-

ticularly fine and frequent examples in Kingsbridge, Salcombe and Ashburton. There are three within a few hundred yards of my house at Slapton. It grows freely, too, around the larger country houses in more isolated situations. Unless the larva (or that even more remote possibility, a freshly emerged moth) can be found in the early months of the year, there can be no proof. Unfortunately the tree, both by its growth and its situations, does not facilitate either beating or searching.

Higher Ley, Slapton, nr. Kingsbridge, S. Devon.

Eumenis semele thyone Thompson (Lep. Satyridae) Comparisons and Remarks

By R. L. H. Dennis

The three aspects of interest dealt with in this article, with reference to specimens from Conway and the Great Orme's Head, North Wales, are the size of the insect, the feature of the medial white transverse hindwing underside band, and the dissimilar colouring and markings of *semele* from different localities.

Size—The following remarks are of some interest. Professor E. B. Ford recieved this information directly from Mr. J. A. Thompson:—

"Two remarkable dwarf races of butterflies occur on the Gt. Orme's Head, N. Wales . . . one of them, the race *thyone* Thompson . . . is not known elsewhere. Its average wing expanse is about 41 mm. male and 43 mm. female (in normal specimens it is about 48 mm. and 52 mm. respectively)"[1].

Mr. J. A. Thompson described ssp. *thyone* Thompson initially in *Entomologist's Record*, **56**: 1944; and not merely for the Great Orme's Head, but for the whole of the Creuddyn Peninsula, such that:—

"Race of *E. semele* . . . which occurs on the limestone cliffs of the Creuddyn Peninsula in Caernarvonshire."

Also stated was the fact that the male was "strikingly smaller than any other British race of *semele*, those in my series of over 100 specimens collected at random averaging 47·7 mm . . . The female is similarly smaller than other races, those in my series averaging 51·1 mm."[2].

The following points arise: —

1. There seems little reason to doubt that the figures are correct, that a statistically representative sample was used, and that the samples were taken randomly over the localities concerned.

2. For what area does the ssp. *thyone* Thompson really represent, the Gt. Orme's Head or the Creuddyn as a whole?

3. One wonders as to what is meant by the remark "(in normal specimens it is about 48 mm male and 52 mm female)". This phrase first on page 220 is repeated on page 290 of Professor E. B. Ford's "Butterflies". One asks if it is the normal wing expanse of the British Grayling that is being referred to, or whether 'normally' indicates merely those *semele* beyond the Gt. Orme in N. Wales. It is clear that while it seems that the former interpretation was implied, if indeed my understanding of that section and page 220 is incorrect, and the latter was in fact what was meant, then Professor E. B. Ford's 'normally' as to mean those *semele* immediately beyond the Gt. Orme, seems remarkably close to Mr. J. A. Thompson's original definition of *E. semele thyone* Thompson.

It is evident from Mr. J. A. Thomson's remarks above[2] that he knew *E. semele* 'normal' specimens to be much larger than 48 mm male and 52 mm female. It also seems clear from the following quotation, that Mr. J. A. Thompson later limited ssp. *thyone* Thompson to the Gt. Orme's Head.

"On the Gt. Orme's Head is the subspecies *thyone* Thompson"[3]. (All this results from the fact that I have not been able to find an official alteration of *E. semele thyone* Th. as to its distribution and size, by him, so as to annul his original definition of 1944).

Size or wing expanse of butterflies is rarely stated, and it must vary a great deal between populations of the same species in different localities. I should think if statistically representative samples were taken for the grayling populations in different parts of the British Isles, some interesting results would obtain. Though we can imagine how much effort Mr. F. W. Frohawk must have put into the construction of his three volumes, one wonders at the value of statements like the following:—

"The average expanse of the wings in the male is 56 mm, in the female, 61 mm".

He has stated wing expanse values for every butterfly, but we have very little idea on what the measurements are based. I have included his figures here, for however accurate or inaccurate they may be, at least they show the margin of difference that exists between the size of Creuddyn and Gt. Orme specimens on the one hand; and perhaps the larger *semele* in southern England or at least elsewhere on the other. I think perhaps one does not have to look too far for the larger *semele*, even in N. Wales. Mr. J .A. Thompson has described *semele* as 'large and brilliant' on the Flintshire hills[3]. Is it not possible with *semele* measuring 41 mm ♂ and 43 mm ♀ on the Gt. Orme; 47·7 mm ♂ and 51·1 mm ♀ on the Creuddyn; and measuring larger elsewhere on the N. Wales coast, that a cline exists? We cannot be sure and so this question will have to be shelved until full data is acquired. Mr Gordon Ellis pointed out that there is not only a dwarf form of *semele* on the Gt. Orme, but on the hillside above Glan Conway also; unfortunately, no further information was given. [G. Ellis, Llandudno, Colwyn Bay and District Field Club Proceedings, Vol. XXII, 1949].

It cannot be said now that *thyone* is in 'immense profusion' (Thompson[3]) and so I have not dared to extract a large sample from the Gt. Orme in any one season. This aspect of the size of *semele* will now be left until late next year. (I would be most grateful for any information on *semele*, especially the measurements of *thyone* T. from private collections).

Medial white transverse hindwing band—"It is usually stated that the underside of the hindwings is whiter in specimens from chalk downs than in those that fly among heather . . . It must be understood that the difference is an average one only, undersides of all degrees of darkness being found in either situation"[4]. Professor E. B. Ford suggested that a numerical comparison be made, and to the best of my knowledge this has not been done. Perhaps we have arrived at a situation where specimens of *semele* from the chalk are commonly referred to as 'the typical chalk form' (J. F. Owen p. 73. *Ent. Rec.*, 1950). R. J. R. Levett (*Ent. Rec.*, 1951, p. 182) described specimens on the Haldon heather moors near Teignmouth, Devon, as having "the underside hindwings marked with whitish,

similar to those of the Chalk Downs of Sussex". I mention all this as an introduction to the comparative remarks of Conway and Gt. Orme *semele* described below, since although what is to follow may not incline to Professor E. B. Ford's suggestion directly, it might throw some light on this variable character as influenced by geology, soils and vegetation. The two extremes of the gradation of this character, well illustrated as figs. 3 and 4 on plate 14 of Professor E. B. Ford's 'Butterflies' (third edition) seem worthy of varietal status.

Mr. J. A. Thompson's original definition of ssp. *thyone* Th. in 1944, was followed by a description, but this was given for *thyone* Th. as resident on the whole Creuddyn, and no further distinction was made for Gt. Orme *semele*. From this and my own observation, it would seem that the discrepancy between Creuddyn and Gt. Orme specimens is one of size only. It seems likely that the genetic factors guiding the coloration of Gt. Orme and Creuddyn *semele* are independent of the genetic controls operating on the size of the insect; and that the presence of the white and grey Carboniferous Limestone is a strong factor in the determination of the similar coloration of *semele* from those two localities as compared to Conway specimens.

Since most readers may perhaps not have *Ent. Rec.* 1944, I include here the brief but noteworthy descriptions originally given by Mr. J. A. Thompson.

Male—. . . '. . . Coloration more uniform than typical *semele*, with the pale areas more ochreous. The forewing spots are smaller than in other races, with the lower of the two frequently absent, and totally obsolete specimens are not very rare. The underside has the colouration duller and less contrasting than in the type, with the white portions of the hindwings tinged with ochreous. The tendency to obsolescence is even more striking on the undersurface . . .'.

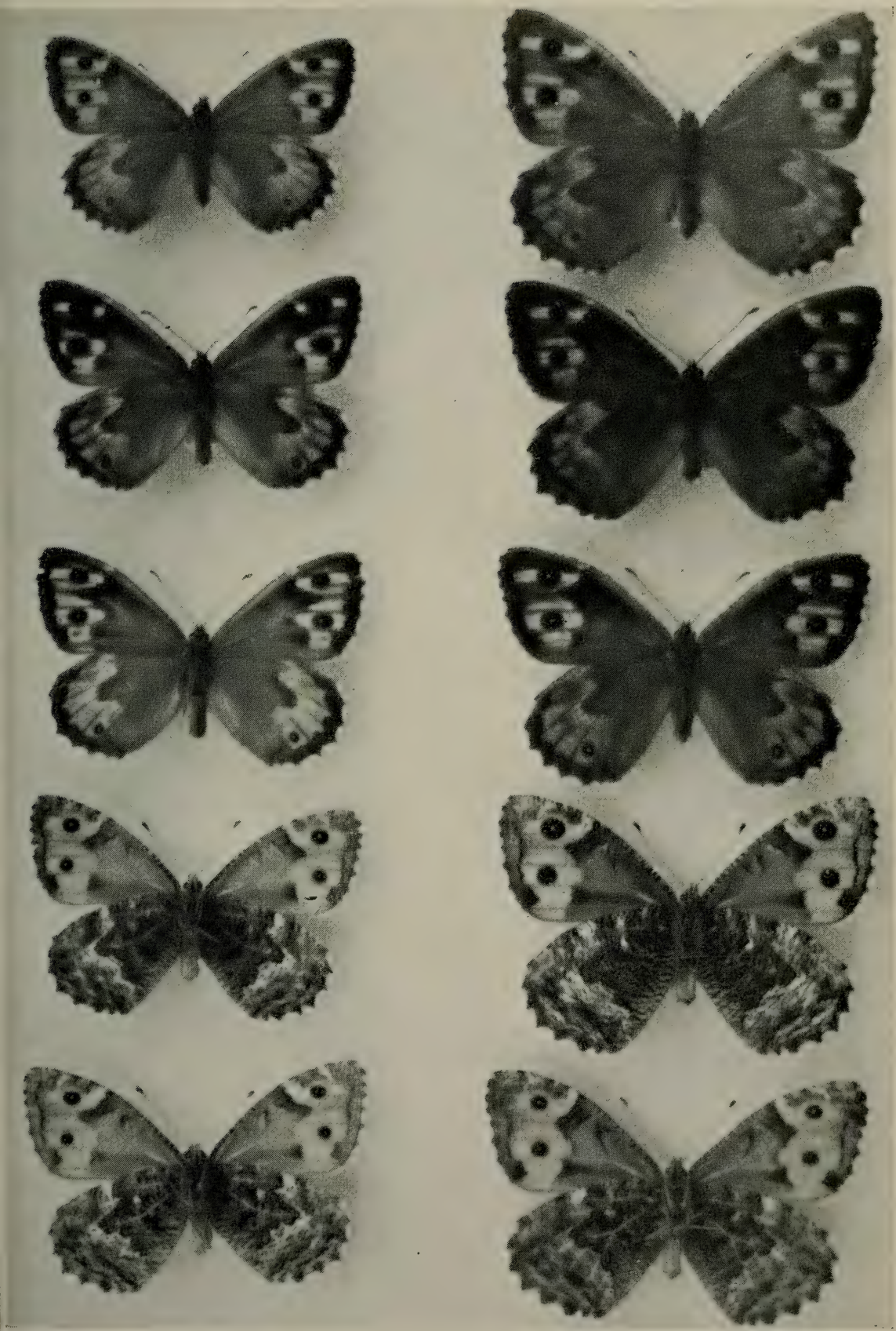
Female—description similar to male, but '. . . obsolescence is less marked'.

It seems clear on the actual measurements given by Professor E. B. Ford (information from Mr. J. A. Thompson) that *thyone* Th. is centred on the Great Orme's Head. However, in view of all that has been stated above, and with reference to Ford's final statement on *thyone* Th. on page 290 (3rd Ed. 'Butterflies') that it "is isolated by a gap of 2500 yds" from "the ordinary form", one wonders again at the meaning of 'ordinary form' and whether such a term should be used in this case; and the effectiveness of isolation, which undoubtedly must have operated in one way or another for this race of *semele* to have evolved. Very likely, *semele* is small throughout this region under discussion in N. Wales, being smaller by far on the Great Orme's Head.

The insects I have chosen for comparison, were taken immediately beyond the Creuddyn on Conway Mt. and Conway Morfa, since the *semele* from these locations (and from Deganwy Castle on the Creuddyn) are at first glance different in coloration from specimens of the Carboniferous Limestone, and in size from Gt. Orme *thyone* Th. They are located 3000+yds distant from the Gt. Orme.

It is certain as an additional comment that Gt. Orme *thyone* Th. emerges earlier than *semele* in adjacent districts. Mr. J. A. Thompson dated the emergence of *thyone* Th., in connection again with the Creuddyn 'towards the 3rd week in June', and remarked that it disappears 'by

Males.—Numbering left to right, down, left to right, etc.
Fig. 1. Gt. Orme; Fig. 2. Conway Morfa; Fig. 3. Gt. Orme; Fig. 4. Deganwy; Fig. 5. Gt. Orme; Fig. 6 Conway Mt; Fig. 7. Gt. Orme; Fig. 8. Conway Morfa; Fig. 9. Gt. Orme; Fig. 10. Conway Morfa.



Females—

Fig. 1. Gt. Orme; Fig. 2. Conway Morfa; Fig. 3. Gt. Orme; Fig. 4. Conway Mt.; Fig. 5. Gt. Orme; Fig. 6. Conway Morfa; Fig 7. Gt. Orme; Fig. 8. Conway Mt.; Fig. 9. Gt. Orme; Fig. 10. Conway Morfa.

the end of July'. This year, with the season perhaps starting somewhat later than usual, *thyone* Th. emerged on the 25th or 26th of June, and reached its numerical zenith circa 15th July. I was away for a week in early July, so I have not the exact emergence dates of Conway *semele* this year. Mr. H. N. Michaelis informed me that *semele* was flying on Allt-wen and towards the summit of Conway Mt. on the 19th July. *Semele* at Conway Morfa on the 21st July seemed to have emerged very recently. On the 23rd July they appeared to be in full swing, while *thyone* Th. on the Gt. Orme had become very drab, and the numbers had dwindled considerably. However, *thyone* Th. can be seen in greater or lesser number, in better or worse condition at different dates than those I have included for this year; all depending I suppose, on our rather unpredictable weather conditions. Mr. Gordon Smith and Mr. W. Reid found *semele* 'flying in abundance' on the 28th July for instance (*Ent. Rec.*, 1951, page 269). The presence of one or two unfortunately battered *semele* on Conway Mt. on 25th July 1969 amongst many specimens in excellent repair pointed to its emergence there perhaps as much as two weeks earlier; though this cannot by any means be considered the emergence date for the bulk of *semele* at that location.

The specimens described are from Conway Morfa and Conway Mountain, and from the Great Orme's Head. Though the description is based on 22 insects from the former two locations, and 30 from the latter; I have taken and released a great many more, and I am satisfied that these set specimens are representative of the populations. They were collected at random without preference for one type specimen or another. I had hoped to obtain a number of specimens from Deganwy which geologically is a continuation of Conway Mt., but I was not fortunate in this respect, and a number of visits to this monadnock produced only a single specimen which is identical to Conway *semele*. I include specimens from all localities in Plate 1 and Plate 2, though my photography can never do the actual specimens service.

Notes on the Environments:—

	Conway Morfa	Conway Mt.	Gt. Orme
Height	21 ft	550-800 ft	0-400 ft
Geology	wind blown sand and heavy shingle	rhyolites and rhyolitic tufts. Andesite. Felsite and quartz porphyry	Carboniferous middle white 1st
flora	marram and other grasses	heather (E. tetralix) bracken, grass patches	short grass
remarks other	fairly dry region	damper region	dry region

The Gt. Orme provides the lightest coloured, the most dry, and least vegetative covered environment, resulting from the bulk of white and grey-white weathered limestone scree and bare escarpment faces, and from the fact that the headland receives less precipitation than areas inland to the west.

Conway Morfa *semele* fly on the sandy and shingle edge of the golf course, the latter only being exposed, and then along the very fringe. Long sections of marram grass occupy most of this narrow zone with

darker green patches of shorter grass (very short on the paths). The shingle on which the butterfly often alights is mostly made up of stones 3 to 4 inches long and grey in overall appearance. It seems somewhat strange that the grayling here should be so similar to those on Conway Mt., which poses a totally different habitat. It could be that *semele* is blown along the shore by the prevalent westerlies from Penmaen Bach (an extension of Conway Mt.).

The rhyolite on Conway Mt., displays deeply weathered surfaces of rustic brown, black and grey giving an overall dark appearance; especially as most of the surface is lichen covered (grey-black). The scree on which many were caught was similarly dark coloured. Further towards the summit, the rock was finer grained ,and generally grey-black and light fulvous, with rusty brown areas matching the underside forewing basal band of *semele*. The females were mostly caught off the heather patches. Deganwy is similar to Conway Mt., and is a very damp area; however, it lacks heather, and small bushes and bracken have advanced over the scree. The butterfly was very scarce in this area in 1969.

Briefly, it is clear that the distinction lies between *semele* from Conway and Deganwy localities, and those from the Great Orme. Especially noticed is the darker and deeper coloration of *semele* from the former locations, and the clear differentiation of the bands of these insects; in contrast to the much duller and the more uniformly lighter coloured *thyone* Th., whose lack of brightness seems to have been an adaptive trait in camouflage, so as to merge into the bulk of grey and white limestone.

For the purposes of this description, I would like to consider the Grayling as having three transverse portions on the wings, applying both to the upper and underside of the insect.

Male. Upperside. Forewing:—The basal band is defined by the blackish diagonal region on the discal cell zone. In fact this androconial region lies outside the discal cell, really occupying the area of the inner part of the venation, encircling an inner dark brown of the disc. The androconial black region follows the curvature of the discal cell round to the costal margin, where it merges with the same dark coloration extending from the base to the apex; and this in turn imperceptably becomes what may be called the small outer marginal transverse band.

In the *thyone* specimens, the black sexual brand is more noticeable as an entity, for it is undoubtedly of a darker shade (near enough black, indeed) than that of either the discal cell zone, the costal margin or the outer margin. But the specimens from Conway mountain, Conway Morfa, and the one from Deganwy give an overall dark appearance; and certainly, though the sexual brand stands out more readily in some insects, in the majority of specimens this darker appearance of the basal zone, including the discal cell, the costal and outer margin, has invaded the central band to a great extent.

The central band occupying the majority of the more easily detected venation is the lightest part of the whole forewing. It is brightened by the yellow-fulvous adjacent to the two usually white pupilled black spots; this fulvous also appears between nervures 3 and 4, but its tint is added to the whole of this central zone, merely being submerged to a greater or lesser degree by brown scales. The distinction here, is that *thyone* Th. has an overall lighter zone, with the effect also that the darker

scales appearing to overlie the light fulvous base fail to occlude its effect in more places more often. So *thyone* Th. specimens have on more occasions the fulvous breaking through the darker scales between nervures 1 and 2. Conway *semele* are darker in this central zone, for reasons mentioned above. Also, the fulvous occupying those positions described previously, is brighter in Conway *semele*, and glints out from the darker background more effectively. In one specimen from Conway the fulvous is nearly absent, and it seems that Conway *semele* generally are more prone towards the extremity of this feature. However, the trait is never really successful in *semele* from any of these localities, for even in the most uniformly dark insects, a tint of fulvous is found distally adjacent to the apical spot. The central band is more contrasted with the androconial brand in *thyone* Th. In *semele* from all these locations, a dark intersection runs along nervure 4 from the sexual brand, and the darkest patch on the central band is between nervures 4 and 5 under the apical spot. The central band ends above the apical spot, where the dark costal margin takes over; a darker section also runs along the inner margin, but this is often only slightly darker than the rest of the central zone, and is never the shade of the costal margin. The brown nervures stand out more readily on the central band of *thyone* Th. than of Conway *semele*.

The two ocellated spots in this central zone are naturally larger in Conway *semele*, as it is a larger insect, though the lower of the two is generally smaller in all insects. These spots are always minutely white pupilled (or not pupilled at all), but the lower of the two between veins 2 and 3 most often lacks the white pupil, especially in Conway *semele*. *Thyone* Th. though a smaller insect, has these minute white pupils more commonly. Mr J. A. Thompson stated that "the lower of the two" spots is "frequently absent", but I have not seen one as such, nor a completely obsolescent specimen.

More pronounced in Conway specimens also is the minutely speckled black, brown and white effect that runs from the base along the very edge of the costal margin usually half-way to the apex and often more as a grey line.

With the Conway *semele* being larger and darker, the costal and outer margins are certainly far more distinct and the apex is a black brown zone. Relatively, the corresponding features on *thyone* Th. are much reduced in width and depth of colour. A white edge runs round the outer margin in Conway *semele* intersected by the brown of the nervures. This edge is smaller and far less well defined in *thyone* Th. and is a dirty (browny) white.

Finally, the fulvous on the central band in both Gt. Orme and Conway specimens really colours from a yellow ochre to orange-yellow, and by no means matches the brightness of the fulvous of the upperside hindwings.

Male. Upperside. Hindwing:—The hindwing upperside has the three bands more distinctly displayed, even though the boundary between the inner basal and central band is an irregular line. Generally, the brown of the basal band is not so dark as the same zone on the forewings. Certainly in the *thyone* Th. specimens, the depth of colour by no means compares with the brown-black of the sexual brand on the forewings,

nor with the darkness of the outer margin. This is also true of Conway *semele*, but these butterflies are infinitely more dark than those of the Great Orme. However, there is one section on this basal zone that is darker than the rest of the band. This is the outer part of the basal zone which forms the boundary and creates the contrast with the central band. This darker boundary line widens towards the costal margin. The effect is equally striking in Gt. Orme and Conway *semele*, but I repeat that the latter are a deeper brown-black.

The central band can be divided into two units; that of an inner light grey brown coloration, and an outer fulvous zone. Through both, the darker venations are clear lines. The fulvous runs into the grey-brown as rounded portions extending inwards towards the base, centrally between the nervures 2-6; but following the latter, the grey-brown invades the fulvous as sharper portions. The proportion of these two sub-zones to each other in the central band varies from insect to insect, but generally they both occupy half the area. The fulvous of Conway *semele* approaches a true orange-brown, much deeper than that of *thyone* Th.

Towards the anal angle, both subdivisions of the central band pass into a darker brown beyond the 2nd nervure, as if the basal and outer bands had attempted a pincer movement of their darker coloration and had almost succeeded. But in specimens from both Conway and Gt. Orme localities, the black lines of the two latter bands form the boundaries of those regions. Again, the entire effect is dampened down in *thyone* Th.

The black spot between the 2nd and 3rd nervures is usually white pupilled in both Conway and Gt. Orme *semele*, though more so in *thyone* specimens. This anal angle spot is if anything, slightly larger in Conway *semele*, for the same reason as those on the forewing upperside.

The small outer margin is more effectively divided from the central zone than on the upperside forewings, and this is ensured by a distinct black line that undulates between the nervures. This line and the outer margin is darker, and the fringe is whiter in Conway *semele*, while in *thyone*, the edge is again dirty white. The black undulating line demarcating the outer margin, below the anal spot at the second nervure, follows the nervure in towards the base for about 1 to 2 mm (depending on the size of the insect) thus making a right angled turn, and then continues usually with two final undulations to the anal angle. Often the angled deviation it makes is obscured, so that the line seems to break at the second nervure and to appear from it a short way along its length. This feature, too, is much stronger in Conway *semele*, being a wider and longer line.

Male. Underside. Forewing;—On the underside, the comparison between Conway *semele* and *thyone* Th. is more apparent. The three transverse bands are also more noticeable.

The basal zone is initiated by a small strip marked by two black lines on the costal margin, which terminates in less than 5 mm and continues in the form of an irregular line distinguished by the fulvous of the basal band from the more yellow-fulvous of the central band to the inner margin.

(To be continued)

Some Observations on the Habits of *Gonepteryx cleopatra,* Linn

By Anthony Valletta, F.R.E.S.

This butterfly is fairly common in the Maltese Islands and owing to its lovely colour, especially the male, it is greatly sought by collectors. It is met with in gardens where *Rhamnus alaternus* Linn. grows, and also in the open country where spiny bushes of *Rhamnus oleoides* Linn, protrude from crevices in the ravines.

The Maltese *cleopatra* differs from the species found on the continents of Europe and Africa both in size and in the intensity of the orange blotch on the fore-wings of the males.

On examining a few specimens, my friend the late Dr. R. Verity, wrote to me in this sense in his letter of the 23rd June, 1952: "I would call your *cleopatra* Europeus Vrty. trans ad *taurica* Stdgr. Your *cleopatra* is quite the opposite of the Alegrian nominotypical type which Robur renamed by the synonym of *mauritanica;* your specimens point to the *taurica* Stdgr. of Asia Minor which has a very restricted and pale orange blotch. In Algeria on the contrary, it is so broad it nearly touches the outer border of the wing and it is of an intense, reddish orange. Besides, the underside of the hind-wings is of a peculiar milky bluish green, whereas in yours the colour is quite yellow on that surface. In *taurica* the size is often small."

Last April whilst collecting in Sicily, I managed to take a couple of females on the 12th and 13th just coming out from hibernation. I noticed their big size and taking them home alive, I succeeded in taking some lovely specimens of a richer colour than the local ones.

For several years, this butterfly has puzzled me a lot in the number of its brood, the time of laying, and whether it mates before going into hibernation or after. For the first two queries I got the answer. I saw females laying in the wild in early March and as late as the 12th June. Fresh specimens were taken in late April and in early May, as well as in July. Thus two broods are given; the first brood is, however, more abundant; the second brood flourishes in shady gardens rather than in the open country. As this butterfly goes into hibernation as early as August, I have occasionally seen both males and females on the wing, on mild days, in early November (2.11.68) and in early February (6.2.70) but as a general rule, the females do not start laying before the last week of February and in March. A female taken on the 3rd March laid on the 6th and subsequent days. The eggs hatched on the 18th and the first pupae were formed on the 14th, the larvae hanging for 48 hours before pupating, and the butterflies started emerging on the 1st May and went on up to the 7th.

On the 16th June I took a female at Boschetto where the *Rhamnus alaternus* is plentiful. She started laying on that same afternoon in a breeding cage in my garden. Eggs hatched on the 21st and the larvae started to pupate on the 5th July; the butterflies emerged on the 17th, the temperature being, then, over 80 Fah. in the shade.

The great amount of rainfall we had this season has solved my third query viz; whether this butterfly mates before going into hibernation or after—heavy showers during the last week of November had made a female drop helplessly from its hiding place in San Anton Gardens and being noticed by a gardener, was passed on to me in a match-box, as a

dead butterfly! I soon realised that the butterfly was not dead, but sound asleep. I put it straight into a breeding cage, indoors. There it stayed motionless up to the end of January. The temperature started going up in early February and on sunny afternoons I took the breeding cage out in the garden and I also put some flowers of *Oxalis cernua* Thunb., the flower on which *cleopatra* feeds in the wild state at this time of the year. The warmth of the sun woke her up and she started to fly and feed. I then put in a twig of the *Rhamnus alaternus* L. to see whether she would lay or not. I was amazed to see her lay the first batch of eggs on the 13th February; she continued to lay on the 14th when the temperature was 63-65 F. in the shade, and on the 15th she was really dead.

The following days were days of great expectations hoping for the best and wondering whether the eggs were fertile or not after such a long period of rest. After five days, the eggs started changing colour, and on the 23rd February tiny caterpillars were noticed nibbling the tender leaves. Naturally this female *cleopatra* had mated before going into hibernation and the eggs remained fertile all the time! But what still puzzles me is the appearance of males in February and March. Are they still needed? A possible conclusion may be, that not all the females have the chance to mate before going into hibernation.

This reminds me of a discussion I had with Mr L. Hugh Newman in February 1965, when he paid a visit to Malta together with his wife. He wanted to know whether it was true that unlike *G. rhamni* Linn. *G. cleopatra* mates before hibernation. At that time, I could not confirm but after five years I succeeded to discover more about the behaviour of this pretty butterfly. It may be that other collectors and breeders of butterflies have more to say about this species.

257 Msida Street, B'Kara, Malta. 27.ii.1970.

Revisional notes on the British species of *Orthoperus* Steph. (Col., Corylophidae)

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

The genus *Orthoperus* is, considering its small extent, one of the more difficult in our micro-Coleoptera and has thus attracted but scant attention from students and collectors. The difficulties arise not merely from the minute size of the beetles which, with their convex form and thin, delicate limbs makes them hard to manipulate and set satisfactorily; but still more from the great similarity of the species to one another and their tendency to vary in several of the characters regarded by past authors as critical. Even more daunting, however, than this inherent intractability of the material, is the resulting confusion that describers and other authors have unwittingly created, in which contradictory statements and misinterpretations have been rife. Or so at least it was before 1948, in which year Hr. Nils Bruce brought order out of the chaos with his study of the Scandinavian species; though, of course, problems remain. If I am able here to advance in some measure the knowledge of our own species, it is due very largely to Bruce's painstaking work.

As far as Britain is concerned, the genus was first monographed by the Rev. A. Matthews in 1885, and his results adopted by Canon Fowler

(1889). Matthews laid a firm foundation, but had to rely for his interpretation of the Continental species upon examples sent him by Marseul and Reitter, who in certain cases were at fault in theirs. Moreover, his descriptions, except of his two new species, are very brief.

Bruce has examined Stephens's and Marsham's types in the British Museum, but unfortunately does not deal with the Matthewsian species—probably he was unable to see them. He discusses some three species occurring outside Scandinavia, but reaches only tentative conclusions through inadequacy of material.

In the present paper one further new synonymy is established. I take the opportunity also of correcting some erroneous records in our literature, where I have been able to see the material on which they were based.

The British List, etc. — Matthews and Fowler treated 8 species as belonging to our fauna; two of them were later reduced to synonyms, following Ganglbauer, and Joy (1932), omitting the doubtful *punctatulus* Matth., included only 5. Kloet & Hincks (1945) restored *punctatulus* and, with the then new species *nitidulus* Allen, brought the number up to 7. Their list is very close to that proposed here, the sole deviations being matters of synonymy and the doubtful status accorded here to *punctatulus*. For present purposes, therefore, I admit only 6 certain species as British, with the possibility of one or two others whose status is not yet determined.

Even without *punctatulus*, our list compares unexpectedly well with 5 certain species for Denmark, Norway and Sweden. It is true that Bruce includes 6 species, but two of them he appears to have later reduced to one—see below under *O. punctatus*. Only the latter, among the Scandinavian species, has not yet been found in Britain.

Diagnostic characters.—I preface my remarks on these with a quotation from Bruce (p. 12) which collectors will do well to note: "For determination . . ., it is of paramount importance for the animals to be well mounted, i.e. with the legs and antennae in a natural position and clearly visible, and with the upper surface uninjured and clean."

Because of the difficulties connected with the preparation and diagnostic use of the male genitalia (see Bruce, pp. 12-15), I make only minimal use of this feature in the key that follows—i.e. where the penis[1] is *externally* characteristic—and refer the student who wishes to pursue it to Bruce's monograph. As the author points out, extreme variants occur which can only be determined by resort to it, but for ordinary examples dissection should be unnecessary. Bruce makes no mention of the existence of a spermatheca in the females. Hr. Gunnar Israelson, however, finds that this organ is present, and moreover, appears characteristic for each species; but further study is required for its full evaluation, and figures have not yet been published. The spermatheca is, of course, very minute and easily missed.

Size, colour, body-shape and even sculpture are all liable to variation —the last only within rather narrow limits and almost only as to strength (in *O. brunnipes* especially). It should be examined under a magnification of ×40 (Bruce, p. 20), or higher for the smallest species. Where that of the elytra is mentioned in the key, the basal part of the disc is meant.

[1]i.e. the aedeagus with the tegmen (which is not characteristic) removed.

Joy in his key uses the word 'shagreened' instead of 'alutaceous' or 'reticulate'—incorrectly, for the first term properly denotes 'roughened with raised points like shark-skin.' That is certainly not the case here, where we have to do with a network of impressed lines or scratches.

But there are more serious flaws in Joy's key, resulting in part from his having attempted to use the shape of the fore tibiae as a leading character; whereas it is in fact only sexual, with slight specific differences in one or two cases. The males have these tibiae rather strongly incurved at or near apex; in the females the inner margin is much less curved, though the outer may be noticeably so, with a slight angle. (Cf. Hansen's figure of this difference in *O. brunnipes* (1968: 165).) Consequently Joy's key will not lead to correct determinations, apart from *O. atomarius* and *mundus;* particularly as he gives *atomus* twice over with contradictory characters (!) and still further confuses the names. Thus, his first *atomus* doubtless represents *nigrescens;* his second *atomus, brunnipes*; and his *brunnipes*, the true *atomus*. In his figures of front tibiae, fig. 4 really represents a ♂, 5 a ♀; 6 (♀ *atomus*, not *brunnipes*) seems exaggerated in the angulation of the outer edge.

Antennal structure is reasonably constant and provides some useful criteria, but there is an important proviso: the insect must be so placed that the full extent of the flattened surface of the segment under consideration is visible. If this be not attended to, the segment may present a dorsally edge-on view which will be deceptive when its breadth has to be compared with that of its neighbours, and easily lead to error. Bruce appears to have overlooked the distinctive second antennal segment in *O. atomus* and possibly other species (? *brunnipes*). The club is similarly formed in all.

Colour characters, used with caution and in conjunction with others, can be helpful for reasonably fresh material; but it must be remembered that very old specimens may be more or less bleached and not show, for instance, darkening of the antennal club.

It is not practicable to attempt to frame a key that will accommodate all the many deviations from the normal, since it would be almost unworkable. Further, some expressions used must obviously be understood in a comparative sense.

Revised Key (excluding *O. punctatulus* Matth., *q.v., infra*)

NOTE: Characters or points not directly contrasted are placed in brackets.

1/4 Very small species not or hardly exceeding 0·6 mm.; shining, base of pronotum as well as of elytra plainly and rather closely punctate, alutaceous ground-sculpture weaker than punctures.

2/3 Yellow to bright castaneous, antennal club and head rather darker; elytra hardly visibly alutaceous; antennal segment 2 narrower, ovate-oblong; penis in side view much wider in middle than near either end. *atomarius* Heer

3/2 Black to pitchy-brown, including club; elytra delicately but very plainly alutaceous; antennal segment 2 wider, straight on one side, rounded on the other; penis in side view of nearly equal width throughout, narrow pointed apex very short. *nitidulus* Allen

4/1 Larger species, with ground-sculpture at least as strong as punctures which are finer and less close in proportion to size; if nearly as small (*nigrescens*), then much duller and strongly reticulate with pronotum not clearly punctured even at base.

5/6 Antennal segment 2 large, rounder, only half as long again as broad; club not or scarcely darkened. (Dark castaneous to light brown;

elytra alone very finely punctate[2]; antennal segment 5 much larger than 4 or 6; on average our largest species.) *atomus* Gyll.

6/5 Antennal segment 2 smaller, less round, about twice as long as broad (or more in *brunnipes*); club more or less dark or dusky, except often in *punctatus* which appears not to be British. (Black to pitchy when mature.)

7/10 Large species (to over 1 mm.), of slightly longer form; usually shining, ground-sculpture not so dense or strong; antennae rather long, often dusky towards apex, segment 2 unusually long and sublinear at least in 8/9. (Punctures varying in strength and density.)

8/9 Ground-sculpture with rounded meshes, but obsolete on pronotum which is impunctate; base of latter slightly produced backward in middle; elytral punctures angled or semilunate; apex of penis with several stout bristles on each side. (Tibiae sometimes distally darker.) *brunnipes* Gyll.

9/8 Ground-sculpture consisting of wavy transverse lines forming in places very long narrow meshes, distinct also on pronotum which is punctate towards base; the latter not produced backward in middle; elytral punctures round, but sometimes with the appearance of radiating strigae; apex of penis without bristles. (The largest species, not yet detected in Britain.)
punctatus Wank. (including *punctulatus* Rtt.)

10/7 Shorter, broader, more rounded species; surface dulled by strong dense round-meshed reticulation; antennae rather short, club dark, segment 2 shorter and broader.

11/12 Smaller, well under 1 mm.; elytral punctures fine, angled under a high power, embedded in and forming part of the ground-sculpture; pronotum impunctate, hind margin not sinuate, sides without a defined yellow border; antennal segments 5 and 6 subequal; narrow basal part of penis short, nearly perpendicular to the broad part, apex without bristles. *nigrescens* Steph.

12/11 Larger, about 1 mm.; elytral punctures round, less fine (but shallow), separate from ground-sculpture; pronotum with punctures at base forming a row along hind margin, which is sinuate and slightly produced backward in middle, sides with a narrow but defined yellow border; antennal segment 6 minute, 5 much larger; narrow basal part of penis long, forming a smooth curve with the broad part, apex with bristles at sides. *mundus* Matth.

Notes on the Species

(Synonymy is complex, and only those synonyms more important for the British literature are given.)

O. brunnipes Gyll. (auct. partim, *nec* Ganglb.; =*kluki* Wank.).—One of our larger species; it is the *O. kluki* (*not* the *brunnipes*) of Matthews and of Fowler. The peculiar form of the elytral punctures under a high power, and probably of the second joint of antennae, is almost diagnostic; but in some points it varies considerably.

The species does not seem at all common with us, at all events in this century; but perhaps it is simply very local. Fowler gives 'moss, vegetable refuse, etc.' for the habitat, and the British records in part suggest damp or marshy localities. Bruce regards it as largely coastal and hydrophilous in North Europe, where it has been taken in diverse situations such as under seaweed, grass, dead leaves, in compost, and perhaps in tree fungi. The series in the Power collection is from Burwell Fen, Cambs., where it appears to have occurred freely. The

[2]Bruce and others describe the elytral punctures as scattered. I cannot agree; though very fine indeed, they seem (with suitable lighting) even closer and more regular than in *brunnipes*.

O. brunnipes of Donisthorpe's collection, from Burnham Beeches and Windsor Forest, is the next species; but his *'punctatulus'*, as well as his *kluki*, are the present one.

O. mundus Matth. (=*brunnipes* Gang., auct. partim; *improvisus* Bruce).—A medium to largish species much confused with others, chiefly the last; however, it is not hard to recognise if the key characters are attended to. It appears to be the *brunnipes* as well as the *mundus* of Fowler, following Matthews.

Some 20 years ago Hr. Bruce kindly looked over certain Orthoperi for me and named as his *O. improvisus* (1946) specimens from Windsor and from East and West Kent, agreeing with the description of *O. mundus* and generally regarded here as that species. Bruce's description, moreover, called to mind Matthews's insect in more than one respect, so it was no surprise when, much later — an opportunity having occurred to examine the types of *mundus* — the 'two' species proved to be clearly one and the same. The earlier name must therefore be revived—a change affecting Continental literature but not ours, into which the later name has not been introduced[3].

This is, in the present era at least, one of our commoner species—notwithstanding that the records in Fowler (pp. 143-4) indicate quite the reverse. In the Supplement (6: 253) a fresh crop of records appeared and it is probable that those given under *mundus* at least are correct. If they are all so, the species occurs up to the Scottish Highlands and in Ireland besides all or most of England. It is the only species of the genus that has occurred to me in any numbers and in several places, as follows: Windsor Forest, under dry beech bark (once in profusion in the presence of small greenish moulds) and occasionally on the cut surfaces of logs, etc., and on the underside of the hard bracket-fungus *Fomes fomentarius* on beech trunks; in woods near Enfield, Mdx., on polypore fungi on beech; and in Kent at Knole Park, Sevenoaks, and Ham Street Woods, under oak bark. Bruce's ecological data for *improvisus* also point to a chiefly arboreal species.

O. atomus Gyll. (=*corticalis* sensu Matth., ? *nec* Redt.; *brunnipes* auct. partim, Joy).—Our largest species as a rule, distinct from all others (except the very small *nitidulus*) by the strikingly large broad second joint of the antennae, and normally by their wholly clear red-yellow colour; in the older Continental (but not British) works partly confused with *brunnipes*. I formerly doubted whether it could be the *corticalis* of Fowler's work, based on Matthews's interpretation, but can now confirm this synonymy from the latter's collection; Bruce (p. 12) proposes it tentatively. He points out (p. 11) that *picatus* Marsh. may be the same, the specimen he saw being a definite *atomus;* but there is no proof that it is the type, and its agreement with the description is poor. Champion's *corticalis* from Leith Hill (Fowler, p. 144) appears also to be

[3]Bruce (pp. 10-11) has seen a Stephensian 'type' labelled *piceus*, that seems to be this species. But the description of *piceus* Steph. does not tally, notably in the important matter of sculpture, so this example can hardly be the real type. As I have argued elsewhere, it is utterly unsafe to assume the genuineness of Stephensian or other ancient types *that conflict with the descriptions*, since it has been shown that substitutions have occurred in certain cases. There is already far too much interference with established names as it is.

the present species, of which some of the older records are under that name. The true *corticalis* Redt., if distinct, is not known from north Europe.

Stated by Matthews to be 'the most abundant of the British species' (Fowler, p. 144), *O. atomus* is the commonest on the Continent along with *brunnipes* (Bruce, p. 5). It is somewhat strange therefore that I have never found it—suggesting that it may be either very local in the south-east or less frequent in the past 30 years than formerly. The records are scattered over England and parts of Ireland; for Scotland I can report it from Aviemore, Inv., in garden rubbish (P. Harwood). Joy's St. Kilda record (Fowler & Donisthorpe, p. 253), in consequence of the muddle he has made over *O. atomus* as already noted, is uncertain as to species; I have not examined his collection. For the habitat, Fowler (*l.c.*) gives 'vegetable and haystack refuse, etc.'; in Scandinavia, besides detritus of this sort (especially in barns, and in thatch), it is associated also with wood, bark, tree-fungi, and birds' nests; in Madeira it is found in damp neglected buildings, on the walls (Wollaston, 1865).

O. nigrescens Steph., 1829 (=*atomus* Steph. partim, ? *truncatus* Steph.; *coriaceus* auct. Brit., *nec* Muls & Rey.).—A small (but not very small) dark species, which should give little trouble if the distinctions from *mundus* be observed. It was introduced into our list by Matthews as *coriaceus* Rey on an example from the London district (exact locality unknown), which I have seen. Again, the true *coriaceus* appears to be more southern. Matthews's and Fowler's description under the latter name does not fully accord with our insect, since it cannot be called 'rather narrow', nor the elytral punctures 'large'; moreover, the antennal club is nearly always darkened. It remained for Bruce to establish its true identity.

The species seems rather uncommon in Britain, but, doubtless like any *Orthoperus*, can occur in numbers locally. Since the original record, it has been noted by Donisthorpe from Woodhay, Hants. (as *coriaceus*, Fowler & Donisthorpe, p. 253); I have checked the specimen, an immature *nirgescens*. Bruce (p. 11) has seen several from the Stephens collection under various names, besides the type, but all are without locality; and also 3 out of 7 examples from the Power collection (Shirley, Surrey) previously mixed with *atomus*. In the Champion collection are two '*coriaceus*' which seem to be pale individuals of the present species. I have taken one specimen, swept from grass under oaks in Windsor Park (19.vii.50, det. Bruce) and possess a pair taken by the late G. H. Ashe in cut grass in his garden at Colyton, S. Devon. Further records are: Tubney, Berks., from spruce; Wytham, Berks., by sweeping; Prattle Wood, Oxon, from moss on oaks (all as *coriaceus*) (J. Collins, in Walker, 1914); these I have not seen. In the area under consideration by Bruce it has occurred only in Denmark and south Sweden.

O. nitidulus Allen.—A distinctive and comparatively new species with no known synonymy, discovered by the writer in Windsor Forest (the Great Park) in the autumn of 1941, in small numbers, on the sawn butts of felled oaks, and found on one or two later occasions in the same area on beech logs and under beech bark; one occurred in the latter situation with several *O. mundus*. On 9th August 1950 I took a few specimens in Arundel Park, Sussex, on freshly sawn beech (Allen, 1950)—this time

accompanied by a single *O. mundus*. There appears to be no other published record, either British or foreign. Even in the field the *shining* black or blackish surface together with the small size are practically determinative. I sent Hr. Bruce some examples from Windsor and he confirmed the species as new and figured the penis with its characteristic internal sac (pl. 2, fig. 10); a male dissected by him has been made the holotype and deposited in the National Collection. By reason of the size and sculpture, the only close ally of this species in our fauna is the next. In my original description the character of the second antennal segment was not noted; I am obliged to Hr. G. Israelson for pointing it out. The differences I ascribed to the anterior tibiae as between *nitidulus* and *atomarius* should be ignored, having arisen out of the misconception regarding this feature already noticed as derived from Joy.

Just as these notes were being completed, I heard from Hr. Israelson in Sweden that he had what seemed to be *O. nitidulus;* and since he first wrote, this identity has been confirmed. The beetles emerged from dead branches of fig (*Ficus*, sp.) collected in Hierro, the most south-westerly of the Canary Islands (ix.1969). I am glad to have the opportunity of mentioning this very interesting find, of which details will doubtless be published elsewhere by the discoverer. Unless, therefore, it owes its presence in one or both of its two known areas to human agency (and there is nothing to suggest this), the species would seem to a member of the Atlantic faunal group and its apparent absence from central Europe thus explained. In Wollaston's *Coleoptera Atlantidum* (1865) I find only two species of *Orthoperus* included, both however from Madeira only and both associated with buildings (see under *atomus* and *atomarius*).

O. atomarius Heer.—Likewise a species without synonymy, very distinct by its minute size, pale colour, and reduced ground-sculpture; but apparently not at all well known, and scarce in collections. Bruce had not seen quite certain examples, but finally accepted the identity of those from Finland as probable (pp. 15-17, 32-3). In the latest Fennoscandian Catalogue (Lindroth, 1960) *atomarius* is placed in synonymy with *atomus;* but this must certainly be a mistake, the two species being very different. Bruce refers to the divergence among authors regarding the pronotal puncturation, not mentioned by Heer; in fact it appears very clear at the base, but on the rest microscopic and scattered.

Although Matthews (p. 110) says "it occurs not uncommonly in damp localities, and also in damp cellars in various parts of the kingdom," *O. atomarius* seems much rarer with us than that statement implies. If, as Fowler (p. 145) suggests, it is virtually attached to the mould *Zasmidium cellare* growing in cellars, Matthews can hardly have been right in the first part of his statement above. In Madeira it has been found (like *O. atomus*) on the inside walls of damp houses (Wollaston, 1865)—no doubt feeding on some similar mould. I know of only four British records: Devizes, Wilts. (Crotch) and Gloucester (Allen Harker), in cellars (Fowler, *l.c.*); Bradfield, Berks. (Joy) (*ibid.*, **6**: 253); Scilly Isles (Joy, *in coll.* Power). I do not know the habitat in the last two cases, nor on the Continent; at Devizes it occurred abundantly.

Possible Additional Species

O. punctatulus Matth.—Described on a single specimen from Gumley, Leics. (Matthews, 1885: 108); at least one of the two later records is false.

The species is a puzzle; Joy (1932) ignores it, but (Kloet & Hincks (1945) include it—no doubt for the good enough reason that it has never been proved invalid. Whether anyone since Matthews has examined the type I do not know, but from the Curator of his collection at Bolton I understand that no specimen now stands over the name; so, unless it should come to light under some other guise, the type is presumably lost. The species must, I think, be treated for the present as doubtful. (The name must not be confused with that of *O. punctulatus* Reitt.—see below—which I have known to happen.)

I have carefully considered the description, but cannot see to which of our known species it can well be referred. There are points that seem to forbid identification with *mundus* or even the variable *brunnipes*, and any other is still less likely. It *may* indeed be a good species; but, being unique, it may be an aberrant individual of some other—despite appearances. The most significant points should be the well-developed and close elytral puncturation, similar 5th and 6th joints of antennae (which character, with the dark club, recalls *nigrescens*), elytra 'long . . . rather depressed', they and the pronotum alutaceous but shining, the latter yellow-bordered.

In Fowler & Donisthorpe (p. 253) *O. punctatulus* is recorded from Newtonmore, Inv., by the latter author. Reference to Donisthorpe's collection shows the insect to be a not particularly abnormal *brunnipes*. I have seen one further record: Headington, Oxon. (H. Britten) (Walker, 1920), also untraceable. Having examined the two exponents of it in Manchester Museum, I am satisfied that they are in fact *O. atomus*; they were taken at Tubney and Stratfield, both near Oxford (J. Collins).

O. punctum Marsh. (1802).—Very doubtful as a valid species, but it may possibly prove to be such. Bruce has examined the (probably unique) ♀ type in the Stephens collection (p. 10). It may perhaps be an abnormal and monstrous *atomus*—one elytron is sculpturally malformed—but two points render a good species conceivable: the lack of alutation and the differently formed anterior tibiae (quite straight, slightly and evenly dilated at apex); it is also rather larger and more elongate. As Bruce remarks, it must be left to its fate until similar specimens turn up.

O. punctatus Wank. (=*punctulatus* Reitt.).—This is in quite a different category from the last two, being a not uncommon Continental species. I include it here and in the key on the chance of its being found in Britain at some future date; the Scottish Highlands are doubtless the likeliest area. The above synonymy is that of the 1960 Fennoscaydian Catalogue—probably due to Bruce, since, though he treated the two as separate in his monograph, he admitted there that they might have to be reduced to one. The species as thus considered is readily known by the character of the microsculpture; the size is large, reaching 1·2 mm. The usual habitat is under bark or in polypori or detritus of conifers in the primeval forest.

Before leaving the Corylophidae, it will be well to consider shortly the British status of *Sacium pusillum* Gyll. This mid-European species (omitted by Joy) has remained in our list from early times, but no captures seems to have been reported since Fowler (p. 146) wrote:—"Under bark; very rare; one specimen was taken many years ago by Mr Wollaston, but was, I believe, accidentally destroyed, and a second has been recently found on an orange in Birmingham by Mr W. G. Blatch". The second of

these finds was clearly an importation; and regarding the first, no data or even locality appear to be extant. The evidence, therefore, that the species is a member of our fauna is so excessively vague and tenuous that I have little hesitation in suggesting that it should no longer be reckoned as such.

ACKNOWLEDGMENTS

I thank the following gentlemen for their kind assistance:—Hr. Nils Bruce, Gårdby, for his monograph, determinations, and helpful correspondence many years ago; Lektor G. Israelson, Hassleholm, for valuable information and for a Canarian example of *O. nitidulus;* Mr E. Gorton, for the loan of material from the Matthews collection; Dr E. B. Britton, for his good offices in the latter connection and for facilities for study at the British Museum (Nat. Hist.); and Mr Colin Johnson, for submitting the exponents of *O. punctatulus* in the Manchester Museum.

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63 Blackheath Park, London, S.E.3. 12.ii.70.

CORRIGENDUM:—In my list of butterflies seen in Morocco in May 1969 (*Ent. Rec.*, **81**: 290), I claimed to have observed *Aglais urticae* L. in the vicinity of Meknes. That eminent authority, M. Gallet of Azrou informs me that the Small Tortiseshell has not so far been recorded from Morocco. Since I did not take a specimen nor see the species at close quarters, the record had better be deleted pending any further evidence of its occurrence in this part of North Africa. — C. G. M. de WORMS, Three Oaks, Shore's Road, Woking, Surrey. 17.iii.1970.

INSECT PHOTOGRAPHY.—It is regretted that it has not been found practicable to implement the suggestion that a regular section for insect photography should be included in *The Record.* Short notes on techniques from the insect end could be inserted, but photographic technicalities had best be left to one or other of the several photographic magazines available. I thank those readers who have written to me for their letters on the subject.—Ed.

Stauder, Deal, 1898; *clarior* Nordstrom, Shoreham, Kent, 1930.

First Record, 1844: Charlton Sand-pit (Bedell, *Zoologist*, 735).

[(*S. mucronata* Scopoli ssp. *umbrifera* Heydemann

Dartford Heath (West, *Entomologist*, **86**: 165), is referable to *S. luridata* (Hufnagel) (*q.v.*) (C.-H.).)]

S. luridata (Hufnagel): **plumbaria** (Fabricius): Lead Belle.

Native. Heaths, chalk downs, shingle beach; on *Ulex europaeus*, *Genista anglica*.

1. Dartford Heath, larvae found on furze (Machin, *Entomologist*, **4**: 154); found larvae in April, on "dwarf gorse" and *G. anglica* imagines reared (L. T. Ford); several imagines, June 20, 1925 (A. R. Kidner); several taken May 30, 1952 (West, *Entomologist*, **86**: 165) (were incorrectly determined as *S. mucronata* Scopoli (*q.v.*)); several, June 20, 1953, several, June 14, 1957 (C.-H.); one, July 1968 (D. O'Keefe). Erith, one, June 27, 1884; Pauls Cray, one, June 27, 1884, one, July 7, 1888, one, July 21, 1890 (Fenn, *Diary*). Shooters Hill; Foots Cray; Bexley; Hayes (*Wool. Surv.*, 1909). West Wickham (*V.C.H.*, 1908). Keston, two bred, June 29, 1901, in E. Nottle coll. (C.-H.). Chislehurst, one, July 14, 1907 (S. F. P. Blyth); five ♂♂, June 15, 1963 (C.-H.). Bromley, one, July 29, 1960 (D. R. M. Long).

3. Faversham* (Morris, *Br. Moths*, **2**: 37). Blean, two, June 25, 1906, one, July 1, 1907; East Blean, two, July 5, 1908; all in J. Platt Barrett coll. (C.-H.). Herne, singletons, June 6, 1937, June 4, 17, 1942 (P. F. Harris).

6. Greenhithe (Farn MS.). Shoreham (*V.C.H.*, 1908). Pinden, one, July 2, 1946 (E. J. Hare).

6a. Darenth Wood (see *First Record*). Chattenden, two, June 28, 1869 (J. J. Walker MS.); three, July 12, 1884, two, June 12, 1886, very common June 8, 1889, two, June 20, 1891, one, June 17, 1893 (Fenn, *Diary*); (Chaney, *Rochester Nat.*, **1885**: 10); several June 20, 1906, H. C. Huggins, in Maidstone Mus. (C.-H.). Chattenden (Tutt, *Ent. Rec.*, **4**: 229).

7. Boxley, two, E. B[artlett], in Maidstone Mus. (C.-H.).

8. East Downs, Folkestone, June (Ullyett, 1880). Folkestone*, one, July 20, 1929, S. P. Doudney, in my coll. (C.-H.). Dover (Webb, 1899); Kearsney, June 25, 1899, three, June 22, 1903; Combe Slopes, two, June 25, 1903, one, July 4, 1904 (H. D. Stockwell, *Diary* et coll.); Poulton Woods, June 12, 1908 (Cardew, *Diary*). Deal* (*V.C.H.*, 1908). Ewell Minnis; Whinless Down (E. & Y., 1949). Near Alkham (Morley, 1931). Chilham, 1936 (C.-H.). Crundale (Scott, 1936). Wye, one, June 2, 1920 (H. G. Gomm, *Diary*); (C. A. W. Duffield).

9. Ramsgate* (Willson, *Entomologist*, **23**: 140).

10. Chart Warren, Sevenoaks, ♂, August 3, 1946 (G. E. Law).

11. Wateringbury (*V.C.H.*, 1908).

13. Tunbridge Wells district, swarming (Cox, *Entomologist*, **4** (62) ii); 1891 (Beeching, *Ent. Rec.*, **2**: 229). "Formerly very abundant on Broadwater Forest, a few on Ramslye straying over on to rough fields in June" (E. D. Morgan, *in litt.*).

15. It is interesting to note that there is no record for this div. prior to 1954 (C.-H.). Dungeness, one, June 19, 1954, two, June 30, 1962 (R. F. Birchenough); June 30-July 3, 1954 (R. F. Bretherton); frequently flushed from herbage, July 9, 1955 (Wakely, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1955**: 78); three, 1956 (W. V. D. Bolt); in m.v. trap, June 29 (1), 30 (3),

July 6 (1), 7 (1), 1962; and in m.v. trap at Boulderwall, June 12 (1), 15 (2), July 3, 1966 (R. E. Scott).

VARIATION.—Cockayne (*Ent. Rec.*, **53**: 26) records a ♀ ab. *luridata* Bork., in RCK from the O'Reilly coll., labelled Tunbridge Wells, 1868. Also in RCK is ab. *umbrifera* Heyd., one, Dartford, bred 1909.

FIRST RECORD, 1831: "Very abundant on heaths by the sides of woods . . . especially at . . . Darenth Wood" (Stephens, *Haust.*, **3**: 210).

Catarhoe rubidata Denis & Schiffermueller: The Flame.

Native. Hedgerows, bushy places; on bedstraw.

1. Birch Wood (Stephens, *Haust.*, **3**: 237). Near Woolwich (Jones, *Ent. week. Int.*, **10**: 187). Burnt Ash Lane, Lee, and George Lane, Lewisham, several, June 11-20, seven, June 28, 1861; several, June 3-27, twenty, June 11, 1862 (Fenn, *Diary*). Near Lewisham, 1867 (Adkin, *Entomologist*, **4** (51) ii). [West Wickham] *(Huckett, *Ent. week. Int.*, **10**: 115). Bexley; Orpington (Carr, *Entomologist*, **32**: 40). Bromley Road; Halfway Street; Eltham; Hayes, Keston, one, 1901 (*Wool. Surv.*, 1909). Kidbrook Lane, very common amongst rose bushes (West, *Ent. Rec.*, **18**: 199).

2. Sheppey (Walker, *Ent. mon. Mag.*, **8**: 184; idem, *Ent. mon. Mag.*, **9**: 163).

3. Broad Oak, frequent at light in 1946 and in other years (C.-H.). Eddington, one, July 14, 1948; one, June 28, ♀ at light July 4, several at light, July 5, 1949 (D. G. Marsh).

4. Deal* (Harding, *Ent. week. Int.*, **6**: 91). Ham Fen, one, June 17, 1950 (C.-H.). Minster Marshes, seven, June 25, one, July 2, 1951, one, June 18, 1952 (W. D. Bowden).

5. Chevening, June 12, 16, 1914 (Gillett, *Diary*). Westerham (R. C. Edwards).

6. Longfield (Jennings, *Entomologist*, **4** (54) ii). Greenhithe (Farn MS.). Otford (Adkin, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1902**: 50). Clay Lane Wood; Birling (H. C. Huggins). Upper Halling (Hards & Gould, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1956**: 79).

6a. Darenth Wood (Stephens, *loc. cit.*). Chattenden (H. C. Huggins).

7. Darland Hill (Chaney, *Rochester Nat.*, **1885**: 10). Westwell, numerous, 1945-47 (E. Scott).

8. Folkestone* (Ullyett, 1880). Kearsney, one, May 10, 1896; six, June 27, 1901; Chilton, Alkham, one, July 12, 1899 (H. D. Stockwell, *Diary*). Dover, one, June 9, 1945 (B. O. C. Gardiner). Ringwould (E. & Y., 1949). Stowting; Brook (C. A. W. Duffield). Folkestone, one, June 28, 1956 (R. W. Fawthrop *teste* A. M. Morley).

9. Ramsgate, one, June 3, 1911 (J. W. C. Hunt).

11. Yalding (*V.C.H.*, 1908). Hoads Wood (P. Cue *teste* E. Scott). Sevenoaks Weald, three, June 18-July 1, 1960 (E. A. Sadler).

12. Wye, ♀, July 9, 1938 (C.-H.); one, June 28, 1955, one, July 24, 1956 (W. L. Rudland). Ham Street, July 22, 1946 (C.-H.); ♀, at m.v.l. in Birchett Wood, July 23, 1969 (B. F. Skinner). Warehorn (Scott, 1950). Willesborough, one, June 29, 1955 (W. L. Rudland).

13. Pembury (Stainton, *Man.*). Tunbridge Wells* ,fairly common (R. H. Rattray in Knipe, 1916); scarce (Given, 1946). Goudhurst, one, 1955 (W. V. D. Bolt).

14. Tenterden (Stainton, *Man.*). Sandhurst, July 27, 1946 (G. V. Bull, *Diary*). Hawkhurst, one, 1952, one, 1953 (B. G. Chatfield).

15. Dungeness (Edwards, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1957**: 26). First Record, 1831: Stephens, *loc. cit.*

C. cuculata Hufnagel: **sinuata** Denis & Schiffermueller: Royal Mantle.

Resident. Hedge-sides, field-borders, woods; on *Galium mollugo*.

This species has shown a very marked and interesting extension of range into Kent within recent times. After a period of more than fifty years with no record of occurrence, the moth appeared in 1952 in div. 5 on the extreme north-western edge of the county, since when it has spread eastwards into 1 and 6.

1. Between Darenth and Birch Wood* (see *First Record*). Sidcup, "Williams of Sidcup was telling me that Hickling, a man who lives near him, took several *sinuata* in a wood on the right hand side of the line past Sidcup station, one of which was a ♀ from which he bred a lot from the ova she laid" (Fenn, *Diary*, 13.ii.1890). St. Mary Cray, one, September 3, 1955, one July 3, 1957 (R. G. Chatelain). Bromley, one in m.v. trap, July 15, 1964 (D. R. M. Long). Orpington, one, July 17, 1964, one, August 17, 1965 (I. A. Watkinson). Bexley, ♀, July 1, 1966 (D. O'Keefe).

3. Kent [Blean?]*, one taken 1861 (Cox *et al.*, *Ent. week. Int.*, **10**: 124). Blean Wood, several (1871) (Parry, *Entomologist*, **5**: 366). East Kent*, one emerged June 19, 1875, from larva taken August 1874 (Jennings, *Entomologist*, **8**: 183).

5. Westerham, by the Pilgrims Way.—one, at light, 1952; five at light, 1953 (R. C. Edwards; Dixon & Edwards, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1954-55**: 24-25); noted here annually since 1952 (R. C. Edwards *personal comm.*, xii. 1961); several larvae on *G. mollugo*, August 28, 1954; two larvae on *G. mollugo*, September 3, 1956, one of which parasitized by *Apanteles fulvipes* Hal., det. G. E. J. Nixon (C.-H.) Biggin Hill, a larva on *G. mollugo*, September 4, 1954; Badgers Mount, four larvae on *G. mollugo*, September 2, 1961, one of which parasitized by *Meteorus deceptor* Wesmael, det. R. D. Eady (C.-H.).

6. Otford, 1955 (W. B. L. Manley in de Worms, *Lond. Nat.*, **1956**: 92). Eynsford, two, July 10, 1960, about 20 larvae on *G. mollugo*, August 1969 (R. G. Chatelain); about 15 at light, August 2, 1962 (C. G. Bruce, B. F. Skinner & R. Fox); several, June 26, several, July 6, 1968 (D. O'Keefe).

16. Hythe West, five, July 1898 (Heitland, *Entomologist*, **31**: 222).

Variation. — One reared May, 1957 from larva taken Westerham, September 3, 1956, is referable to ab. *circulata* Rebel (C.-H.).

First Record, 1831: "Very rare; the only locality I know is a lane between Darenth and Birch woods" (Stephens, *Haust.*, **3**: 237).

[**Epirrhoe tristata** L.: Small Argent and Sable.

Doubtfully Kentish.

1. "Farnborough, uncommon" (H. Alderson, in *Wool. Surv.*, 1909). There are no *tristata* in the H. A. Alderson coll. (C.-H.).

8. Dover district*, the species is listed among those that had become scarcer in East Kent (Webb, *S. E. Nat.*, 1903: 55).]

E. alternata O. F. Muller: **sociata** Borkhausen: Common Carpet.

Native. Woods, marshes, hedgebanks, waste places, etc.; [on *Galium aparine*] Frequent and found in all divisions. "Generally common" (*V.C.H.*, 1908).

There are two generations, the moths of the second brood being normally fewer in number and smaller in size.

A. R. Kidner (*Diary*) records finding two larvae at Sidcup on October 2, 1927, but makes no mention of the foodplant. E. D. Morgan (*Lepidoptera of Tunbridge Wells* MS.) gives the feral pabulum as "bedstraw", but this may refer to Sussex. At Ham Fen, I have observed the moth flying in abundance among and settling on *G. aparine*, and strongly suspect this to be the foodplant there (C.-H.).

VARIATION.—Haworth (*Lep. Brit.*, **2**: 333) refers to the holotype of his ab. *degenerata* thus: "Habitat Cantio rarissime. Exemplarum solum vidi". This is indeed a rare ab., and the only Kentish example that I have seen is one which I took at Dungeness, August 5, 1955 (C.-H.).

FIRST RECORD, 1804: Haworth, *loc. cit.*

E. rivata Hubner: Wood Carpet.

Native. Hedgebanks, downs, wood-borders, bushy places; foodplant unknown. Frequent on the chalk in 5-8. "Common on the chalk" (*V.C.H.*, 1908).

1. West Wickham Wood (Wells, *Entomologist*, **24**: 74); 1951 (E. E. J. Trundell). Courtfield Wood, two, July 8, 1884 (Fenn, *Diary*), Lewisham, 1885 (Marriott, *Young Nat.*, **7**: 79). Kidbrook; Lee; Lewisham; Bexley; Eltham; Wilmington (*Wool. Surv.*, 1909). Orpington, 1954 (L. W. Siggs); one, July 28, 1964 (I. A. Watkinson).

3. Broad Oak, 1938, and occasionally at light subsequently to 1955 (C.-H.) Oldridge Wood (J. A. Parry). Eddington, at light, July 5, 1949 (D. G. Marsh, *Diary*).

4. Deal, August 7, 1890 (Fenn, *Diary*). Ham Fen, one, June 17, 1950 (C.-H.). Minster*, July 2, 6, 1951 (W. D. Bowden). Ickham, occasionally, 1954-59 (D. G. Marsh).

9. Ramsgate, one, 1910, two, 1911, one, 1913 (J. W. C. Hunt). Brooks End, two (W. D. Bowden).

11. Hoads Wood, one, June 20, 1951 (W. L. Rudland).

12. Ashford (P. Cue *per* E. Scott). Willesborough, two, 1954, three, 1955, three, 1956; Wye, two, 1955-56 (W. L. Rudland). Orlestone Woods, two, July 28, 1956 (R. F. Bretherton).

13. Pembury, common (Stainton, *Man.*); c. 1950 (V. M. Sage). Tunbridge Wells* (Knipe, 1916).

14. Tenterden, common (Stainton, *Man.*). Sandhurst (G. V. Bull).

15. Burmarsh, two at dusk, August 17, 1947 (P. le Masurier).

16. Folkestone, one, September 10, 1953 (A. M. Morley).

VARIATION.—Sauzé (*Trans. Cy. Lond. ent. nat. Hist. Soc.*, **1896**: 9) exhibited an ab. from Deal, "having the broad white fascia on the forewings bisected throughout its length by a distinct dark line, which was faintly continued in the corresponding white band on the hind-wings"

In RCK are: ab. *maculata* Rebel, Folkestone; also, an ab. with "median band widened", Dover, 1893.

FIRST RECORD, 1809: "Habitat in cretaceis sepibus in Cantio. Imago f. Jul. frequens" (Haworth, *Lepidoptera Britannica*, 332).

E. galiata Denis & Schiffermueller: Galium Carpet.

Native. Chalk cliffs and downs, shingle beach, rough grassy places,

EXCHANGES AND WANTS

For Sale. — Formosan butterflies, beetles, moths, dragonflies, cicadas, praying mantis, wasps and other dried Formosan insect specimens, living cocoons of Saturnidae, etc., prepared for collection, educational programmes.—*Taiwan Novelty Co.*, P.O. Box 860 Taipei, Formosa, (Taiwan).

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Wanted.—Parts 1 and 6 of Volume 78, or alternatively the whole volume. State price required to Box No. 116.

Wanted.—Entomologist Volumes 2 and 4; Entomologist's Record, Vol. 41, Parts 7 and 8, 11 and 12. Vol. 45, Parts 3, 5 and 12 or complete volumes if bound. Top Prices offered.—*B. Skinner*, 85 Elder Road, London. S.E. 27.

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For Sale.—One male and one female *Papilio schmeltzi* H-S. Both are fresh specimens caught in 1969. Set and data labelled. The pair £50.—Box No. 295. The *Entomologist's Record.*

Wanted Urgently, for a study of migration, any unpublished records of the following lepidoptera outside their normal areas of residence: *Eurois occulta* L. (Great Brocade), *Enargia paleacea* Esp. (Angle-striped Sallow), *Lithomia solidaginis* Hübn. (Golden-rod Brindle), *Plusia interrogationis* L. (Scarce Silver Y), *Itame brunneata* Thnb. (Rannoch Looper). Exact dates, sex, and circumstances of capture wherever possible. — *R. F. Bretherton*, Folly Hill, Birtley Green, Bramley, Surrey.

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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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.

CONTENTS, Vol. 82, Part IV

NOTE.—It has been decided to resume the publication of the Contents annually, so that the listing in detail of the contents with each monthly part will be discontinued.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION
(Founded by J. W. TUTT on 15th April 1890)

TO OUR CONTRIBUTORS

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VOL. 82 No. 5 MAY 1970

THE ENTOMOLOGIST'S RECORD

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Edited by CANON G. A. K. HERVEY and J. A. G. BARNES

For a century and a half those who have loved wild country have judged the Lake District supreme in England and an increasing number of visitors come from all over the world to enjoy its beauty. For the first time, with the publication of the 'Natural History of the Lake District' a survey of this lovely area has been attempted in depth.

The variety of its landscape, which includes sea coast and sand dune, moorland, bog and fell, streams and raging torrents as well as the more well-known mountains and lakes, provides an unusual diversity of habitats for plants and animals — habitats moreover that because of the difficult terrain have so far suffered less from the activities of man than have most parts of the country.

In this book a team of naturalists who know both area and subject intimately have shared their knowledge of the richness and variety of the plants, insects, fish, birds, mammals and geology of these habitats and have provided a fascinating book for the general reader and the naturalist alike that will do much to enhance their pleasure in and knowledge of the Lake District. Size 8¾″×6″, 240 pp, 32 pp plates including 8 pp in colour, 4 pp maps. There are line drawings in the text, 60s. net (£3.00 net).

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WARNE 1-4 Bedford Court, London, WC2E 9JB

Stigmella spinosella Joannis (Lep. Nepticulidae); A Species New to Britain

By Lieut.-Col. A. M. Emmet, M.B.E., T.D., M.A., F.R.E.S.

On the 22nd September 1969, I was collecting with Mr J. M. Chalmers-Hunt, at Benfleet, Essex. He was keen to take some of the *Prunus*-feeding Coleophoridae, for *C. hornigi* Toll, *C. badiipennella* Dup. and *C. anatipennella* Hübn. all occur there, the first of them often in abundance. Also in evidence on the blackthorn were the mines of *Nepticula plagicolella* Staint., but as this is a very common insect, we were not paying much attention to it. However, amongst them I chanced to notice a mine which clearly was not the work of *plagicolella*. A more intensive search revealed perhaps a couple of dozen, but all except three (one found by Mr Chalmers-Hunt and generously given to me) were already vacated by their larvae. At the time I assumed that they were the mines of *Stigmella prunetorum* Staint., our other recorded *Nepticula* on *Prunus*, and a species still unfamiliar to me.

Recently I was checking some of my own collection of leaf-mines against the material in the Hering herbarium, and these *Prunus* leaves from Benfleet were among those which I compared. As a result, it seemed to me highly probably that my mines were not the work of *prunetorum* Staint. at all, but of *spinosella* Joannis, a species hitherto unrecorded from Britain. But I could not be certain, as there seems to be some confusion in Professor Hering's *Prunus* album; some mines with the characteristics of *prunetorum* are labelled *spinosella*, and vice versa.

To resolve the doubt, I sent several of the Benfleet mines to Dr Josef Klimesch in Austria, who has on previous occasions given me his kind assistance with this group. His reply reads as follows:—

"I examined the enclosed mines on *Prunus spinosa*. They belong undoubtedly to *Stigmella spinosella* Joannis! This is indeed a very interesting discovery for your fauna! I have found this species only in warm places of Central Europe (eastern part of Austria, Trieste, South Tyrol, Trentino). *S. spinosella* produces only one generation, the larva feeding in August. I enclose a mine of *S. prunetorum* Staint. for comparison for your collection."

The date of larval appearance explains why we found almost all the mines vacated in the second half of September. It may also explain how *spinosella* has hitherto escaped notice, for August is, on the whole, the "off-season" for Nepticulid larvae.

I have at least one cocoon from the three larvae, so I may, if I am lucky breed the moth; but I am always suspicious of laggard larvae, disease or parasitisation so often being the cause of their slow development.

We have then, three Nepticulid species feeding on *Prunus*, their mines being readily distinguishable:—

(a) *Nepticula plagicolella* Staint. Bivoltine, in a "tadpole" mine—i.e. a very fine sinuate gallery debouching abruptly into a large, roundish blotch. Fig. 3.

(b) *Stigmella prunetorum* Staint. Bivoltine, in a "gut" mine—i.e. with sinuations compacted upon one another in a manner reminiscent of en-

trails; alternatively it is found in a spiral mine. In either case, the latter-half of the mine generally straightens itself out. The mine is completely filled with frass packed loosely, so that the individual grains may be seen. Fig. 2.

(c) *Stigmella spinosella* Joannis. Univoltine, in a variable and irregular mine, sometimes following the margin, sometimes confined to the central part of the leaf. The frass starts with a few close contortions, but soon becomes a more or less solid line, leaving a narrow pale margin at the edges of the gallery. There is a tendency for the mine to end in a small blotch, often caused by the track doubling back on itself (described from mine examples). The egg, in the cases where I have been able to see it, is on the underside of the leaf. Fig. 1.

As so oftens happens, a "new" species can turn out not to be so new after all, and in this instance, a former taking of *spinosella* has already come to light. When I sent my mines to Mr. S. N. A. Jacobs for him to draw, he recognised them as similar in appearance to some which he took near Teignmouth, Devonshire, on 22nd August, 1939. The mines were tenanted, and he had noted the larva as "whitish"; he failed, however, to rear the moths. The war intervened, and it was not until many years later that he sent these mines, with other Nepticulid mines, to the late Mr A. G. Carolsfeld-Krause who pronounced them to be *Ectodemia* (*Stigmella*) *spinosella* Joannis. Furthermore, in a letter to Dr J. D. Bradley of the Commonwealth Institute of Entomology at the British Museum (Natural History) dated 21st May 1963, Carolsfeld-Krause mentioned that he had recently seen some mines of this species collected in Britain by Mr Jacobs. So the credit for the discovery of *Stigmella spinosella* Joannis in Britain falls on our editor!

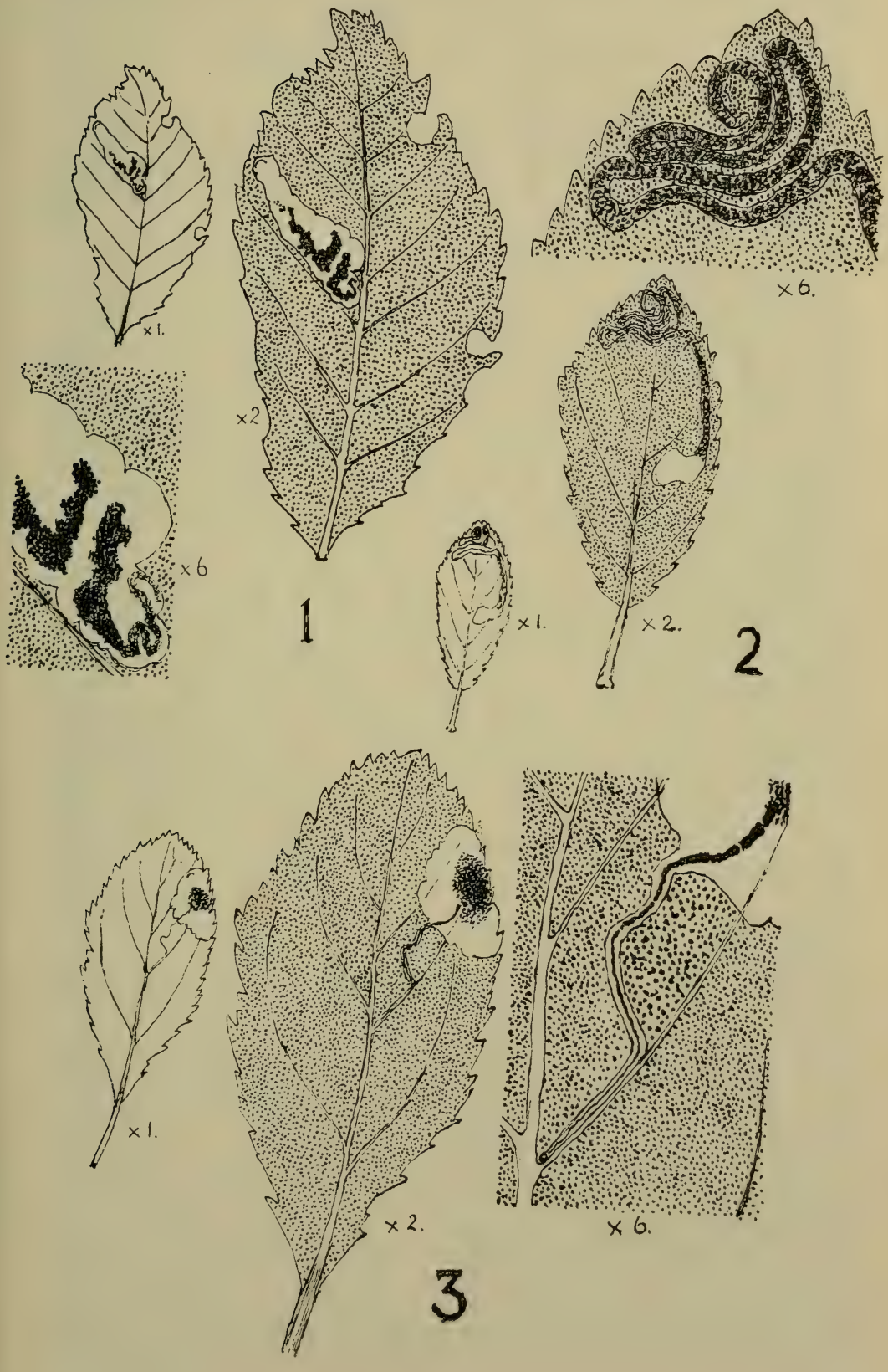
Dr Klimesch describes *spinosella* as occurring in warm places in Central Europe; Teignmouth is situated in one of the mildest parts of Britain; and Benfleet, with its hillside of southern aspect, overlooking the Thames estuary, has a climate which enables several species on the fringe of their range, to flourish. So it is in such situations that a search for new localities of *spinosella* is most likely to be rewarded.

My thanks are due to Dr. Klimesch for his authoritative determination of the mines, and to Mr Jacobs for his fine drawing of the mines of the three *Prunus*-feeding species.

Labrey Cottage, Victoria Gardens, Saffron Walden,
Essex. 20.iii.1970.

[It is generous of Col. Emmet to suggest that any credit is due to me in this matter, but I fear that I can only be charged with gross dereliction of duty in not having followed up Carolsfeld-Krause's determination with a published report. The specimen of the mine illustrated is from one of my Teignmouth leaves. The credit goes to Col. Emmet for having followed the matter up without delay.—Ed.].

Fig 1. *Stigmella spinosella* Joannis.
Fig. 2. *Stigmella pruneorum* Stainton.
Fig. 3. *Nepticula plagicolella* Stainton.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Ross-shire and Sutherland Lepidoptera Records

By Derek C. Hulme

(Continued from *Ent. Rec.*, **81**: 168-172)

Part Two—Sutherland

My coverage of Sutherland is limited to ten weeks per year, between mid-May and late September, based at Durness. Most of this time is spent guiding small parties of ornithologists and botanists. The evenings hardly get dark at this latitude in the period May to late July so that the nocturnal species are poorly represented in my first list.

The north-west corner of Britain's mainland seems well-favoured by occasional mass-migrations of lepidopterous species. On one day in 1968 the ground was alive with Silver Y moths. Everywhere one walked on the Cape Wrath peninsula and in the Durness region numbers of this immigrant would rise from the rough grass. In 1969 all but six of the 59 Painted Lady butterflies encountered in the northern counties, between 4th and 14th August, were seen in N.W. Sutherland. Another notable 1969 record was my first Scottish Humming-bird Hawk. However, the observation that has given me most satisfaction was the discovery of a small colony of the Chimney-sweeper near the north coast—112 miles further north than my previous limit on Ben Nevis.

Pieris brassicae L. Few observed in the most north-westerly county of Scotland. Recorded from Bonar Bridge (NH69), one on the 25th July 1964; Durness (NC36), singles on 11th July 1966 and 25th July 1969 and (NC46), three on 15th July 1967; Oldshoremore (NC25), one on 25th July 1968; Ardmore (NC15), one on 26th July 1968; Rogart (NC70), three on 22nd July 1969. *P. rapae* L. One at Dornoch (NH88) on 26th July 1960. *Ford* 1945 states that the Small White is seldom seen in Sutherland and Caithness. *P. napi* L. Scourie (NC14), one on 1st September 1967; Strath More (NC 44), a few on 10th June 1968 and one on 24th July 1969; Ardmore (NC15), one on 13th June 1968 and two on 20th August 1969; Loch Stack (NC24), one on 27th May 1969; Durness (NC46), singles on 8th July and (NC36) on 25th July 1969; Lairg (NC50), common on 16th August and seen here on four other dates in 1969; Rhiconich (NC25), one on 10th July 1969. *Eumenis semele* L. One on the Dornoch dunes (NH88) on 30th August 1964. *Erebia aethiops* Esp. A worn specimen on Ardmore peninsula (NC15) on 20th August 1969. *Maniola jurtina* L. Not common but widely distributed between the extreme dates of 25th June and 18th August (both in 1969). Singles recorded at Inverkirkaig (NC01), Kearvaig (NC27), Durness (NC36), Clo Mor (NC37), Melness (NC56), The Mound (NH79) and Dornoch (NH88). Three together at Rogart (NC70) on 22nd July 1969. *Coenonympha pamphilus* L. About 20 between the lighthouse and the Old Man of Stoer (NC03) on 17th June 1964. *C. tullia* Müll. Singles at Sandwood (NC26) on 16th July 1967 and in Strath More (NC44) on 24th June 1969. *Vanessa atalanta* L. Singles recorded at Rhiconich (NC25) and Balnakeil (NC36) on 8th June 1965; Clo Mor (NC37) on 12th June 1966; Durness village (NC46) on 17th June 1966 and Cape Wrath (NC27) on 15th June 1967. *V. cardui* L. With the Handa records I have noted 63 Sutherland specimens of this immigrant. In 1966 four were seen on Handa, and five on the Cape Wrath peninsula: two at Cape Wrath (NC27) and two at Co Mor (NC37) on 12th June; one at Sandwood Bay

(NC26) on 18th September flew strongly west over the beach but turned inland when it met rolling waves. In 1968 only one was seen—at Durness (NC37) on 8th August. In 1969 two were seen at Cape Wrath on 4th August; next day 22 were seen at Sandwood Bay—fifteen together on thistles—and one at Oldshoremore (NC16); sixteen were observed on 6th in 10 km. squares NC44, 45 and 46 around Lochs Eriboll and Hope; four on 7th August at Durness (NC36). *Aglais urticae* L. Rarely seen though observed throughout the county. Singles at Inverkirkaig (NC01) on 25th July 1960, Dornoch (NH88) on 27th July 1960, Scourie (NC14) on 17th June 1964, Bonar Bridge (NH69) on 30th August 1964, Laxford Bridge (NC24) on 9th June 1965, Kinlochbervie (NC25) on 16th July 1967, Tarbet (NC14) on 27th May 1969 and Durness (NC36) on 20th August 1969. Two together at Ardmore (NC15) on 20th August 1969. *Argynnis aglaia* L. Singles on Invernaver Nature Reserve (NC76) on 27th August 1966 and at Durness (NC37) on 30th July 1967. Ten counted at Balnakeil (NC36) on 7th August 1969. *Polymmatus icarus* Rott. Melness (NC56), one on 18th July 1967; Durness (NC36), three on 30th July 1967 and fourteen on 7th August 1969; Ardmore(NC15), one on 30th May 1968.

Laothoe populi L. A larva on sallow at Achmelvich (NC02) on 25th July 1960. *Macroglossum stellatarum* L. An imago examining low plants on grassy slopes east of Cape Wrath (NC27) on 24th July 1969. *Cerura vinula* L. Larvae on sallow at Badcall (NC14) on 26th July 1960 and 24th August 1961. *Lasiocampa quercus* L. Larvae fairly common in 10 km squares NC14, 24 and 44. Imagines flying at Eddrachillis (NC14) on 9th June 1965, Ardmore (NC15) on 13th June 1968, twelve on Eilein Ard at mouth of Loch Laxford (NC15) on 10th June 1969, Rhiconich (NC25) on 10th June 1969 and Cape Wrath (NC27) on 25th June 1969. *Macrothylacia rubi* L. Four larvae on *Luzula* at Achmelvich (NC02) on 24th July 1960 and a larva at Ardmore (NC15) on 20th August 1969. *Phragmatobia fuliginosa* L. One at Sandwood Bay (NC26) on 24th June 1968. *Parasemia plantaginis* L. One at Sandwood on 22nd June 1969. *Arctia caja* L. Two larvae at Dornoch (NH88) on 17th August 1961.

Hepialus fusconebulosa Deg. A ♀ caught in wood at the east end of Scourie Loch (NC14) on 19th June 1964. *H. hecta* L. One at Kyle of Durness (NC36) on 27th July 1966.

Ceramica pisi L. A larva on lousewort at Durness (NC36) on 7th August 1969. *Cerapteryx graminis* L. Fairly common at lighted windows at Durness (NC36) in August. One at Inverkirkaig (NC01) on 25th July 1960. A dead specimen in lighthouse garage at Cape Wrath (NC27), September 1969. *Apamea monoglypha* Hufn. Three noted between 19th July and 4th August 1969 at Durness (NC36). *Plusia gamma* L. Mass migration in Durness area (NC27, 36 and 37) in 1966 (see *Ent. Rec.*, **78**: 215): one on 30th May; myriads on 31st May but only a few on 1st and 12th June. Two specimens only in 1969: one with two *V. cardui* at Sandwood on 5th August; the other at Durness (NC36) two days later.

Xanthorhoe designata Hufn. One at Ardmore (NC15) on 13th June 1968. *X. montanata* Schiff. One in Strath More (NC44) on 21st July 1969. *Perizoma albulata* Schiff. One at Tarbet (NC14) on 16th June 1964. *Euphyia bilineata* L. Singles at Achmelvich (NC02) on 24th July 1960, Scourie (NC14) on 14th June 1964, Strath More (NC44) on 28th July 1966 and Melness (NC56) on 18th July 1967. *Lampropteryx suffumata* Schiff. One taken on the 2364 foot summit of Ben Stack (NC24) on 21st June

1964. *Lygris testata* L. One at Kinlochbervie (NC25) on 17th September 1967. *Rheumaptera hastata* L. Three ssp. *nigrescens* Cockerell on slopes of Ben Stack (NC24) on 2nd June 1967. *Odezia atrata* L. Five flying in sunshine after showers in Strath More (NC44) on 26th June 1968. This species was flying abundantly in Glen Nevis (NN17), Inverness-shire, up to 1250 feet on 29th June 1957 (see *Ent. Rec.*, **69**: 248). Confirmed at this Inverness-shire locality by E. Pickard on 14th July 1966 (see *Bull. amat. Ent. Soc.*, **25**: 124). *South* 1961 states that it does not appear to have been noted north of Moray. *Eupithecia pulchellata* Steph. One at Durness (NC36) on 15th June 1967. *Abraxas grossulariata* L. Cape Wrath (NC27), 24th July and 4th August 1969, two and one. *Ematurga atomaria* L. Strath More (NC44), abundant on 29th May 1968; Sandwood (NC26), three on 29th May 1966, Cape Wrath (NC27), two on 22nd May 1967. *Dyscia fagaria* Thunb. A specimen rescued from a peat pool at Tarbet (NC14) on 19th June 1964.

Mesographe forficalis L. Two in Strath More (NC45) on 21st July 1969. *Crambus pratellus* L. A few at Scourie (NC14) on 17th June 1964. *Agriphila culmellus* L. One Alltnacaillich (NC44) on 28th July 1966. *A. tristellus* Schiff. Abundant at Durness (NC36) on 7th August 1969.

Ancylis badiana Schiff. One at Scourie (NC14) on 14th June 1964.

Endrosis sarcitrella L. Fairly common in buildings at Scourie (NC14) and Durness (NC36), *Hofmannophila pseudospretella* Staint. One at Durness (NC46) on 21st August 1961. One found alive in remote long-abandoned croft house on Whiten Head (NC46) on 10th July 1969. *Anthophila fabriciana* L. Two records only: single at Scourie (NC14) on 16th June 1964 and Durness (NC36) on 11th June 1969.

Handa, Sutherland

The uninhabited island of Handa (NC14) lies close inshore off the north-west coast, just over a mile across Handa Sound from Tarbet and three miles N.W. of the village of Scourie. The surface area of 766 acres consists mainly of rough sheep pasture and poorly drained peat bog with a few small lochs, attractive sandy beaches and machair. Handa is famous for its awesome stacks and sea-cliffs of horizontally-bedded Torridonian Sandstone, rising sheer from the Atlantic to almost 400 feet and providing nesting sites for thousands of sea-birds. The highest point is 403 feet above sea level. The only buildings on the island are a reconstructed bothy, a stone day visitors' shelter and a few low ruins of croft houses. Mixed young trees planted in a small fenced enclosure in 1964, to provide future shelter for migrant birds, should eventually increase the number of lepidopterous species. The island was established as a bird reserve by the R.S.P.B. in 1962. Though the birdlife and botany have been systematically recorded, the entomology is barely mentioned in the Daily Log.

Pieris brassicae L. Singles on 13th, 15th and 29th June 1966 and 11th June 1968.

P. rapae L. One on 13th June 1966.

P. napi L. One on 11th June 1968. a

Maniola jurtina L. Five on 30th June 1965; two on 26th July 1966; common on 3rd July 1967; three on 24th July 1968 and singles on 5th August 1968, 9th July, 8th and 18th August 1969.

Coenonympha tullia Müll. Five on 3rd July 1967 and three on 9th July

1969.

Vanessa atalanta L. One on 13th September 1965.

V. cardui L. Two near the Great Stack and one at Port an Eilein on 13th June 1966 and one crossing from the island to the mainland two days later. Eight counted on 8th August 1969.

Aglais urticae L. Singles on 8th and 18th August 1969.

Macrothylacia rubi L. A larva on 17th September 1969.

Plusia gamma L. About twelve on 13th June 1966 and one on 5th August 1968.

Euphyia bilineata L. One on 9th July 1969.

Ematurga atomaria L. Common on 30th May 1966, 11th June 1968 and 9th June 1969.

Dyscia fagaria Thunb. A ♂ on 15th June 1966.

Pyrausta cespitalis Schiff. A ♀ caught on 15th June 1966.

Olethreutes schulziana F. Three on 20th June 1964; two on 30th June 1965; common on 13th June 1966; four on 3rd July 1967 and one on 9th July 1969.

Part Three—A list of Ross-shire records for 1969 will follow and then it is hoped to keep the lepidopetra notes regularly up to date for both counties.

Kyle & Glen, Muir of Ord, Ross-shire.

Hooked, on *Phaseolus*

By Charles F. Cowan

It is fifteen long years since I gave up collecting butterflies. But, of a sudden, I began again, last November.

It was a leisurely process. One specimen a day was taken and, by lucky chance, the first fifteen were all different. In contrast, the next two similar periods each produced only four new species, and in days 46-60 the increase was only two, while a mere singleton was added in the next. A slight improvement in the run-up to the first hundred days resulted in three more, and at last patience was rewarded. By the end of February the target figure of 30 different species was attained.

For this was the complete set of pictures of *The World of Butterflies*, perfectly printed on the reverse side of labels on tins of Crosse & Blackwell baked beans. Being my own cook, it was possible to ensure consumption of a tin a day (including Christmas) in the interests of science. Now full of beans, I have written for and received my album, completed it, and so qualified for the free colour print of a further nine species.

In the process some 90 duplicates were amassed, including 27 towards a second set and 22 towards a third. *Megalura peleus*, *Catagramma astarte* and *Cethosia myrina* appear to be distinctly rare.

The pictures are remarkably good and, whether collected in the village store, the supermarket, or some other locality, are invariably well preserved. They are from colour photographs of set specimens on a plain white ground rectangle about 7×5 cm. The scale is not uniform, so that for instance "*Pryoneris*" (properly *Prioneris*) *thestylis* appears as large as "*Armandia*" (now *Bhutanitis*) *lidderdalei*. Those two are instanced as they are the only errors in nomenclature although, as I have had to show

recently, the specific name *Papilio claudia* is preoccupied in *Euptoieta* and cannot be used for the *Agrias* species. Again, the specimen of *Kallima inachus* is so forwardly set that, in order to accommodate its pointed wings, its overall size appears much reduced.

Only the three families are represented; Papilionidae (seven species), Pieridae (nine), and Nymphalidae (fourteen), which is strange. Does this suggest that further series are planned? The Riodinidae and Lycaenidae at least could each provide thirty suitable subjects for future beanfeasts.

The album contains notes, in somewhat colloquial English, of interest on each species. It is noticed that the old myth, long since exploded, still survives; that *Kallima* rests on twigs of dead leaves to elude its predators. Even the statement that it rests "on a twig with its head downwards so that its tails touch the stem and appear to grow out of it" is faithfully repeated. If its head were down, the tails would be in the air. If "downwards" means towards the ground, the tails would "grow out" backwards along the twig, opposed to the other growing leaves. Actually this popular fallacy is a composite of two separate correctly stated facts. The insect when reposing on a tree trunk rests head down, like so many other of the stronger Nymphalids. It then, perhaps, resembles a casual drooping leaf. But its leaf-like appearance affords its full measure of protection when the insect is directly threatened. Then it flies zig-zag away, flashing its bright colours, only to disappear in an instant by settling on the jungle floor, canting over on its side among the dead leaves. Dead leaves, to coin a phrase, do not grow on trees. They lie, rotting on the tropic jungle floor, and twigs are for green, growing, leaves. It is on the ground that *Kallima* seeks refuge in emergency, among the brown leaves which it so beautifully resembles; even to having those markings which, our booklet says, look like "the first stages of insipient decay".

But in general the booklet is first class, and the figures are quite excellent; from Nos. 1 and 2, the only European examples, a British *Papilio machaon* and a *Colias croceus,* through to No. 30, "*Pryoneris*" *sita.* May we hope for another series—but after a reasonable interval?

Collecting Lepidoptera in 1969

by R. Fairclough

Spring was so late in coming this year that by the time that I went to Cornwall on 1st April hardly any insects had been seen on visits to the countryside, while moths in the trap were two or three weeks behind their normal dates. At Lanivet the sun shone for the whole of the eight-day stay, giving a delightful holiday, but the nights were cold with frosts on the first four. The trap was run in my sister's garden in the middle of the village. In the chilly conditions few species were recorded, thirteen in all, it being pleasing to see *Lithophane socia* Hufn. and *L. ornitopus* Hufn. I have seen only two of the former at Leigh in eighteen years and the latter not since 1952. The *ornitopus* laid, and in breeding these I was surprised to find that the larvae, which had all spun up by the end of May, did not pupate till early September except one which emerged on 4th August.

At West Pentire on the sandhills on the 2nd, apart from a snake sunning itself, larvae of *Macrothylacia rubi* L. and *Philudoria potatoria* L. were seen, while *Aglais urticae* L. was on the wing. Two days later a

colony of *Panaxia dominula* L. was found on comfrey growing along the railway line at the disused station of Grogley Halt in the lower Camel Valley. Those collected pupated before the month was out, the moths being all typical when they emerged. I looked for the *Euphydrias aurinia* Rott. larvae where they had been seen in 1968 but none was there, possibly because the ground had been burnt over.

The first mercury vapour trip was made on Easter Monday (7th) to a roadside site in the Luxulyan Valley. Had the weather been warmer one might have slept by the sheet for all the disturbance either the traffic or the moths made, only common March sorts such as the *Orthosia* species, *Biston strataria* Hufn. coming to the light with an early *Lampropteryx suffumata* Schiff. An *Acleris literana* L. must have stowed away in the car for it was found on arrival at Lanivet.

Back home I joined Messrs T. Harman and T. Homer at Abinger on the 10th, where they hoped to take *Jodia croceago* Schiff. The sallows were perfect (another indication of the late spring) but though the conditions appeared to be favourable very few moths, including *Panolis flammea* Schiff., were shaken from the catkins. The most frequent was *Conistra vaccinii* L. which was moreover the only visitor to some sugar put out away from the sallows. The catch at their m.v. light reflected the unexpected poverty of the night.

The weather remained cold throughout April, giving little encouragement to the collector. Having failed to find *Amphisbatis incongruella* Staint. on Ashdown Forest on the 14th, I swept two at Blackheath two days later, though none was seen to fly. The only excitement was caused by a mallard which rose from her nest of six eggs in the deep heather.

The British Ent. & Nat. Hist. Soc. held a field meeting at Riddlesdown on the 27th, where we searched on hands and knees for the larvae of *Parectopa ononidis* Zell. in clover leaves. Some sunshine after a heavy shower was welcome, but the mines were scarce and those I found failed to produce any moths.

Unsuccessful attempts were made during the first week-end of May to find *Eucosoma pauperama* Dup. on the North Downs. *Gonopteryx rhamni* L. and *Polygonia c-album* L. were about while the first *Pyrgus malvae* L., *Anthocaris cardamines* L. and *Pararge aegeria* L. were seen, but small moths of any kind were very scarce. Following a warm day on the 3rd, the m.v. was taken to Leith Hill among some rowans for *Epigraphia steinkellneriana* Schiff. The flight turned out to be poor despite slight drizzle, all activity ceasing after 10.30 with the cessation of the rain. Nineteen species had arrived including *Odontosia carmelita* Esp., *Colocasia coryli* L., *Pachycnemia hippocastanaria* Hubn., *Selenia tetralunaria* Hufn. and *Ectropis consonaria* Hubn. but not the wanted micro. which I have seen only in Alice Holt Forest under Mr E. Sadler's direction, and where the absence of rowan puzzled me until Meyrick's mention of hawthorn as another foodplant was noticed.

The best chance capture of the year was that of a *Solenobia inconspicuella* Staint. which appeared in the car as I drove out on the morning of the 5th.

The Plaistow woods were glorious with spring flowers on the 11th, but hardly any insects were about, *Leptidea sinapis* L. being represented by one specimen only. A few *Leucoptera wailesella* Staint. were taken on the dyers greenwood, but the spun shoots contained larvae which all

proved to be *Cnephasia* species.

Some *Chloroclystis debilitata* Hübn. larvae were found at Mychett between showers on a cold 18th May, but none of *Parascotia fuliginaria* L. Later in July-August I took four of the moth in the home trap where no more than this total have been recorded over many years. They were very fresh, and there is no doubt that the species does occur here on the weald clay.

A visit to Cardiganshire was made over the bank holiday week-end, joining Messrs S. Coxey and M. J. Leech. En route a lot of *Coleophora laricella* Hübn. cases were found by the Usk road, some pupated, while a few spinnings among the larch needles resulted in *Pandemis cinnamomeana* Treits. being bred later. On our first night which was muggy and wet the larvae of *Coenophila subrosea* Steph., for which we had made the journey, were easy enough to find from about half an hour before dark. Others seen on the bog myrtle were *Lasiocampa quercus* L., *potatoria*, *Amathes castanea* Esp., and in dayilght, spun *Orthotenia undulana* Schiff. and *Amelia viburnana* Schiff. The beautiful *subrosea* larvae were as co-operative as has been reported by earlier collectors, feeding on willow from the next day and emerging with little loss between 20th July and 8th August.

The weather for the three days of my stay was cold with heavy showers resulting in little of the microlepidoptera being seen except a few *Clepsis senecionana* Hübn. My friends were pleased to take *Lampropteryx otregiata* Metc. in a number of places, just odd ones being put up by day while at night it was common and almost the only species on the wing in one area. We ran two m.v.s and an actinic tube in woodland at Tre'r-ddol on the night of the 26th. After two wet nights this one turned clear and cold, only fourteen species being seen at the concourse of lights. *Notodontia trepida* Esp., *Celema confusalis* H.-S., *Thera variata* Schiff. and *Anagogo pulveraria* L. were among these.

A search for *Aptura iris* L. larvae at Plaistow on the last day of the month was terminated by rain. The only moths caught were singles of *Mompha subbistrigella* Haw. and *Buccalatrix ulmella* Zell., with *Epinotia tedella* Clerck as usual common in the spruces.

I went to Mickleham the next day to try the beeches for *Ornix fagivora* Staint. The only moths of the right size were the last of the spring brood of *Lithocolletis faginella* Zell., but a few other species were caught, one being *Pammene nimbana* H.-S. which was not recognised at the time despite its being on the wanted list. The pines produced *Epinotia rubiginosana* H.-S. and I swept *Stomopteryx taeniolella* Zell. and *Adela fibulella* Schiff. from the herbage.

That evening as I hurriedly cut some oak from the front hedge a *Coleophora binderella* Koll. case was spotted on the neighbouring hazel. It was more pleasing still to find when time allowed on the morrow that there were a dozen more all feeding in a small area on the young leaves on the top of the hedge. They were kept in a sleeve until they had pupated, for the *Coleophoridae* resent being confined indoors in the larval stage.

Mickleham was tried on the evening of 12th June for *nimbana*, Alan using the net on a fishing rod while I stirred the higher beech boughs. We caught only one and it became obvious in retrospect that we were too late. Tiring of the arm-aching technique, we went to the purging

buckthorns and were pleased to take a good lot of *Ancylis unculana* Haw. and *Buccalatrix alnella* Vill. There were many micros and geometers on the wing that evening as dusk drew near, giving a first glimpse of the warm summer to come.

The lights were taken to Blackheath on the next night. This is about the same distance from my home as is Ashdown Forest, but has not been used at night before. Fifty-seven species were seen, including *Hyloicus pinastri* L., *Stauropus fagi* L., *Tethea ocularis* L., *Apatele alni* L., *Polia hepatica* Clerck (*tincta* Brahm.), *Chesias rufata* F., *Plagodis dolabraria* L. and *Perconia strigillaria* Hübn. but not *Dyschia fagaria* Thunb. for which we had hoped. The area turned out to be a pleasant one to work, having a more intimate atmosphere than Ashdown.

Odd specimens of *Ancylis obtusana* Haw. and *Spatalis bifasciana* Hübn. had been taken last year at Plaistow, and I had tried unsuccessfully there on the 7th of this month, finding that the forestry people had sprayed the best ride with brushwood killer. It seemed possible that Holmwood, where alder buckthorn is very common, might yield the moths, so the evening of the 14th saw us there. Alan's first insect from the buckthorn was, he announced, "Only a *Phalonia*". This, nearly thrown out, was, in fact, *Clysia ambiguella* Hübn., and he was exhorted to keep up the good work. Four more of this rare moth were caught, as well as plenty of *Ancylis apicella* Schiff., *Acornutia nana* Haw. and one *Epinotia demarniana* F.R. The mosquitoes were also very active on this warm night.

Four days later we returned on a cooler evening. Six more *ambiguella* were caught, some as they flew freely round the bushes. There was no sign of the species which had prompted our search, yet Alan brought in a *bifasciana* from a small wood near the house a few days later despite the foodplant being apparently absent. Many of the buckthorn shoots at Holmwood were withered, suggesting *Sorhagenia janisewskae* Riedl, but we were too late, the larvae having left.

As buckthorn seemed to be producing wanted moths we returned to the purging species at Mickleham Down on the 25th, hoping for *Hysterosia sodaliana* Haw. This we found impossible to beat from the bushes but we caught a few as they flew between 9 and 9.45 p.m.

A successful trip to the north to find larvae of *Orgyia recens* Hübn. was made during the last week-end of the month. I was surprised to see *sinapis* still on the wing in Salcey Forest on my way back.

The night of 1st July was so promising following a hot muggy day that the m.v. was taken to try a new site in woodland near Ockley, about ten miles west of home. The temperature remained above 60F, but out of some fifty species, a poor number for such a night, not one moth, large or small, was really interesting. The first *Miltochrista miniata* Forst. and *Gastropacha quercifolia* L. turned up, *Comibaena pustulata* Hufn. was common and the fresh *Angerona prunaria* L. were all ordinary. That experience turned me back to daylight collecting again, not that I miss much sleep these days. Holmwood was tried on the 4th to see if imagines of *janisewskae* could be caught. They were not, but a lot of common species, *Cnephasia*, *Pandemis cerasana* Hübn., etc., were about. One that constantly came dancing along the rides and round the bushes was *Ptycholoma lecheana* L. The mosquitoes were more attentive than ever.

In Tutt's "Hints" there is a note about the occurrence of *Cosmopteryx eximea* Haw. near Bat and Ball Station, Sevenoaks, and as Mr S. Wakely has confirmed this for more recent times I went to attempt to beat the moth onto my net on the 5th. Hop seemed non-existent around the station so the road to Seal Chart was taken, bringing back nostalgic memories of life at Sevenoaks just before the last world war. Odd bits of the plant were tried without success, and in desperation the journey was extended to Offham where there is a hedge plastered with hop, but these large quantities were just as barren.

Eastern Kent was visited when my wife and I spent two nights at Kingsdown on the 11th and 12th, allowing me to try for some of the sea-holly insects at Sandwich. The smoker was brought into action and I was pleased to catch fresh *Agonopteryx cnicella* Treits., but *Phalonia maritimana* Guen. must have been over. Other species smoked out or seen flying in the daytime or evening were *Phal. margaritana* Haw. (*dipoltella* Hübn.), *Marasmarcha lunaedactyla* Haw., *Homoeosoma sinuella* F., *Nyctegretis achatinella* Hübn., *Bryatopha desertella* Dougl., *Col. frischella* L. and a small *Gelechid* not so far identified. Butterflies were scarce, only *Maniola jurtina* L., *Coenonympha pamphilus* L., and *Polyommatus icarus* Rott. showing themselves.

I visited Folkestone Warren the next day finding the paths badly overgrown, with the chalk slippery underfoot. Some *Collicularia microgrammaria* Guen. were taken, and as little else was to be seen I turned to searching the scabious for *Agonopteryx pallorella* Zell. which spins the smaller leaves lengthways. Two plants out of many examined held larvae. From these were bred a few moths with an odd *Eana osseana* Scop. The cliffs at St. Margaret's in the evening did not yield *Cnephasia genitalana* Pierce or *Grapholita caecana* Schlag. as I had hoped, the commonest moth being *Eucosma fulvana* Steph., with *Elachista triatomea* Haw. noticeable despite its small size.

Having seen *Nemotois minimella* Zell. in Cornwall last year, Alan and I were keen to find its relative *N. cupriacella* Hübn. We swept the devil's-bit scabious along the rides of the Plaistow woods on the 20th without catching anything of interest. One *Coleus croceus* Fourc. passed us flying northwards and we saw a few *Argynnis paphia* L. and *Limenitis camilla* L. on what was a predominantly cloudy day. We returned on 3rd August, when we caught two *minimella*, but not the larger species. At one point in a ride *Choreutis myllerana* F. (or *punctosa* Haw.—I have not sorted them out since setting them) which I had seen only in singles before, were common, the easiest way to catch them being to sweep the rushes among which the skullcap grew.

Between these two dates two trips were made to Brighton to search for *Cryphia muralis* Forst. On 26th July one was taken, while *Yponomeuta plumbella* Schiff. swarmed around the euonymus bushes. The second visit was a blank, only *C. perla* Schiff. being found and a female *Celastrina argiolus* L. noted. A third attempt on 8th August produced one more *muralis* in about the same place as the other though well over a mile of suitable walls were scanned.

Holmwood had been examined for devil's-bit on the 1st but none seen, possibly due to the park-like cutting of the rides which now prevails. There used to be a lot of wild flowers behind the pond until the mowing was started, and while this tidying up process may have improved

conditions for picnickers it has done nothing for entomologists.

A few visits were paid to Juniper Valley off Headley Lane at this time. *Argynnis aglaia* L. were flying with the first *Hesperia comma* L. among hordes of *Thymelicus sylvestris* Poda and *Zygaena filipendulae* L., but the presence of *Melanargia galathea* L. was surprising. As well as two here, one was seen on Westcott Downs. These are the only ones I have observed in Surrey apart from one at Betchworth in 1946. The objects of the trips were two plumes, *Pterophorus baliodactylus* Zell. and *Oxyptilus pilosellae.* Hopes of the second were faint but the quantities of marjoram suggested the first would be there, yet neither was found.

After a long absence a return was made to Camber and Dungeness on 5th August. I smoked the salt marsh plants, but apart from one each of *Pediasia aridellus* Thunb. and *Eucosma maritima* Westw., the other insects such as *E. tripoliana* Barr. were ready to move without any inducement. At Dungeness *Euproctis chrysorrhaea* L. swarmed on all the bushes, many of the females having deposited their hairy egg masses. Among the lower plants *Plutella maculipennis* Curt. was a nuisance and only one *Col. otitae* Zell. was taken from the catchfly. The night was warm, clear and calm, lack of wind not being usual in this area as collectors well know. The microlepidoptera were disappointing in view of these conditions but a number of *Aristotelia palustrella* Dougl. and *Neofriseria suppeliella* Wals. were taken. Only two *Cynaeda dentalis* Schiff. appeared but this, which was common years ago, may have been almost over. The bigger moths were more interesting with the specialities of the district turning up; it being pleasing to see *Thalera fimbrialis* Scop., *Calophasia lunula* Hufn. and *Nola albula* Schiff., though *Lasiocampa trifolii* Schiff. and *Eilema pygmaeola* Doubl. were few where I remember seeing them in large numbers on the sheet in the past.

With a continuance of the very warm weather the m.v. was taken to Blackheath on the 8th, where it was set up near the pines with *Lozotaeniodes formosana* Frol. in mind. The temperature remained above 60F, facilitating a steady flow of moths which made a total of sixty-six species, including a *Thera firmata* Hübn., unexpected at this date, *Gnophos obscurata* Schiff., *Acasis viretata* Hübn., *Amathes ditrapezeum* Schiff., *Cosmia affinis* L., *Apatele leporina* L. and an early *Deuteronomos alniaria* L. There were no interesting micros.

The following night being hotter still, the light was put on at Holmwood, which with its heavy clay soil was a very different site from the dry sand of Blackheath. Most of the species seen were nevertheless the same, but a late *Tethea fluctuosa* Hübn. in good condition turned up with *Lymantria monacha* L., and *Dysstroma citrata* L., which occurs only in small numbers about here, and one *Amphipyra berbera* Rungs. The most interesting moth to me was *Stenolechia gemmella* L., two being taken.

Having failed to knock out this moth by day from the trees thereabouts, I returned with Alan at night. As little was reaching the sheet he tried jarring the oak boughs and by this means caught a dozen with some *B. ulmella.* The larger moths were rather dull, *Cosymbia albipunctata* Hufn. being commoner on the sheet than usual as it is little attracted, while *Eupithecia inturbata* Hübn. was the best of the bunch. The copper underwing this time was *A. pyramidea* L. At home two taken proved to be one of each kind. The species was easily separated

after reading the excellent article by Goater & Christie (*Ent. Gaz.*, **20**: 259). It must be remembered that few of these moths visit m.v. light; therefore, it was surprising to take four good ones in the space of three days.

The first *Acleris cristana* Schiff. were caught on the 13th, while on the next day I was pleased to find a likely-looking Surrey wood, explored in the previous winter, held the moth. Two days following, some new ground in Sussex was also successfully tried.

Mr S. Wakely joined me on the 20th in a search for the larvae of *C. ambiguella* at Holmwood. The slight spinning together of the buckthorn berries was detected on a number of bushes, though they were never common. These required overwintering out of doors as the larvae hibernate full-fed, pupating shortly before the emergence date.

August 25th saw me back in Lanivet. Some time spent searching on boggy ground nearby yielded a few *Acleris comariana* Zell. but two *Col. potentillae* Staint. on the Comarum were a surprise. No more of these could be found, yet there was plenty evidence of the feeding of *Hemaris tityus* L. on the devil's-bit in the area though it was too late to catch the larvae at work.

The 26th was spent in the St. Agnes-Portreath district looking for coastal m.v. sites and for *cristana*. The moths beaten out were its relatives *A. latifasciana* Haw., *A. emargana* F. and *A. sparsana* Schiff. Some *Argynnis paphia* L. were seen on the next day, one being quite outside any woodland. Possibly the butterfly behaves in Cornwall much as in Ireland where it appears to be a hedgerow insect.

The fresh wind, which had blown since my arrival, having dropped, the m.v. was placed by the cliffs near St. Agnes on the 28th. The wanted moth was *Antitype xanthomista* Hübn. and one had appeared soon after nine o'clock. Eight others followed, all before ten, but all in poor condition. This took out some of the joy of seeing a moth for the first time, especially as the holiday date had been chosen as the most likely for fresh specimens. There were few other species, one *Euxoa obelisca* Schiff. being welcome and a single *Ammagrotis lucernea* L. showing that the exception proves the rule of their not coming to m.v. *Agrotis puta* Hübn. was easily the commonest moth and the *Scopula promutata* Guen. differed little from Portland specimens.

An *otregiata* was disturbed from a hedge near Lanivet two days later, and two came to the sheet that night at Luxulyan where I had gone to avoid the troublesome wind. Few moths were seen despite the shelter of the woodland.

On the morrow in warm sunshine some *Lobesia littoralis* Curt. were caught behind the lighthouse on Trevose Head as they flew over the thrift on the enclosure bank, while in more exposed areas *Stenodes straminea* Haw. and *Aspitates gilvaria* Schiff. were seen.

A second night visit to St. Agnes on 1st September was preceded in the daytime by another search for *cristana*. Five were caught at Portreath and one in an area kindly indicated to me by Mr W. G. Tremewan. The night became cloudy and fairly still giving promise of a good catch at the lights. Bats in numbers, however, worked so closely that results were poor, only two *xanthomista* reaching the sheet with a dark form of *Tholera cespitis* Schiff. and some *Stilbia anomola* Haw. Switching off for twenty minutes had no effect, the bats being back immediately the

light shone again. At the actinic tube, placed out of sight near the beach, two fresh *xanthomista,* an *obelisca* and two *Catropia margaritellus* Hübn. were taken between nine and nine-thirty when, unfortunately, the battery failed.

While working a cliff path at Portholland on the 3rd a number of *Pammene spiniana* Dup. were netted with *Acleris rhombana* Schiff. and *latifasciana,* but no *cristana* in what looked a promising place.

The trap was run at Lanivet. Late August is not an exciting time and nothing surprising was found among the sixty-three species recorded. The best hope was of migrants, but with the wind in a northerly quarter throughout, only six *Nycterosea obstipata* F. turned up.

From the return home all available days were devoted to collecting *cristana,* most of the time on my own, as Alan was transferred to Harlow on 9th September, to my regret, and was able to join me on only a few of the subsequent week-ends.

The autumn weeks were the opposite of those in 1968, the clay woodland paths developing wide cracks where a year before we had slid through mud and water. The amassing of data about *cristana* continued, every specimen caught being recorded as last year. At one time despite the fine weather numbers were small but October made up for this, the previous year's total being passed. Fifty-two forms were seen, and out of six hundred and eighty moths, one hundred and two were one form (*striana* Haw.).

The trap here, after a protracted poor start had much better numbers from August to October though still without the 'better' species as in 1968. One interesting first was *potatoria* which I have never seen anywhere in this district despite its being such a widespread common moth. The calm conditions allowed more micros than usual to reach the interior of the trap, *Pammene fasciana* L. (*juliana* Curt.) and *Microscardia boleti* F. being newcomers. The migrants have already been recorded.

Blencathra, Deanoak Lane, Leigh, Surrey. 31.12.69.

Some Records of Migrant Lepidoptera in South Westmorland, 1969

By J. Briggs

My Robinson-type 125 watt. m.v. trap was operated most nights from 1st March to 31st October, 1969. It is sited on top of a coal bunker outside my house overlooking a coppiced woodland on southerly sloping carboniferous limestone, about 2½ miles north-east of Silverdale. The situation is just within the Westmorland boundary. Records are kept of all species of lepidoptera found either in the trap or its immediate vicinity. The following notes refer to species of migrants seen or taken this year.

Plusia gamma L. The first evidence of an immigration to this district was noticed in early August. On the 9th five *P. gamma* were noted, and on the 10th 219. In September peaks of occurrence for this species were noted on the 9th and 18th. October was noteworthy for the large numbers seen both by day and night throughout the district.

Nomophila noctuella Schiff. Odd specimens noted on 12th and 14th August. In September only four specimens were noted, but in October it became more common so that 41 were counted on the 21st.

Udea ferrugalis Hübn. An example of this well-known migrant was taken resting on the house wall on 22nd August. Another on 23rd October.

Nycterosea obstipata F. One male specimen was captured near the light on 19th October.

Peridroma porphyrea Schiff. A few occurred each night from 21st to 24th October.

Heliothis armigera Hübn. An unfamiliar moth (female) found sitting on the wall near the trap proved to be this rare migrant. Dr. N. L. Birkett of Kendal later confirmed this as only the second record of this species occurring in this north-western area of England. The only other known record being that of a specimen taken by Dr. Birkett in his trap in Kendal on 7th September 1958.

Diasemia ramburialis Dup. While glancing over some insects on my setting boards Dr. Birkett noticed an unfamiliar Microlepidopteron. This was soon determined as *D. ramburialis.* The specimen was captured resting on the wall near the trap on 23rd October. I find that I also took a specimen of this species here, in similar circumstances on 28th October 1968. This species is described by B. P. Beirne (British Pyralid and Plume Moths, 1954, p. 128) as "A rare non-resident immigrant captured occasionally on the south coast of England and once taken in Lincolnshire." I have not searched the literature, but believe this to be the most northerly point in the British Isles at which this species has been taken.

Laphygma exigua Hübn. A male specimen of this species was taken in the m.v. trap run at Leighton Moss, Silverdale, Lancs., by Mr. John Wilson, the N.S.P.B. warden there, on 23rd October. It is a scarce migrant in this district, and has previously been recorded from Hutton Roof, by the Rev. J. Vine Hall, and Kendal by Dr. N. L. Birkett.

Frimley House, Deepdale Close, Beetham, nr. Milnthorpe, Westmorland.
19.i.1970.

New Forest Mercury Vapour Light Records for 1969

By L. W. Siggs

1969 was a "mixed" year. The number of specimens taken was lower than usual from March to July, and only a little higher from August to October. On balance, it was not a good year for numbers.

The number of specimens recorded in my m.v. trap was:—

	Nights	Total	Average
March	15	304	20
April	24	2422	101
May	26	869	33
June	30	2601	84
July	31	5893	190
August	31	8431	272
September	23	3609	157
October	30	1867	62
November	12	174	14

What was lacking in "quantity", however, was more than compensated

by "quality".

Thirteen species occurred in the trap for the first time. This is remarkable as a trap has been run regularly since 1959 (a Robinson trap with m.v. since 1962). They were

Eremobia ochroleuca Schiff. (2). Normally found on chalk and limestone.

Lithophane leautieri Boisd. Normally a coastal species.

Plusia orichalcea Fab. A rare migrant.

Plusia gracilis Lempke (3) I have recorded 10 *"festucae"* since 1959, some of which may have been *gracilis*, but the six I have retained in my collection are all *festucae*.

Hemistola immaculata Thunb. Feeds on Travellers' Joy and normally occurs on chalk.

Scopula imitaria Hübn.

Scopula emutaria Hübn. A little North of its usual habitat.

Sterrha seriata Schrank.

Lygris pyraliata Schiff.

Larentia clavaria Haw.

Euchoeca nebulata Scop. (2).

Abraxas sylvata Scop.

Ligdia adustata Schiff. Feeds on spindle which is not common locally.

Occasional visitors who turned up in 1969 were:—*Trichiura crataegi* L., *Nola albula* Hübn., *Comacla senex* Hübn., *Polia nitens* Haw., *Leucania obsoleta* Hübn., *Nonagria dissoluta* Treits. (2), *Caradrina ambigua* Fab., *Apamea infesta* Ochs., *Celaena leucostigma* Hübn., *Zenobia retusa* L., *Z. subtusa* Fab., *Catocala nupta* L., *Cosymbia pendularia* Clerck (2), *Sterrha muricata* Hufn. (3), *Mesoleuca albicillata* L. (2), *Perizoma flavofasciata* Thunb., *Horisme vitalbata* Schiff., *Eupithecia innotata* Hufn., *Apeira syringaria* L., *Ectropis consonaria* Hübn.

The total number of species of macrolepidoptera recorded in 1969 was 378. Comparable figures for earlier years are:—1963, 357; 1964, 352; 1966, 317; 1967, 357.

The total number of species recorded at any time now stands at 463.

In the following species, the 1969 figure was appreciably higher than the previous highest (shown in parentheses):—

Pheosia gnoma Fab. 213 (171); *Pterosoma palpina* Clerck 43 (26); *Phalera bucephala* L. 143 (126); *Euproctis similis* Fuessl. 83 (43); *Lymantria monacha* L. 99 (58); *Drepana falcataria* L. 67 (42); *D. lacertinaria* L. 84 (63); *Cilix glaucata* Scop. 43 (28); *Nola cucullatella* L. 21 (11); *Eilema griseola* Hübn. 31 (14); *Phragmatobia fuliginosa* L. 198 (141); *Agrostis puta* Hübn. 137 (92); *Amathes glareosa* Esp. 32 (10); *Amathes c-nigrum* L. 1424 (1042); *Axylia putris* L. 207 (153); *Cosmia trapezina* L. 267 (232); *Craniophora ligustri* Schiff. 32 (12); *Aporophyla lunula* Stroem. 92 (75); *Agrochola lota* Clerck. 155 (87); *Tiliacea aurago* Schiff. 10 (5); *Lithacodia fasciana* L. 129 (58); *Rivula sericealis* Scop. 885 (361); *Bomolocha fontis* Thunb. 10 (4); *Schrankia costaestrigalis* Steph. 51 (11); *Laspeyria flexula* Schiff. 65 (45); *Cosymbia punctaria* L. 52 (33); *Sterrha biselata* Hufn. 28 (16); *Xanthorhoë ferrugata* Clerck 279 (163); *X. fluctuata* L. 34 (19); *Nycterosea obstipata* Fab. 75 (11); *Thera firmata* Hübn. 39 (23); *Epirrhoë alternata* Mull. 165 (149); *Chloroclystis coronata* Hübn. 18 (5); *C. rectangulata* L. 13 (6); *Abraxas grossulariata* L. 22 (11); *Deilinia pusaria* L. 20 (11); *Semiothisa*

alternaria Hübn. 125 (65); *S. liturata* Clerck 29 (17); *Deileptenia ribeata* Clerck 8 (1); *Nomophila noctuella* Schiff. 1818 (310). It is seldom that comparative figures of this sort are available. It is necessary to run a standard trap (in this case a Robinson trap since 1962) with a standard light source (80 watt. m.v.) nightly throughout a number of years in the same spot, keeping records of the number of each species found in the trap each morning. It may, perhaps, be deduced from these figures that the theory of the decline in moth populations is being overstressed. It is also nice to know that the toll taken by birds of specimens discharged from the trap, and by the bat who nightly catches specimens flying round the trap and then flies round the house to the shelter of the porch to eat them and litter the floor with their wings, is not so great as to prevent many species from more than holding their own.

MIGRANTS. 1969 was a good year. The figures are:—*Lithosia quadra* L. (10); *Agrotis ipsilon* Hufn. (640); *Perizoma porphyrea* Schiff. (63); *Leucania vitellina* Hübn. (2); *Laphygma exigua* Hübn. (16); *Plusia orichalcea* Fab. (1); *Plusia gamma* L. (975); *Cosymbia puppillaria* Hübn. (1); *Nycterosea obstipata* Fab. (75); *Diasemia ramburialis* Dup. (1); *Palpita unionalis* Hübn. (2); *Nomophila noctuella* Schiff. (1818); *Udea ferrugalis* Hübn. (183); *Plutella maculipennis* Curt. (33).

POLYMORPHISM

Biston betularia L.		*Sterrha aversata* L.	
typical	102 (83%)	*remutata*	129 (67%)
carbonaria	10 (8%)	*aversata*	64 (33%)
insularia	11 (9%)		

Achlyia flavicornis L. Typical 30, melanic 1.
Eilema deplana Esp. Typical 6, *unicolor* 10.
E. griseola Hübn. Typical 26, *flava* 5.
Apamea crenata Hufn. Typical 4, *alopecurus* 1.
Luperina testacea Schiff. Typical 30, melanic 1.
Hydriomena furcata Thunb. Typical 45, *obscura* 1.
Alcis repandata L. Typical 50, *conversaria* 2.
Ectropis biundularia Borkh. Typical 39, melanic nil.
Phigalia pedaria Fab. Typical 29, melanic 1.

Sungate, Football Green, Minstead, Lyndhurst, Hants.

Migratory and other captures

STEEPLE BARTON, OXFORDSHIRE, 1968-69

By H. B. D. KETTLEWELL

The following is a list of species taken in my trap at Steele Barton Vicarage.

1968	28. 4.68	*Phylogophora meticulosa* L. 2
		Agrotis ypsilon Von Rott 2
	16. 5.68	*A. ypsilon* 1 (pale)
		P. meticulosa 1
	1. 7.68	Sahara sand arrives Oxford
	4. 7.68	*Nomophila noctuella* Schiff. 1
	5. 7.68	*N. noctuella* 2
		P. meticulosa 2
	8. 7.68	*N. noctuella* 1
	6. 9.68	*Spaelotis ravida* Sch. 1 ♂
	8. 9.68	*S. ravida* 1 ♂

27. 9.68 *Erannis defoliaria* Clerk 1 ♂
Spilosoma lubricipeda 1 ♂
29. 9.68 *N. noctuella* 1
5.10.68 *Vanessa cardui* 1
19.10.68 *P. meticulosa* 8-900
Peridroma saucia Hb. 2
A. ypsilon 5
20.10.68 *P. meticulosa* 300-400
P. sauci 1
26. 5.69 *Heliothis armigera* Hb. 1 ♂
1969 16. 5.69 *N. noctuella* Schiff. 2
N. noctuella 2
Plusia gamma L. 2
28. 5.69 *P. gamma* 15 (pale)
31. 5.69 *Caradrina exigua* Hb. 1.
28. 7.69 *C. exigua* 2 (1 fresh ♀)
N. noctuella 5 (1 worn ♂)
P. meticulosa 1
1. 8.69 *C. exigua* 2 (1 ♂, 1 ♀)
3. 8.69 *N. noctuella* 5
A. ypsilon Von Rott. 3
P. gamma 200-300
13. 9.69 *S. ravida* Schf. 1 ♂
N. noctuella 10
P. saucia Hb.
A. ypsilon 30
15. 9.69 *S. ravida* 1
N. noctuella 20
17. 9.69 *Leucania vitellina* 1 ♂
P. saucia 1
A. ypsilon 50
P. gamma 200 including one "*gamma* minor"
4.10.69 *N. noctuella* 20
6.10.69 *P. gamma* 200
C. exigua 1 ♂
N. noctuella 15
P. saucia Hb. 2
A. ypsilon
7.10.69 *N. noctuella* 12
P. gamma 100
9.10.69 *A. ypsilon* 8
P. saucia
P. gamma 100-200 each of last three nights
N. noctuella 20-30
12.10.69 *P. meticulosa* 1000
N. noctuella 100
P. saucia 10
A. ypsilon 15
14.10.69 *N. noctuella* 17
P. gamma 100-200
16.10.69 *P. meticulosa* 50
P. gamma 40

16.10.69 *Nycterosea obstipata* 1 ♂
18.10.69 *P. meticulosa* 1000
P. gamma 100
V. atalanta (flying south) 1
19.10.69 *N. noctuella* 25
Palpita unionalis 1 ♂
P. saucia 15
21.10.69 *N. obstipata* 1 ♂
22.10.69 *Plusia orichalcea* Fab. (syn.=*aurifera* Hb.) 1♂ in perfect condition
N. obstipata (1 ♂, 1 ♀ fertile)
P. unionalis 1 wing
N. noctuella 20
P. gamma 70
P. meticulosa 200
S. lubricipeda (1 ♀)
23.10.69 *N. obstipata* 1 ♀
24.10.69 *V. atalanta* 1
P. gamma 20
P. saucia
A. ypsilon
26.10.69 *N. obstipata* 1 ♂ worn
27.10.69 *N. obstipata* 1 ♂
2.11.69 *V. atalanta* on wing in garden
Caradrina clavipalpis ♂ in trap
5.11.69 2 *V. atalanta* on wing
17-20.11.69 *P. meticulosa* 2
P. gamma 4
P. saucia 1 (pale)
13.12.69 *P. gamma* 1 (pale)
Also *V. cardui*. One in m.v. trap. Glenelg W. Scotland 13.8.69

Observations on British Butterflies in 1969

By C. J. Luckens

Spring came rather slowly in 1969, and it was not until the last day of March that we saw the first newly-awakened *Aglais urticae* L. near my parents' home at Haywards Heath in Sussex. This was released after being found beating at the windows inside the local chapel, which seems to be a favourite hibernation site year after year.

The following day, April 1st, was a classic spring day of sun and showers, and it was a welcome sight to see a male *Gonepteryx rhamni* L. flying through the garden.

More *A. urticae* were seen in the ensuing week and April 7th my wife and I released no less than nine from the aforementioned Chapel. On the same day, since it was so warm and sunny, we drove through some narrow, elm-bordered lanes near Lewes where conditions seem ideal for *Nymphalis polychloros* L. We were unsuccessful in our search for this rare insect, but *Nymphalis io* L. and *A. urticae* were abundant in the area. The following day we again tried for *N. polychloros* near Seaford, once more without success, but this will not deter me from

searching year after year in various suitable localities.

April 9th was warm and sunny and my wife and I went to Alice Holt Forest for the day. *A. urticae*, *N. io*, and *G. rhamni* were now very much in evidence, and we also saw several Roe deer.

On April 11th we returned to Scotland, and observations were limited until the latter half of May, when we visited a hillside near Kilmacolm on the 20th. The weather was glorious, and *Callophrys rubi* L. was flying in numbers on the blaeberry-covered banks, together with a few *A. urticae and Pieris napi* L. We returned to the same place the following afternoon, when the same butterflies were seen and also a surprise *Vanessa cardui* L., flying very determinedly northward. The next day I saw a *Pieris rapae* L. at Tollcross in the very heart of Glasgow, looking most forlorn amid all the fumes.

May 23rd saw my wife and me heading north for Lochaber, and on the morrow we searched the Fort William area for *Carterocephalus palaemon* Pall. The weather was unsettled, however, and though we found several possible sites, *C. rubi* and *P. napi* were the only butterflies on the wing.

In the last week of the month we started south on our way to Sussex, stopping off at Monks Wood on May 29th. Here *Pieris brassicae* L., *P. napi*, *P. rapae*, and *Pararge aegeria* L. were fairly common, but *Antocharis cardamines* L. was only just emerging. Near Haywards Heath on May 30th, *Pararge megera* L. was seen, and *Clossiana selene* Schiff. was just out. *Clossiana euphrosyne* L., once the commoner of the two fritillaries in this locality was nowhere to be found.

Ditchling Common, on the last day of May, produced a varied assortment of butterflies. The 'whites' were flying everywhere in the hot sun; *Lycaena phlaeas* L. and *Erynnis tages* L. were plentiful, and there were *a few Pyrgus malvae* L., *P. megera*, and *C. rubi*—no sign of *Euphydryas aurinia* Rott. however.

On June 2nd, we journeyed to Hod Hill, near Blandford, but after a fine start to the day the weather turned dull and rainy at about 3 p.m. Only one male *E. aurinia* was seen in the short time available but several *Vanessa atalanta* L. and *V. cardui* flitted about on the north vallum. We stayed overnight in the area, but the following morning dawned wet and windy. To our satisfaction, however, we saw the clouds almost gone by 11 a.m., and on Hod Hill, in the Dorset Naturalists' Trust reserve *E. aurinia* was flying in very good numbers. Some of the females were freshly emerged and, clinging to grass stems, were drying limp wings in the sun. In a spiders web were several desiccated bodies of male *aurinia*, and after I untangled the wings of one live victim, which was wrapped up like a silken parcel, it flew off apparently none the worse for wear! Worn *C. rubi* were still flying with plenty of *E. tages*, but *Aricia agestis* Schiff., *Cupido minimus* Fuess. and *Lysandra bellargus* Rott. had apparently not yet emerged.

We returned to Sussex that evening, and the next expedition was to the downs near Petworh on June 6th and 7th. A few *Hamearis lucina* L. were about there and I spotted one male hopelessly stuck to its own pupa case and crippled Other butterflies seen were *P. megera*, *P. aegeria*, *Coenonympha pamphilus* L., *C. rubi*, *Polyommattus icarus* Rott., *G. rhamni*, *P. malvae*, *E. tages*, and *Ochlodes venata* Br. & Grey. The two

day-flying moths, *Euclidimera mi* Clerck and *Ectypa glyphica* L. were also abundant, and could be confused quite easily with *H. lucina* on the wing.

We started back north on June 9th, again visiting Monks Wood en route, where *A. cardamines* was now flying freely, but none of the skipper tribe was out in this locailty.

After our return to Glasgow the weather continued hot and sunny and we drove out to a moss near Kilmacolm on June 12th but *C. selene* did not appear to have emerged yet. The prolonged dry weather continued until the middle of the month and then unsettled conditions prevailed.

On June 20th, while we were staying in the Oban area, it was still very changeable, but we were delighted to see *E. aurinia* flying in some numbers on a rough hillside during the sunny spells, in company with large, fresh specimens of *P. icarus* and a few *L. phlaeas*.

C. selene was out in plenty on the Kilmacolm moss, June 24th (males fresh, females just out), and is of a large and fine race in this area. *Parasemia plantaginis* L. was also flying in the sunlight.

On July 2nd I climbed Ben Lomond but *Erebia epiphron* Knoch. was not flying in its haunts around 2,000 ft. The day was sunny but breezy and it was early in the season for this butterfly in Scotland. I was more successful on July 14th when, after being present at the birth of my son in the early hours of the morning, I made a flying visit to Ben Lawers (with permission from my wife!) and found this dark-winged insect plentiful in marshy hollows.

C. selene females were still fresh near Kilmacolm on July 16th and the first *Maniola jurtina* L. were flopping around in the reeds. Incidentally, after countless visits to this wild moss (within 20 minutes' drive from Glasgow city) I have never failed to see at least one Roe deer on each occasion—quite a record!

After another visit to the Ben Lawers massif on July 17th, when *E. epiphron* was still fresh and even more numerous, I stopped off near Callander to investigate a colony of *Aphantopus hyperanthus* L. There seems to be a far greater proportion of vars. *arete* and/or *caeca* among these Scottish Ringlets than their southern counterparts; the ground colour is also of a greyer tint on the underside. Another colony of *A. hyperanthus* near Aberfoyle on July 24th also showed the tendency to diminished spotting on the underside, and in this locality *C. selene* was still about.

We saw the first *Erebia aethiops* Esp. of the season on July 29th, when the males, looking very black on the wing, were newly emerged in Glen Aray. The weather changed, however, as we continued towards Oban, and we saw no more butterflies of note.

The next expedition was to the east coast on August 5th, to a place beside the Firth of Forth which Mr. A. MacLaurin had told me of, and where, on some grassy cliffs, *Aricia artaxerxes* Fab. was flying in limited numbers and past its best. *P. icarus* was common, and there were more *V. cardui* than I have ever seen before in such a small area.

Two days later we set off for the south of England again in brilliant sunshine. On the way down we halted at Arnside, where we were pleased to note the abundance of *E. aethiops* in its only known locality south of the Border. Several pairs were found *in cop.* In contrast *Argynnis cydippe* L. is in one of its most northerly stations here, and

this beautiful butterfly was also flying in numbers in the hot sunshine. I also saw a tiny specimen of *Eumenis semele* L. of estimated wingspan of about 40 mm.

After staying the night at Rushden, Northants, we visited Salcey Forest in the morning. *G. rhamni* and *N. io* were present in hundreds on the tall thistles, and a small larva of *Leptidea sinapis* L. was found on Yellow Pea.

The following morning in Sussex, *Polygonia c-album* L., *N. io*, and *A. urticae* were on the *Buddleia* bushes in my parents' garden in better numbers than I have seen them for years. About mid-morning, Dr. A. Rydon and I investigated the woods nearby, where my parents had seen *Limenitis camilla* L. and *P. c-album* in plenty this year in mid-July. I had not seen *L. camilla* commonly in this locality since 1957, so it was a great pleasure to see a few specimens still flying this late in the season. Later we went over to some woods in West Sussex where Dr. Rydon had taken *Apatura iris* L. this year. The weather deteriorated, however, and on the grassy rides a few butterflies were active—a few *Argynnis paphia* L. some worn *L. camila*, and *N. io* on thistles. A pair of green woodpeckers preceded me down one of the forest tracks, rising at intervals with rebuking calls as I approached too closely. I was interested to see one hover at a thistle head and attempt to catch a specimen of *N. io*. A single example of *Celestrina argiolus* L. was noted high up, and back at the house my wife captured and released one on the same day.

I again accompanied Dr. Rydon to the West Sussex woods on August 11th, a gloriously sunny day. On our arrival at the selected ground, almost the first butterfly we saw was a fine male *Colias croceus* Fourc., which I secured after a chase, and which led me to a large patch of Birds Foot Trefoil around which a female *L. sinapis* ab. *erysimi* was fluttering. The second brood of this interesting little butterfly was fairly frequent in this place, but in another wood, noted for *L. sinapis*, none were seen. In most of the rides *A. paphia, L. camilla, P. c-album* and *V. atalanta* were flying, and in one place *Thecla quercus* L. was especially numerous around oaks, but no *A. iris* were seen.

The following day my wife and my mother came with me to the same locality, but though it was fairly sunny and warm, a stiff breeze seemed to keep *L. sinapis* low down in the grasses, and we only found one male at rest and saw a female fly over the bushes.

On August 14th, the whole family (including the cat, who is very interested in collecting lepidoptera—she once nearly accounted for a Chequered Skipper!) went over to the downs near Petworth. It turned cloudy after lunch, but we saw *A. agestis, P. icarus, P. megera, M. jurtina* (some still fresh) and *Thymelicus sylvestris* Poda. Later on in the woods heavy rain completely soaked me while I searched for *iris* ova.

August 18th saw Dr. Rydon and myself on a stretch of downland in the Lewes area. Here *Lysandra coridon* Poda were still flying in numbers, with *P. icarus*, a few *A. agestis*, and some very dark *C. pamphilus*. We also saw a *V. atalanta* attacked by a Dragonfly, and I narrowly missed stepping on an Adder.

The next day my wife and I drove down to the New Forest, via the Wiltshire Downs. Unfortunately, we failed to find *Hesperia comma* L. in one of its haunts near Salisbury, but saw many other common chalk butterflies. In the New Forest *E. semele* was still fresh and in good

numbers near Island Thorns enclosure (one late *Plebeius argus* L. was also seen), and *P. c-album* and *N. io* were common in the southern part of the forest.

On August 21st, we again visited the downs near Lewes, and were delighted to see *Lysandra bellargus* Rott. just out and looking like shining pieces of blue sky fallen on the turf. The next day it was even more common in the same area (along with *L. coridon*, *P. icarus* and *A. agestis*), but the females had not yet emerged, and as we returned to Scotland on August 25th we were not able to assess the strength of the colony.

Butterflies seen in my parents' garden during our fortnight's stay included: *P. aegeria*, *P. megera*, *M. jurtina*, *Maniola tithonus* L., *N. io*, *A. urticae*, *V. atalanta*, *V. cardui*, *P. c-album*, *L. phlaeas*, *C. argiolus*, *P. brassicae* and *P. rapae*.

After our return to Glasgow, we travelled in rather cold and dull conditions on August 30th to the Oban area. Worn *E. semele* were still flying in the usual place in Glen Lonan with many *L. phlaeas*, but on this occasion we were unsuccessful in our search for *E. aurinia* larvae in their localities near Oban. The following week, however, a quick search in a Scabious-filled field near Lochgilphead revealed several larval colonies of this butterfly, and we collected two medium-sized webs. In this beautiful area of flowery fields and coastal pastures *N. io* was seen and several *A. urticae*.

So ended our personal observations on butterflies in 1969. We found it a good year for many species, especially the woodland 'aristocrats' such as *A. paphia* and *L. camilla*. According to reports, *A. iris* was about in good numbers this season in Sussex, but unfortunately we were unable to take a trip south at the right time—however, 1970 is another year!

161 Henderson Street, Glasgow, N.W., Scotland.

South Essex and beyond—1969

By R. TOMLINSON

The first new species for me was captured by torch light in nearby Martinhole Woods on the mild cloudy night of January 25th. These were *Erannis defoliaria* Clerck. which showed up very well on twigs bordering the woodland paths. Other moths seen in this wood were 2 *Phigalia pilosaria* Schiff., 1 *Erannis marginaria* Schiff., 1 *Thera rupicapraria* Schiff. and 1 *Tortricodes tortricella* Hübn. The Heath trap placed elsewhere in the wood had captured 12 moths in two hours—11 *pilosaria* and 1 *Alsophila aescularia* Schiff.

I made this trip and the next on February 22nd there with Graham Glombek, a young enthusiast just beginning to collect. On April 10th the Robinson trap in the garden caught 35 moths, one being the two-spotted form of *Orthosia gothica* L., the first of these captured this year. Dates of the other two are May 9th and May 12th, both in the mercury vapour light trap at Mucking.

I joined my friends the Pymans at Little Baddow on April 12th and we set up the generator and white sheet on an area of heath not far from a wood, a spot we had not worked before. We ran the light for two hours and a few moths came in, braving the clear, cold conditions that

prevailed at the time. Almost all the usual visitors though, but two were new to me, and these were *Orthosia cruda* Schiff. and *O. populeti* Fabr.

A rather early *Noctua pronuba* L. was among 45 moths caught in the Mucking m.v. trap on April 25th. On May 3rd the trap in my garden caught another melanic *Lycia hirtaria* Clerck, the fifth I have captured since 1966. I had two fairly early *Hadena suasa* Schiff. in the Mucking trap on May 4th. On May 8th this trap captured another new species for me, a very fine *Saturnia pavonia* L. This laid a number of eggs for me within a couple of days and when they duly hatched I brought the larvae through on blackthorn. Not all survived, I am afraid, but I do have 29 cocoons that I will watch carefully towards the time of the moth's emergence.

I made a field trip to the One Tree Hill Wood (Northlands) here on May 10th with Graham Glombek and the Grimsells and ran two lights, the blended bulb over the white sheet from the generator, and the battery run Heath trap placed further along the bridle path through the wood, well away, as always, from the influence of the big light over the sheet. Quite a number of moths came in, the most notable being three *Lampropteryx suffumata* Schiff., 1 *Acasis viretata* Hübn, and a new one for me, *Nycteola revayana* Scop. The Heath trap held 21 moths—a smaller representation of the species that we had at the sheet. We packed up after three hours and 20 minutes at 12.25 a.m.

Among 60 moths in the trap at Mucking on May 12th were another *pavonia*, a *viretata*, and a *Nycterosa obstipata* Fab. The next night there got an almost melanic *suasa*, the darkest I have ever seen and this from an area where *suasa* is not uncommon.

I went to Coombe Woods, Langdon Hills with Graham Glombek on 26th May during daylight hours, capturing a *Pseudopanthera macularia* L., a new moth for me. This same night the garden trap contained 20 moths, one of them being *Spilosoma lubricipeda* L. with buff forewings. Not so dark as some of the Aberdeen specimens that Mr Huggins showed me in his collection, nor perhaps quite so dark a buff as some of his Irish captures of this moth, but still worth recording.

Also worth recording, and possibly one of the best finds of the year, was obtained in the garden trap on May 28th. This was an ab. *nigra* Prout of *Gonodontis bidentata* Clerck, of which South says: "occurs in the mosses of Lancashire and in Yorkshire". I believe that this melanic *bidentata* is the first of its kind recorded actually in Essex, but think perhaps I would be sticking my neck out if I claimed it to be the first recorded outside its rather more well known localities, such as Cannock Chase, Staffs., and Lancashire and Yorkshire. I have, however, checked several sources and found no mention of captures other than in the above mentioned places. I would be interested to hear of such records, if they exist, from other collectors. Mr Huggins often retorts "everything is turning black" when he is confronted with, or is told of such things, and I am inclined to agree with him, for the occurrence of more melanic specimens of moths appear to show but one thing. A current phrase is "black is beautiful", but not when it concerns lepidoptera, I am afraid. Whether the present "Clean Air Bill" for home and industry, if enforced, will call a halt to the most of melanism in lepidoptera—largely Heterocera—remains to be seen.

I went beyond Essex on June 14th, when I went with the late David

More to Woodwalton Fen. We left my home at 4.15 p.m., had a ten minute tea break at Thaxted and arrived at the Warden's House at Ramsay Heights, by the fen, shortly before 7 p.m. We booked in the Lion Hotel, Ramsey, and then motored to the Fen itself, David's Triumph 1300 making easy work of the uneven fen approach. We set up in the Copper Field and ran two lights, David having the 160 watt blended bulb and myself the 125 watt mercury vapour bulb, both over white sheets. We lit up at 10.45 p.m., the Honda generator making no trouble about running the two lights. Quite a number of moths came in but only one was new to me, an *Eumichtis adusta* Esp. We also ran the Heath trap down a nearby ride, and this held 20 moths, one of which I kept; an ab. *nigro-rubida* Tutt of *Apamea crenata* Hufn. Mr Barry Goater and Dr M. Morris came by during the evening, and ran their light further along. We packed up at 2.35 a.m. and drove back to the hotel.

The next day, June 15th, was very similar, very sunny and warm. We ran both lights in the ride between the bridge and the shooting lodge, also running the Heath trap down a little ride off the main one. The lights were on by 10 p.m. Mr Austin Richardson was working the copper field with his light on this occasion. Once again many moths came in, I found the eyed and poplar hawks a nuisance there were so many round the light over my sheet. However, I took several moths that were new species for me, *Drepana cultraria* Fab., *Bapta bimaculata* Fab., *Mysticoptera sexalista* Ratz., *Hydriomena coerulata* Fab. and an *Arenostola extrema* Hübn. The last named was in the Robinson trap by the Warden's House. We packed up at 2 a.m., myself satisfied with our captures, despite the fact our real quarry *Hydrillula palustris* Hübn. had eluded us. We drove home the next morning through heavy rain.

I think most collectors will agree that 1969 was a good summer; whether it was this that made an increase in certain species or perhaps the species were increasing their range, it is hard to say. Certainly I had some "good finds" here during this period. My m.v. trap got five *Spilosoma urticae* Esp.—one at Mucking on June 19th, two on June 22nd, another there on the 25th, and one with spotted forewings in the garden trap on 1st July. I had three *Chilodes maritima* Tausch., one at Mucking on June 27th, one on July 12th, and one in the garden trap on July 23rd. At Mucking on June 19th the trap got a fine example of *Arctia villica* L. var. *ursula* F.

I had about one thousand moths in this trap on the night of July 1st: I picked out two *Schoenobius gigantellus* Schiff., one *Hadena compta* Schiff., and one *Plemyria rubiginata* Schiff. Two *compta* and two *rubiginata* turned up the next night in the same trap, together with a *Bena fagana* Fab. and a *Polia nitens* Haw. In fact nine more *nitens* turned up; two in the garden trap on 3rd July (one on 8th July, one the next night, four the following night, and two at Mucking on the 12th.

In addition, I had *Euphyia cuculata* Hufn. in the garden trap on the 4th July, a *Pyrrhia umbra* Hufn. on July 13th at Mucking, an *Erias clorana* L. on the 15th, two *Apamea ophiogramma* Esp. in the garden trap on 20th, two more the next night, two more on the 23rd, two more the next night, and one more the following night. Two new species for me at this time were the micro *Pyralis farinalis* L. in the garden trap on 26th July and *Semiothisa liturata* Clerck on a field trip to Coombe Woods Langdon Hills with G. Glombek on July 27th. A very nice *Evergestis pallidata* Hufn. had

turned up in the garden trap on 23rd July. A new species in this trap for me was a single *Apamea scolopacina* Esp. on July 28th. Talking of fresh species reminds me that I had a *Mormo maura* L. on August 11th, and *Cosymbia punctata* L. the next night there. I also captured the ab. *Celaena fibrosa* Hübn. of *Celaena leucostigma* Hübn. on August 11th, and another there on the 13th.

I visited the Pymans at Little Baddow on August 16th, and we ran my light at a local beauty spot called Heather Hills. Two species new to me here were a *Ligdia adustata* Schiff. and a *Euphyia unangulata* Haw. The same night, the trap at Mucking caught a *Nycterosea obstipata* Fab. for me.

I was to capture two more species new to me this year. These were *Orgyia antiqua* L. in the garden trap on September 4th, and an *Epione repandaria* Hufn. from the Chelmer Valley reserve on 13th September. I was with the Pymans on this trip.

A couple of amusing incidents, if you can call them that, occurred on the night of June 28th, when Brian Harrod, his son and I ran the m.v. and a Heath trap at the western end of One Tree Hill woods. I set the generator with the sheet and m.v. bulb up on the woodland edge, and placed the Heath trap further in the wood along a broad path. We had noticed two or three gangs of youths strolling about the area, and when we lit up, several of them drifted over to us. It transpired that the Army Cadets were camped on one side of the wood, while the Air Force Cadets were ensconced at the other end, and were roaming about holding mock battles between the rival groups. I noticed one youth clutched an air rifle and he stated that he had thought my Heath trap was a ghost in the wood. Even though the little Heath trap was very, very dim (owing to a loose connection I discovered later) I left it on the go.

During the evening round the main lamp over the sheet I was physically attacked by a pint-sized warrior who suddenly appeared from nowhere. I managed to hold him at arm's length until he was convinced we were only harmless moth collectors. He must have thought that my cap comforter which I habitually wear on my excursions made me a member of the opposition.

Upon examining and packing up the Heath trap I noted two nasty dents in one side, with two spent shattered lead slugs on the ground. I remembered the lad with the air rifle and his encounter in the wood with a "ghost."

We had very few moths this night, no doubt because of the almost full moon; but still, it was memorable none the less.

I led a meeting of the British Entomological and Natural History Society at Stanford-le-Hope on September 17th. Only four of us turned up, Eric Bradford, R. M. Payne and a young Austrian coleopterist from Vienna, Gunther Wewalka. Payne was pleased to record *Tetrix vittata* Zett. (Orthoptera) from the area. A full report of that meeting will be published in the society's proceedings during the year.

Ray Cook came over this evening, and ran his generator and light by the reed-beds at Mucking. Of note was a female *N. obstipata* which laid eggs for him, and now he has a nice series of the moth. I noted four *obstipata* in my trap during the latter half of the year, four *Antitype flavicincta* Schiff., six *Apamea ophiogramma* Esp. and a very late *Sylepta ruralis* Scop., this last named on 21st October.

As for immigrants, I had 56 *Plusia gamma* L. in the garden trap on

August 1st, 18 *Nomophila noctuella* Schiff. on September 23rd, 43 gamma on October 10th, 43 on 18th and 43 on 21st October.

I had obtained twenty species new to me during the year, and I will not complain if 1970 is only half as good.

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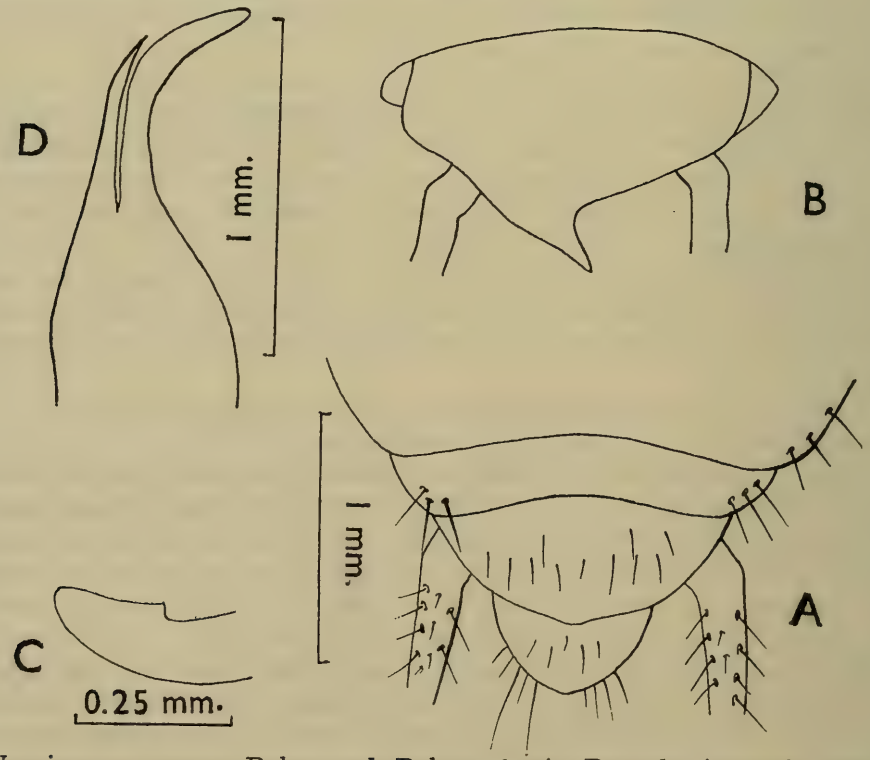
51 King Street, Stanford-le-Hope, Essex. ii.1970.

On the hitherto undescribed male of *Hemimerus sessor* Rehn and Rehn (Hemimerina)

By G. K. Srivastava, Calcutta

This species was originally described by Rehn and Rehn (1936) on 4♀♀ from Mt. Gargues, Kenya Colony, taken from the type of *Cricetomys gambianus raineyi* Heller. Recently, 1♀ 1♂ and 2♂♂(?) nymphs of this species were very kindly sent to me for identification by Dr. J. Aubert of Musée Zoologique, Lausanne (Switzerland). These are labelled as "Guinée Française Région de Nimba, 1-3.i.1957, J. de Beaumont, Hemimerus sur *Cricetomys gambianus* (Water.)". The male sex of this species hitherto unknown is described below.



Hemimerus sessor Rehn and Rehn, ♂, A. Dorsal view of apex of abdomen; B. Ventral view of apex of abdomen showing ultimate sternite and portion of cerci; C. Lateral outline of process of ultimate sternite; and D. Outline of parameres. (Figs. A. and B same scale).

Male: Agrees with males of other species of the genus *Hemimerus* Walker except the terminal abdominal segments which possess characters of taxonomic importance.

Penultimate tergite transverse, somewhat trigonal, lateral margin slightly arcuate and convergent apically with very slight production mesad, greatest width almost double the greatest median length. Penultimate and ultimate tergites in lateral view with their axes not in the same plane, ultimate tergite slightly arcuately deflexed ventro-caudad.

Ultimate tergite, in dorsal view, somewhat triangular, median length slightly less than one-half the greatest (proximal) width, lateral margin arcuate and gradually converging to obtuse apex, ventral surface concave, lateral margin with a few long chaetae. Ultimate sternite transverse, trigonal, somewhat symmetrical, median length excluding the production, slightly more than one-half the greatest width, in dorsal view sinistral portion of distal margin straight and dextral portion slightly sigmoid, production extending sinistro-caudad with immediate apex blunt, compressed in lateral view, dorsal margin evenly arcuate, ventral margin with a small shoulder, greatest length of production almost equal to one-third of the greatest length of sternite. Cerci as in other members of the genus. Parameres as seen in fig. D.

Measurements (in mm.)—

	♂	♀	♂(?) nymph	♂(?) nymph
Length of body (without cerci)	8·17	8·94	7·74	6·47
Greatest width of mesonotum	3·44	3·61	3·18	3·18
Length of thorax	3·61	3·95	3·44	3·18

Affinities.—With the portion of Rehn and Rehn's key (1936, p. 475) dealing with males, this species comes close to *Hemimerus talpoides* Walker in not having the ultimate tergite broadly transverse but differs in having posterior margin of penultimate tergite slightly produced mesad and ultimate tergite with ventral surface concave.

Acknowledgments.—I am thankful to the Director, Zoological Survey of India, Calcutta, for providing necessary facilities. My thanks are also due to Dr. J. Aubert, Musée Zoologique, Lausanne (Switzerland) for sending this interesting material for study.

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Notes and Observations

Plusia accentifera Lef. in Kent.—On 10th September last year I took a small, somewhat worn, plusia from my moth trap at Halstead. This has kindly been identified by the staff of the British Museum (Natural History) as *Plusia accentifera* Lef., a resident of the Mediterranean area, feeding on *Mentha*. So far as I am aware, this species has not previously been recorded from the British Isles.—T. J. Dillon, 8 London Road, Halstead, Nr. Sevenoaks, Kent.

EMERGENCE OF SATURNIA PAVONIA L.—I have just read the March *Record*, page 90. I have been breeding this species for many years and was surprised to read in the notes from M. R. Shaw (*Ent. Rec.*, **82**: 90) that overwintering a second winter is thought to be unusual. In most years I have had a small proportion, say one in a dozen, remain to emerge in the following year, and I have two records of moths emerging after three winters.

In 1951 at Black Heath, Chilworth, Surrey, I collected fifteen larvae on 25th August, on the occasion of a field meeting of the South London (now British) Entomological and Natural History Society. Seven larvae were parasitised, and of the remainder, five died as pupae in 1952 for reasons not recorded. This left three to emerge, one in 1952, one in 1953 and one in 1954.

The other instance of three winters in the pupal stage started in 1952 when a male assembled in my garden at Tadworth ,Surrey, to a female from Wych Cross, Sussex. The bulk of the brood emerged in 1953, but three remained and all of these are thought to have survived until 1955, when two emerged and the third was found to be dead.—A. S. WHEELER, Chelston, 18a Broadhurst, Ashtead, Surrey. 30.iii.1970.

A NORTH AMERICAN HAWK MOTH IN BRITAIN.—I am told that I should record the following North American species taken here in May 1965. It is *Sphinx drupiferarum* Abbot and Smith, and it was taken in my moth trap on 21st May. I wonder whether it came direct from North America, perhaps in an aeroplane, or a ship, or whether it had been bred in captivity in this country and had been released.—C. S. H. BLATHWAYT, Amalfi, 27 South Road, Weston-super-Mare.

MORE COLLECTING EXPERIENCES.—The collecting experiences of some of your correspondents bring to my mind many strange contacts during half-a-century in the field, and for the amusement of your readers I recount my two silliest stories.

During World War II I spent a pleasant hour in the sunshine netting *icarus* on the sand-dunes at Freshfield on the Lancashire coast in the eternal search for those "vars" one never finds. As I was thus engaged I became aware that I was being closely watched by a man standing a short distance away. As he showed no sign of departure, and to break my feeling of embarrassment, I strolled casually towards him to engage him in some kind of intelligent conversation. As I drew near I noticed that he wore the uniform and rank-badges of a major in the British Army. He immediately fired two questions at me:— 1. Were they good to eat?; 2. Did I make a lot of money catching them? On hearing my replies he cast a pitying look at me and went away.

When I was a schoolboy in the earlier years of the century I spent my summer holidays on a farm in Hampshire. The district squirmed with *urticae* in those wonderful days; they emerged in great quantity every day from pupae hung up under the eaves, under the thatch and round the window-frames of the old farmhouse. But Auntie refused to allow me to catch any because they were "created by God's munificent Hand."

"If you want to do something useful," she said, "you can destroy some of those nasty black caterpillars on the nettle-beds by the bullock-yard."

"But, Auntie," I protested, "they too were created by God's munificent Hand."

"Nonsense!" replied Auntie. — GRESHAM R. SUTTON, 16 Kenilworth Gardens, Loughton, Essex. 17.iii.1970.

SPILOSOMA URTICAE ESP. (LEPIDOPTERA: ARCTIIDAE) IN THE NEW FOREST.— A perfect ♀ specimen of *Spilosoma urticae* Esp. was found at rest on a post in marshy surroundings at Bishop's Dyke, south of Lyndhurst, New Forest, Hampshire, early in the morning of 10th June 1967. The specimen was retained for ova but did not lay and died a few days later, still in perfect condition. The literature and personal communications would suggest that the species is not found commonly in Hampshire. I am aware only of a record for the Isle of Wight (South, "Moths of the British Isles," vol. 2, 1961 edition) and at M.V. in the Gosport area.—G. R. ELSE, 10 King George Road, Portchester, Nr. Fareham, Hampshire.

ACHERONTIA ATROPOS L. AT TORQUAY.—A just dead specimen of the death's head hawk moth was found on a tennis court in Torquay on 20th September. It was in excellent condition.—H. L. O'HEFFERNAN, Home Lea, Thurlestone, Kingsbridge, S. Devon. 9.ii.1970.

PARASCOTIA FULIGINARIA *L.* (LEP. PLUSIIDAE) IN N.W. KENT.—A specimen of this local insect came to mercury vapour light in my garden at Dartford, Kent, on the night of July 14th 1969.

I believe this to be the first record of this moth for Kent west of the Medway during the present century. Prior to this A. B. Farn had recorded a specimen at light trap at Greenhithe in August 1891, while in the previous decade five were recorded from Lewisham and Blackheath (Chalmers-Hunt, Lep. of Kent, Vol. 2: 344).

Probably all these nineteenth century moths were from larvae which had lived on fungus in cellars or other ill-ventilated buildings which were a common feature in those days. My recent capture may have been a wanderer from its haunts in Surrey, or from the Continent, although it seems quite probable that it is of local origin from Joyden's Wood, Bexley, an extensinve area of deciduous woodland now being replanted with conifers by the Forestry Commission. My garden adjoins this woodland.— B. K. WEST, 36 Briar Road, Bexley, Kent.

HIBERNATING BUTTERFLIES. — My daughter and son-in-law recently acquired an old farm house in the hamlet of Halsett, about three miles from East Prawle. Some structural repairs were necessary and workmen were employed to remove and replace the floor boards and joists in one of the ground-floor rooms.

In the late afternoon of the 8th January 1970, one of the workmen, who is himself a keen and accurate observer of both bird and insect life, rang me to say that they had discovered a large number of hibernating butterflies. I promised to go over the following day and arrived before midday to find that most of the boards had been removed. In the process many of the butterflies had fallen into the debris which covered the floor of the cellar and could not be recovered.

The butterflies had been found resting on the underside of the floor boards, between the joists, often in clusters. They had rescued twenty-eight, of which twenty-four were *Nymphalis io* L. (Peacock) and four were *Aglais urticae* L. (Small Tortoiseshell), but they estimated the total disturbed at not less than one hundred, and probably nearer one hundred and fifty.

In the autumn of 1969 small tortoiseshells were not noticably abundant in this area but peacocks were unusually plentiful.—G. A. Cole, Higher Ley, Slapton, S. Devon. 26.i.1970.

Sphingid Larval Feeding.—It has often been stated that larvae which have started life feeding on a particular plant will not change this diet even when the alternative offered is known to be one of their usual foodplants.

I was given the chance to rescue some Sphingid larvae, of various species, from being killed when discovered in gardens in this area. Amongst these were *Acherontia atropos* L. and *Coelonia fulvinotata* Butl. I had abundant supplies of *Tecomaria capensis*—one of their favourite foodplants here—but no convenient source of the plants on which they were feeding when I obtained them:—*A. atropos* (1) Two larvae found on jasmine, one in final instar, the other in 4th instar. The latter was kept on Jasmine until after the final skin change, when it was offered *T. capensis* which it readily accepted, as the older larva had done. Both produced fine moths.

(2) Four larvae found on potato; three nearly full fed (two of them parasitized by a Tachinid fly) and one just starting its final instar, were offered the choice of tomato, *T. capensis*, privet and jasmine leaves. They refused to eat at all for some hours, wandering all over the plants and cage. Eventually the three older ones started nibbling *T. capensis* and jasmine, finally settling for the former. The younger one did not eat for nearly 36 hours and then ate *T. capensis* but shrank in size daily at first, then began to grow again, reached normal size, and pupated. Only one of the two unparasitized (as far as could be visually ascertained) larvae produced a moth

(3) A larva found on *Nicotiana glauca* left this plant as soon as the leaf withered and ate *T. capensis*, at first reluctantly and then with relish. Produced a moth with rather fainter "skull" pattern than usual.

(4) Four larvae, two green and two brown, found on Zimbabwe creeper (*Podranea brycei*) all left the creeper before the leaves withered and ate *T. capensis*. All produced normal moths.

Coelonia fulvinotata Butler

Three larvae found on *Bigonia*, one just starting 4th instar, the other two moulting to final instar. The two older ones were offered *T. capensis* after skin change and they accepted it readily. The younger one was left on *Bigonia* until the skin change, and was then offered *T. capensis* which it accepted. Two out of the three eventually produced moths.

Quite the opposite behaviour is demonstrated by this experience with *Celerio livornica* Esp. Eggs were laid in captivity on flower heads of valerian and the newly hatched larvae were offered the choice of Valerian and grape vine leaves. Only about a quarter (14) chose vine, the rest Valerian. After the second instar, all were sleeved out on the growing foodplants. The valerian feeders made poor progress and all died before the final instar, refusing to change to vine leaves which were offered directly they were seen not to be growing normally. All except one of the fourteen vine feeders reached maturity, pupated and produced moths. The moths obtained in all the instances mentioned above were, of course, released, to help ensure the existence of the species.

New food plants. In connection with the "Save Our Sphingidae"

operation the South African Museum here states that my observations have resulted in five new (for South Africa, certainly) food plants being known for *A. atropos*, namely *Ligustrum vulgare* L. (Oleaeaceae) (privet); *Lycium austrinum* Miers (Solanaceae); *Nicotiana glauca* R. Graham (Solanaceae; *Olea* sp. (Oleaceae) (wild olive); *Podranea* sp. (Bigoniaceae)..

Two new food plants for *C. fulvinotata* are *Acanthus mollis* L. (Acanthaceae) and *Hebe speciosa* (R. Cunn.) (Scrophulariaceae).

Two new food plants for *Hippotion eson* Cramer are *Coloscasia* sp. (Araceae) and *Coprosma baueri* Endl. var. *variegata* (Rubiaceae).

It sometimes happens that large moths like Sphingidae have difficulty in ridding themselves of the pupa case when this has been resting on the surface instead of in its natural underground chamber and, in consequence, a wing may become deformed.

For some years now I have been using a one inch layer of wood wool, completely covering the pupae and extending to the sides of the box, so that the emerging moth must force its way up through the wood wool and in so doing, it rids itself of the pupa case. Adequate space between the top of the wood wool layer and the top of the container is essential so that the moths may have plenty of room in which to expand their wings. An additional advantage is that the wood wool can be kept moist by regular spraying with water, thus ensuring a damp atmosphere round the pupa. This practice has proved one hundred per cent successful in the hot dry climate of a Cape Town summer.—H. L. O'Heffernan, 12 Firth Road, Rondesbosch, C.P. South Africa. 3.iii.1970.

Mountain Sawflies in North Wales.—Although I have so far not given this group the attention it merits, I have seen or taken the following between 2,000 and 3,200 feet. *Dolerus aeneus* Hartig is generally plentiful in June. A small form of *Pristiphora quercus* Hartig was seen occasionally at rest on *Vaccinium myrtillus* at about 2,500 feet. *P. breadalbenensis* (Cameron) was frequent up to 3,000 feet mainly among *Vaccinium*. Galls of a species of *Pontania* found in June and July on leaves of *Salix herbacea* L. at 3,100 feet, were not bred. The most interesting was one specimen of *Pachynematus clibrichellus* (Cameron) flying over sedge in June at 3,200 feet; Benson records this species only from north Scotland. All the above species were seen on the Carneddau range which stretches from the coast near Aber to the Nant Ffrancon.—H. N. Michaelis, 5 Glan-y-Mor, Glan Conway, near Colwyn Bay.

Current Literature

Proceedings and Transactions of the British Entomological and Natural History Society, vol. 2, part 3 (October 1969), published by the Society, pp. 71-102, 10/-.

This includes "The Study of Woodlice" by S. L. Sutton with two plates showing 8 figures: one of a typical species, and the others of details of various woodlice at various magnifications seen with the scanning electron microscope. Another paper is on Homoeosis and related Phenomena in the small copper Butterfly, *Lycaena phlaeas* L. by T. S. Robertson, illustrated by four explanatory diagrams and line drawings illustrating 45 examples of Homoeosis and heteromorphosis. Three short notes are contributed by F. D. Buck. The indices for 1967 and 1968 are also issued separately with this part.—S.N.A.J.

The English Lepidoptera or the Aurelian's Pocket Companion by **Moses Harris,** xv+66 pp. and one coloured plate, 8vo. E. W. Classey Ltd. £4.

This book, another of Messrs. Classey's facsimile reprints, brings to the present day lepidopterists the possibility of adding this once plentiful but now scarce collector's handbook for the pocket. It is believed to be the first book on the subject, although one or two broadsheets had been published previously.

The coloured plate sets out the neuration and external anatomy of a butterfly and is followed by explanatory notes on pp. iii-v. The preface explains the contents of the text and also some practical hints on collecting, breeding, setting and preserving insects in pp. vii-xv. The table is set out alphabetically in two sections, *Papilio* (butterflies) and *Phalaena* (moths). The columns give English name, larval food, date of pupation, date or Imago, expanse of wings, usual haunts, description of the upperside, and the Linnean trivial name where this existed.

The printing has been well handled by the German firm of Hain; a good paper has been used, and the volume strongly bound in buckram. It is a collector's piece available to many lepidopterists to whom a copy from the original edition would be an extravagance, whose main interest lies in giving us a good idea of the knowledge of the Lepidoptera nearly 200 years ago.—S.N.A.J.

From **Dr. H. G. Amsel** I have separates including **Zu Kenntnis der Microlepidopterenfauna von Karachi (Pakistan),** *Stuttgarten Beitrage zu Naturkunde Nr. 191: 1-48* in which 9 new genera, 12 new species and one new subspecies are set up, with 31 black and white illustrations of the adults, 29 half-tone photographs, and two excellent hand drawings, 5 neuration figures, and 17 figures of ♂ genitalia.

Three of his papers from *Beitr. naturk. Forsch. Südw. Dtl.* XXVII described a new *Ethmia* species from China (pp. 75-76) with a photograph of the imago, **die Afghanischen Ethmia Arten** (pp. 115-19) setting up a new species and two new subspecies with a photograph and ♂ genitalia of *E. kabulica* sp. nov. **Uber Homonymien bei Afghanischen Coleopteren** on (pp. 49-50 sets up three new names for *Coleophora* species whose names were preoccupied).

From *Zeitschrift der Weiner Ent. Ges.,* **52**: 49-50. **Deuterogonia pudorina Wck. neu fur Osterrich** adds this species to the Austrian list on the identification of 2♂♂ and 2♀♀ received from R. Pinker from Neumarkt a.d. Raab.—S.N.A.J.

Obituary

CARTWRIGHT TIMMS, F.R.E.S., died on 1st January 1970

He was born in Birmingham on 28th December 1901, and educated at the Central Secondary School, Birmingham. He was for many years a freelance writer and contributed articles, short stories and verse to more than 120 publications. He was a prodigious reader and liked walking in town and country. His entomological interests were mainly centred on the Diptera and he formed a small local collection of this order from Warwickshire. He published little on insects other than a few short

collecting notes on Diptera and Lepidoptera in the *Entomologist's Record* and the *Entomologist*

He was a gifted speaker at local societies and it was an enthusiastic talk of his on Diptera that inspired the writer of this notice to study the order.

He was president of the Birmingham Field Naturalists' Club and became a Fellow of the Royal Entomological Society of London in 1941.

Following a heart attack he sold his collections to Watkins and Doncaster and latterly kept freshwater aquaria to satisfy his natural history bent.

He had no children, but we offer our condolences to his wife, who survives him.—K. G. V. Smith.

CAPTAIN R. A. JACKSON, C.B.E., R.N.

Like other readers of *The Record* I was greatly saddened to read of the loss of Captain Jackson. In his obituary notice Baron de Worms mentions Rex Jackson's participation in 1963 in 'The Naturalist' radio programme about the butterflies of the New Forest which I produced. I hope I will be excused for relating the following incident which occurred on this occasion and which has always caused me to remember him with particular affection.

After we had finished recording the programme in Broadcasting House in London, I was escorting the late Maxwell Knight and other speakers to the lifts when Captain Jackson suddenly remembered he had left his umbrella in the studio and turned back in that direction. Returning to the studio a few minutes later I found myself confronted in the corridor by an irate and formidable middle-aged lady producer—the personification of 'Auntie BBC' who was holding Rex firmly by the arm. In the middle of her tirade, I noted that the expression on Rex's face resembled that of a rather naughty schoolboy. "This rude man," I heard her say, "burst into my studio in spite of the red light and exclaimed in a loud voice 'What the hell—where am I?'. And in the middle of my recording too."

Unfortunately for him, he had been confused by the fact that all the studios in this part of Broadcasting House look alike and had walked into the wrong one, finding himself to everyone's consternation in the middle of a musical programme. Eventually, I managed to soothe the producer's ruffled feelings and as I took Rex on to the right studio, he looked at me, grinning as he remarked in that rich naval voice of his, "What an extraordinary female!" And we both roared with laughter.

J. F. Burton, B.B.C., Natural History Unit, Broadcasting House, Bristol 8. 19.iii.1970.

Bumble Bee Distribution Maps Scheme.—The Insect Distribution Maps Scheme currently operated by the Biological Records Centre has now been expanded to include Bumble Bees. Records of the occurrence of bumble bees of any species, and from all parts of the British Isles are now needed in order that up-to-date distribution maps may be prepared. Offers of help from people willing to participate in the scheme by providing present or past records, or specimens for identification, will be most welcome.

Instructions and record cards for bumble bees are available from BDMS/E Bee Research Association, Hill House, Chalfont St. Peter, Gerrards Cross, Bucks.

PESTS OF RICE, by D. H. Grist and R. J. A. W. Lever (a correction).—In my review of this book (*Ent. Rec.*, 81: 253-54) I regret having ascribed the illustrations to Mrs Isobel Grist, when the credit for them should have gone to Mrs Margaret Lever. Mrs Grist did the proof reading. I apologise to both ladies for having made this unfortunate mistake.—S.N.A.J.

EXCHANGES AND WANTS

For Sale. — Formosan butterflies, beetles, moths, dragonflies, cicadas, praying mantis, wasps and other dried Formosan insect specimens, living cocoons of Saturnidae, etc., prepared for collection, educational programmes.—*Taiwan Novelty Co.*, P.O. Box 860 Taipei, Formosa, (Taiwan).

Wanted to Purchase.—Entomologist's Monthly Magazine. A run of this periodical including the first thirty volumes.—*J. M. Chalmers-Hunt*, 1 Hardcourts Close, West Wickham, Kent.

Wanted.—Parts 1 and 6 of Volume 78, or alternatively the whole volume. State price required to Box No. 116.

Wanted.—Entomologist Volumes 2 and 4; Entomologist's Record, Vol. 41, Parts 7 and 8, 11 and 12. Vol. 45, Parts 3, 5 and 12 or complete volumes if bound. Top Prices offered.—*B. Skinner*, 85 Elder Road, London. S.E. 27.

House to Let.—Good collecting area. Sea's edge, every convenience, very comfortable, sleeps five. August 22 to September 5 only.—Write *Heslop*, Belfield, Burnham-on-Sea, Somerset.

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Wanted Urgently, for a study of migration, any unpublished records of the following lepidoptera outside their normal areas of residence: *Eurois occulta* L. (Great Brocade), *Enargia paleacea* Esp. (Angle-striped Sallow), *Lithomia solidaginis* Hübn. (Golden-rod Brindle), *Plusia interrogationis* L. (Scarce Silver Y), *Itame brunneata* Thnb. (Rannoch Looper). Exact dates, sex, and circumstances of capture wherever possible. — *R. F. Bretherton*, Folly Hill, Birtley Green, Bramley, Surrey.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION
(Founded by J. W. TUTT on 15th April 1890)

TO OUR CONTRIBUTORS

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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

A. A. ALLEN, B.S.C., A.R.C.S.
NEVILLE BIRKETT, M.A., M.B.
J. M. CHALMERS-HUNT, F.R.E.S.
C. A. COLLINGWOOD, B.SC., F.R.E.S.
H. C. HUGGINS, F.R.E.S.
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Major A. E. COLLIER, M.C., F.R.E.S.
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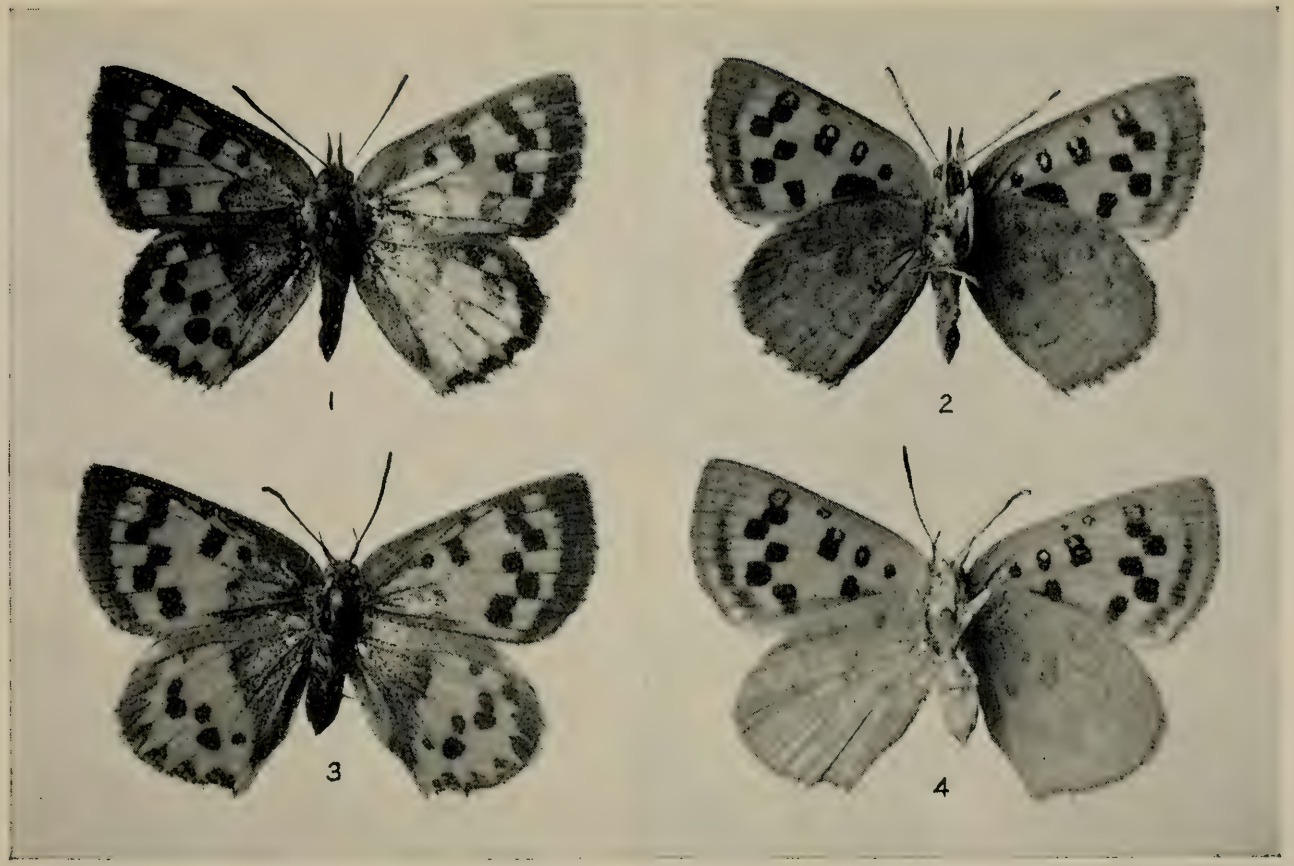


Photo: H. N. Wykeham

Poecilmitis pyroeis hersaleki subsp. nov.

Fig. 1. ♂ Holotype (upperside). Fig. 2. ♂ Holotype (underside)

Fig. 3. ♀ Allotype (upperside). Fig. 4. ♀ Allotype (underside).

Figures approximately 1·8 times natural size.

Correction: on Plate V for *Poecilmitis thysbe beaufortia* read

Poecilmitis beaufortia charlesi subsp. nov.

A New Race of *Poecilmitis pyroeis* Trimen* (Lepidoptera : Lycaenidae) from the Eastern Cape Province

By C. G. C. Dickson

No. 22.

The extreme eastern form of *Poecilmitis pyroeis* (Trimen) differs noticeably from nominate *P. pyroeis* from the Cape Flats and the mountains of the Cape Peninsula, as is shown by specimens received recently from Mr L. P. Hersalek, and, in the writer's view, constitutes a separate race. The specimens concerned were taken on Witteklip Mountain and at Greenbushes, to the west of Port Elizabeth—while the butterfly was found, sparingly, in the former locality by the late Mr Gowan C. Clark and the writer as far back as 1949. One of these early specimens was examined by the late Dr G. van Son who, in a letter, stated that it differed, in his opinion, from nominate *P. pyroeis*. Mr Hersalek has found this butterfly in fair numbers within the past few years — and without having been aware of our earlier captures near Port Elizabeth. With this adequate material now available, it is possible to give a description of the insect.

Poecilmitis pyroeis hersaleki subsp. nov.

Male. Upperside.

Blue from wing-bases a little more extensive and more darkly scaled than in nominate *P. pyroeis;* the black spotting and borders tending to be heavier, as in the holotype.

Forewing . The blue area more pronounced than in the nominate race and accentuated by some dark scaling at its outer edge, part of which represents the remaining outer margin of the innermost black spot in area 1b. A shifting pinkish to violaceous-blue lustre over part of the reddish-orange wing-surface beyond the basal blue, which embraces the large black postmedian marking in area 1b—this iridescence being absent or virtually absent in topotypical *pyroeis*.

Hindwing. The blue more pronounced than in topotypical specimens, always reaching fully the dark discocellular streak and edged outwardly with dark scaling. The strong shifting lustre over the reddish-orange ground-colour and black spotting practically extending, in all specimens, to the black crenulate border.

Underside.

As in the nominate race, allowing for individual variation in specimens. Length of forewing: 13·25-14·5 mm. (14·5 mm., in holotype).

Female. Upperside.

The blue area from bases well developed, darker than in nominate females and bounded outwardly by some dark scaling. The black spotting and borders consistently well developed.

Underside.

Like that of nominate specimens.

Length of forewing: 14·25-16·25 mm. (15·5 mm., in allotype).

♂Holotype, Eastern Cape Province: Lady's Slipper (Witteklip) Mts.,

Zeritis pyroeis Trimen, Rhopalocera Africae Australis, Pt. II, pp. 264-265, Pl. 5, fig. 1 (1866).

W. of Port Elizebeth, 1.xii.1967. (L.P. Hersalek); specimen presented by Mr Hersalek to British Museum (N.H.); British Museum Reg. No. Rh. 17170.

♀ Allotype, E. CAPE PROVINCE: Greenbushes, W. of Port Elizabeth, 15.ii.1968. (L.P.H.); specimen presented by Mr Hersalek to British Musuem (N.H.); British Museum Reg. No. Rh. 17171.

Paratypes in the author's collection: Witteklip Mtn., 27.xi.1949, 1 ♂ (C.G.C.D.); data as holotype, 1 ♂;data as allotype, 1 ♂; as hollotype, 19.ii.1968, 1 ♀ (L.P.H.).

Paratypes in Coll. L. P. Hersalek: as holotype, 1.xii.1967, 1 ♂, 2 ♀♀, 19.iv.1968, 2 ♀♀ (L.P.H.); as allotype, 15.ii.1968, 1 ♂, 1 ♀ (L.P.H.).

Paratypes in Coll. Transvaal Museum: as holotype, 15.ii.1958, 1 ♂, 19.iv.1968, 1 ♀ (L. P. Hersalek).

In the smallest of the male paratypes, the black postmedian spots of the hindwing form a continuous band and are, in part, very much elongated (parallel to the veins). The richness of the basal violaceous-blue colouring, in the male, is noticeable in this race, as is the dark outer scaling (in both sexes). One of the male paratypes (forewing 14 mm.) is particularly darkly scaled.

Specimens which resemble nominate *P. pyroeis* are found up the West Coast of the Cape Province for a very considerable distance. They have been taken at Oude Post (Saldanha), at Het Kruis (some way inland) and to the south of Lambert's Bay; while the late Dr van Son took apparently similar examples at Hondeklip Bay. Specimens from certain mountains some way inland from Cape Town differ somewhat from nominate specimens but not always very consistently so. Compared with the nominate form, these specimens are of greater average size, and occasionally have the upperside black markings abnormally developed. They may have the basal blue more intermixed with darker scaling and, in the forewing of the male, more restricted than in nominate specimens. Two female specimens taken by Mr C. W. Wykeham far to the east of Cape Town, on the Lange Berg Mountains, are reminiscent of the Port Elizabeth females, but no males have as yet been caught there.

This very handsome race of *P. pyroeis* is being named after Mr Hersalek, who has paid so much attention in recent years to the butterflies and dragonflies of the Eastern Cape Province, and has published his observations in the Entomologist's Record—the present butterfly being referred to in *Ent. Rec.*, **81**: 259-260 (Oct., 1969). In a letter dated 21st March 1970, Mr Hersalek states, further:—

"I have found this butterfly in small colonies (over the past few years) at Witteklip (25 m. W. Port Elizabeth). During December, January and February it occurs in moderate numbers, while less so in April and May.

"In February 1970, the prevalent drought in the Eastern Cape tended to affect this butterfly, as only single specimens were seen.

"Collecting throughout the year at Witteklip, one is sure to come across *P. pyroeis hersaleki* singly or in numbers. In habits, this butterfly tends to keep to the slopes of mountains (up to 1000 ft. at Witteklip) or on slopes of hills caused by a river dissecting a plain (St. Albans). One colony at Witteklip occurred on a strongly southwesterly-swept rock slope. As long as the sun shone, and despite the wind, *pyroeis hersaleki* still flew. In my experience with this species, the larger female is more common than the beautiful male. A glance at the male's copper-red

brilliance (shot with violet) and deep purple-blue wing-bases, is a lasting memory."

A full account of the life-history of nominate *P. pyroeis*, with figures, has been published in J. ent. Soc. S. Afr., Vol. XI, pp. 50-62 (1948).

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

The Habits of *Apatura iris* L. the Purple Emperor

By Major-General C. G. Lipscomb

Heslop in his book "Notes and Views of the Purple Emperor" indicates that there is evidence that modern generations of the butterfly no longer have the depraved taste for carrion that was a characteristic of their ancestors.

This may well be so and I have no evidence to the contrary, but in its place the butterfly seems to have developed a fondness for entering houses to quite a remarkable degree as well as other curious feeding habits.

The past season was a particularly good one in South Wiltshire for these butterflies and they were comparatively common throughout July in Blackmoor Copse—the reserve managed for the S.P.N.R. by the Wiltshire Trust for Nature Conservation.

Our resident warden, Mr. McIntyre, who also works for the Forestry Commission, lives on the edge of the copse and the following record of Purple Emperors noted in and around his house is of interest:

July 12th—Two males in rear garden — one was observed for twelve minutes probing a flat stone recently covered by splash from the bath waste pipe.

13th—One male in house.

17th—Two males in kitchen.

19th—One male in kitchen. This was captured sitting on a pile of dirty washing and shown to the Trust meeting on the same day before release.

23rd—One male in rear bedroom.

24th—One male in front bedroom.

On July 19th I was responsible for organising the Trust meeting and on my way to the copse in the morning passed another house standing by itself in a field that borders the copse. As my car drew level I noticed three big black butterflies flying around it and occasionally settling on walls and windows as though seeking a way in.

A quick look with my field glasses confirmed they were all male Purple Emperors and as I wanted a live one to show at the meeting I left my car, net in hand, to try and effect a capture. I rang the front door bell and when the lady of the house appeared we stood talking on the doorstep for a few moments while I explained my requirement. While we were talking a male dashed past us into the house where it settled on a window halfway up the front stairs and was easily captured. My hostess was not a bit surprised at the invasion of her house and told me they were alway coming in, so much so in fact that she was keeping her window shut on sunny days to keep the butterflies out.

The warden's house is one of four similar houses in a group and I know that the butterflies enter the other three with almost equal frequency,

although no records have been kept. It is only the males that behave like this and no females have been seen in the vicinity of a house let alone inside one.

In 1968 an observation tower at treetop height was constructed in the copse, the box on the platform being built of deal planks well soaked in cuprinol. In mid July while a friend and his family were in the box five male Purple Emperors were settled on the outside apparently feeding hard either on the cuprinol or resin oozing from knots in the wood. The butterflies were so engrossed, or possibly intoxicated, with their diet that they took no notice at all of the very close proximity of the other occupants of the tower. This was apparently an isolated occurrence as none have subsequently been seen visiting the tower.

It is difficult to know what is attractive about a house to the males of this fine butterfly. I thought at one time that it might be the light reflected from the windows but this doesn't account for the gentleman who forced his way in through the front door. Perhaps it is just idle curiosity to know how the other half lives.

Nymphalis polychloros L. in North Wales.—This butterfly has been known to occur in or around the Creuddyn, Caerns. for about a century. It was first mentioned by Harding in *Ent.* XV, was noted by G. E. Ellis in 1944, 1945, 1946 and 1948, and I can find no record since the last date. The late Dr. Willoughby Gardner asked me to look out for it about 1919 or 1920, but does not seem to have given any record to the late S. Gordon Smith when he was compiling his list of butterflies and moths from Cheshire and North Wales, though W. G. told me he had seen it a few times. I have often walked over the ground where it is likely to occur, without result until 15th August 1969, when I watched a specimen for about twenty minutes feeding at flowers of knapweed and bramble. Unfortunately I had no camera with me at the time, and the next few days were not suitable for butterflies. It will be realised from the few available records that this species is very scarce and must be at the extreme edge of its northern range, so visiting collectors are requested to refrain from taking and killing the large tortoiseshell, even if they are fortunate enough to see one.—H. N. Michaelis, 5 Glan-y-mor, Glan Conway. 15.iv.1970.

New Forest Records.—In my article on New Forest mercury vapour light records for 1969 (antea: 136) I included three *Plusia gracilis* Lempke. Recently doubt has been expressed as to whether they are not *festucae* L. after all. I identified them myself from Heath's "Guide to the Critical Species," but have not had the genitalia examined. Mr. ffennell of Martyr Worthy has seen the specimens, but has not examined the genitalia, but he thinks they are probably *festucae*. Goater tells me that *gracilis* has not otherwise been reported from Hampshire.

Until I have been able to get my insects checked, it would be as well to disregard my record. — L. W. Siggs, Sungate, Football Green, Minstead, Lyndhurst, Hants. SO4 7FQ. 1.v.1970.

Stigmella (Nepticula) ulmariae Wocke (Lep. Nepticulidae) re-established as a British Species

By Lieut. Col. A. M. Emmet

The middle of the nineteenth century was a fertile period for the study of the Nepticulidae. In this country Stainton, and on the continent Frey, Heinemann, Herrich-Schäffer, Wocke and Zeller (to name but a few) were actively engaged in seeking out Nepticulidae feeding on new foodplants. These they regarded as new species and named them accordingly. However, in this country at any rate, the early part of the twelfth century saw a slump in the study of the microlepidoptera, and of the Nepticulidae in particular. At the same time there grew up a tendency, led, I rather think, by Meyrick who, as we shall see, was certainly abetted by Waters, to deny specific status to some of the forms named by their predecessors and to "lump" small groups together under the senior name in the association.

Meyrick in his Handbook (1928) presents one such group under the name *Nepticula poterii* Stainton, citing *filipendulae* Wocke, *ulmariae* Wocke and *serella* Staint. as synonoyms. But the pendulum of opinion swung again. Continental entomologists, amongst whom Hering and Carolsfeld-Krausé are the best known names in this country, have paid far more attention to the Nepticulidae than we have done, and have re-established these moths as four good species (see Hering 1957).

Ford in his Guide to the smaller British Lepidoptera (1949), followed this trend. However, he gave specific status to only three of the quartet; the absentee that he did not mention even by way of synonym was *ulmariae*. Likewise, Dr. J. D. Bradley, when revising the list of British Lepidoptera for the new edition of Kloet and Hincks to be published in due course, omitted *ulmariae* after careful consideration, since he had been unable to trace either specimens of authenticated records from Britain. The only reference to it in British entomological literature which had come to his notice was a passing allusion by Professor E. G. R. Waters (1928) in a note on *N. serella* Staint. in which he stated that the species, *ulmariae* and *filipendulae* were probably conspecific. So much for the circumstances in which *ulmariae* was lost to our British list: now for the story of its reinstatement.

For the past two or three years I have noted Nepticulid mines in meadow-sweet at Wicken Fen, Cambridgeshire, all of which had been vacated by their larvae before I found them. Following Meyrick, I had provisionally identified them as *poterii*, but was dissatisfied as they appeared to be differently formed from the mines of *poterii* on salad burnet (*Poterium sanguisorba*) which I find from time to time on the downs at Biggin Hill in Kent. Moreover, I have succeeded in rearing *poterii* and it is one of our smallest "Neps"; the meadow-sweet mines appear to be the work of a slightly larger insect.

Because of these doubts I compared my Wicken Fen mines with the material in the Hering herbarium and found that they corresponded with his examples of the mines of *S. ulmariae*. Furthermore, included in Hering's album are two mine-bearing meadow-sweet leaves collected by Waters in 1922 and 1925 respectively at Cothill, Berkshire, which is situated about five miles south-west of Oxford. Accompanying these

Berkshire leaves is a label in Waters's handrwriting which reads "*Nepticula ulmariae* Wocke (?=*poterii* Staint.)" followed by the name of the locality and the dates in which the leaves were collected.

Having seen Waters's mines from Cothill and my own from Wicken Fen, Dr. Bradley decided to add *Stigmella ulmariae* Wocke to the British list.

Since Waters seems to be the man who had personal acquaintance with *ulmariae* in Britain, I though he might have more to say on the subject, and accordingly I embarked on a little elementary research. My first find was in a chapter entitled "Micro-Lepidoptera" which he contributed to the handbook on the Natural History of the Oxford District, which was presented to the British Association on the occasion of their meeting in Oxford in 1926. There he states that *Nepticula ulmariae* Wocke occurs amongst meadow-sweet on the tract of calcareous peat at Cothill.

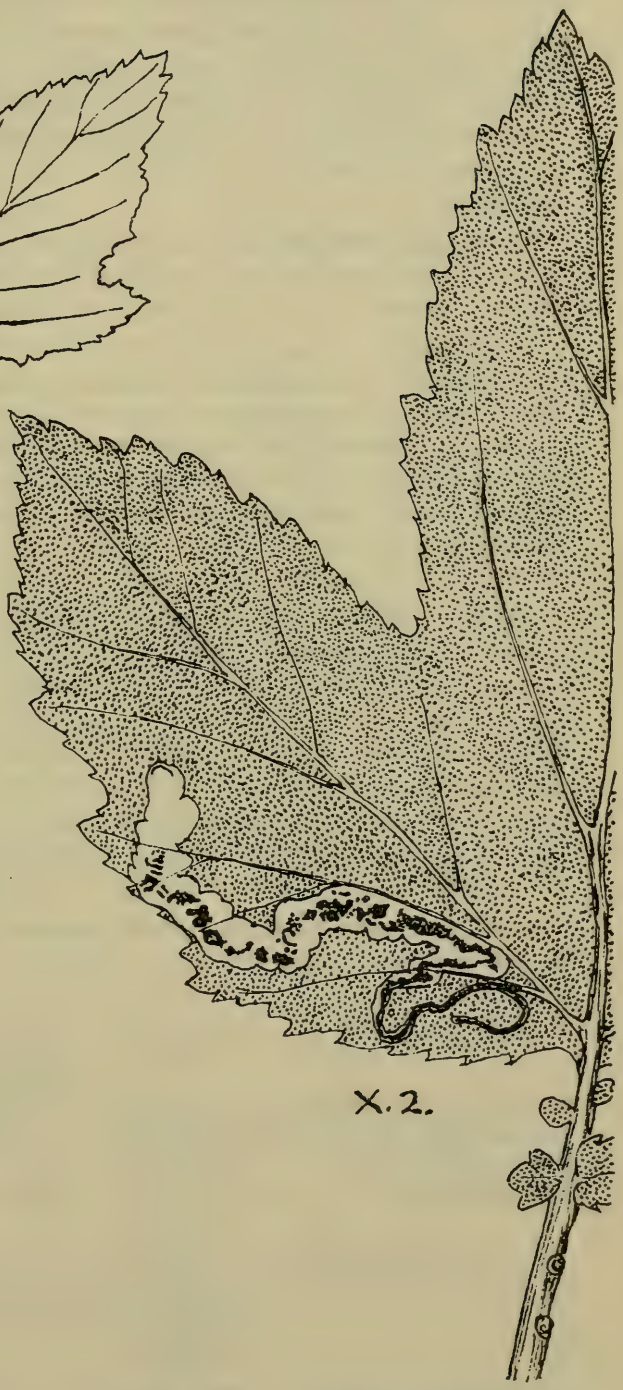
My next discovery was in his list of the Micro-Lepidoptera of the Oxford District, first published in 1928. Under the heading *Nepticula poterii* Staint. he writes: "Cothill, larvae sometimes plentiful on *Spiraea ulmaria* and *Potentilla erecta*. South Hinksey, larvae on *S. ulmaria*. Yarnton, one mine in *S. ulmaria*, 1922. The names *N. ulmariae* Wocke and *N. serella* Staint. have been given to imagines bred from *Spiraea ulmaria* and *Potentilla erecta* respectively, but evidence that they are specifically distinct from *N. poterii* is not yet forthcoming. (See E.M.M. LX, 1924, p. 99)."

Here then was another reference to be investigated. Waters wrote an account of the Tineina of the Oxford District which was serialised in the Entomologists' Monthly Magazine, and the passage in question is to be found in his chapter on the Nepticulidae. Here are verbatim extracts:—

"A species of Nepticula, not described by Tutt, occurs in several localities round Oxford (Cothill, South Hinksey, Yarnton) on *Spirea ulmaria*. The larva (yellow with brown head) is not scarce in October when I can sometimes find as many as a dozen in an hour, and there is a brood in July; but the great majority of them are the prey of parasites and I have reared only four specimens of the moth. I think there is little doubt that they are referable to *N. ulmariae* Wocke . . . . This is not the first time the occurrence of a British *Nepticula* on *Spiraea ulmaria* has been noted. In the E.M.M. XXXVII (1902) p. 223, Mr. E. Meyrick recorded the capture of a *Nepticula* among meadow-sweet in a marsh by the Kennet near Chilton Foliat, Wilts; he referred it, however, to *N. filipendulae*."

He adds in a footnote:—"Whether *N. ulmariae* Wocke is really distinct from *N. filipendulae* Wocke—a species found on the closely allied plant *Spiraea filipendula* and recorded from Britain and Silesia—is a point on which I am very sceptical. I am unable to detect any clear distinction between my specimens bred from *Spiraea ulmaria* and the specimens of *N. filipendulae* in the British collection at South Kensington, and consider it highly probable that they are conspecific. It should be added that my specmens are also absolutely identical in appearance with examples of *N. serella* Staint. seen at South Kensington (Stainton's type in the British collection and several bred by Hodgkinson in the Bankes collection), all bred from *Potentilla tormentilla* [=*P. erecta*]. It is not possible that all three (*ulmariae*, *filipendulae* and *serella*) are one and the same species? The difference in foodplants proves nothing all the plants being closely

Nepticula ulmariae Wocke.
Wicken Fen 26.x.1968.
on Filipendula ulmaria.
A.M. Emmet leg
S.N.A.J. del. 8.iii.1970.



allied; and the form of the mine would naturally vary according to the character of the leaf. Perhaps a study of the genitalia would throw light on the problem. Should the three prove conspecific, the names *ulmariae*

and *serella* would have to be sunk as synonyms of *filipendulae*." He goes on to give records of *N. poterii* Staint. as a separate species.

Professor Waters's changes of opinion may be summarised as follows. In 1924 he inclined to the view that there were two species in the group—*filipendulae* (embracing *ulmariae* and *serella*) and *poterii;* in 1926, when he wrote for the "British Asses", he seems to have restored *ulmariae* to specific status, but in 1928, in his Oxford List, he had tentatively adopted the opinion that all four were referable to *poterii.* This certainly was entirely reasonable in the absence of comparative study of the genitalia.

The next task was to discover whether Meyrick has a claim to be the discoverer of *ulmariae* in Britain. In the note referred to by Waters he writes:—

"*Nepticula filipendulae* In the marsh [on the Kennet near Chilton Foliat] I captured a specimen which I refer to this species from amongst *Spiraea ulmaria,* on which I imagined it fed."

Two points emerge. First, if his insect was *ulmariae,* Meyrick did not recognise it as such and makes no mention of the name. Secondly, Waters used to take *ulmariae* and *serella* on the same ground at Cothill (a locality I myself know well): equally both species could occur together in Meyrick's Marsh by the Kennet. So although it is very probable that Meyrick's moth was *ulmariae,* we cannot say so categorically and in my opinion the credit for the discovery of *ulmariae* in Britain falls to Waters.

Waters tells us that he bred imagines from the meadow-sweet at Cothill. His collection is now in the Hope Department of the University Museum at Oxford, so I wrote to enquire whether the specimens were still extant. Mr. E. Taylor sent me the following information: Over the label "*Nepticula poterii* Staint." there are fifty specimens whose particulars are tabulated below. In the fourth column I have added my own opinion as to the probable identity of each group, but I must make it clear that this determination is based solely on the foodplant and not on a morphological examination of the specimens.

Details of specimens labelled *Nepticula poterii* Staint. = *ulmariae* Wocke = *serella* Staint. in coll. Waters.

Foodplant	Locality	No. of Specimens	Probable determination according to current doctrine
Filipendula (Spiraea) ulmaria	Cothill, Berks.	16	*N. ulmariae* Wocke
Potentilla erecta (tormentilla)	Cothill, Berks.	23	*N. serella* Staint.
,, ,,	Corfe, Dorset	5	,, ,,
,, ,,	Dolwyd-delen Caernarvon-shire	1	,, ,,
Filipendula vulgaris (Spiraea filipendula)	Watlington Oxon.	3	*N. filipendulae Wocke*
Poterium sanguisorba	Watlington Oxon.	2	*N. poterii* Staint.

So *poterii*, the name borne by them all, is probably the least well represented species! Through the kindness of Dr. B. M. Hobby I have been allowed to see these specimens. It is of course quite impossible to differentiate between them by means of superficial characters, but I was able to confirm my opinion that the meadow-sweet mines are the work of a larger insect than that which feeds on salad burnet: the imagines from meadow-sweet are slightly bigger in most cases.

N. ulmariae is bivoltine and should not prove too difficult to breed. If as a result of this paper entomologists find it in new localities and rear it successfully, there are two points to be borne in mind. First, at the moment (if we ignore Meyrick's doubtful specimen) this is an Oxbridge species, but it must surely have a wider—even a redbrick—distribution. Its discovery in new localities should therefore be recorded. Secondly, it is as yet unrepresented in the National Collection at the British Museum (Natural History).

My thanks are due to Dr. J. D. Bradley, who kindly rechecked in my presence that there are no specimens of *ulmariae* in the National, Bankes or Ford collections; to Mr. E. Taylor who supplied the interesting information from the material in the Waters' collection; to Dr. B. M. Hobby who, in the absence of the Hope Professor, gave me permission to view the specimens; to Mr. J. M. Chalmers-Hunt who lent me Waters's own copy (annotated in his hand) of the List of the Micro-Lepidoptera of the Oxford District, and to Mr. Jacobs for his clear drawing of the mines made from the leaves I collected at Wicken Fen and also for the use of his run of the Entomologists' Monthly Magazine in which I was able to trace the history of *Nepticula ulmariae* Wocke in Britain.

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Host Records for *Anthrax conspircuta* Wiedmann (Diptera, Bombyliidae)

L. McLeod, B.S.c., F.R.E.S.
25 Sleford Close, Balsham, Cambridgeshire.

Life histories of the family Bombyliidae are interesting in that the larval instars are spent as parasites of immature stages of a variety of other insect families. These include Orthoptera, Lepidoptera, Hymenoptera, Coleoptera and other Diptera including the Bombyliidae (secondary parasitism).

Adult flies of the subfamily Anthracinae are often found resting on sand or patches of soil in the sun. When slightly disturbed they rise a short distance above the ground and hover until the cause of the disturbance has gone, whereupon they return to their original position. They also tend to chase away other flies and butterflies from their small territory.

Anthrax conspircuta Wiedmann (=*pithecius* Fabricius =*rubiginipennis* Macquart) is widely distributed throughout west, central and southern Africa, having been recorded in Nigeria, Uganda, Kenya, Tanganyika, Ethiopia, Rhodesia, Zambia and South Africa. (Bezzi 1924, Hesse 1956).

Although not uncommon, little is known of its breeding habits and the following two hosts records are worthy of note.

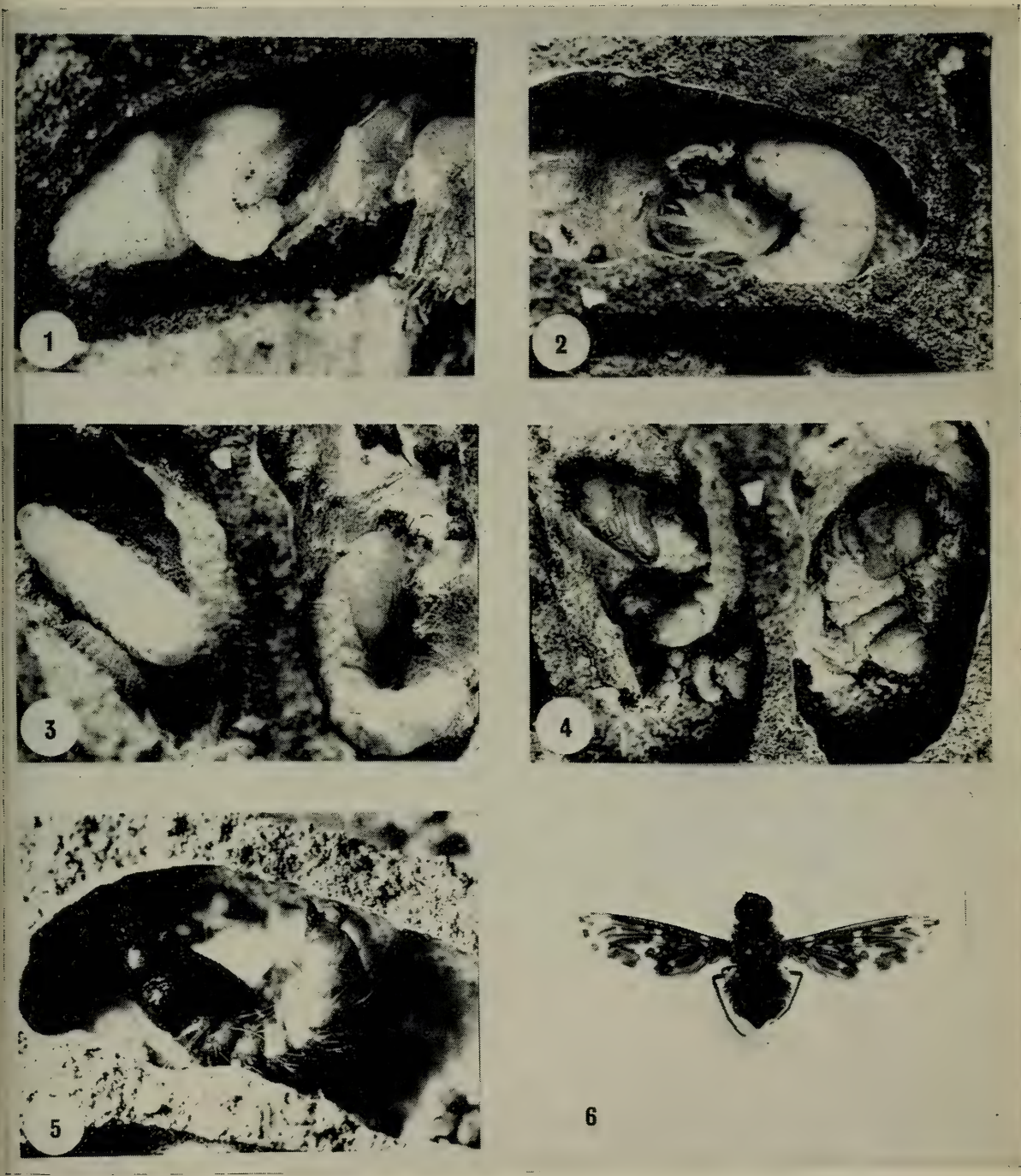
During October 1966 at Karen, near Nairobi, Kenya, I observed a female *Synargris analis* (Hymenoptera, Eumenidae) collecting dry red soil and rolling it into a pea-sized ball by mixing with mucous. She kept flying off with each ball slung underneath and I eventually managed to follow her to the mud nest which was situated on the wall of a friend's house. The mud nest was already fairly large and contained several cells.

I observed the female on six more occasions and photographed her carrying paralysed caterpillars (unidentified) which were taken into the most recent unsealed cell before she laid her egg and finally sealed the entrance.

Two weeks after my initial observation I decided to remove the nest from the wall and to open each cell in order to photograph as many stages in the life history of *S. analis* as were then present. I also expected some parasites because I had previously recorded Chrysidae, Mutillidae, Ichneumonidae, Eulophidae, Conopidae, Tachinidae, Rhipiphoridae, Meloidae and Melyridae, from other hymenopteran mud nests.

On opening the concrete-like cells I discovered three smooth, glistening, white dipterous larvae, as well as the expected stages of *S. analis*. One of the dipterous larvae was parasitic on a late *Synagris* larva, and each of the other two was feeding on an early *Synagris* pupa. The integument of the parasites was transparent and their white colour resulted from the numerous fat, bodies situated just below the surface. The larvae possessed twelve segments and were approximately ¾ inch in length, being widest in the middle.

At this time I was not aware of the identity of the parasitic larvae. On emergence of the adult fly, I immediately recognised them to be *Anthrax* sp. and they were later identified as *Anthrax conspircuta* Wiedmann.



ANTHRAX CONSPIRCUTA Wiedmann

Fig. 1. 3rd instar larva feeding on pupa of *Synagris analis;* Fig. 2. 3rd instar larva with remains of the *S. analis* pupa upon which it fed; Fig. 3. Prepupa and pupa. Note the remains of the *S. analis* larva beneath the prepupa; Fig. 4. Two pupae in adjacent *S. analis* cells; Fig. 5. Pupa shortly before emergence with black head and thorax; Fig 6. Adult male. Figures 1, 2, 3 and 5 × 2; Fig. 4 × 1½; Fig. 6 × 1¼. (Figs. 1-5 from colour transparencies).

The larvae continued to feed despite the disturbance to their normal surroundings. The parasitised *Synagris* larva became small and shrivelled while the *Anthrax* larva swelled and increased in length to approximately one inch. The two parasitised *Synagris* pupae also shrivelled as the *Anthrax* larvae sucked out the body substance from them. (Figs. 1 and 2).

Eventually only dried skins remained of the hosts and the *Anthrax* larvae rested motionless in the mud cells.

Frequent observations showed a gradual change from a fat white glistening third instar larva to a more solid-looking prepupa, cream-coloured and slightly reduced in size. (Fig. 3).

Two weeks later, I found that one of the prepupae had transformed into a typical Bombylid pupa with a conspicuous head crown of heavily sclerotised teeth. Each abdominal segment possessed a ring of long bristles and dorsally a row of short hooks. The last abdominal segment terminated in two pairs of short sclerotised spines.

The other two prepupae soon transformed likewise into similar ochrous-yellow pupae. (Fig. 4). They remained thus for 3-4 weeks at which time the head and thorax became black (Fig. 5) two or three days before emergence of the adult flies.

The second occasion for me to encounter *A. conspircuta* was in January 1969. Numbers of mud nests had been sent to me from Kenya. One of them was a remarkably large nest of the Megachylid bee *Chalicodoma cincta* spp. *combusta* Smith.

Three days after receiving them and before I had a chance to open up the nests, two *A. conspircuta* pupae had bored their way through the mud wall of the nest and the adult flies were flying furiously around the cage. Unfortunately this activity caused some damage to their wings (Fig. 6).

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Acknowledgements

My grateful thanks to H. Oldroyd and C. R. Vardy of the British Museum (Natural History) for their help in identification. Also to G. R. Cunningham-van Someren for supplying me with various Hymenopteran mud nests.

Eumenis semele thyone Thompson (Lep. Satyridae) Comparisons and Remarks

By R. L. H. Dennis

(concluded from page 110)

Corresponding with the forewing upperside, there is a dark edge along the costal margin, but here the black coloration is interspersed with whitish and grey-brown. This edge in *thyone* Th. is little more than a poor grey, or very small specks of black and white alternately and linearally set out along the margin as far as the two black streaks mentioned above. In Conway *semele* this costal margin is far darker and invades the deeper fulvous of the discal cell more effectively.

In *thyone* Th., these two short black streaks defining the basal band at the costal margin are very thin and are separated by the fulvous of that band and with a little darker brown. Often in *thyone*, the outermost line and demarcating factor of the basal band is a weak feature, and hardly gives more emphasis to the richer fulvous that separates that band from the yellower central zone. Also, the inner of the two black streaks seems to follow the outline of the outer curvature of the discal cell, and is the stronger of the two. These streaks often converge and join at the junction of the 4th nervure with the apex of the discal cell, but generally they are apart at this point. In Conway *semele*, these two short streaks are wider, better defined and undoubtedly of a more solid black appearance; the space between often filled with a grey or a lighter black.

Towards the base, a third and final black curved streak invades the discal cell from the costal margin, about 3 mm from the other two. In *thyone* Th., this is often apparent but is a very faint feature, and may be lost (as in some cases) amongst the slight grey that enters the discal cell from that margin. In Conway *semele* it can be very bold and wide, and may stand out from the dark-brown and grey that extends from the base to the limits of the basal band, and which again enters the discal cell; but, the feature can be lost as in *thyone* Th.

The really deep fulvous area in this basal zone corresponds to the sexual brand on the upperside, and this is a far deeper blend in Conway *semele*, approaching a true red-brown. Towards the inner margin the colour of the basal band becomes lighter with a certain yellow tint added to the red-brown. As with everything else, *thyone* Th. is toned down, and often the fulvous tinge fails to define the basal band effectively below vein 3, so that the yellow of the central band encroaches on the basal band between nervures 1b and 3.

Along the inner margin a grey colour runs from the base towards the anal angle, below nervure 1b, stopping short at the boundary of the basal band. In *thyone* Th., the grey seems little more than a lack of scales on this part; but on those from Conway, the grey band is wider and runs as far as the anal angle, more often than not to join the outer margin. In fact, this grey colour begins at the base below the median line of the discal cell, and runs diagonally to the boundary of the basal band below or on nervure 1b. In Conway *semele*, the grey frequently overspills into the area between veins 1b and 2; also a concentration of grey scales announces the boundary between a great part of the area

between veins 1b and 2 in Conway *semele*, and this feature is never well displayed in *thyone* Th.

In the central band the dark zone of the costal margin continues beyond the dark streak interceptions that form the boundary of the basal band with, as it were, two whiter and two darker sections, a whiter area first next to the basal zone. In reality these areas are merely concentrations of one or the other colour in the interspersed matrix effect that involves both. In Conway *semele* the contrast of black and white is stronger.

The rest of the central band is represented by yellow-brown, again somewhat stronger in Conway *semele*. The latter's central band suffers from a greater interference of black and white, partially surrounding the apical spot from the costal margin, apex and outer margin. The two spots in this band seem larger in Conway *semele*. The apical spot is larger in insects from both localities, sometimes much larger, and the white pupil is more clear.

The outer margin is supposedly defined by the black undulating line, which is less clear on the forewing upperside. This makes the outer marginal transverse band thin, and this is certainly the case in *thyone* Th., but in many insects from that locality, the grey of the outer marginal band extends beyond the black line boundary and darkens the yellow-brown of the central zone with a little grey. In Conway *semele* it is grey-black that extends beyond the black boundary line. Between nervure 1b and 2, the outer margin bulges out a little, especially in Conway *semele*, and then ends round the anal angle (beyond nervure 1b) as a thin edge.

Male Underside. Hindwing:—Here, the contrast between Conway *semele* and *thyone* Th. is very marked. The three transverse bands are more distinct, and the central band has decreased in width with the expansion of the outer zone beyond merely a marginal strip.

In view of the difficulty of comparative description caused by the complicated effect of the scales, an overall simplified contrast can be made. The basal and outer band of the Conway specimens is far darker approaching a brown-black. These bands in *thyone* Th. are almost ochreous with a dark overlay of brown and brown-black, to a greater or lesser extent obscuring the underlying lightness. In insects from both localities, the medial white band varies considerably in its configuration, its definition, its coloration and extension into the outer transverse band; certainly the outer band of the Conway *semele* is not lost in its definition to any extent in the encroaching light colour of the medial band, as are those from the Gt. Orme.

The basal transverse band in all insects from either locality is the widest, and is defined clearly by an irregular black line. Conway *semele* and *thyone* Th. have another such line cutting midway through the band, following the irregularities of the defining line as if in sympathy with them. This midway line is more apparent in *thyone* Th., as it stands out from the lighter background; in Conway *semele*, it can be wider, or totally missing, and is often a broken feature of discontinuous black; it is usually submerged or subdued by the black of the whole basal section.

The ground colour of this band in *thyone* Th., was described above; it is fact represented by a complexity of hachuring of short black streaks —on a lighter yellowy-brown and whitish patchy background—as if they

were drawn with an increasing radius from the base. Yet these black-streaked curvatures increasing outwards towards the central band, give more of a mottled appearance in *thyone* Th., but are darker towards the base where the streaks are more concentrated.

This curved hachuring by black streaks enters a new degree in Conway grayling, for here the streaks are wider and more concentrated, and they cut what is in effect white and brown streaks, whereas the latter is the background chopped into uncountable flecks. Along the inner margin of the basal zone and distally beyond the transverse line that cuts that zone, these curved streaks are finer, since the effect is not swamped by the deep black that takes command over most of the basal band, and in many specimens a true white appears as a strong background out of the flecking. In *thyone* Th., this inner marginal feature becomes ochreous and brown, and the flecking is weaker than over the rest of the basal zone.

On the discal cell, adjacent to the transverse line that cuts the basal band, and placed near the origin of the 5th and 6th nervures, is a white spot, but this may be pronounced or absent or represented as a yellower-brown from the basal band, as on a number of *thyone* Th. specimens.

Now the feature of special interest. Insects from both localities have the medial white transverse band, and little can be said about the difference in width of the band between Conway and Gt. Orme grayling. The white band of *thyone* is often of an ochreous tint, and in some specimens, one cannot be sure whether a yellow of the white band is invading the outer zone, or the yellow-brown of the outer margin is doing the reverse. In a number of *thyone* specimens there is a gradation from white at the boundary of the basal zone, through yellow, yellow-brown to the brown-black of the outer marginal line.

In both Conway and Gt. Orme *semele*, the band is never thoroughly white. In *thyone* Th. there are always small speckles of brown in the white band, however small. In Conway *semele* this becomes black-brown, and the speckles are those streaks often well defined continuing from the curvature pattern of the basal band. The medial white band in Conway specimens is often encroached upon by the dark patterns of the basal and outer band, and these curved streaks on occasion, only fall a little short of occluding the white band. Some *thyone* Th. are equally suffused, but by lightly coloured yellow-brown specks. For all these attempts to swamp the medial band by dark coloration in Conway *semele*, the contrast of black and white is more effective. The comparison then, is between the yellow-white and dark yellow-brown of *thyone* Th., and the speckled brown on white and brown-black of Conway *semele*.

The central band, finally, is of a highly irregular pattern, with a bulbous portion beyond the discal cell.

It was mentioned above, that the outer transverse band extends beyond the limits of its outer marginal undulating line. On insects from both localities, the respective patterns of the basal band are generally repeated, but usually of a lighter tint so that the difference of yellow-brown (*thyone* Th.) to brown-black (Conway) again obtains.

Usually, the black line of the outer margin is thicker in Conway *semele*. As with the upperside hindwing, this line breaks at nervure 2, and then continues as it were from the anal spot. This anal angle spot varies from insect to insect; it is mostly small (often minute) and white pupilled.

In the females from both localities, the three transverse bands are more noticeable, though the outer band is again a marginal feature. The previously expressed generalization stated often above, of dark coloured Conway grayling and light patterned Gt. Orme grayling obtains more effectively. Having described the males in such detail, this will not prove so necessary with the female specimens.

Female. Upperside. Forewing:—The basal band is much wider and more irregular, and in some specimens attempts by a sharp extension to invade the central band between the spots along the 4th nervure. The basal band is dark brown, but is defined at the boundary with an even darker brown or brown-black, most especially towards the costal margin beyond the apex of the discal cell, where a broad dark strip occurs, and this in many cases—again most effectively in Conway *semele*—extends towards the base along the sub-costal part of the discal cell. This boundary darkness again broadens between the nervures 1b and 2, after a thinning of it between nervures 2 and 3, and is usually a larger section in Conway specimens; generally, the latter have the basal edge's darkness somewhat occluded by the rest of the band.

The central band ranges mostly from a very light fulvous to a yellow-brown; darker brown, however, occupies the apex beyond the apical spot (usually surrounding a good portion of that spot), the lines of nervures—especially the area from half the distance between the 3rd and 4th nervure to the 5th nervure, enclosing the apical spot—and along the inner margin. This gives a globular and discontinuous pattern of yellow brown with the two forewing spots most emphatically displayed. The ratio of yellow-brown to dark brown on *thyone* Th. averages much higher than on Conway *semele*, where the yellow-brown is often darkened by a gloss of brown scales that shrouds what would otherwise have been a better contrast. The boundary of the central band and basal band is expressed on the costal margin by an extension of the yellow-brown that runs either side of the apical spot between nervures 5 and 6; also by the darker edge of the latter band. The two spots seem to differ little in size, and are similar in grayling from both localities, being slightly elongated between the nervures (and usually measuring 2 mm+ across).

The outer margin is similar to that of the male, except more clearly defined; it is darker in Conway *semele*. The pattern along costal margin is likewise similar to that of the male, but wider and longer; the pattern is far bolder in Conway *semele*.

Female. Upperside. Hindwing:—The basal band is far darker in Conway *semele*, and so is the darker edge above vein 3 along the irregular border of the band. Below the 2nd nervure, the basal zones dark brown coloration invades the central zone, and the boundary of the basal band is lost towards the inner margin. A much greyer-brown runs along the inner margin stopping short usually before the basal band's boundary. With close scrutiny, it is possible to see the boundary between the basal and central bands below vein 2. Generally, there is a gradation from greyish-brown along the first sub-division (proximal) of the central band at the costal margin, to brown at the anal angle and to slightly heavier grey-brown along the inner margin of the basal band; the whole surrounding the dark brown basal band.

In *thyone* Th. the basal band is a lighter brown, but still encroaches upon the central band beyond vein 2. A similar encirclement of the basal

band described above does take place but far less often. In Conway *semele* the central band is more often divided into 3 sections: first (proximal) grey-brown; then, brown; and finally, the globules of fulvous (the brown veins penetrating all). In *thyone* Th., this triple subdivision does obtain, but often the first subdivision colours little differently from the fulvous subdivision, being if anything more yellow; the brown mid-subdivision can be absent or exist as slight patches.

It seems that in *thyone* Th., the fulvous subdivision of the central band more often occupies the whole central band, becoming lighter towards the base. It is far less often restricted to globules of fulvous separated by the darker brown running along the nervures, or the presence of the brown of the mid-subdivision. However, the little globules in the Conway *semele* appear to own a deeper fulvous than those of *thyone* Th.

There seems to be little difference between the size of the anal angle spot (usually white pupilled) of Conway *semele* and *thyone* Th. The costal margin above the central band in Conway *semele* is of the same grey-brown as the first subdivision of that band. The outer marginal features in specimens from both localities is similar to those of the male. *Female. Underside. Forewing*:—The costal marginal feature of the basal band is similarly contrasted as in the male specimens. The fulvous, so bright and coppery in Conway *semele* on the basal band, forms the most notable divergence between Gt. Orme and Conway grayling.

In the males, a description was made of two black streaks initiating the basal band on the costal margin. In the females, these streaks are longer and hold a darker patch between them. The black streak actually forming the boundary of the band, does extend in a few Conway specimens across the whole forewing, but usually only as far as the 3rd nervure. In *thyone* Th., these streaks are brown-black and not as wide, and in this feature as every other, Conway females are more impressive by far.

The grey-brown of the costal margin runs from these two streaks to the base, and then along the inner margin to the basal zone's boundary, being grey below vein 1b, and grey-black—ending in a black wedge at the boundary—between nervures 1b and 2. Compared to this description of Conway *semele, thyone* Th. is considerably toned down and only a grey runs along the inner margin below vein 2; the black wedge at the boundary is generally a weak feature. The fulvous of the basal band is surrounded by grey, black and brown then, except at one point—between veins 2 and 3 at the bouidary with the central band.

It was also mentioned in the description of the males, that there was a 3rd and final black streak invading the discal cell from the costal margin. In the females, this is a very definite feature, and in some it cuts right across as a curve, and occupies a transverse portion of the discal cell. Undoubtedly, this feature with a fourth and far less noticeable streak baseward, is more pronounced in Conway *semele*, being considerably blacker, longer, wider and more curved. In *thyone*, it can be very weak and nearly absent.

The sequence in *thyone* Th. from the basal boundary along the costal margin is: white patch, grey-brown patch, white patch, grey-brown patch, white patch and finally the speckled brown-white apex with a slight brown-grey cap over the apical spot (but divided from it by the yellow of the central band). The sequence is the same in Conway *semele*, but the grey-

brown is black and only forms a small intersection in the white; the apex too is whiter. In fact, in Conway *semele*, this part of the wings shows a better concentration of white scales. Also, Conway grayling have a darker and more evident cap over the apical spot, but are similarly divided from it by yellow of the central band.

Below vein 7, the apex darkens into the outer margin, a very light grey-brown in *thyone*, defined by a weak and thin (often broken) undulating blackish line down to vein 1b; a dark brown in Conway *semele* defined by a stronger undulating line, and the outer marginal coloration often enters the central band in the region of vein 4 as grey-brown scales. The outer margin bulges baseward between veins 1b and 2, being darker and larger in Conway *semele*. The white fringe is interrupted by brown-black forming the ends of the nervures in Conway *semele*, and grey in *thyone* Th.

The central band ranges from a yellow-orange to yellow brown, the *thyone* Th. specimens in this region being duller. The two white pupilled black spots occupying this band are larger and a deeper black in Conway *semele;* one Conway Mountain specimen has these spots standing out very effectively.

Female. Underside. Hindwing:—The description of the male underside hindwing basal band applies here also, with the addition that the short black streaks giving the concentric pattern are respectively stronger in specimens from both localities, displaying an equal contrast to that of the males.

It is the central band that differs. In the females, the white medial band is occluded to a very great extent in specimens from either locality, by a similar concentration of different coloured scales. What is seen, is the white background submerged by the brown-black and yellowy-brown scales attempting to break through the concentration of the latter. If it were not for the irregular and variable presence of the undulating boundary of the outer margin, it would seem as if the females had two transverse bands; the more distal of the two, grading from a white speckled brown at the boundary of the basal band to a darker brown scale concentration speckled black, towards the outer margin.

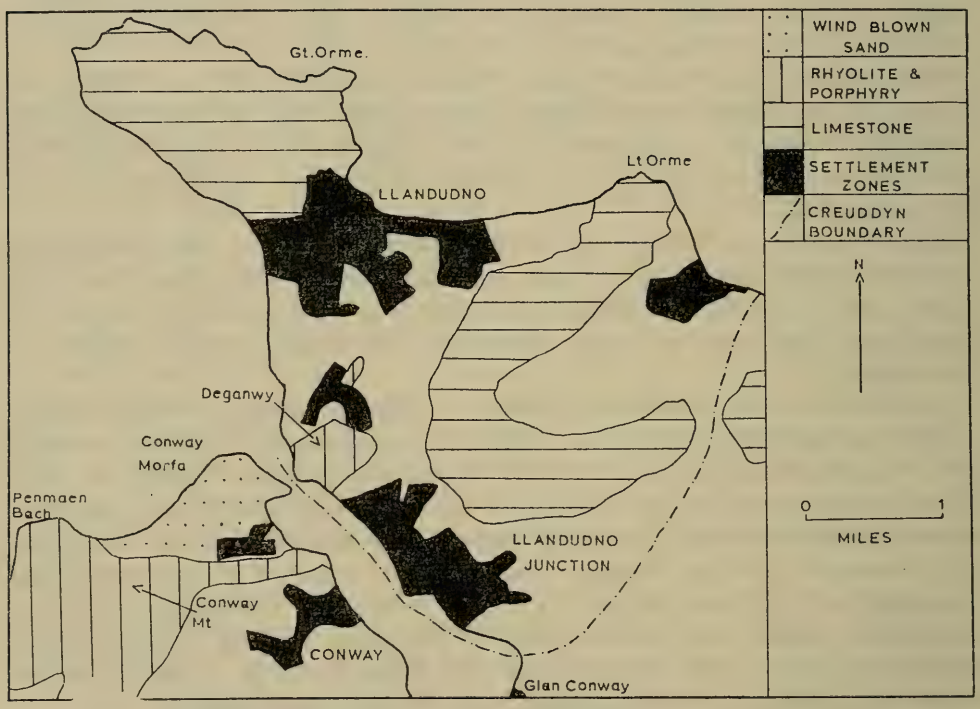
As the concentration of dark scales is so heavy on the central band of Conway *semele*, on *thyone* Th. the 'white' band is more often noticeable, especially as the depth of the basal band is darker than the outer marginal band; the medial white band sometimes has the chance too of giving the whole hindwing—beyond the basal bands defining black line—a general dull white appearance. At close quarters, the configuration of the medial band is seen more easily in *thyone* Th. The four lower specimens (figs. 7 to 10 in plate 2 indicates this). Fig. 8 from Conway Mt. gives a good idea of how the concentric scales from the basal band can continue into the medial band to occlude the white appearance.

Towards the outer margin, the amount of black in Conway *semele*, and the depth of brown in *thyone* Th., increases. As in the males, the outer band extends beyond the black undulating line. Really, there are two such undulating black lines, but the inner of the two, running from the anal angle to the costal margin usually stops short at the anal angle spot. This line is also present in male grayling from these localities, but is usually such a small and faded feature as not to be seen. In the females, this line is indefinite; most unusual forms are taken by these outer mar-

ginal defining lines, and every specimen seems to vary on this point. Mostly, it is just an indefinite black wavy line (of variable length) in a background of brown scales. The white fringe (divided from the rest of the wing in all specimens by a *very* fine black line) is interrupted by black (Conway) and grey (*thyone* Th.) triangular wedges where the nervures end. These are larger in Conway *semele*.

The brown coloration contrast of *thyone* Th. and Conway *semele* is similar to that of the males. The spot at the anal angle is minute but still white pupilled in most specimens. As in the males, there is a dull spot near the origins of the 5th and 6th nervures.

The female underside, reveals the greatest difference between the specimens from the Conway and Gt. Orme localities.



I would be most grateful for all and any information on *semele;* on varietal forms, and on populations differing from those I have laboriously described above. The reason for all the detail, is to pin-point features with reasonable accuracy, so that anyone who may care to send me or the Editor of the *Entomologist's Record* information, on matters of description ,of *semele*), will have a base level for comparison.

Above, *Eumensis semele* was referred to having a medial white transverse hindwing underside band! In the Jan. issue of the *Ent. Rec.* 1969, Mr. G. Thomson explained that there has been criticism against the naming of extreme forms which have a gradation of character between them. This is obviously the case of the medial white transverse hindwing underside band of *E. semele*; the two extremes are well displayed in Plate 14, figs. 3 and 4 (opp. page 71) of Professor E. B. Ford's 'Butterflies' (Third Ed. Reprint 1967). For the first, (fig. 3) with a totally occluded medial band, I suggest the name f. *nebulosa* NOV. For the second (fig. 4) with a clear white band, f. *alba lineola* NOV., and these terms do allow brevity of terminology!

93 Abbey Road, Rhos, Colwyn Bay, N. Wales.

[1]E. B. Ford. 'Butterflies' Third Ed. 1967, page 220.
[2]J. A. Thompson. *Ent. Rec.*, 1944, page 65.
[3]J. A. Thompson. *Ent. Rec.* 1952, page 162.
[4]E. B. Ford. 'Butterflies' Third Ed. Reprint 1967, p. 124.
[5]G. Ellis. 'Proceedings of Llandudno, Colwyn Bay & District Field Club, Vol. XXII, 1949'.

Keeping Butterflies where they are

By S. R. Bowden

I do not share the general objection to the introduction of completely foreign butterflies—confusion of records is easily avoided in this case, and the likelihood of direct competition with a native species is generally very small. But mixing subspecies is another matter.

It is sometimes proposed to reinforce a dwindling British stock of a butterfly by bringing in large numbers of the species from abroad or from quite another part of the British Isles. Many such proposals have been foolhardy: it is in general very dangerous to attempt such reinforcement. It is in any case unlikely that the foreigners themselves will be better adapted to the British environment than its own inhabitants are: on the contrary, they may need even more cherishing.

The "same species", even if not visibly a distinct subspecies is almost certain to differ a great deal genetically, and to be balanced for a biotope different from that into which it is introduced. Nevertheless, the native and foreign populations will almost certainly cross freely and there will be a great increase in numbers in the first year. In the second generation average fitness will fall, probably below that of either of the constituent populations. By the third and fourth generation the locality may have few "pure" individuals left, and a catastrophic drop in numbers is to be expected.

It is possible. that in a few cases the introduced population will be as close to the British one as it appears to be, and that the unfortunate effects predicted above will be small or even undetectable. It would, however, be essential to verify this beforehand by captive pairings carried to the third generation (avoiding direct in-breeding).

There are other circumstances in which the ill consequences can probably be avoided. Firstly, if only relatively very few foreign insects are brought in (so that after the first hybrid generation only back-crossing to the native stock is likely) the results may be good, though becoming negligible after a short time—they will certainly be inadequate to overcome the taxonomist's objections.

Secondly, the invaders may be placed where the natives are already extinct, or have never existed. I should be quite interested to see how southern European *Aricia agestis* Schiff. or *A. artaxerxes* Fab., or both, would fare on the Burren of Clare. But this would hardly be reinforcing our Brown Argus.

Apart from maintaining an adequate number of habitats, each large enough to support (say) a thousand adults in good years, I can see only one way of assisting the survival of our butterflies, and that is the method already adopted for *Lycaena dispar* Haworth. Learn how to rear and pair the species in captivity, and keep a sufficient part of the population

artificially protected through at least its vulnerable stages. Ideally, the captive stocks are to be returned to the wild each year and a fresh sample of the population taken for protection. This should leave the genetic composition virtually unchanged, since the effect of the operations is merely to relax selection on a random sample of the individuals.

We should do well to assume that all our resident butterflies are, or will be, in danger, and begin developing the techniques that we shall need. All rather bothersome, of course, compared with care-free collecting, but the personal rewards are greater.

And meanwhile we had better leave all those Large Blues, Wood Whites and Glanville Fritillaries in Switzerland, Italy or the south of France, where for the moment their outlook is happier.

53, Crouch Hall Lane, Redbourn, Herts.

Notes on the London types of Dermaptera described by Linnaeus and Fabricius

By A. Brindle

The difficulty of the interpretation of some species described by earlier authors is well known. The all too brief descriptions can be interpreted in various ways so that different authors in subsequent years may hold differing views on the identity of any particular species, and an examination of the original specimens or specimen, where possible, is obviously desirable.

Only two species of Dermaptera were described by Linnaeus and seventeen species were described by Fabricius; of these the types of both of the Linnaean species and types of four of the Fabrician species are in London. These have recently been examined, and the purpose of the present paper is to publish notes on these specimens. It is hoped to publish a later paper on the remaining types of the species described by Fabricius, which are in the Museums at Kiel and Copenhagen (Zimsen, 1964).

(a) The types of species described by Linnaeus.

These are in the Linnaean collection, belonging to the Linnaean Society, and are housed at Burlington House, London, W.2. At present the types are in the sequence given in Linnaeus (1758) and so the types of Dermaptera immediately follow those of the Staphylinidae, being in the same drawer as *Emus hirtus* and other representatives of this family. A proposed re-housing of the collection, however, may alter the existing arrangement.

There are three specimens of Dermaptera in the Linnaean collection, one specimen each of *Forficula auricularia* Linnaeus; *Labia minor* (Linnaeus); and *Labidura riparia* (Pallas). The latter specimen is thought to have been added to the collection subsequently by Sir James Edward Smith, who purchased the collection in 1784. The other specimens represent the Linnaean types, and thus are holotypes. Both types are pinned, and each bears a small label with the specific name, in the handwriting of Linnaeus, on the pin below the specimen. The types are in good condition.

Forficula auricularia Linnaeus 1758, *Syst. Nat.* (10), **2**: 423.

This type is a male with well developed forceps, approaching the *forcipata* form of Stephens. The type locality is Europe.

Forficula minor Linnaeus 1758, *Syst. Nat.* (10), **2**: 423.

This type is a female, so the distinctive projection on the penultimate sternite of the male of this species is absent, but the specimen seems to be without doubt a female of the species now accepted as *minor*. The type locality is Europe. The current name for this species is *Labia minor* (Linnaeus).

(b) The types of species described by Fabricius.

Three types of the species described by Fabricius are lost (Zimsen, 1964): these are those of *Forficula flexuosa* from Cayenne (=French Guiana); *Forficula biguttata*, from Hungary; and *Forficula flavipennis* from Senegal. The identity of *flexuosa* is not known (Burr, 1911: 97), and the description could apply to a number of Neotropical species. *F. biguttata* is now syonymized with *Anechur bipunctata* (Fabricius) (Burr, 1911: 74), and from the original descriptions, *biguttata* refers to the female and *bipunctata* refers to the male of this species. *F. flavipennis*, included in Burr (1911: 66) under *Enkrates* is now regarded as the prior name for *Chelisoches plagiatus* (Fairmaire) (Burr, 1911: 66); the relevant details of this synonymy are given in Brindle (1967).

Types of four species are in the Banks collection in the British Museum (Natural History), all in reasonable condition.

Forficula dentata Fabricius 1775, *Syst. Ent.*: 270.

The type of this species is a male specimen of *Forficula auricularia* Linnaeus, labelled Madeira, and constitutes the holotype of *dentata*, since no other specimen exists. Burr (1911: 81) synonymizes *dentata* with *auricularia*.

Forficula parallela Fabricius 1775, *Syst. Ent.*: 270.

These types consist of two female specimens of *Forficula auricularia* Linnaeus, both of which are labelled Madeira. There are also two specimens of *parallela* in Kiel (Zimsen, 1964) so that all these constitute syntypes. Burr (1911: 81) synonymizes *parallela* with *auricularia*.

Forficula morio Fabricius 1775, *Syst. Ent.*: 270.

There are two specimens standing above this label in the collection, one male and one female. The male simply bears a circular label with the numbers 63/47, whilst the female has a written label "Otaheite" the former name of Tahiti. There are also two specimens of *morio* in Kiel (Zimsen, 1964) so that all these constitute syntypes. The London specimens are clearly the species now named as *Chelisoches morio*, so that a lectotype of this species should be designated after the specimens in Kiel have been examined.

Forficula pallipes Fabricius 1775, *Syst. Ent.*: 270.

There are two specimens standing above this label in the collection, one male and one female. The abdomen of the female has evidently been replaced at some time since it is upside down. The male bears a written label "*pallipes*" but no locality, and is clearly a male of *Chelisoches morio* (Fabricius). The female simply has a circular label with the numbers 63/47 as in the male of *morio*, and may be conspecific though a closer

study would be desirable. These are the only types of this species and thus are syntypes.

The Fabrician types mentioned above are all pinned, and the types of the first two species need no comment; they agree with the original descriptions and localities. The types of the last two species, however, raise some doubts.

The specimens of both *morio* and *pallipes* appear to be conspecific, but the original descriptions do not suggest that this is correct. That of *pallipes* immediately follows that of *morio* (Fabricius, 1775: 270) and relevant comparisons of the two descriptions are as follows:—

morio: Magna: thorax ater: elytra atra, alae hyalinae, apice atra: pedes nigri, plantes ferrugineus.

pallipes: Magna: thorax niger, margine exteriori albido: elytra fusca, alae albae, linea apicis fusca; pedes albi.

Burr (1911: 37) synonymizes *pallipes* with *Labidura riparia* (Pallas) which would agree better with the original description, and this synonymy was followed in Brindle (1966). An inspection of the types of *pallipes*, however, resulted in this name being synonymized with *morio* in Brindle (1969).

It seems unlikely that Fabricius would describe specimens of *morio* under two different names, unless, as in *Forficula auricularia*, he described each sex as a different species, and the difference in the original descriptions suggest that he had two distinct species before him. Further doubts are raised by the fact that the male standing above *morio* and the female standing above *pallipes* have a similar label—a circular one bearing the numbers 63/47.

However, the position is that the female of *morio*, which is clearly *Chelisoches morio* has the correct label—Otaheite, and agrees with the original description. The male of *pallipes* has the specific name on a written label and has no locality—no specific locality was given in the original description. From this *pallipes* should be synonymized with *morio*.

There may have been some re-arrangement of specimens at some time in the collection, and there are specimens of *Labidura riparia* in the same drawer of the collection as the types mentioned above, but these specimens are placed towards the front of the drawer and are not labelled. However, it is not clear if a re-arrangement of the specimens would resolve the discrepancies. If, for example, the two specimens bearing the labels with the same numbers should be together, this would result in the other two specimens having the labels "pallipes" and "Otaheite", which would be absurd. If Fabricius describes the males and the females as separate species, as in *Forficula auricularia*, this would be more satisfactory, but would still not solve the problem of the difference in the original descriptions. Although *Labidura riparia* does correspond better with the original description of *pallipes*, than *Chelisoches morio*, the legs of *Labidura riparia* are scarcely white. The fact that the male of *pallipes* carries the specific name means that the synonymy of *morio* with *pallipes* must be accepted, in spite of the discrepancies mentioned above, unless future investigation brings other facts to light.

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Adapting the Robinson Mercury Vapour Light Trap for Field operation using 12 volt car battery power

By Hilton L. O'Heffernan

This unit extends the cone and vanes of the Robinson M.V. light reap so that a 20 watt fluorescent black lamp can be used. This lamp is run from a 12 volt car battery, via a transistorised convertor, and will operate for about 20 hours on each charge.

My outfit has been in regular use for some years and has proved its worth. For example, during a recent visit to Port St. Johns, in the Eastern Cape, I had two standard 125 watt M.V. traps operating from the mains, in gardens, while the 20 w. portable trap was operated about three miles away. One night the portable took more Sphingidae than both the other traps combined. On average I would judge it to capture between one half to two thirds of the number obtained by the standard 125 w. trap, which, considering the reduction in the lamp power, seems quite satisfactory.

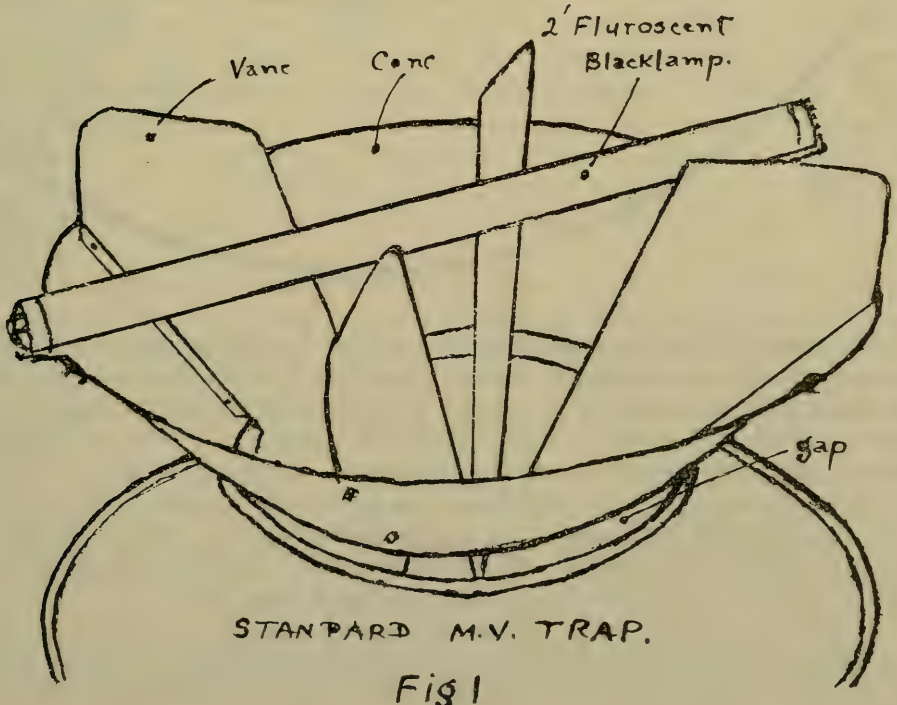


Fig 1

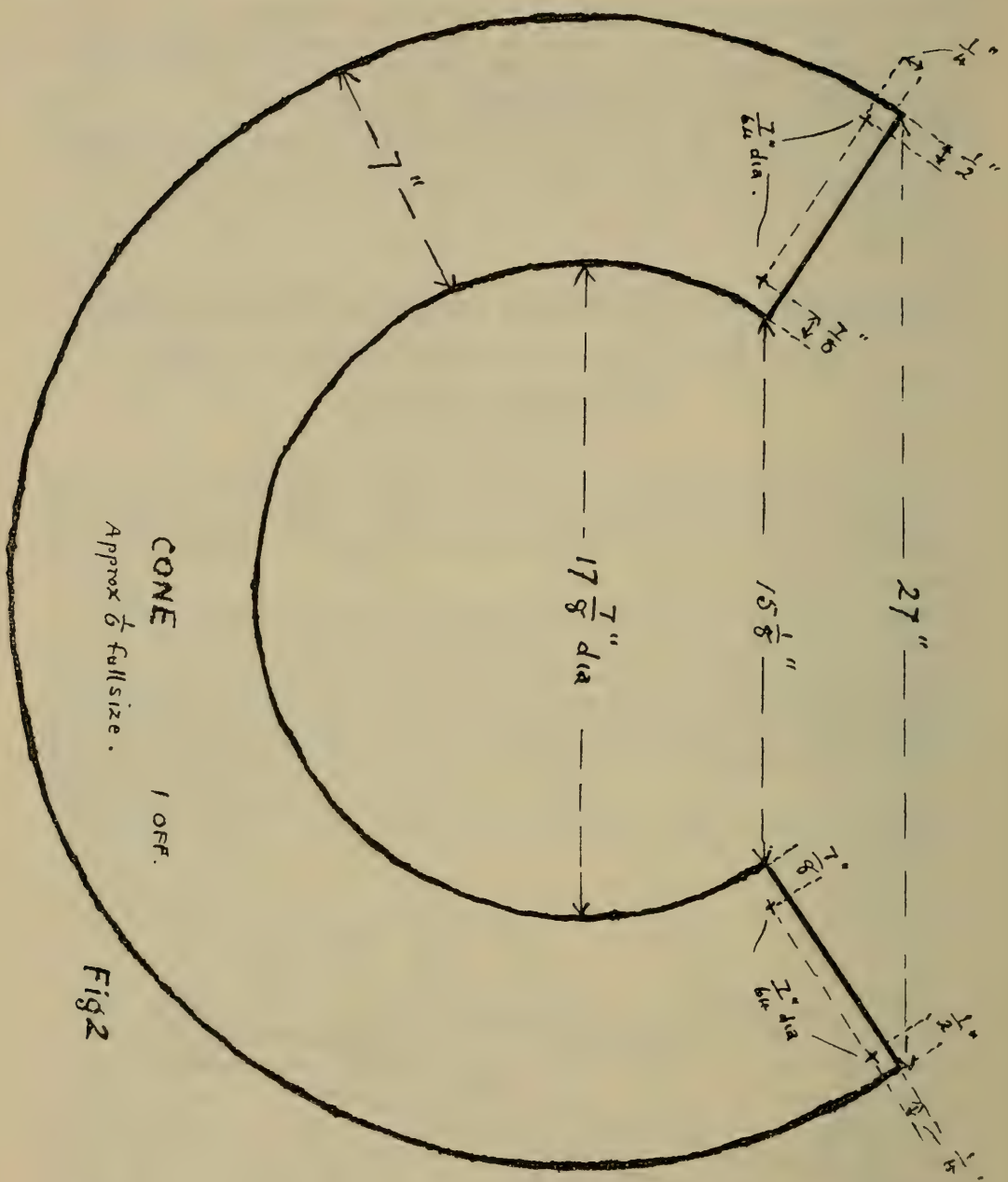


Fig 2

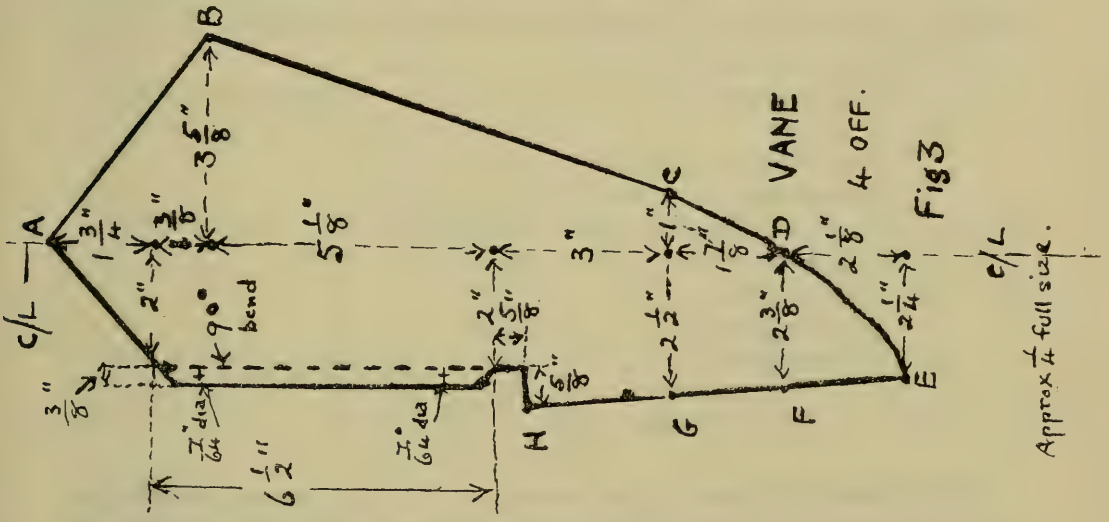
The material used for the cone, vanes and lamp brackets is 20 S.W.G. aluminium sheet, a piece measuring 3 feet by 3 feet being required, and the tools needed consist of tin snips, a hand drill (with 7/64th inch drill), a small screwdriver, pliers, centre punch and hammer. A vice will help in making the right angled bends for the vanes, but is not essential. Apart from reasonable accuracy in making the holes in the vanes to correspond with those drilled in the cone, the dimensions given are not at all critical; the unit merely fits into the top of the existing cone, and the vanes are spaced to match up with those of the Robinson trap (Fig. 1).

It will be observed (Fig. 1) that the bottom edge of the new cone does *not* fit flush with the top of the existing one, there being a gap of about one inch all round. This is done so that insects. attracted by the light

coming from the inside of the trap via the celluloid collar, can fly through this gap and into the trap.

The diameter of the top edge of the cone is governed by the length of the fluorescent lamp used; mine is designed to suit the 2 foot Philips 20W/08/TLA blacklamp, which needs a Philips type FA 1320C inverter (2·2 Amp. consumption) for use with a 12 volt car battery. No details are given for the brackets needed to secure the lamp holders in position on the cone since these will vary according to the holders employed.

I used 6BA round head brass bolts ($\frac{3}{8}$th inch long) and nuts to bolt the cone together and secure the vanes to it, so that the whole unit could be easily dismantled for transport, as otherwise it would take up rather a lot of room. If this feature is not required, then small rivets could be used



instead of the bolts and nuts, for a neater job.

To draw a full scale cardboard template of the vanes from the details given (Fig. 3), first draw a centre line (c/1) and then, starting at point A and proceeding *downwards,* mark off the dimensions indicated. From the points thus obtained draw lines at right angles to the c/1, terminating these at the dimensions shown, which will give you points B, C, D, E, F, G, and H. Join as indicated with straight lines, except C. D. E. which is a gentle curve. Points A, B and E are rounded off for appearance and safety.

When the cone has been cut out and drilled (Fig. 2) it is bolted together, the first of the vanes being also attached by these bolts, and then the remaining three vanes are secured in appropriate positions matching those of the Robinson cone. Before placing the completed unit into the existing cone, the 125 w. m.v. lamp must of course be removed from its holder.—9.ii.1970.

Collecting near Mombasa, October 1969— A Commentary

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

The following notes, in amplification of and correction to Baron de Worms' article "Collecting near Mombasa, October 1969" (1970, *Ento-*

mologist's Record, **82**: 34-36), may be of interest.

The Sekoke Forest, sometimes spelt Sokoke, is divided into two portions, the one nearest to the coast, where we collected, consisting mainly of *Brachystegia* (Caesalpinacea) growing on sandy soil, and an inland section on red laterite soil where *Brachystegia* is not the dominant tree. The forest is almost at sea level and generally dry, any rain it receives quickly disappearing through the sand. It is, I believe, one of the few large areas of *Brachystegia* remaining in Kenya. It is usually combined with the Arabuku Forest and jointly covers an enormous area, containing large areas of grassland surrounded by forest. It is the home of several rare species of birds, and it is said to contain a small number of Sable Antelope (*Egocerus niger* Harris). The two butterfly specialities are *Charaxes blanda* Roths., *kenya* Poult. and *Pseudathyma lucretioides* Carp. & Jackson, *blanda* being found nowhere else in Kenya.

My records for the area are:—

Papilionidae	13	species
Pieridae	28	,,
Danaidae	3	,,
Satyridae	7	,,
Nymphalidae (including 15 *Charaxes*)	42	,,
Acraeidae	10	,,
Libythaeidae	0	,,
Lycaenidae	16	,,
Hesperiidae	10	,,
Total	129	,,

The Makardara Forest, on the other hand, is a rain forest, situated on a ridge at a height of about 1,500 ft. some ten miles inland in the Shimba Hills. True rainfall is not sufficient to support rain forest but the deficiency is made up by the heavy condensation from the clouds blowing up from the sea. The Shimba Hills, which hold the only sizeable, if not by now the only, herd of Sable Antelope in Kenya, consist mainly of grass land with a certain amount of Vernonia scrub dotted with patches of rain forest, most of them impossible to penetrate.

Specialities of the area are *Euxanthe tiberius* Gr. Sm., *Charaxes lichas* Dbl., *bebra* Roths., *Euphaedra orientalis* Roths. and *Pseudathyma lucretioides*.

My own records are:—

Papilionidae	14	species
Pieridae	27	,,
Danaidae	4	,,
Satyridae	8	,,
Nymphalidae (including 16 *Charaxes*)	60	,,
Acraeidae	26	,,
Libythaeidae	1	,,
Lycaenidae	48	,,
Hesperiidae	36	,,
Total	240	

Turning to the various small errors, the September rains (line 6, p. 34) are the short rains, the long rains breaking in March or April. *Belenois thysa* (line 29, p. 34) has the upperside white in the male and varying from white to ochreous in the female, both sexes have a bright yellow underside to the hind wing. I would describe the ground colour of *Euryphene chriemhilda* (line 5 from bottom, p. 34) as fulvous, the same colour as *Argynnis* spp., the female mimics *Danaus chrysippus*.

Papilio leonidas (line 20, p. 35) has the spots pale blue, not white, and mimics *Danaus limniace*. *Salamis parhassus* (lines 31-32, p. 35) is the Mother-of-Pearl, the much rarer *cacta* has a dead leaf like underside and a purple-flushed brown upperside.

The list of species contains one or two printing errors and one or two sub-specific names have been omitted. These are:—

PAPILIONIDAE:—The Coast subspecies of *P. dardanus* is *tibullus* Kirby.

NYMPHALIDAE:—The Coast subspecies of *Euphaedra neophron* is *littoralis* Talbot.
Neptis kiriakoffi should read *kariakoffi*.
Byblia ilythyria should read *ilithyia*.

SATYRIDAE:— *Phyocaenura leda* should read *Physcaenura*. *Mycalesis subapicalis* should read *Mycalesis campina subapicalis* (the *campina* has, somehow, got a line to itself).

LYCAENIDAE:— *Pentila mombasae* I have always considered to be a subspecies of *P. amenaida* Hew.
The Coast subspecies of *Hemiolaus caeculus* is *littoralis* Stempf.

Mombasa, 13.iv.70.

Notes and Observations

Forestry Commission Charges.—My purpose in writing concerns certain disturbing matters relating to the Forestry Commission, and I am wondering whether other readers have run up against them or heard of many such cases. Briefly the position is this. An area called Laughton Forest, situated in north Lincolnshire, is a collecting ground which I have been in the habit of visiting for well over forty years; my association goes back to before the time when the F.C. took over the land. I am on good terms with the keepers, etc., and for years held a general permit from the F.C. just to conform to rule, though I was never asked to show it. However, I am now informed that a new permit is required each year and that £2 must be paid for this and an additional £1 if I take my car into a ride in the Forest. The F.C. adds that an additional £2 will be charged for each permit covering other areas owned by the F.C. The form letter goes on to say that these permits are required if areas of forest are visited for special purposes such as studying entomology,

It will be seen that if the imposed rules are observed to the letter one might spend quite a sum in the course of a single year, and still only visit some areas no more than once or twice, in other words, as

much as £2 for a visit. Apart from the matter of money, and that is serious enough in these days of inflation, I do strongly object to the issue on principle and I feel that my reaction must be shared by many. Nowadays, members of the general public are invited to visit some of these forests and, of course, are not charged but we are singled out as victims of officialdom. Mr. F. W. Byers wrote to the *Record* (81: 336) to say that he had been asked to pay £2 for a permit to enter Salcey Forest. He did not pay, of course, and was very angry, but mere anger will not soften the hearts of officials. However, if no one pays, the thing may die out, but if we meekly give in, it will mean yet another bit of personal liberty will have gone.

I might add that I now do far more photographic work than collecting. As mentioned before, I have always been on friendly terms with the authorities at Laughton, and have helped in small ways on many occasions. — GEORGE HYDE, 26 Warnington Drive, Bessacarr, Doncaster, Yorks. 18.iv.1970.

[The exact reason for singling out the entomologist for this imposition is difficult to imagine, but possibly it is in some way connected with a feeling of guilt on the part of the Commission, and is a "conservation" measure to be set against the destruction of insect life which it has brought about: I do not think I am far wrong when I say that by the destruction of biotopes, the Commission has destroyed more insects than have many generations of entomologists.—Ed.]

A NOTE ON *PHOSPHUGA SUBROTUNDATA* STEPH. (COL., SILPHIDAE).—As this species is securely known only from Ireland (where it is common), the Isle of Man, and (in very few captures) the Western Isles of Scotland round to Orkney, it was a little surprising —to say the least—to see it included in a list of Coleoptera from under some stones at Staines, Middx. (Muggleton, 1968, *Ent. Rec.*, **80**: 290). The beetle was there noted as having been even more frequent than its very close ally, the common *P. atrata* L. That the true *P. subrotundata* should be a native of Middlesex may fairly be ruled out at once, in view of its known restriction to the Gaelic lands; though it is not inconceivable that a gravid female, carried by chance to the spot (e.g. with imported plants), might have started a colony which could, possibly, persist for a time.

However, seeing that no reference is made to the extraordinary nature of the occurrence—indeed Mr. Muggleton remarks (p. 287) that "[all] the species involved are commonplace" — I think it far more likely that there has been a confusion of names and that the insect in question must be the brown form (v. *brunnea* Hbst.) of *P. atrata*, which despite Fowler's statement (1889, *Col. Brit Isl.*, **3**: 53) that it "appears to be chiefly found in high districts", seems rather to occur anywhere with the typical form, and not rarely. This fits in with the fact that both *atrata* and the supposed *subrotundata* were noted as commonest in the same year, 1965. The variety (*not* a species), which looks like an immaturely coloured example but is a true entity in that it does not grade into the black type, has occasionally been listed or recorded in error as var. *subrotundata*.

The present species was earlier treated as a variety of *atrata* (as in Fowler, *l.c.*) but was subsequently raised to specific rank—see Johnson, F. W., *Ent. mon. Mag.*, **39**: 96-7; Sharp, W. E., 1913, *ibid.*, **49**: 255. The

latter interesting note deals particularly with its distribution, which, as the author remarks, affords a close parallel to the present Britannic range of the ground-beetle *Carabus clathratus* L.;* but the *Phosphuga* has not been found anywhere on the Continent. I believe that a few authorities still prefer to regard the beetle as a subspecies of *P. atrata*, chiefly, I gather, because of the improbability that these islands should possess a truly endemic species; but to my mind it is fully distinct, and those with much experience of both insects are emphatically of that opinion. If the Red Grouse (*Lagopus scoticus*) has evolved within our limits, why not also *P. subrotundata*?—A. A. Allen, 63 Blackheath Park, London, S.E.3. 7.iv.70.

*It can scarcely be doubted that this fine *Carabus* formerly occurred also in East Anglia—see Morley, 1914, *Ent. mon. Mag.*, **50**: 97-103.

Obituary

HAROLD SYMES, M.A. (Oxon).

Harold Symes died peacefully at his home in Bournemouth, on December 21st, 1969, after a short illness.

He was born at Ruislip on 27th May 1886 and while he was still a baby his parents moved to Sevenoaks where he entered preparatory school before going on to Marlborough College and Trinity College, Oxford. There he was an exhibitor from 1905 to 1909 and obtained a Second Class Honours Degree in the Classics. On coming down he taught as Classics Master at King's School, Bruton, until 1919. He was commissioned a Second Lieutenant in the Territorial Army in January 1915, but was rejected for active service because of short sight. Seeking no advantage to himself from the shortage of qualified masters he loyally stuck to his post at Bruton until the war ended. Then after a two year spell at Exeter College he moved on to a temporary post at Llandovery College. He taught for short periods also at King William's, Isle of Man, and Clayesmore, finishing at King Alfred's, Wantage, where he remained until he retired. During the last war he did secretarial work at a school at Brockenhurst.

He was a keen sportsman. Hockey was his game; he was Captain of Trinity College Hockey Club in 1907 and played full back until he was well into his forties for the Oxford University Occasionals.

In his young days he travelled a great deal in France and Greece, keeping careful diaries of his travels.

In 1944 he married Miss Constance E. Barrow and they took up residence in Bournemouth. He joined the then South London Entomological and N. H. Society in 1950 and although distance precluded him from attending ordinary meetings he hardly missed an annual exhibition.

His interest in natural history, particularly entomology, dates back to his earliest schooldays and his first notes were written in 1897, when at eleven years of age, he was actively collecting several orders of insects and recording his captures in that same neat handwriting that he maintained until the end. Gradually the lepidoptera established supremacy in his interest and for over 60 years he studied, collected and bred butterflies and moths, painstakingly recording every detail of his activities. He left a note book in which is recorded the date on which he saw or

took every species from 1922 to 1969!

He was a prolific correspondent, but his first published note was not until 1938, when, in *The Entomologist* for November, he recorded his capture of *Lampides boeticus* L. in the New Forest. It was not until 1951 that on the invitation of Mr P. B. M. Allan, he began his long series of articles in the *Record*, contributing in all no less than 132 notes and papers. He was active member of the Board of Governors of this journal, serving as Honorary Secretary until his death.

His collection is small, but remarkably complete, beautifully set and contains numbers of specimens of other orders collected over 70 years ago. During the course of his long life he made many friends. To the last he was indefatigable in pursuit of his hobby and was always anxious to impart his knowledge and experience to other and younger collectors. He remembered the days before the motor car, when insects were plentiful and the countryside unspoilt. He supported generously a great many bodies working for the preservation and conservation of what remains of our British countryside. To his widow, we and his many friends, offer our sympathy in her bereavement. Harold Symes will be sadly missed by all who knew him. A.C.R.R.

Current Literature

Proceedings and Transactions of the British Entomological and Natural History Society Vol. 2, part 4, 32 pp. + 2 pl. (one coloured). Published by the Society, 13/-.

Mr W. G. Tremewan opens this part with Further Records of *Zygaena* Fabricius (Lep. Zygaenidae) from Turkey, in which he calls attention to 24 species and subspecies, being records additional to his previous paper (*Proc. Brit. ent. nat. Hist. Soc.* **1**:-54-56). There is another excellent article by Mr F. V. L. Jarvis to add to the literature on the genus Aricia. This one is entitled "A biological Study of *Aricia artaxerxes* ssp. *salmacis* (Stephens) "and includes a coloured plate illustrating the text with 32 figures. P. N. Lawrence has written "An introduction to the Collembola" with a plate of 20 figures illustrating the order. P. J. Chandler and A. E. Stubbs add "A Species of *Norellia* R-D. (Dip. Scatophagidae) new to Britain", and give a very full and diagnostic account. The Transactions close with an account of *Colotis daira Klug.* ssp. *nouna* Lucas (Lep. Pieridae) in Spain, by Brigadier H. L. Lewis.

The Proceedings cover meetings from 13th February 1969, until 26th June, and complete this issue.—S.N.A.J.

Fjellets Sommerfugler (The Macrolepidoptera of the Mountains of Southern Norway) by **Magne Opheim,** 33 pp. including 6 pl. (2 in colour), and a map of the country concerned. Published by Norsk Lepidopterologisch Selskab, Oslo.

The introduction gives an account of the district under discussion, and the Artsliste (List of Species) names 40 species of butterflies, with coloured illustrations of six and black and white of seven, and 135 moths of which three are illustrated in colour and 42 species and subspecies in black and white. The paper is, of course, in the Norwegian language, but the publication would be most helpful to anyone wishing to collect in the area.—S.N.A.J.

Africa's Bain, the Tse Tse Fly, by **T. A. M. Nash,** 22 pp. + 8 pl. Collins, £2 2/- (£2.10).

In his preface the author states that this book is written for everyone interested in Africa's great problem with this insect, whether "beginner, be he undergraduate or postgraduate, biologist, doctor, veterinarian or humble naturalist".

The first chapter introduces the problem in a few words, followed by a very interesting historical account of the subject from the middle of the fifteenth century up to the indictment of certain *Glossina* flies as vectors of trypansomiasis. History is continued in Chapter 3, showing the effect of the disease on African development.

The strange life cycle of *Glossina* is discussed in Chapter 4, and the distribution of the species in Chapter 5, together with the discussion of the distribution of the Glossina species and the vegetation of their haunts. The alimentary tract is explained in Chapter 6. Behaviour in the field, sources of food, and breeding sites all have their chapters: thereafter all aspects of ecology and control are discussed.

There is a long and interesting chapter headed "Sleeping Sickness and Man", and after some words on biological control and the situation today, the book closes with a selected bibliography and index.

I set out to review this book by browsing through it, but the author spoke truly when he said that the book was for a wider field than the specialist: I read the book and found it most interesting.—S.N.A.J.

Pests of the Coconut Palm, by R. J. A. W. Lever, 13 + 190 pp. Ministry of Overseas Development (F.A.O.), 28/-.

This book sets out to inform all those concerned with the growing of coconut palms, but is especially for the use of research workers, personnel of plant protection services, and growers. One is astonished by the number of species, mostly insects deleterious to the coconut palm: this book deals with 110 species of insects as well as three mites, one nematode, one land crab, birds, five rats (in detail) flying foxes and fruit bats in general, and other mammals from wild pigs to elephants are mentioned.

The introduction opens with a description of the coconut palm illustrated by drawings and photographs. This is followed by a classification of insect pests, insect damage in relation to the environment of the palm, the shedding of immature nuts, and current needs and research trends.

Part 1 covers accounts pests with descriptions of the damage done and the creature causing it, with geographical range. This is well illustrated by photographs and drawings and runs from p. 14 to 145. Part 2 deals with vertibrate pests; Part 3 with insect pests of copra; Part 4, practical aspects of pesticidal applications. Twelve and a half pages are given to references, followed by an index. An addendum of further comments on certain species, and finally there is a list of supplementary references.

The book is well printed and illustrated and is bound in a strong paper cover. The author is to be congratulated on his bringing together from so many sources, so much information of practical use to those for whom it is intended. The book should find a place on the shelves of all concerned with or interested in coconut growing and infestation from any angle.—S.N.A.J.

The Systematics of Anthocharis midea Hubner (Lepidoptera) Pieridae) by **Cyril dos Passos** and **Alexander B. Klots**. Entomologica Americana, **45** (1969), pp. 1-34.

As mentioned in its title, this paper makes a detailed study of this North American falcate orange-tip butterfly, mainly to clarify its geographical variation and nomenclature. A very complete study has been made with assistance from other parts of the world in the location of type material. Professor Klots has set up the sub-genus *Falcapica* to cover the species and two sub-species are set up. The paper is illustrated by a photograph of the figure in Jones's Icones, and a series of upper and underside photographs by A. B. Klots of the existing type material. The synonymy is given in very full detail, and the life history, foodplants and parasites of the species discussed. There is a bibliography of 152 items to finish this interesting paper.—S.N.A.J.

Central and North European Ariciae (Lep.). Relationships, Heredity, Evoluton. (Aricia Studies No. 10) by **O. Hoegh-Guldbers** and **F. V. L. Jarvis.** Aarhus, 1969. 119 pp. + 3 coloured plates.

In this further addition to their extensive study of this family, the author's many experiments are described and the results tabulated, and beside their application to the particular species under study, the authors suggest that their methods could well be applied to the similar study of other species and genera. The text is illustrated by photographs and diagrams. The authors are to be congratulated on their tenacity and the success which they have achieved.

The text is in English with summaries in that language and in Danish. —S.N.A.J.

Collecting, Preserving and Studying Insects, by **Harold Oldroyd** (Second Edition), 336 pp. 15 pl. Hutchinson, 50/- boards, 25/- paper cover.

The first edition of the author's book ran to five impressions and this revised edition has brought in several new methods which have since come into use. After the introduction, the book is divided into three main parts, Collecting, Preserving, and Examining and Studying Insects. Under the first head are four sections dealing with where to look for insects, catching and trapping, keeping, breeding and rearing, and killing and temporarily preserving. The second head includes preparing and mounting for permanent preservation, examining insects in a collection, and photographing insects. The third includes principals of zoological classification and nomenclature; what are the insects and their allies? How an insect is identified; further reading, and recording and describing new species.

From cover to cover, this book is full of useful and interesting information, as much to the professional as to the beginner, and it is well illustrated by drawings and photographs. It is so full that it is difficult to decide which part is the most interesting, and the student will find the solution to many, if not all his relevant problems in some part of this book. The author's style is such as to appeal to the skilled and unskilled alike; it is clear without unnecessary technicalities, and the uninitiated can understand it without any feeling that the author has been "talking down to them", surely the hallmark of good instruction. In short, this is a book which should be in the possession of every entomologist.—S.N.A.J.

EXCHANGES AND WANTS

For Sale. — Formosan butterflies, beetles, moths, dragonflies, cicadas, praying mantis, wasps and other dried Formosan insect specimens, living cocoons of Saturnidae, etc., prepared for collection, educational programmes.—*Taiwan Novelty Co.*, P.O. Box 860 Taipei, Formosa, (Taiwan).

Wanted to Purchase.—Entomologist's Monthly Magazine. A run of this periodical including the first thirty volumes.—*J. M. Chalmers-Hunt*, 1 Hardcourts Close, West Wickham, Kent.

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For Sale.—One male and one female *Papilio schmeltzi* H-S. Both are fresh specimens caught in 1969. Set and data labelled. The pair £50.—Box No. 295. The *Entomologist's Record.*

Wanted Urgently, for a study of migration, any unpublished records of the following lepidoptera outside their normal areas of residence: *Eurois occulta* L. (Great Brocade), *Enargia paleacea* Esp. (Angle-striped Sallow), *Lithomia solidaginis* Hübn. (Golden-rod Brindle), *Plusia interrogationis* L. (Scarce Silver Y), *Itame brunneata* Thnb. (Rannoch Looper). Exact dates, sex, and circumstances of capture wherever possible. — *R. F. Bretherton*, Folly Hill, Birtley Green, Bramley, Surrey.

Urgently Wanted for laboratory experiments, larvae (or pupae later) of *Biston strataria.—Dr H. B. D. Kettlewell*, Dept. Zoology, Parks Road, Oxford.

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.

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The British Entomological and Natural History Society announces that awards may be made from this Fund for the promotion of entomological research with particular emphasis on:—

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in the above order of preference, having regard to the suitability of candidates and of the plan of work proposed.

It is envisaged that the awards would be made to assist travelling and other expenses necessary for field work, for the study of collections for attendance at conferences, or for exceptional costs of publication of finished work. In total they would not exceed about £100 in 1970 or 1971.

Applicants should send a statement of their qualifications, of their plan of research, and of the precise objects for which awards are sought, to R. F. BRETHERTON, C.B., M.A., F.R.E.S., Hon. Treasurer, Folly Hill, Birthley Green, Bramley, Surrey, as soon as possible and in any case not later than 30th September 1970.

Applicants need not be resident in the United Kingdom, and research in any part of the world may qualify.

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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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VOL. 82 No. 7-8 JULY/AUGUST 1970

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Fig. 1. *Maniola jurtina insularis* f. *parafeminea* f. nov.
♂ upperside type, Dunblane, Perthshire, 18.vii.66.
2. *Maniola jurtina jurtina* f. *marginata* f. nov.
♀ upperside type, Köon, Marstrand, Sweden, 5.viii.69.
3. *Maniola jurtina insularis* f. *hyperanthoides* f. nov.
♂ upperside type, Torrie Forest, Perthshire, 1.viii.69.

New Forms of *Maniola jurtina* L. (Lep. Satyridae)

By George Thomson.

Amongst the material which I arranged at the end of last season were a good number of interesting forms including three which have so far not received names. I deal with these here in the same manner and order in which I listed the forms in my 1969 paper (*Ent. Rec.*, **81**: 51 et seq.). I have not included minor variation which falls within the normal range of the species.

A. Size.

Other than the usual geographical size variation I collected only two specimens in 1969 which could be considered outwith the normal range for the species. It is notable that they were both taken in the same locality, on the same day within a few yards of each other. One of these is dealt with under *Combination Forms*, the other is

f. *major* Leeds

1♀ Dunblane, Perthshire, 8.viii.69, with a wingspan of 60mm.

B. Albinism

f. *brigitta* Ljunch

1♂ Cramond Island, Midlothian, 23.vii.69—patches on both hindwings.

1♂ Dunblane, Perthshire, 22.vii.69—patches on both right wings.

1♂ Tentsmuir, Fife, 28.vii.69—patch on right hindwing (from D. A. Robertson).

f. *cinerea* Cosm.

1♂ Ashtead Common, Surrey, 15.vii.69 (from B. Wurzell).

1♂ Great Cumbrae, Bute, 17.vii.69.

2♂♂ Cramond Island, Midlothian, 23.vii.69—one of these males is possibly the most beautiful *jurtina* I have seen. The colour ranges through golds, bronzes and brass with subtly contrasting dark margins and androconial streaks.

1♂ Köon, Marstrand, Sweden, 23.vii.69—hindwings only (from A. P. Waters).

1♂ Saltzburg, Austria, 31.vii.69—hindwings only (from I. MacDougall).

1♀ Köon, Marstrand, Sweden, 27.vii.69 (from A. P. Waters).

1♀ Banstead Downs, Surrey, 19.vii.69 (from B. Wurzell).

1♀ Cramond Island, Midlothian, 23.vii.69.

1♀ Vieugy, Hautes Savoie, France, 16.viii.64—hindwings only.

1♀ Aberdour, Fife, 16.vii.69.

1♀ St Fort, Angus, 29.vii.69 (from D. A. Robertson).

f. *brigitta-cinerea* Ljunch and Cosm.

1♀ Blackness, West Lothian, 7.viii.69—this is the first specimen I have come across displaying both these albinistic tendancies. I have here used the combined name as suggested in my 1969 paper.

f. *pallens* Th.-Meig.

1♀ Blackness, West Lothian, 7.viii.69.

D. Variation in the Apical Eyespot.

f. *antiparvipunctata* Leeds

1♂ Great Cumbrae, Bute, 17.vii.69.
1♂ Cramond Island, Midlothian, 23.vii.69.
1♂ Aberdour, Fife, 16.vii.69.
1♀ Easthaven, Angus, 23.vii.69—left side only (from D. A. Robertson).

f. *anticrassipunctata* Leeds

1♀ Dunblane, Perthshire, 22.vii.69.

f. *caeca* Rebel

1♀ Dunblane, Perthshire, 23.vii.69.

f. *erymanthoides* Esp.

2♂♂ Cramond Island, Midlothian, 23.vii.69.
1♂ Köon, Marstrand, Sweden, 24.vii.69 (from A. P. Waters).
2♂♂ Ashtead Common, Surrey, 11.vii.69 (from B. Wurzell).
1♂ Banstead Downs, Surrey, 19.vii.69 (from B. Wurzell).
2♀♀ Cramond Island, Midlothian, 23.vii.69.
1♀ Köon, Marstrand, Sweden, 7.viii.69 (from A. P. Waters).
1♀ Easthaven, Angus, 23.vii.69 (from D. A. Robertson).

f. *bioculata* Rebel

1♂ Cramond Island, Midlothian, 23.vii.69.

f. *addenda* Mousley

1♂ Cramond Island, Midlothian, 23.vii.69.
1♂ Stirling, 21.viii.69.
4♀♀ Cramond Island, Midlothian, 23.vii.69.
1♀ Dunblane, Perthshire, 7.viii.69.
2♀♀ Tentsmuir, Fife, 28.vii.69 (from D. A. Robertson).

NOTE.— One point should be cleared up here. The form of the male which has what appears to be an additional spot *immediately* below the apical eyespot should be refered to *erymanthoides* and not *addenda*. The problem arises with specimens which have an additional eyespot towards the apex of the forewing, as also occurs in the female, as Mousley intended his name to cover all forms having additional eyespots on the forewings. It would probably now be more convenient to restore Leeds' name *antipluripunctata* (1950) to cover the form in which there is an additional eyespot or eyespots in an area 'unassociated with a submedial row'.

F. Other Hindwing Variation.

f. *postexcessa* Leeds

1♂ Easthaven, Angus, 23.vii.69 (from D. A. Robertson).
1♂ St Fort, Angus, 29.vii.69 (from D. A. Robertson).
1♀ Boddin, Angus, 31.vii.69 (from D. A. Robertson).

f. *costa-cava* Cabeau

1♀ Brassac, Tarn, France, 12.viii.69.

New Forms.

f. *parafeminea* f. nov. (Plate , fig. 1)

Type: ♀ Köon, Marstrand, Sweden, 5.viii.69, in my collection.

Description: Colour and all markings variable as with a typical male. Wingshape, both fore- and hindwings, identical to those of a typical female, i.e. forewings long (rather than broad) with a strongly concave

outer margin: hindwings strongly dentate. The form obviously can only occur in the male and should not be used for the common form of the male with slightly concave outer margins to the forewings but which are broad as in the typical form.

f. *marginata* f. nov. (Plate , fig. 2)

Type: ♂ Köon, Marstrand, Sweden, 5.viii.69, in my collection.

Description: *Outer* margin of the upperside hindwings with fulvous 'chevron' shaped marks between the veins. It is important that this should not be confused with two other tendancies in *jurtina*. One is the *sub-marginal* fulvous band which is f. *rufocincta* Fuchs. to which it is not related as the fulvous of *marginata* varies independently of this band. Also it should not be confused with albinistic *jurtina* which are somewhat lighter on the outer margins of the hindwings and which are frequently found in North East France.

It is rather surprising that this remarkable form has not been observed before. It is comparatively frequent in the South West Swedish *jurtina* and I have two Scottish specimens other than the type mentioned above. Unfortunately, because of the close tones of the fulvous and the ground colour this form does not come up well in black and white.

f. *hyperanthoides* f. nov. (Plate , fig. 3)

Type: ♂ Torrie Forest, Perthshire, 1.viii.69, in my collection.

Description: Underside and upperside forewings completely lacking the apical eyespot. All wings considerably shorter than normal. The form is therefore a combination of f. *anommata* Vty. and f. *brevipennis* Lempke.

This is probably the most remarkable specimen I have seen. The forms *anommata* and *brevipennis* are, without doubt the two rarest of *jurtina* forms. The statistical possibility of these two forms occuring together in the same specimens must be remote indeed unless there is a link between these two factors. For this reason I consider it well justified to give this combination form a distinct name. I have noticed before that a modification of the wing shape can have an effect upon the size of the eyespot, but this is by no means always the case. It is also interesting to note that the form *hyperanthoides* is remarkably similar to *Aphantopus hyperanthus* (L.) with which it flies commonly in the Torrie Forest area.

Combination Forms.

f. *nana* Stephen + *rectoformis* Thomson

1♀ Dunblane, Perthshire, 8.viii.69—wingspan 42mm.

f. *cinerea* + *erymanthoides* + *addenda*

1♀ Cramond Island, Midlothian, 23.vii.69.

f. *cinerea* + *antiparvipunctata*

1♀ Vieugy, Hautes Savoie, France, 28.viii.65.

f. *erymanthoides* + *pallens*

1♀ Vieugy, Hautes Savoie, France, 25.vii.64.

f. *erymanthoides* + *marginata*

1♂ Köon, Marstrand, Sweden, 27.vii.69 (from A. P. Waters).

1♀ Torrie Forest, Perthshire, 6.viii.69.

f. *erymanthoides* + *addenda*

1♀ Cramond Island, Midlothian, 23.vii.69.

f *addenda* + *antipluripunctata*

1♀ Banstead Downs, Surrey, 19.vii.69 (from B. Wurzell).

f. *postexcessa*+*biocutata*

1♂ Banstead Downs, Surrey, 19.vii.69 (from B. Wurzell).

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Leeds, 1950. *Proc. Trans. South London ent. Nat. His. Soc.*, 1948-9.
Thomson, G. 1969. *Maniola jurtina* (L.) and its Forms, *Ent. Rec.*, **81**: 7-14, 51-58, 83-90, 116-117.

98 George Street, Dunblane, Perthshire.

Moths on Hoy, Orkney, June 1969

By Guy Howard

In June 1969 I stayed 10 days on Hoy together with Arthur Shapiro who has himself given an account of butterflies seen during that period (Shapiro 1970). These notes are a supplement to that description. The main purpose of my visit was to take part in a search for *Lasiocampa quercus callunae* Palmer. Males were in fact assembled to virgin females at Rackwick and I am most grateful to Dr. H. B. D. Kettlewell for inviting me to help in this investigation.

I ran an MV trap from June 7-14th. The trap was sited in the lower part of Berriedale which can be approached from the road near Rackwick—40 minutes walk—or by a longer trek from the NE in the direction of Hoy post office. Berriedale was chosen because the burn of Berriedale has cut its way down the hillside producing, in its lower course, a sheltered area supporting a wider variety of plants than are found on the surrounding slopes. In particular there are Aspen, Rowan, Birch, and Sallow. A description of plants in Berriedale can be found in Orkney Field Club Bulletin No. 3, 1969.

The following were taken at MV light:

Ceramica pisi L.
Blepharita adusta Esper.
Lacanobia biren Goeze.
Euplexia lucipara L.
Anticlea derivata Schiff.
Hydriomena ruberata Freyer.
Chloroclysta miata L.
Coenotephria salicata Hübn.
Eupithecia venosata F.
Eupithecia nanata Hübn.
Selenia dentaria F.
Odontoptera bidentata Cl.
Opistograptis luteolata L.

Of these *A. derivata, S. dentaria* and *O. bidentata* have not been previously recorded in Orkney. All three came in fair numbers. The *O. bidentata* were small and fairly dark and the *E. venosata* particularly large.

Regarding diurnal moths, *Saturnia pavonia* L. were flying in the sun from about 3.00 p.m. until after 4.00 p.m. NE of Berriedale. I saw the first *L. quercus callunae* in flight on the cliffs above Rackwick on June 11th. It appeared darker and heavier in flight than the male *S. pavonia*. One male *Parasemia plantaginis* L., in immaculate condition, was taken flying at midday over heather moor near Rackwick. *Anarta myrtilli* L. was frequent on moor near Muckle Rysa in the afternoon sunshine. Those taken had reddish-brown forewings. At Rackwick two Anartids were smaller with no hint of red on the brownish forewings, and the central white dot was relatively larger. I am grateful to Mr D. S. Fletcher, B.M. Nat. Hist., who examined the genitalia of the latter two insects as well as two of the reddish-brown ones. He confirmed that they were all *A. myrtilli*. *Ematurga atomaria* L. was abundant everywhere on the moorland.

After I left Hoy, Arthur Shapiro took the following moths on or around June 21st and all flying over moorland by day:

Hada nana Hufn.
Xanthorhoe montanata Schiff.
Dyscia fagaria Thunb.

At a time when many animals are tending to become exterminated by reckless human interference, it is reassuring to mention that I saw an otter crossing the road near Hoy post office. Again, a few days later I saw a pair with young playing around rocks in the sea nearby. I also had a close view of a Golden Eagle.

I am very grateful to Mr R. I. Lorimer for help in identifying certain of these insects. Some of the above records are included in his recently published summary of Orkney Lepidoptera. (Lorimer 1970).

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Shapiro, A. M. 1970. Notes on Spring Butterflies in Orkney. *Ent. Rec.*, **82**: 85.

Lorimer, R. I. 1970. Orkney Lepidoptera 1868-1968 (with addenda covering 1969). *Ent. Gaz.*, **21**: 73-101.

1 Brackenview, Mill Hill Road, Barnes, SW13. 16.vi.70.
Barnes, SW13. 16vi.70.

Ireland, 1969: A Postscript

By H. C. Huggins, F.R.E.S.

My two pupae of *Euchloe cardamines* ssp. *hibernica* Williams duly emerged early in May and are the two largest I have, in spite of being reared in a jam pot on my dressing table. The male, however, like all my other Irish specimens, has no trace of a yellow suffusion on the underside of the forewings; I shall especially look out for this feature at Dingle in the next few weeks. The female has a saffron suffusion on the upper side of the hind wings and the apical marking is largely covered in grey. Both insects seem to me to have rather larger green marblings on the underside than English specimens.

Mr D. S. Fletcher has kindly gone over my Hydraecias taken in 1969 and has spotted another *H. lucens* Freyer. This makes my second Dingle specimen, but I still cannot see why *lucens* is so rare in the peninsula. These two must be less than 1 per cent of my captures.

I have this year bred about a dozen *Eupithecia venosata* Fab. from Slin Head: all were ssp. *plumbea* Huggins, and two bred by Mr E. S. A. Baynes from pupae which had remained over from the previous season were of the same subspecies. We have neither of us bred any more ab. *sepiata* Huggins, as we must have now had between fifty and sixty, it is evident that *sepiata* is a great rarity. All our Dingle *venosata* are ssp. *plumbea.*

Amongst the *Schoenobius forficellus* Thunb. that came to my trap was a male very strongly suffused with peaty brown. It is, however, not nearly as extreme as the all brown ones Fassnidge and I used to take in the New Forest bogs, and Mr Chalmers-Hunt tells me he has recently taken some there. It is odd that the Dingle *forficellus* are not darker, as all the surrounding land is bog.

Notes on the Microlepidoptera

By H. C. Huggins, F.R.E.S.

Dichrorampha sedatana Busk. I read with much pleasure the paper on the Dichroramphas by Messrs Bradley and Tremewan (*Entomologist's Gaz.*, **21**: 3-12). I was glad to find that they had established what I have always held, that *Dichrorampha sedatana* Busk is a good species, though of course I have known it as *saturnana* Guen. It is a rather curious insect; I have never bred it from anything else but tansy, and to my eye it cannot be confused with *D. plumbana* Scop. I have bred *plumbana* many times, but always from yarrow, the only insects I have bred from tansy, apart from *sedatana,* have been *D. esquana* Hübn. and *D. flavidorsana* Knaggs.

I have never bred *sedatana* and *flavidorsana* from the same locality though both are usually accompanied by *sequana. Flavidorsana* is, in my experience a much more domesticated insect than *sedatana;* a large proportion of my captures in Kent were either bred from or flying round tansy in old gardens, and when I discovered it on Tresco, Isles of Scilly, it was on some tansy clumps just outside a garden.

I have never found *sedatana* in such places, though it was formerly quite common in south Hampshire, north Essex, and Suffolk, particularly in the Sudbury area. I say formerly because I have not looked for it for thirty years, and road widening and increased cultivation may have wiped it out where I used to see it.

Messrs Bradley and Tremewan suggest that it would be of interest to study the life history of *D. plumbana* Scop. I agree, but this is easier said than done: I have bred a number of *plumbana* from a bed of yarrow that was at the bottom of my garden at Chestnut Street near Sittingbourne, but they were always accompanied by *sequana, petiverella* L., *plumbagana* Treits and *politana* Guen., and all the larvae looked exactly alike except that *sequana* was a little smaller. The only hope of studying any one species of these yarrow feeders would be to sow seed of yarrow in a pot and keep it carefully covered with muslin, and then introduce females of the desired insect.

Collecting Butterflies in Provence, April 1970

By M. R. Shaw

Once again I was fortunate in being able to spend three weeks in the company of my parents, collecting this time in the French department of Var. Adequate accounts of the area have recently appeared in this journal (Bretherton, 1962; de Worms, 1966), but experiences always seem to differ considerably, and much of the ground covered has also altered. This is particularly true of the heavily wooded area around Bormes, which was visited by Bretherton before the enormously destructive fires of 1965, and by de Worms immediately afterwards. My own efforts were directed towards three centres:—the coastal strip around Bormes; the low limestone hills at Carnoules; and the more varied country near Draguignan. Since these sites are relatively close to one another we were able to retrace our steps on a number of occasions, thereby effectively extending our time-span in each area. This enabled us to see a greater number of species than we would have found possible with more static plans.

We took our car across the channel to Boulogne on April 3rd, boarding the car-train for Avignon which we reached in cold, dull and windy weather early on the 4th. Spring seemed hardly nearer than in England, and it was a depressing drive to Carnoules, as all we saw on the wing was a few hibernated *Vanessa cardui* L., and the season looked to be as late as I had feared. But the sun fortunately accompanied the wind during the next two days, and collecting quite close to the village on olive terraces in sheltered spots low down on a south-facing slope, I caught a nice series of *Thestor ballus* F., which appeared to be very locally well established. Males were quite common and mostly very fresh, though difficult to catch, and seemed to have the territorial habits of hairstreaks, as they would often return to the same patch of bare earth on which they generally preferred to rest. Although males were seen over a considerable area of largely dry scrub in which there was little *Lotus*, the females, which were only just emerging, stayed among large patches of the foodplant on moister ground, and in these places I saw very few males. Other butterflies just starting to emerge in this area included *Euchloë ausonia* Hb., *Pieris rapae* L., *P. napi* L., *Parage megera* L., *Callophreys rubi* L. and *Philotes baton* Bgstr., with fresh singles of *Zerynthia rumina* L. and *Leptidea sinapis* L. and the odd hibernated Vanessid making up the total. But butterflies were few and far between, and the thyme was not yet out, so rather than waste time waiting we decided to leave for Bormes where I hoped the maritime influence would be bringing spring forward a little. On the way I was given a pupa of the spectacular *Saturnia pyri* Schiff. which unfortunately emerged while I was still in France, and rather ill-equipped to cope.

April 8th was our first full day in Bormes, but we had only a few minutes of sunshine to relieve the gloom of our exploration of the heavily devastated Cap Bénat area. By keeping an eye on the low scrub I found two fresh males of *Glaucapsyche melanops* Bdv. at rest before the threatened rain drove us back to the car, but we decided that the 1965 fire had made such a mess of Cap Bénat that further exploration would be futile, though I should think that in a few years more some of

the ground will be very favourable for recolonisation. Most of the *Arbutus* has already recovered, and there was a good variety of low vegetation, with only the various pines irreversibly affected. Moving westwards towards La Londe we eventually found ourselves out of the burned area, and as the sun was firmly hidden we spent the afternoon looking on *Arbutus* for larvae of *Charaxes jassius* L. Eventually we found two larvae, both of which conveniently pupated while we were still in France, and probably were of the same parentage. Both these and another smaller one that I found a few days later were on the southern side of very healthy bushes with dark green leaves, and all three were in sunny situations, resting head outwards along the rib of the upper surface of leaves near the top of the spray. The third (smaller) larva that I found fed up and moulted once, into its final instar, while we were in France, but as soon as we returned to England it again went into hibernation, and it was not until I exposed it to full sunshine ten days later that it resumed moving around and feeding, apparently with no ill effect. This surprised me, as I had previously been under the impression that larvae were a good deal more choosy about which instar they were in for hibernation. Throughout our stay at Bormes we gave the *Arbutus* a lot of attention whenever the sun went in, and although we found only three *C. jassius* larvae, we saw a fair selection feeding on the plant, including a few large larvae of some species of eggar (Lasiocampidae), ova of *Saturnia pavonia* L. and several nests of what will probably turn out to be *Euproctis chrysorrhoea* L.

The weather on April 9th was again poor, and we did little but drive around looking for promising places should it improve. A visit to the village of Gassin, where there is a large grove of *Celtis australis* (nettle tree) in the square, was disappointing since the buds were hardly swollen, and it didn't look worth returning for *Libythia celtis* Fuessl. for weeks to come.

The next two days were much more promising, with less wind and almost continuous sunshine, though the air was still very cold. Casual collecting in the garden of the Grand Hôtel at Bormes provided a few fresh *Pieris mannii* Meyer and also the first *Iphiclides podalirius* L. of the holiday, but most of our time was spent around, and to the north of, La Londe where I found a colony of *Zerynthia polyxena* Schiff. in a sandy and stony area near a stream. They were very fresh, and seemed to keep active rather later in the day than most of the butterflies flying with them, which included singles of *Issoria lathonia* L. and *Polygonia c-album* L., as well as the first *Anthocaris cardamines* L. We also found a few *Colias crocea* Fourc. flying among the masses of *E. ausonia*, and in view of the progress here, we decided that a day-trip back to Carnoules on the 12th might be profitable. We were again fortunate with the weather, and I found females of *T. ballus* even more plentiful than males (though this was probably because they are very much more conspicuous) in the area we had visited previously. I again took a single fresh *Z. rumina*, together with larger numbers of all the species I had seen there before, the only additions being a few males of *Anthocaris euphenoides* Stdgr. and one fresh male *Glaucopsyche alexis* Poda. It seemed that our enthusiasm to revisit this locality had overshot the advance of spring, for the thyme was still not out and the *Biscutella*

flowers were only just opening, so we promised ourselves another visit later on.

April 13th was unpromising at first, but with steadily improving weather we set out to explore the Forêt du Dom. Near a small stream beside the main road I found a single fresh *Z. poylxena*, and one very fresh *Callophrys avis* Chapman (our main quarry that day) among hundreds of *C. rubi*. This looked like yet another place to come back to, as the lavender was not yet in flower and *C. rubi* was still fresh. In fact, we felt that for the time being the Bormes area was likely to be decreasingly profitable, and we departed for Draguignan the next day. On the day we stopped in a shady square at Cogolin, and found ourselves surrounded by *Celtis* in full leaf, and so I was not surprised to see a few *L. celtis* fluttering around the topmost sprays. Eventually one particularly battered example offered itself to the net, but it was too worn to be worth keeping. However, I was pleased to identify it, and also to see the tree in leaf.

Collecting around Draguignan proved to be most profitable, as the weather (which had apparently been atrocious before we arrived) held good almost all the time we were there, and the butterflies were very fresh and emerging in droves. On our first full day, April 15th, we collected along the road from Montferrat to Bargemon, hoping to find *Erebia epistygne* Hb. at the junction with the road from Montferrat to Comps, where once it was plentiful. But all we found was a colony of the large and colourful day-flying geometer *Fidonia plummistaria* de Vill. One female that I took laid a number of eggs, arranged in long lines on the side of the box, but attempts to rear them on various leguminous plants (but not *Dorycnium suffruticosum*) failed. Further towards Bargemon we investigated a large area of moist meadowland by a stream, but again we found that old records of profusion had dwindled to nothing and we saw no sign of *Z. polyxena* on this heavily grazed land. But the collecting was better on the wooded hillside across the road, and here I caught a single *Polygonia egea* Cramer in excellent condition, among several *P. c-album*. I also caught a fresh *L. celtis* at rest on an oak tree with opening buds, though *Celtis australis* was apparently absent from the area. Both *Gonepteryx* species were abundant and *Papilio machaon* L. was seen for the first time among better numbers of *I. podalirius* at blackthorn blossom. *L. sinapis* was common, too, but examination of large numbers here (as elsewhere) failed to turn up *L. duponcheli* Stdgr. I have found it in its summer form at Digne, emerging definitely later than *L. sinapis*, and if this behaviour is repeated in the spring brood it would perhaps account for my failure to find it throughout our holiday. Just as we were about to leave, a single fresh *E. epistygne* blundered helpfully into the net, and I saw the first of many *Clossiana dia* L.

April 16th was again hot and windless, and we explored the terraces on the eastern outskirts of Draguignan, along the New Grasse Road. Unfortunately most of the abandoned vine terraces in this part of France became redundant at about the same time, rather too long ago for profiable collecting, since pine scrub has now swamped much of the useful low vegetation. But on the more-or-less neglected olive terraces we did quite well, catching singles of *Scolitantides orion* Pall. and *P.*

mannii, missing a single *Z. rumina* as it slid gracefully down a long flight of bramble-covered terraces, and picking out two females of *A. euphenoides* (males of which were in hundreds) from swarms of Pierids. Both were resting on flowers of *Biscutella*, fluttering only a short distance to the next plant, but they did not appear to be ovipositing. In the late afternoon I found quite by accident that several mostly fresh *L. celtis* were frequenting a clump of young oak trees in bud. When disturbed (by kicking the trunk) they generally returned to the same branch, and were not difficult to collect. Again, I saw no *Celtis australis* in the neighbourhood. One seems to hear of *L. celtis* being found well away from its recognised foodplant (which does not grow wild on the Western side of the Alps, and is thus more-or-less confined to areas of habitation—especially village squares) with considerable regularity. It has the reputation of being a highly migratory species and certainly seems to colonise any new growth of *Celtis* very quickly.

The Montferrat-Comps road was revisited on the 18th, and towards the top of the pass after the Bargemon turn we found a strong colony of *E. epistygne* flying among oak, broom and rose scrub on stony ground. They were mostly fresh, with rather few females, and seemed to extend from the Military School at the top of the pass almost, but not quite, down to the Bargemon turn, and were well spread on both sides of the road. *G. melanops* and *P. baton* were also flying; fresh, but few and far between.

The following day we set out to explore the Old Grasse Road from Draguignan, and we soon found some promising terraces. The first butterfly I saw as the sun pushed through the dense haze was a fresh male *Z. rumina*, but we saw no more. The weather was not very helpful, as the weak sunlight failed to warm the cold air which prevailed on every morning while we were in France, and apart from a single *G. alexis* and a female *A. euphenoides* which is heavily suffused with orange on all four wings, the butterflies were rather uninspiring and few in number.

On the 19th we had to be in St Raphaël in the morning, so we decided to continue to Agay where I hoped to find *Z. rumina*. A mile or two north of the village in a broad, dry river-bed, I caught three fresh males in spite of only intermittent sun, and also found that most of the Pierids were *P. mannii*, still fresh. *G. melanops* was well spread in small colonies, and I felt well satisfied in view of the wet and overcast start to the day.

The 20th was warm and sunny again, and we collected along the banks of the River Argens near Le Muy. I found a few *L. celtis* flying around nettle trees growing by the bridge, but after we had followed the path by the river for about half a mile I found some more, again on young oak trees in bud. Here also *Z. polyxena* was abundant and still fresh in a lush meadow, and there was a good show of Pierids, among which I was pleased to see several *P. mannii*. Hibernated Vanessids were in greater abundance here than in any other place we visited, *Nymphalis polychloros* and *N. antiopa* being especially prominent. The rain of the previous day seemed to have advanced and generally freshened up the spring enormously, and the deciduous trees were bursting into leaf along these vivid green and most beautiful river banks.

We decided to make the 21st our last day at Draguignan, and we returned to the terraces on the Old Grasse Road in much brighter con-

ditions than on our first visit. Quite a lot was flying, including a few *Z. rumina* in perfect condition. We then returned to the New Grasse Road, where I hoped to see more of *S. orion*, but in this I was out of luck. It was really too early for it in a slightly late spring.

Our plans after leaving Draguignan were to return to the Bormes area to try again for *C. avis*, and then to move slowly north-westwards so as to reach Avignon on the 25th. We arrived in the Forét du Dom at lunchtime on the 22nd, and in the spot where I had found *C. avis* on April 13th I caught one more. By now *C. rubi* was scarce and worn, and beside the stream I caught a single *Lysandra hispana* H.-S. along with a few *Z. polyxena* and *G. alexis*. We stayed the night at the eastern end of the Forét du Dom, and the next day on high ground just behind the coast we found a large unburned area in which *Arbutus* was the dominant shrub. *C. avis* was quite abundant here, settling frequently on the bare earth of the track which we followed from the road. Only a few were worn, and *C. rubi* was rather less plentiful, though a few examples of the latter were still fresh. *Z. polyxena* was also to be seen on this unlikely-looking high ground far from water. I was surprised to see that although the lavender was fully in flower, neither of the *Callophrys* species was feeding—perhaps this well documented habit is reserved for the hotter weather of the afternoon. By then we had moved back to our spot of the previous day, hoping to see *L. hispana* again, but all we saw of interest were a few more *G. alexis* and some very fresh males of *Heodes tityrus* Poda.

We then drove to Carnoules, making our last visit to the terraces which had produced *T. ballus* on April 24th, but by now this short-lived butterfly was over, and I saw only two worn males. *Coenonympha pamphilus* L. was laying strong claim to the lower ground, and I saw a few *Z. rumina* higher up the slopes. *P. baton* was still fresh and common, and *G. alexis* was just beginning to appear in force, along with a few *Polyommatus icarus* Rott. Both *P. machaon* and *I. podalirius* were around, and I also caught a large fresh female *Spialia sao* Hb. Moving on towards St. Maximin we stopped in several places to examine *Leptidea* spp. which all turned out to be *sinapsis*, and I again saw *Z. polyxena* in fresh condition beside a stream.

The 25th was our deadline for Avignon, and we stopped only once on the way in a broad dry river-bed just inside the department of Bouches-du-Rhône where we ate our lunch. As is often the case when the sun is hot, nothing much was flying between about noon and 1.30 p.m., but after this I quickly collected a very fresh series of *Euchloë tagis* Hb. which was flying quite slowly, and frequently settling, among the thyme. I was very pleased with this find, as I had caught and examined hundreds of the closely related *E. ausonia* in the hope of finding this local species, and had considered that I had missed my chance by then. Two fresh male *Pontia daplidice* L. and several fresh *G. melanops* were also seen, and a single fresh female *E. epistygne* gave me the last surprise of the holiday. Then we drove to Avignon, put the car on the train, and unpacked our winter jerseys for England.

I had had a most successful holiday, seeing 51 species of butterflies which included no less than nine new to my collection. We were also extremely fortunate in the weather at a rather uncertain time of year, since after a shaky start it was almost continuously fine, and the fact that

the spring delayed its appearance until I had actually arrived in Var meant that almost everything I saw was in immaculate condition.

Species seen, with first dates, were as follows:

P. machaon: Odd examples here and there (14.4.70).
I. podalirius: Becoming common and widespread (10.4.70).
Z. polyxena: Le Muy, La Londe, Cogolin, Forêt du Dom, Le Rayol and Mazauges. Often seen in small numbers away from water (10.4.70).
Z. rumina: Draguignan, Agay and Carnoules. Mostly in open places, terraces, etc., on hillsides (6.4.70).
L. sinapis: Becoming widespread and common in suitable places (6.4.70).
A. euphenoides: Commonest in the Draguignan area and at Carnoules. Very variable females at Draguignan (12.4.70).
A. cardamines: Abundant in many places round Draguignan, Le Muy and in the Forêt du Dom. Singly elsewhere (11.4.70).
E. tagis: A single flourishing colony in the Durance valley (25.4.70).
E. ausonia: Widespread and very plentiful (5.4.70).
P. daplidice: Worn singles at Draguignan and Agay, and two fresh males in the Durance valley a week later (19.4.70).
P. brassicae: Few, but widespread (6.4.70).
P. rapae: Widespread and abundant (6.4.70).
P. mannii: In small abundant colonies at Bormes, Agay and Le Muy. Odd examples elsewhere (9.4.70).
P. napi: Widespread and common (6.4.70).
A. crataegi: A number of larvae on hawthorn and blackthorn.
C. australis: Mainly in Draguignan, but elsewhere becoming more in evidence on our last couple of days (16.4.70).
C. crocea: Common near La Londa, singly elsewhere (6.4.70).
G. rhamni: Mainly near Draguignan and Bargemon (15.4.70).
G. cleopatra: Widespread and usually common (6.4.70).
C. jassius: Three larvae found on *Arbutus* near La Londe.
M. didyma: One fresh female dead on roadside at Les Arcs (22.4.70).
M. cinxia: One fresh male at Agay (19.4.70).
C. dia: A few colonies found, mostly around Draguignan (15.4.70).
I. lathonia: A single male at La Londe (11.4.70).
V. cardui: Numerous and widespread, worn at first but fresher later (4.4.70).
P. egea: A fresh example taken near Bargemon (15.4.70).
P. c-album: Well spread in small numbers (11.4.70).
N. antiopa: Numerous at Le Muy, singly elsewhere (7.4.70).
N. polychloros: Mainly at Carnoules and Le Muy (6.4.70).
L. io: A few at Bargemon and La Londe (11.4.70).
A. urticae: One seen near Bargemon (17.4.70).
L. celtis: Almost everywhere where *Celtis australis* was in leaf (Cogolin, Le Muy, Avignon) and also near Draguignan in three separate places among oak (14.4.70).
P. aegeria: Here and there in shady places, usually singly (8.4.70).
P. megera: Widespread in suitable places (5.4.70).
C. pamphilus: Becoming common towards the end of our stay, especially at Carnoules (6.4.70).

E. epistygne: A large colony between Montferrat and Comps. Also singly near Bargemon and in the Durance valley (15.4.70).

C. rubi: Common and fresh almost everywhere, becoming worn towards the end (5.4.70).

C. avis: In two places in the Forêt du Dom, abundant in one (13.4.70).

T. ballus: Fresh and abundant near Carnoules (5.4.70).

H. tityrus: A large race just emerging in the Forêt du Dom (22.4.70).

L. phloeas: Widespread, but in small numbers, especially on agricultural land (9.4.70).

L. argiolus: Generally common, males already past their best, but females perfect until we left France (8.4.70).

S. orion: One fresh female at Draguignan (16.4.70).

P. baton: Locally common at Carnoules and around Draguignan (4.4.70).

G. melanops: Cap Bénat, Agay, Bargemon and the Durance valley; very local (8.4.70).

G. alexis: Forêt du Dom, Carnoules, Draguignan and in several spots towards Avignon. Very local, but probably hardly yet emerging (12.4.70).

P. icarus: Just appearing as we left France (24.4.70).

L. hispana: A single fresh male near a stream in the Forêt du Dom (22.4.70).

C. alceae: A few seen in hot dry places, especially along the coastal strip (11.4.70).

P. malviodes: Rather few seen, but widely scattered (5.4.70).

S. sao: One large fresh female at Carnoules (24.4.70).

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de Worms, C. G. M. Easter on the French Riviera, April 1966. *Ent. Rec.*, 1966, **78**: 192.

The Foodplant of Celastrina argiolus L. This butterfly has been unusually common here for the past few years, and as there are few hollies in the road, I have been looking for an alternative food-plant. Five years ago I saw a female in my son's garden apparently laying eggs on a *Crataegus pyracanthus*, but she was out of reach and I forgot to follow her up a ladder. On May 10th this year, however, another female was laying on *pyracanthus* in my own garden here and I carefully marked one place, and succeeded in finding an egg on a bud cluster. I cannot find that this plant has previously been recorded as a food for this species. H. C. Huggins, 65 Eastwood Boulevard, Westcliff-on-Sea. 31.v.1970.

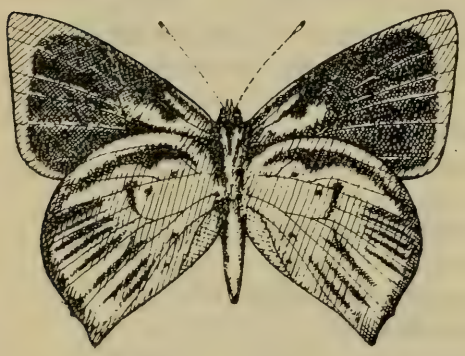
Correction.—It should be noted that the garden referred to in my note about *Nymphalis antiopa* L. (*Ent. Rec.*, **81**: 293) is in Massey Avenue, Belfast, and not at my Southampton address.—Anthony Irwin, Dept. of Zoology, Southampton University, Southampton SO9 5NH. 25.v.1970.

An Extreme Aberration of *Lycaena phlaeas* L.

By Capt. A. P. GAINSFORD

While collecting at Wembury Point, near Plymouth, on 10th October 1969, at about 2 p.m. in warm sunshine, I had the good fortune to take a melanic aberration of *Lycaena phlaeas* L. (small copper) which seemed to me to be a new aberration worthy of a name.

It will be seen from my drawings that on the upper side the copper colour is limited to the base of the forewings, and on the under side the black area of the forewings is sharply limited by the tornal band of the usual colour. I submitted coloured photographs of the upper and under sides of the insect to Mr T. G. Howarth of the British Museum (Natural History), who kindly looked into the matter, and in his letter of 18th February he wrote: "The specimen appears to be nearest ab. *melanophlaeas* Vill & Guen. though in this the marginal orange band of the upper side of the hind wings is partly obscured.



LYCAENA PHLAEAS, LINN. AB. NOV.

(UNDERSIDE.)

LYCAENA PHLAEAS, LINN. AB. NOV.

(UPPERSIDE.)

"This ab. was described in 1835 and nearly a hundred years later Siviter Smith named and figured ab. *berviniensis* in *The Entomologist* 1932: 242, which I believe to be a synonym of *melanophlaeas*.

"If you have access to a copy of this journal, you will see from the figure that your specimen is very close to it except for the immaculate marginal band of hindwing. On the underside your specimen is more extreme, being darker towards the base of the forewing and the post-discal-submarginal series of black spots on the hind wings are radiate".

On 10th April he wrote: "Thank you very much for your kind letter, the slides and sketches, and also for your suggestion that I should describe your magnificent aberration of *Lycaena phlaeas*.

"As you will no doubt realise, in many varieties you sometimes find modifications and intergradations which really do not require names and I feel that your specimen is one of these and should be referred to as ab. *melanophlaeas* Vill. & Guen. as I mentioned in my previous letter."

In view of the above, I agree with Mr Howarth, that a new name is not necessary, and I thank him for the trouble he has taken with this matter.

Mulberry House, 58 Whitchurch Road, Tavistock, Devon.

Collecting on Mt. Etna, Sicily

By Anthony Valletta, F.R.E.S.

After spending a week in Rome with my wife, I decided to visit Sicily again this spring. Whilst in Rome I had no chance to go out collecting, but I kept my eyes wide open all the time, for even in this busy city, butterflies were on the wing.

On the first morning, April 18th, I saw a *Gonepteryx rhamni* L. crossing St. Peter's Square, and a couple of *Colias croceus* Fourc. and several *Pieris rapae* L. feeding on the daisies in the courtyard of St. Paul outside the walls. We spent the following day with friends some 30 km. outside Rome towards Riano-Romano. As it was a sunny, warm day, I did not omit to take my net with me, and whilst lunch was being prepared, I succeeded in taking *Euchloe ausonia, Pararge megaera* L., *Caradrina exigua* Hübn. and *Aspilates ochrearia* Rossi, and saw for the first time, *Iphiclides podalirius* L. on the wing, flying high up and very fast. After lunch I also noticed that *C. croceus, P. rapae, Pieris brassicae* L., *G. rhamni*, and *Vanessa cardui* L. were also on the wing in that area.

The remainder of the week was spent in visiting historical places and various friends.

On the 24th, my wife flew back to Malta and, later in the evening, I took another plane for Catania. There was a delay in the flight so I arrived at Catania airport rather late. There, I was met by Sig. Sebastiano Distefano, a student at the Instituto Policattedra di Biologia, who is doing research on *Polistes gallicus* L. (Hym. Vesp.). Had it not been for his constant help and companionship I would have done very little indeed. He most willingly joined me in the hunt, and drove me to the various localities.

This time I wanted to have a complete circumetnea trip looking for the rare *Anthocaris damone* Boisd. which last year, unfortunately, I missed, as the first week in April was rather wet and still cold. This beautiful and much sought butterfly was first discovered and taken in Sicily in 1824 near Catania, by Ghiliani, and for the remainder of that century it was not seen again, so much so, that some authors thought its identification was erroneous. However, it was taken again in 1905 by Kruger near Nicolosi, and since then it has spread out all over Etnea. I understand that lately it has been found also near Palermo. This butterfly breeds also on the south coast of the Italian peninsula in Reggio Calabria and Aspromonte.

Throughout the whole week (25th April-2nd May) the weather was mostly sunny and warm, and the temperature was well over 70° F., so much so that butterflies were already on the wing by 7 a.m most days.

On 25th April, whilst my companion was taking the daily observations of a huge nest of *Polistes* at San Giovanni Galerno (350 m.) I collected on rocky ground from 7.30 until 8.30 a.m. The only plants in this area of desolation were *Scrophularia canina, Spartium junceum, Genista aetnensis, Lonicera implexa* and *Valerian officinalis*, which grew here and there amongst the cracking boulders of lava. It felt like walking on charcoal, cracking the terrain with every step I made. Green lizards were everywhere basking in the scorching sun as the temperature

was already high. The first butterfly on the wing that morning was a somewhat battered *Lampides boeticus* L. which was flying round the honeysuckle; this was followed by *P. brassicae, P. rapae, E. ausonia, P. megera, Coenonympha pamphilus* L., *Glaucopsyche alexis* and *Lycaena phlaeas*. That was all for that day, as I had to meet Professor Marcello La Greca, the director of the Instituto Policattedra di Biologia Animale, and Professor G. Sichel, the Lepidopterist, with whom I had been in contact for a good number of years.

On the 26th, we left Catania just after 9 a.m. and were at the town of Zafferana (574 m.) by 9.45. It was a very hot day with a temperature of 80° F. We started collecting at the height of 650 metres and very soon we found colonies of *C. pamphilus, P. icarus, Aricia agestis* Schiff., *Pararge aegeria* L. and *P. megera* as well as the charming geometer *Chiasma clathrata* L. subsp. *aurata* Turati. We drove further up to 900 m. and there we came across a female *A. damone* crossing the road, followed by a male—an exciting experience to get the first couple of this much desired species in a matter of a few seconds! *Zerynthia hypspiyle* was flying in the shade of the trees and *G. alexis* Schiff., *E. ausonia, Anthocaris cardamines* L., *Pieris napi* L. and *Celastrina argiolus* L. visited the wild flower which bloomed by the sides of the road. *C. croceus, P. rarae* and *P. brassicae* were also noticed, but in small numbers. *I. podalirius* flew high up on the tree tops beyond our reach. This area is well wooded with plantations of Spanish chestnut and vines. At 12.30 p.m. we had to pack up, as we had been invited to a picnic lunch organised by one of my friend's professors in the grounds of his villa close by. Other students with their girls were also invited and, together with the professor's family, we were an appreciable group. We all enjoyed the delicious food and the exquisite wine in the shade of the trees.

Monday, 27th April, Nicolsi (700 m.) was our venue for the morning. The time for collecting was limited to only two hours, from 7.30 until 9.30 a.m. When we reached this peaceful town, we drove further up and stopped at Contrada San Lucio, which happened to be a good collecting spot. Beside the species already mentioned, we succeeded in taking *Pieris mannii, Nymphalis polychloros* L. *L. celtis, Cyaniris semiargus* Rott. and *Gonepteryx cleopatra* and the nice moth *Hipocrita jacobaeae* L.: *Z. hypsipyle* and *A. damone* were again taken. *I. podalirius* was here easy to take, as it tried to rest on the branches of the almond trees, which, together with olive trees formed the main plantations. Although Nicolosi is supposed to be the ideal spot for *A. damone,* only two specimens were taken, perhaps because it was still early in the day for the butterfly to be on the wing. For such a short period, however, we did very well as twenty different species were taken, just by staying on the road and taking the butterflies as they crossed from one side to the other. Again *A. cardamines* and *E. ausonia* were the most common.

On the 28th we drove to Andrano (560 m.) and went another 100 m. further up, and, going up a narrow country lane, which we later discovered was known as Contrada Rovolito, we found a paradise of butterflies. The area is planted with almond trees, pistacio, figs, prickly-pears and olives, and all along the rubble walls bloomed a variety of

plants which attracted many butterflies. Here, we added to our list *Aporia crataegi* L., *Leptidea sinapis* L., *Papilio machaon* L., *Aglais urticae* L., *Philotes baton* and *Vanessa atalanta* L. *A. damone* was also on the move, and as a surprise, we took two *Arctia villica* L., a male and a female, and the latter laid a number of eggs in the pillbox, which later proved to be fertile. We also had another surprise that morning. It was almost noon, and walking further, we came across a donkey tied to a tree and enjoying his feed: he wagged his tail continuously to keep the flies away, and as often happens, after a big feed, he had to obey the laws of nature and left some semi-soft brownish rolls on the ground: later we noticed two Hesperiidae, the only two seen so far, viz. *Pyrgus malvoides* and *Pyrgus armoricanus*. In this locality we had four hours collecting and twenty-six species were taken.

The 29th turned out to be a miserable day with no sun and with a cool breeze. We changed our route, and instead of going upwards, we went down almost to sea level. We stopped at Lentini (56 m.) where the biggest orange groves are situated. Driving from one grove to the other, we came across a patch of uncultivated ground where the only vegetation consisted of grasses, thistles, wild garlic and blackberry bushes. Naturally no butterflies were on the wing, so we resorted to 'beating'. Only one *V. cardui*, one *C. croceus*, two *A. ochrearia* and an *Eublemma parva* Hübn., and its variety *carthami*, were taken. We moved further towards Syracuse until we came to Carlentini and stopped at Contrada Roccadia, some 200 m. above sea level. Again we started beating and were surprised to find three species of burnets, viz., *Procris statices* L., *Zygaena purpuralis* Brun. and quite a good number of *Amata marjana* Stgr.; other moths disturbed included an *Acontia* (*Tyta*) *luctuosa* Schiff., a *Plusia gamma* L. and quite a number of *Synapha moldavica* Esp. and *Lithostege duponcheli* Prout. Later on in the morning we came across a colony of *A. agestis*, a couple of *C. pamphilus* and *Maniola jurtina hispulla* which was just emerging. By noon it started to rain, and went on all the afternoon—and evening. During the night the temperature dropped further, and the next morning Mt. Etna was covered again with snow.

The morning of Thursday, 30th, was still fresh but the sky was very clear. We drove to Bronte (790 m.) and at this height a cold wind was blowing, so we tried a sheltered place at a lower level. On the way we noticed two *P. machaon* chasing each other in a field where some prickly pears were growing, so we stopped and started the hunt. Close by there was a spring which provided enough moisture for a variety of wild plants. On the opposite side of the road a country lane separated two huge plantations of almond and fig trees. This cosy spot, known as Contrada Roccoletto, proved to be an excellent habitat for a variety of butterflies, especially for *A. damone*, *P. baton* and other Lycaenids already taken. Here we came across *P. napi* again and *Polygonia egea* Cram., *Melitaea phoebe* Schiff., *Pontia daplidice* L. were taken for the first time. More *P. machaon* were on the wing, and eighteen species in all were taken in one hour.

The 1st May (a public holiday) we paid a short visit to Bronte as this had proved a fruitful area, before proceeding to Randazzo. We again got *A. damone* and more *M. phoebe* plus all the other species taken

on the previous day. An interesting capture, however, was two specimens of *Ascalafus longicornis* (Ascalaphidae—Neuroptera) and *P. statices*. At 10.30 a.m. we reached Randazzo (765 m.): on rough ground consisting of lava boulders with little vegetation, we came across *A. damone* again. Here it was in full force, both sexes flying about in search of food as the day was very hot. This Contrada known as 'Nave?' produced few

List of the different Species taken

	San Giov. Galerno—350 m.	Zafferana—574-1000 m.	Nicolosi—698 m.	Adrano—560-660 m.	Lentini—56 m.	Carlentini—200 m.	Bronte—790 m.	Randazzo—765 m.	Linguaglossa—550 m.	Motta St 'Anastasia—200 m.
Papilio machaon sphyrus Hb.				×			×			
Iphiclides podalirius L.		×	×	×						
Zerynthia hypsipyle latevittata Vrty.		×	×					×		
Pieris brassicae L.	×	×	×	×			×			
Pieris rapae L.	×	×	×	×			×	×		
Pieris napi meridionalis Heyne.		×					×	×		
Pieris mannii todaroana Pincit.			×	×						
Pontia daplidice L.							×			
Leptidea sinapis sartha Ruhl.				×				×		
Aporia crataegi var augusta Trti.				×						
Euchloe ausonia romana Cal.	×	×	×	×		×	×	×		
Anthocaris damone Boisd.		×	×	×			×	×		
Anthocaris cardamines turritiferens Vrty.		×	×	×			×	×		
Colias croceus Fourc.		×	×	×	×		×			
Gonepteryx cleopatra L.			×	×						
Vanessa cardui L.		×	×	×	×		×			
Vanessa atalanta L.				×						
Aglais urticae L.				×						
Nymphalis polychloros L.			×							
Polygonia egea Cr.							×			
Melitaea phoebe Schiff.							×	×		
Pararge aegeria sardoa Vrty.		×	×	×			×	×		
Pararge megera australis Vrty.	×	×	×	×			×	×	×	
Coenonympha pamphilus L.	×	×	×	×	×		×		×	×
Maniola jurtina hispulla Esp.						×				
Lycaena phlaeas L.	×	×	×	×			×	×		
Lampides boeticus L.	×									
Lycaenopsis argiolus L.		×	×							
Glaucopsyche alexis Poda.	×	×	×	×			×	×	×	
Aricia agestis calida Bell.		×		×		×	×	×	×	
Cyaneris semiargus Rott.			×	×						
Polyommatus icarus Rott.		×		×		×	×	×	×	×
Philotes baton Bergstr.				×			×	×		
Pyrgus malvoides modestior Vrty.				×						
Pyrgus armoricanus Obth.				×						
Carcharodus alceae australis Zell.								×		
Adopea lineola clara Tutt.										×
Libythea celtis Fuessl.			×							

other species such as *E. ausonia, A. cardamines, Lycaena phlaeas* L., *G. alexis, A. agestis, P. megaera* and *Carcharodus alceae* Esp.

At noon we shifted to a totally different locality known as Contrada Monacachiusa, a shady wood full of oak trees, in the shade of which a variety of Liliaceae with a sprinkling of Orchidaceae were blooming. Only four specimens of *A. damone* were taken, but *Z. hypsiphyle, L. sinapis, P. napi* and *M. phoebe* outnumbered the other species.

Later in the afternoon, we had lunch at a restaurant at La Pineta (1450 m.). We admired the white summit of the volcano and the wonderful view below us. No butterflies were on the wing at this height as the temperature was very low. At 4 p.m. we reached Linguaglossa (550 m.) and stopped at Contrada Piano Rivo, where almond trees and vines grew. Nothing exciting was on the wing at this time of the day excepting a few *A. agestis, P. icarus, G. alexis, C. pamphilus* and *P. megera.* We drove straight to Zafferana and back to Catania, thus completing a collecting trip round Mt. Etna.

Saturday, 2nd May, my last day in Sicily, the morning was gloomy so we stayed close to Catania, and drove as far as 'Motta Sant' Anastasia (200 m.). We collected on the clayey land covered mostly with grasses and umbelliferae. Again we resorted to beating. *M. hispulla, L. icarus* and *C. pamphilus* were disturbed, but *A. marjana* was again on the wing. The last species taken was a Hesperiid, *Adopea lineola* Ochs., the only specimen of its kind taken during the whole week.

Thus my second collecting trip in Sicily came to an end with a bag of 38 different species of butterflies. I cannot conclude this collecting account without thanking Sig. S. Distefano who was a faithful companion and above all an excellent driver. My thanks are also due to both Prof. La Greca, the director of the Institute, and Prof. G. Sichel for their past and present help, and also to Dr. J. D. Bradley and Mr. D. S. Fletcher of the British Museum (Natural History) for identifying the moths.

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257 Msida Street, B'Kara, Malta, G.C.

Majorca, 3-17 May 1970

By S. N. A. Jacobs

In order to recuperate from a severe attack of the prevalent influenza of last Christmas, I suggested an early holiday for my wife, and she selected Majorca. I recollected a remark of Commander Harper some years ago, on the paucity of lepidoptera on this island, but was not put off, because firstly, recuperation was the main object ,and secondly, a fauna does not have to be prolific to be worthy of study. The local travel agent fixed us up with an air booking and accommodation in a good hotel at Cala Mayor, a suburb to the west of Palma, and had we been bent on acquiring sun tan, this would have suited us very well; the hotel was excellent and the beach very well kept, with invitingly clear water. However, we only set foot on the beach once, when we returned to the hotel a little early for dinner.

For entomologists, I would recommend accommodation on the northern side of the island, where, I understand, accommodation can be booked in the less populated areas such as Puerto Pollensa. I would not recommend the north western coast because this is mountainous, with a sheer drop to the sea. Of course the mountain road is very well worth exploring, and no doubt accommodation is available at various points on its length.

The central and south eastern portion of the island may be said to consist of fertile land, intensively cultivated, mainly for market gardening, although some grain is grown; it is thus not readily available to the entomologist. The south west of the island, where it is not occupied by hotels and builders' refuse, is given over mainly to groves of almond and locust bean trees, while olive groves are situated on the higher land along the slopes of the north western mountains, where there is sufficient soil for their cultivation. The almond trees did not appear to be in very good condition, but better kept newer groves were to be seen on the north west side of the fertile plain. The locust beans, which, I am told, are used locally for the production of industrial alcohol, the residues being used for horse feeding, seem to struggle for a mearge existance in the rocky soil, which is roughly ploughed between the rows to keep the yellow marguerites and various broom species down to a reasonable ground cover. These trees seem to survive in the rocky soil with split trunks, often a mere shell, and it is indeed remarkable how some of them remain standing, let alone bearing their fruit!

Margaronia unionalis Hübn. might well inhabit the olive groves but I did not have occasion to work these, only being in their vicinity when being driven either in coach or car.

We arrived after dark on 3rd May, and on the following day explored the ground between the main westward road and the seaside belt of hotels. This consisted of locust bean groves with some scrub land, and my first capture was a single *Metzneria catalaunella* Moesch., which Dr Klaus Sattler tells me, so far as he is aware, is a new record for Majorca. Four hours of working this ground however, only produced some half a dozen micros, the small Gelechiid moth *Isophrictis kefersteniella* Zell., which bore a very close resemblance in life to *Plutella maculipennis* Curt., *Phlyctaenia martialis, Nomophila noctuella* Schiff. and the aforementioned *Plutella,* a few *Vanessa cardui* L. and *Coenonympha pamphilus* L. were seen.

That evening, I was struck by the paucity of insects at the hotel lights; in fact, during our fortnight's stay, I only saw four moths flying round the lights. One of these, *Hypena obsitalis* Hübn. had the temerity to enter the hotel coffee room, and to add insult to injury, it settled on the ceiling above my head. I promptly pillboxed it, much to the politely concealed interest of the hotel visitors.

The next day ,and several days thereafter, we worked the slope behind Cala Mayor, and by dint of hard working, a series of *I. kefersteniella* was taken. The only moth present in plenty was *P. maculipennis; noctuella* and *martialis* were also fairly frequent, but material to be taken was indeed hard to find, and most of these were singletons. Last year, Dr. Joseph Klimesch sent me some Nepticulid mines which he had found in Majorca, but search as I would, I could not find even an empty mine; one of his mines was a new species in *Lavandula stoechadis,* and I gave much attention to the occasional plants, without result. There were a few Phycitinae, not yet determined, and a Tortricid which was apparently a light coloured race of *Adoxophyes* (*Tortrix*) *consimilana* Hübn. (*unifasciana* Dup.) was taken. There were a few butterflies, the most frequent of which was *Pararge aegeria aegeriades,* the southern form of our species, which looks more like *P. megera* L. having a bright fulvous ground colour, but the underside of the hind wings shows a wide band of purplish sheen round the outer margin. A few *V. cardui* were flying in a northerly direction, apparently towards the mainland; this flight became more in evidence daily until 8th May when it was at its strongest, and thereafter fell off sharply, so that during the remaining week of our stay, only singles were noted.

By the slow process of walking up the game, a small daily bag was brought in, but all told, I only brought home somewhere about one hundred specimens.

On the 6th, a very wet day, we visited Valldemosa by coach, to see the Chopin museum in the erstwhile monastry which, on the government dispersal of the order occupying it, had been sold in apartments to various buyers: the musician spent a year there with George Sand, and the suite occupied now contains many interesting exhibits, including original manuscripts. This suite opens on to a very pleasant and colourful little garden. However, to my mind, the Chopin connection is rather overcommercialised.

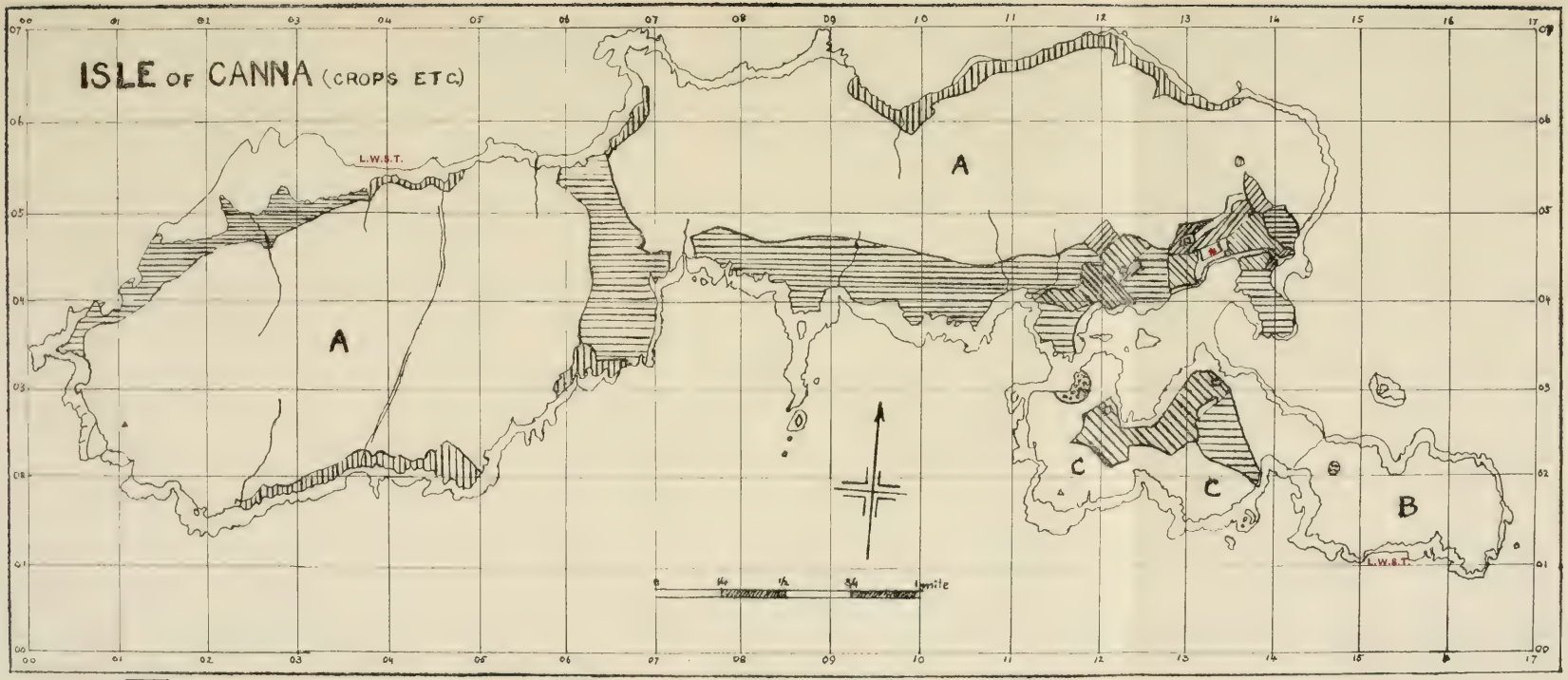
On the 8th we went by coach to Porto Pollensa and here, during the lunch halt, I was fortunate in pillboxing a nice specimen of *Eublemma ostrina* Hübn. by the rather unsporting process of walking it up again and again until it was too tired to fly!

Back on the slopes behind Cala Mayor, *Tyta luctuosa* Schiff. was taken flying in the sunshine as also was *Erastria fasciana* L. but the latter was in poor condition. One afternoon we had the pleasure of meeting a gecko which I saw retreating under a stone. Unlike the lizards, it quickly accepted our presence, and explored my trouser leg in the hope of finding an insect meal there.

One form of life was really prolific on the island, and that was snails! They were there in their millions, almost every tree having more than one hundred readily visible on the trunk, and goodness knows how many in the crevices, and the low herbage was also full of them. There were many species, from minute "steeple" shells which sat in closely packed groups on the trees, to something like our garden snail. These larger species are assiduously collected by the inhabitants for food, and in the Saturday street market in Palma, they form a prominent item among the food exhibits, in sacks, bushel baskets, and baths, often under the watchful eyes of the stall-holders' children, who were kept busy throwing the "spry birds" back into the seething mass from which they sought to escape. I saw no snails approaching the size of our "Roman" snail, and I am glad to say the local breed did not find its way into the hotel menu!

ZYGAENA LONICERAE SCHEVEN (LEP. ZYGAENIDAE) IN SCOTLAND. — On 21st June I was given by Mr C. Plowman a box containing three moths and one butterfly. Two of the moths (*Spilosoma lubricipeda* L. and *Callimorpha jacobaeae* L.) and the butterfly (*Anthocharis cardamines* L.), which had been taken in Yorkshire, had obviously been dead for several days and were stiff. The third moth, however, was fresh, and had been taken that day on the outskirts of Edinburgh and proved to be *Zygaena lonicerae* Scheven.

The circumstances of the capture must be made clear. The captor, Mr Plowman, is a perfectly reliable person, and no doubt can be placed on his observation or his story of where, when and how he took the moth, which he saw fly through the open window of his stationary car in the region of the north side of Corstorphine Hill, Edinburgh. It is my considered view that it would have been impossible for the moth to have travelled in his car from Yorkshire, as it had been cleaned out thoroughly before leaving, and the windows had not been opened before Edinburgh. He did, after all, see the moth actually fly into the car. I do not doubt the possibility of the moth having been carried in another car, and, unless further *loniceraea* are found in this part of Scotland, one must be somewhat suspicious about the status of such a specimen. It is interesting to observe, however, that this moth is either the first specimen of *Zygaena lonicerae* to be taken in Scotland or the first recorded case of the moth being carried from its original locality by our most common form of transport.—GEORGE THOMSON, 98 George Street, Dunblane, Perthshire. 26.vi.1970.



Permanent grass, etc.

Crops and rotation grass.

A Moorland grazed by sheep all the year round.

Plantations.

Cliffs from which sheep are excluded.

B Moorland only grazed by sheep in autumn and winter.

Sandhills.

Lake.

C Crofters' common grazing never grazed by sheep.

MACRO-LEPIDOPTERA CANNAE

The Butterflies and Moths of Canna

By J. L. Campbell

The island of Canna lies two miles west of the island of Rum, and ten to fifteen miles south west of the island of Skye in the Inner Hebrides. It it about six miles long and half a mile broad, and is mainly composed of basalt. It differs from most of the other Hebridean islands in that it lies east and west and not north and south, and so is considerably sheltered from northerly winds by cliffs rising to 600 feet, inhabited in summer time by feral goats and by innumerable puffins, fulmars, Manx shearwaters, guillemots, razorbills and kittiwakes. The southern exposure favours the sheltered parts of the island considerably. The maximum elevation is within 700 feet.

The low-lying island of Sanday, which is about a mile and a half long, is joined to Canna by a footbridge. The only sandhills and the only freshwater lake here are on Sanday, the western part of which is occupied by crofters who keep cattle but no sheep.

Also part of Canna estate is the small island of Heiskeir (misspelled 'Oigh-sgeir' on the Ordnance Survey maps) situated about six miles south of the west end of Canna. This consists of about ten acres of grass-covered rock with a highest elevation of 32 feet. A great deal more rock bares at low tide, and there is an important lighthouse here, manned by three keepers.

Readers will find a detailed description of Canna and Sanday, with maps and photographs, in a paper printed in Vol. XXIII of the *Proceedings of the Royal Physical Society* (1939) entitled 'The Natural History of Canna and Sanday, Inner Hebrides: A report upon the Glasgow University Canna Expeditions, 1936 and 1937' under the general editorship of D. S. Bertram. I shall allude to this under the abbreviation of G.U.C.E.

In 1937 a Hebridean expedition organized by the Department of Botany at King's College, Durham University, made its headquarters on the island of Soay (about 10 miles from Canna) from which were made 'long expeditions by motor-boat to Canna, Sanday, Rhum and Eigg'. The entomological results of these expeditions were shortly afterwards published by the late Professor J. W. Heslop Harrison in the *Proceedings of the University of Durham Philosophical Society*, Vol. X, part 1, pp. 10-23, under the title of 'A Contribution to our Knowledge of the Lepidoptera of the islands of Coll, Canna, Sanday, Rum, Eigg, Soay, and Pabbay (Inner Hebrides), and of Barra, Mingulay and Berneray (Outer Hebrides)'. The off-print of this article which I have is undated, but it did not appear later than 1938. Here I shall refer to it as H.H.1.

The same writer published in the May and June, 1955, numbers of the *Entomologist's Record* (Vol. 67) an article called 'The Lepidoptera of the Lesser Skye Isles', including Canna. I shall refer to this as H.H.2.

There are some puzzling inconsistencies between H.H.1 and H.H.2, one being that although the author made no visits to Canna after my occupation began on 29th May 1938 (at any rate as far as anyone here is aware), species such as *C. mesomella* L., *P. bicolorata* Hufn. and *A. rhomboidaria* Schf. are stated in H.H.2 to have been found on Canna although mentioned neither in H.H.1 nor in my Canna list published in the *Scottish*

Naturalist in 1954. This, and some similar questions are matters that await further investigation and comment, although this may not be easy, as it is now understood that none of the specimens referred to in H.H.1 or H.H.2 have been preserved.

In the spring of 1936 I was living on the island of Barra, in the Outer Hebrides, about 35 miles west of Canna. I had collected lepidoptera in Knapdale, Argyllshire, amongst other places, between 1918 and 1926, and so had some knowledge of the species likely to be found in the Scottish Highland and Islands. It occurred to me that it would be interesting to see what could be found on an island like Barra; my curiosity was aroused when a friend described an encounter with what was obviously a *C. vinula* (Puss Moth) larva. In 1936 and 1937 I collected on Barra with the encouragement of Mr A. R. Waterston of the Royal Scottish Museum. The first article I wrote on Hebridean lepidoptera appeared in the *Scottish Naturalist* of Nov.-Dec. 1936, and dealt with migrants observed that summer, and in particular with a remarkable invasion of *C. croceus* (Clouded Yellow) seen on the west side of Barra that September.

Two years later I published in the same journal a paper on 'The Macrolepidoptera of the Parish of Barra'. The term 'parish' was used to include the neighbouring small islands which embodied the results of the collecting done there in 1936 and 1937. I refer to this article here as J.L.C.1.

My first visits to the island of Canna were made in April and May 1938 and were in connection with the purchase of the island, where I have lived and farmed ever since. Some collecting was done in 1938 and 1939 but none again until the summer of 1945 when I was in ill-health and collected in the neighbourhood of my house in the search for rest and relaxation.

The results of the collecting done on Canna, and on occasional visits to Heiskeir and the shores of Rum in search of flotsam, were embodied, along with the Barra list for comparison, in an article published in the *Entomologist* of March 1946 entitled 'Catalogue of a collection of Macrolepidoptera made in the Hebrides between 1936 and the present date'. I shall refer to this article as J.L.C.2.

More collecting was done on Canna in 1947, the great butterfly year, and in the early summer of 1951 a mercury vapour moth trap was acquired which has been used every year since, and has added many new names to the Canna list. At all times before and after this, records of migrant lepidoptera were kept and any other unusual species were noted.

The Canna collection, as it then was described in an article submitted to the Scottish Naturalist on 11th March 1954, called 'The Macrolepidoptera of the Isle of Canna'. This I shall refer to as J.L.C.3. It included of course the early additions to the Canna list made by the m.v. trap, and appeared in Vol. 66 of the journal mentioned.

Since 1945 I have published various reports from Canna in the *Scottish Naturalist*, the *Entomologist* and the *Entomologist's Record*, mostly in the last named, particularly reports dealing with the summers of 1955, 1956, 1966 and 1968, which were outstanding.

Earlier good summers were 1939, 1945, and 1947: had the m.v. trap been available in 1945 and 1947, results might have been remarkable.

Specimens of all the lepidoptera in the following list exist in my overcrowded cabinet, except *M. stellatarum*, which was seen, but not caught,

in 1947. For purposes of comparison readers should see the list from the Island of Rum published in March 1969 in the *Transactions of the Society for British Entomology* under the editorship of W. O. Steel and G. E. Woodroff; a list to which the light trap operated on Rum by my friend Mr Peter Wormell since 1957 has contributed substantially.

THE VEGETATION OF CANNA

G.U.C.E. describes the vegetation of Canna in 1937. A much earlier vegetation has been described in the pollen analysis of peat from Canna carried out by Mr J. R. Flenley, which showed that at various periods woods existed on Canna containing pine, hazel, willow birch, oak and alder had disappeared entirely. Truly native trees, very few in number, are rowan, aspen, hazel, willow and juniper, the last only on cliff faces, and none except the creeping willows growing in situations accessible to sheep, which have access to the eastern two-thirds of Sanday and most of Canna apart from plantations and certain cliffs, and arable ground in the summer time.

When I came to Canna in 1938, the planted trees then growing on the island were sycamore (easily self-seeding here), wych-elm, ash, wild cherry, alder, elder, willow, hawthorn, a few oak, two or three beeches, holly, Spanish and horse chestnut; in the gardens, apple, plum, pear; as windbreaks, there was veronicas, escalonia, gorse, broom, fuchsia; a few rhododendrons and azaleas. There were the usual garden bushes — gooseberries, raspberries, black and red currants. Of conifers, there were Corsican pines, larches, and spruce. None of these trees, except three ashes and two wych-elms in my garden and a small batch of weather-beaten sycamores at the eastern end of the harbour, had been planted before 1880, and a good many including the conifers, only after 1900. The total acreage under trees hardly amounted to five.

The plantations described in G.U.C.E. have been extended by about twelve acres, in blocks of two four, and one three acre plantations and two half-acre windbreaks, all within half a mile of Canna harbour. Trees of which the numbers have been considerably increased are pine, larch, spruce, oak, wild cherry, alder, elder, hazels, and willows, cuttings of several kinds having been brought from the mainland and propagated here.

Trees which have been introduced are limes, birches, poplars (Black Italian and balsam), grey alder, domestic cherry, Antarctic beech, and whitebeams. Spanish broom has also been planted. The introduction of the first limes, birches, Black Italian poplars and domestic cherries goes back to 1942, but the bulk of this planting began here in 1949, and was stepped up after seagulls brought myxomatosis to the island in 1955 and reduced the rabbit menace to reasonable proportions, one result being the appearance of hazel in places where it had never been seen before. Willow herb has established itself in my garden and in one of the plantations.

Around the same time a formerly drained lochan on Sanday was revived by blocking the drainage channel, and once it filled water lilies and bull-rushes were introduced, and some spruces, pines, alders, gorse and willows were planted beside it, as well as two or three plants of bog-myrtle brought over from South Uist (this plant being entirely absent from Canna). This lochan is now a stronghold of dragon flies, which have

been identified as *Ischnura elegans*, V. der L., *Libellula quadrimaculata* L. and *Sympetrum striolatum* Charp. (Repton School Canna Expedition Report, 1961, p. 50).

Apart from these plant introductions, there has been some natural increase in the following. (1) Sycamore, self sown under existing earlier trees (and obviously destined to replace the original larch plantation described by G.U.C.E.); (2) Hawthorn, ash and elder similarly self-sown; (3) bramble, which is practically an evergreen here and is becoming a pest in the new plantations; (4) bluebells, (wild hyacinths) which have spread enormously since I came here in 1938. The ground covered by bracken on the other hand, does not seem to have increased much. It may be added that the number of wild flowers found on Canna approximates to that of the macro-lepidoptera (about 260).

Comparatively few lepidoptera are to be found on the parts of the island grazed by sheep. The places where most species occur are (1) my garden and the old and new plantations, (2) the western third of Sanday (crofters' common grazing, where sheep are not kept), (3) South facing cliffs or steep slopes above the sea on Sanday and near the west end of Canna which are also inaccessible to sheep. On Canna the ravine of Haligary river, beneath Compass hill at the east end of the island, which has been strongly fenced for about twelve years, and where willows, balsam poplars, and alders have been planted along the banks of the stream, has become the chief locality for butterflies here, as many as eight different species having been seen flying together (see the *Record* of 15/III/69, **81**: 68).

G.U.C.E. recorded eight species of butterflies and forty-two species of macro-moths on their expeditions of 1936 and 1937. I have been able to confirm all their records, the species that took longest to find being *X. galiata* (Galium Carpet) which is associated with south-facing cliffs and rocky places here and not very common. It is striking that out of the 42 macro-moths recorded by G.U.C.E. from Canna in their report published in 1939, only thirteen species have the same names in the 1961 edition of South's *Moths of the British Isles*. Of the remaining twenty-nine, nineteen are there given different generic names, three different specific names, and seven have both different generic and specific names. This turnover seems excessive by any reasonble standard; the purpose of a name, that it should permanently and unmistakably designate the object to which it refers, seems to be becoming forgotten in entomology. As it is impossible to keep consistent records of lepidoptera over an extended period of years for purposes of comparison, if the names and the order in which they occur are going to be subject to continual alteration, I have decided to keep in this article the order and nomenclature that were used in my previous articles in the *Scottish Naturalist* in 1938 and 1954, and in the *Entomologist* in 1946 (and to a considerable extent were used in H.H.1 and H.H.2), as otherwise comparisons between these different lists become unnecessarily difficult.

(To be continued)

Notes and Observations

LYCAENA ? DISPAR BATAVUS L. (LARGE COPPER) IN IRELAND.—Following the recent series of notes about this butterfly (*Ent. Rec.*, **81**: 305; **82**: 31, 89), the present incident may be of interest. While bird-watching at Malinmore, Co. Donegal, on 24th August 1968, I was amazed to see a butterfly which appeared to be a large copper. Unfortunately I am unfamiliar with this species, but the specimen (which rested briefly on a grass bank) was unlike any butterfly I have seen. It seemed to be in good condition. The weather was sunny with a slight westerly breeze.—ANTHONY IRWIN, Dept. of Zoology, Southampton University, Southampton SO9 5NH. 25.v.1970.

GONODONTIS BIDENTATA CLERK AB. NIGRA PROUT.—I am glad Mr Tomlinson retracted his neck in time! (*antea* 145). Ab. *nigra* Prout is not uncommon in south east and south west London and north west Kent, and doubtless it occurs throughout the Metropolitan area including the Essex side. I get several every year at Bexley, and also an intermediate form with the central area of the otherwise black forewings, dark brown. —D. O'KEEFE, 51 Parkhill Road, Bexley, Kent. 21.v.1970.

MELANIC VARIETY OF BISTON STRATARIA HUFN.—At the annual exhibition of the South London Entomological and Natural History Society on 26th October 1963, I showed a completely melanic male variety of *Biston strataria* Hufn. which was taken on 4th April 1963. This was recorded with figure in the Proceedings (*Proc. S. Lond. ent. nat. Hist. Soc.*, 1963: 40). I understand that this was the first time that this variety had been recorded in Great Britain and at the time Dr. H. B. D. Kettlewell suggested to me that further specimens might be expected to occur in the future. I am pleased to say that another male appeared in the same trap on 2nd May 1970.—L. W. SIGGS, Sungate, Football Green, Minstead, Lyndhurst, Hants. 5.v.1970.

EUCHLOE BELEMIA ESP. VISITS MALTA.—After a lapse of nine years I had another great surprise in taking another species new to the Maltese Islands; this time *Euchloe belemia* Esp.

On the morning of 5th April 1970, while collecting at Wied Is-Sewda, Attard, I came across two butterflies which I thought were *Pontia daplidice* L., as actually I went there for this particular butterfly, which is always to be found in this locality, when, however, I saw the underside of the hindwings, I saw at once that I had something unusual, something new! These two butterflies turned out to be *Euchloe belemia* Esper, a species of North Africa, the Canaries, the south of Spain and Portugal, Asia Minor and Syria.

I may recall that in this very place I took *Danaus chrysippus* var. *alcippus* Cramer on 10th April 1952, and *Polygonia egea* Cramer on 20th March 1948. This valley, which is in the centre of the island, is a favourite spot for migratory butterflies such as *Colias croceus* Fourch., *Vanessa cardui* L., *P. daplidice*, and not forgetting the Whites.—ANTHONY VALLETTA, F.R.E.S., 257 Msida Street, B'Kara, Malta, G.C. 10.v.1970.

AN ARGIOLUS YEAR?.—Stationed for four years (1958-62) in the Lake District, I searched for the Holly Blue, *Celastrina argiolus* (L), but saw only two, on 15th May 1960.

On my retirement to the western limb of Hertfordshire, I hoped to see more, knowing it to be frequent in the south and west. Holly and ivy were present in plenty, but it was awaited in vain for five years, until one flew past as I dug beside the holly hedge bordering my small garden, on 3rd May 1970.

A week later I had a fortnight in the Lake District and my first visit was to the spot where I had seen it ten years earlier. Before the car door was opened one flew past, and then others were seen. This was 12 May 1970, in the woods above Haverthwaite, and in the following three days more were seen there, at Spark Bridge, and at Satterthwaite (all in 10 Km. square 34/38), and at Broughton in Furness (34/28). At the latter place the species was well known until about 20 years ago, but had not been seen since.

Back in Hertfordshire in my garden (42/91) more individuals were seen on 2 and 3 June 1970. Decidedly an *argiolus* spring!—C. F. COWAN, Little Gaddesden House, Berkhamsted, Herts. 5.vi.1970.

PHTHORIMAEA OPERCULELLA (ZELLER) (LEP. TINEINA) REARED FROM A TOMATO. — A tomato, stated to have been imported from the Canary Islands, and which was bought at a supermarket in West Wickham, on February 17th, 1970, contained a Gelechiid larva that was feeding upon the flesh. It was rose pink, with anal and segmental areas greenish-brown; head dark brown, plate of 2nd segment black. The larva began to spin up at the beginning of March in the folds of Kleenex tissue lining the plastic container, and pupated on March 7th. On March 20th the moth emerged and in due course was determined by Dr. Klaus Sattler of the Dept. of Entomology, British Museum, as that of *Phthorimaea operculella* (Zeller). I wish to thank Dr. Sattler for kindly undertaking the determination, also my daughter Anita who first drew my attention to the larva.—J. M. CHALMERS-HUNT, St. Teresa, Hardcourts Close, West Wickham, Kent. 8.v.1970.

Current Literature

Wings in the Meadow, by **Jo Brewer.** xvii + 189 pp. 35/- (£1.75). Dent.

This book, which follows the life history of the Monarch butterfly may, at first glance seem anthropomorphic, and the reader, if bound to science, may wish to put it down, but I advise perseverence, for there is much matter provocative of thought in it. Some we may consider fallacious, but other matter is well worth personal thought. The book is delightfully illustrated with nature subjects from the United States (though unfortunately the artist is unnamed) which adds to its pleasing nature, and it makes pleasant reading for the entomologist who finds a moment for relaxation. Much technical material, explained in simple language, is to be found in the text, and will be welcomed by the amateur, who, though he may not care to admit it, is sometimes a little hazy about such things.

Putting aside the romantic aspect, this book makes a very good ecological study of the territory crossed by the migrating *Danaus*. The book

finishes with a glossary of scientific terms, and two maps illustrative of the routes taken. I have had the pleasure of hearing Mrs Brewer talk on the subject at the British Entomological and Natural History Society, and was impressed by her pains-taking study of the species.—S.N.A.J.

Natural History of the Lake District: Edited by **Canon G. A. K. Hervey** and **J. A. G. Barnes,** 230 pp. + 32 pl. (8 in colour) + 3 maps. Frederick Warne & Co. Ltd., £3.

This book was envisaged by the late Canon Hervey, and consists of a series of papers by various authors, each a specialist in the subject treated. After a general introduction by Canon Hervey the various sections follow. Section 1 by A. G. Lunn gives an interesting account, not only of the present Geological state of the area, but the probable history of its development during the past 500 million years. It is illustrated by diagrams and photographs, a geological and a general map, and in addition, a quarter inch Ordnance Survey map constitutes the inside cover papers.

In Section 2 Canon Hervey gives a detailed account of the life of the specialised vegetation of the district, mentioning many species of particular interest, many of them illustrated by drawings and coloured photographs. The plants are treated under headings grouping them according to their habitats from summits to the sea shore, and mention is made of a few plants which occur both on the summits and the sea shore. O. L. Gilbert follows with an account of the lichens, again divided between typical habitats; four species are illustrated. Juliet Frankland and T. Hering finish with a general account of the fungi.

Life in the water by T. T. Macan covers a wide range from flat worms to salmon and lesser fish, with a foreword explaining the various types of water, and describes the inhabitants by their various orders, with photographs of representatives of all these orders. Section 4, Invertibrates, is opened by a short account of the molluscs by Nora F. McMillan with drawings of the shells of three snails. Dr. Neville Birkett gives a good account of the insect fauna. In his preamble, he mentions the very large number of insect species reported from the Lake District to show the impossibility of dealing with them all, and tabulates the number of species in each order with the number recorded from the district, and the percentage of the total represented by that number. He then mentions several insects by habitat: mountains, moorlands, woodlands, raised bogs and mosses, salt marshes and sandhills, which are typical of their habitat, and concludes with a list of migrant lepidoptera divided into regular and occasional visitors. There is a good coloured plate of lepidoptera associated with the Lake District, and photographs of other orders. The section is completed by R. J. Parker with a note of the spiders and allied forms, which include spiders, harvestmen, and chelifers, adding that mites occur, but are too small and numerous to be treated here. The three orders treated are illusrated by typical drawings.

Section 5, the Vertibrates, commences with a note by T. T. Macan on the Amphibians and reptiles (which accounts for the absence of the former from the water life section); eleven species are mentioned. The

birds are treated by J. A. G. Barnes in sections again headed by the various types of locality. The author's "conclusions" points out that an account of such a deversified order must be selective, and deals in the main with species typical of the region. He mentions new arrivals and comments on the rise and fall of certain populations with suggestions as to the cause of these changes. There are coloured photographs of some local species, and the account closes with a list of scientific and vernacular names for the birds treated. The mammals are treated by P. Delap; he opens with a very interesting account of the rabbit from its introduction in Norman times. The selected species are dealt with under their own headings, and among those treated are the red squirrel, the otter and the pine marten. The various species of deer each has an account, and finally there is a list of 37 species recorded from the district.

Canon Hervey's epilogue brings the account to a close. There follows a short account of organisations in the district concerned with various aspects of its natural history, and three museums are mentioned. There is a bibliography citing 78 titles, and an index. The book is well printed on good paper and strongly bound in boards. It is an excellent piece of teamwork, the various authors having combined harmoniously to produce a book which must be of great interest to both naturalists and country lovers, if the latter can be truly separated from the former.—S.N.A.J.

Separates received from **Dr. L. A. Gozmany** include:—

Some Tineid Moths of the Ethopian Region in the Collections of the British Museum (Nat. Hist.) II. Acta Zoologica Academiae Scientiarium Hungaricae XIV 3-4: 301-334.

Five new genera, three sub-genera and 30 new species are set up in this interesting paper, with many text figures of their genitalia.

Three New Tineid Species (Lepidoptera) from Madagascar and Rhodesia. Acta Zool. Acad. Sci. Hungaricae XVI 1-2: 105-108.

Beside the three new species, eight species are mentioned, and the paper is illustrated with genitalia drawings.

Some Tineid Moths (Lepidoptera) from Madagascar. Acta Zool. Acad. Sci. Hungaricae XV 3-4: 287-297.

In this paper five new genera and seven new species are described, with the relative genitalia figures.

Scientific Results of Hungarian Zoological Expeditions to Tanganyika No. 13, Tineid Moths (Lepdoptera) collected by Dr. J. Szunyoghy in the Mt. Meru Area in 1965-66. Annales Historica-Naturales Musei Nationalis Hungarici **61**: 279-294.

This paper sets up one new genus and 13 new species with illustrative genitalia figures.

Tineid Moths from Ghana, West Africa II. Ann. Hist. Nat. Hungarici **61**: 295-299.

Sixteen species are mentioned, of which two are new, and in addition, a female still undetermined is mentioned, with genitalia figures.

Eine neau Tineide aus Afrika: Tinea roesleri. Ent. Zeitschrift, **79**: 70-72. The species is described and genitalia figured.

Die von E. Arenberger in Klein Asien gesammelten Symmociden (Lepidoptera). Zeits. Weiner Ent. Ges., **53:** 20-28.

This paper mentions nine species, of which three are new, with male and female genitalia figures.

Dr. Gozmany is to be congratulated on his continued hard work on these genera and on the number of new species which he has determined; long may he continue the good work.—S.N.A.J.

Life on a little-known Planet by **Howard Ensign Evans,** illustrated by **Arnold Chapman:** 318 pp. Andre Deutsch, 50/-.

This book is a very good example of the modern tendency to introduce a reasonable sense of humour into scientific fact, and this is not distorted by any thought of the anthrpomorphism which has so surely damned some other informal scientific publications. Of course, the little known planet is our own world seen from an entomological aspect and much matter of great interest is brought to the reader's notice.

Chapter I is headed The Universe seen from a suburban Porch, and the author's ruminations could well be given serious consideration by people in many different walks of life. The author has worked in a general anatomy of the insect, and also the main orders, for the benefit of non-entomological readers. Springtails are the subject of Chapter 2, and the cockroach is examined in Chapter 3 from, as the chapter heading states, the intellectual and emotional angle. Dragonflies occupy Chapter 4 and the Cricket has Chapter 5. Glow-worms and fire-flies are the subject of Chapter 6, while we look at butterflies in Chapter 7. The private life of several different members of the fly family have their place in Chapter 8. Bedbugs and their relatives in Chapter 9 (headed Bedbugs cone-nosed bugs and other cuddly animals) give an excellent example of the author's modus operandi; he commences with some light anecdotes and works on to some historical facts with a human touch, and finishes with a treatise on the elementary part of bio-chemistry and insect physiology, the whole being both interesting and readable.

Each chapter is a lecture in itself, and Chapter 13, Is Nature necessary? develops into a very human appreciation of the pros and cons of conservation today; how the desire of the intelligent man for really natural nature reserve conflicts with the many who think that they can invade an area in their hordes and still leave it unchanged and a place of beauty. He also discusses how the claims of a biotype of particular interest may be brought down by the professional "conservator" with a built-in drainage complex on the one hand or by housing and industry on the other. The whole gives a picture which is far from simple, and which leads one to fear that the days of nature are severely numbered, and if this is so, it is indeed a poor lookout for us.

Following the 13 chapters, there is a section headed Notes on Classification, a paragraph for each of the foregoing chapters, and a bibliography "for further reading" follows, the titles also grouped under the relative chapters. An index completes the work.

The author's human humour and his appreciation of living things makes me envy his students: let us hope that when they have grown out of their obsession with the destruction of our society and the raising of a better world out of the (sterile) ashes, they will fall back on his outlook on nature. Then the better world will be coming within their reach. The book makes good reading for entomologists and for many others beside who are concerned with Nature and its problems. The book is bound in cloth boards and is well printed on good paper. Try it and see!—S.N.A.J.

A Field Guide to the Butterflies of Africa by **John G. Williams,** 238 pp + 24 coloured plates: Collins, 45/-.

The author points out that more than 2400 species are known from Africa south of the Sahara, and the number is being added to yearly, so that it is necessary to make a selection, and he states that he has selected those species most likely to be of interest to visitors, adding that the more popular swallowtails and *charaxes* are given more treatment than the less popular skippers and browns. I have heard this selection criticised by an entomologist interested in the African butterflies, who says that too much space has been given to the *Charaxes* species, which, in spite of their popularity, are seldom seen by the casual visitor. However, be this as it may, the book will be most welcome to all interested in the African butterflies whether residents or visitors.

The preface sets out the rules of the game and warns against overcollecting, and also neglect of the specimens when taken. It also stresses the necessity for data labels and for the assurance of a final destination for the collected specimens in a suitable museum. The Introduction explains the physical characters of a butterfly, its life cycle, and general classification, giving text figures of species representing the main families. Collecting, setting and storing are also covered, and finally there is a glossary of some of the entomological terms used.

The main text describes the selected species with black and white text figures to supplement the coloured plates so well executed by the author. The plates are printed on both sides, with the explanation of the figures on the facing page; they illustrate 283 species, while 436 species are described in the text. Some of the text figures repeat material from the coloured plates, but these figures are useful in their place. The text is followed by a bibliography of some 34 titles, and an index.

The whole is well printed on very suitable paper, and is bound in strong cloth board. It is a book which should not come amiss to anyone interested in butterflies, and will be of particular interest to those likely to visit Africa, or who have African correspondents. As books go nowadays, the price is most reasonable, and within the reach of practically all likely to need it.—S.N.A.J.

etc.; foodplant unrecorded.

1. Dartford*; Shooters Hill (West, *Ent. Rec.*, **18**: 199). Bexley district (L. W. Newman, in *Wool. Surv.*, 1909). Woolwich*, 1939 (R. G. Rigden, in de Worms, *Lond. Nat.*, **1956**: 90).

5. Westerham (R. C. Edwards).

6. Cuxton (Chaney, *Roch. Nat.*, **1885**: 10). Eynsford, a few, August 1912 (S. F. P. Blyth); one, 1954 (B. K. West). Pinden (E. J. Hare).

6a. Cobham Wood (Chaney, *loc. cit.*).

7. Rochester-Maidstone Road (Chaney, *loc. cit*). Westwell (Scott, 1936); ♂, August 17, 1955 (P. Cue, *per* E. Scott). Walderslade, one, 1951 (G. A. N. Davis).

8. Recorded many times coastally from Deal to Folkestone. The only inland records are: Alkham, July 5, 1934 (J. H. B. Lowe). Stowting; Brook (C. A. W. Duffield). Wye. (Scott, 1936). Betteshangar Park, two, June 11, 1951 (W. D. Bowden).

9. Margate (Spiller, *Entomologist*, **46**: 318); a few on fences and disturbed from bushes, June 29-August 19, 1915, May 20, 1920, one, September 10, 1923 (H. G. Gomm, *Diary*); (H. C. Huggins). Ramsgate (Schooling, *Proc. Nonpareil ent. nat. Hist. Soc.*, March 4, 1897, *per Entomologist*, **30**: 153).

13. Tunbridge Wells, 1891 (Beeching, *Ent. Rec.*, 2: 229). Tunbridge Wells* (Knipe, 1916).

15. Dungeness, June 13, 1931, June 25, August 13, 1932, May 24, 1933 (G. V. Bull, *Diary*); June 11, 1932 (J. H. B. Lowe); (E. J. Hare); two, June 14, 1955 (G. A. N. Davis); three, 1957 (P. Cue); a few, August 18-19, 1958 (E. C. Pelham-Clinton); 1959 (A. L. Goodson); thirty-two, June 8-July 13, with max. ten on June 30, six, August 8-30, 1962, all in m.v. trap (R. E. Scott); 1967 (de Worms, *Entomologist*, **101**: 117).

16. Folkestone*, larvae and imagines (Meek, *Ent. mon. Mag.*, **1**: 190). Folkestone Town, three (A. M. Morley).

First Record, 1831: Near Dover, one, 1818, abundant June 1819 (Stephens, *Haust.*, 3: 223).

[**Costaconvexa polygrammata** Borkhausen: Many Lined.

Questionably Kentish.

I rather doubt the following record. The moth, which is now extinct and closely resembles in appearance *Orthonama vittata* Borkhausen, was apparently restricted to the Cambridgeshire fens. Moreover, the figures of each in Newman's *Natural History of British Moths*—the popular work at the time—are transposed, which must have added greatly to the confusion.

"Mr Webb states that a specimen was taken at the Mill Pond at Dartford, in 1874" (H. Goss, in *V.C.H.*, 1908).]

Camptogramma bilineata L.: Yellow Shell.

Native. Hedgerows, gardens, bushy places, waste ground, etc.; on "chickweed". In all divisions. "Generally abundant" (*V.C.H.*, 1908).

The moth is in one generation, from about the third week of June to well into August, but has been recorded exceptionally as follows: May 25, 1893, at Lee (Fenn, *Diary*); May 27, 1912, at Chevening (Gillett, *Diary*); September 13, 1935, at Sidcup (A. R. Kidner); and September 21, 1963, at

Bromley (D. R. M. Long). It is seldom observed at light, but occasionally comes to sugar and more often to the blossoms of *Kentranthus*, buddleia, etc.

Kidner (*Diary*) records the larva as fairly plentiful in his garden at Sidcup in February and March 1920, and several there from February 16, 1936, but gives no indication of the foodplant. D. R. M. Long, however, records finding the larva at Bromley on chickweed.

VARIATION.—Hawkins (*Entomologist*, **58**: 59-60, fig.) described ab. *virgata* Hawkins on the basis of a ♀ that he took at Herne Bay, July 22, 1923.

In RCK are the following named abs.: *margaritata* Kautz, Lewisham, 1891, Westwell, 1909; *infuscata* Gumppenberg, Margate, 1907, 1908, Westwell, 1908(2), Lewisham, 1896, Herne Bay, 1908, Bexley, 1915, Shoreham, 1909, Dover, 1881, Folkestone, 1901, North Kent, 1920; *fuscofasciata* Meves, Frindsbury, 1884, Lewisham, 1894, Sidcup, 1911, Margate, 1908; *bubaceki* Kautz, Folkestone, 1896, Dover, 1889, S. Webb, one (figured Barrett, *Lep. Br. Is.*, **8**: plt. 364, fig. 2b); *stygiata* Kautz, North Kent, 1920(2), Folkestone, 1908; *brunneata* Kautz, Westcombe Park, 1893; *flavobrunnea* Lempke, Folkestone, 1906. Also, a *somatic mosaic*, "D. Watson/Southfleet/24.7.1928".

FIRST RECORD, 1861: Burnt Ash Lane, Lee, in considerable abundance, June 1861 (C. & J. Fenn, *Diary*).

[(*Entephria flavicinctata* Hübner: Yellow-ringed Carpet.

Recorded erroneously (in *Ent. Gaz.*, **10**: 12) as having occurred severally at Dover in 1943 and 1944)].

Larentia clavaria Haworth: Mallow Moth.

Native. Waste places, marshes, waysides, gardens; on *Malva sylvestris*, [*M. rotundiflora*], *Althaea officinalis*, hollyhock. Frequent and found in all divisions.

The larva has mostly been found on *M. sylvestris*. Thus, Knaggs (1870) noted it as abundant on this on the Lower Sandgate Road, Folkestone; and I found it plentifully on this in waste places bordering saltmarshes at Stoke and elsewhere in div. 2; also, upon a dwarf form of *Malva* at Dungeness, that I suspect is *M. rotundiflora* (C.-H.). The larva has also occurred on hollyhock, at Farnborough (W. Barnes, in *Wool, Surv.*, 1909), and in gardens at Ashford (P. Cue, *teste* E. Scott); and on *A. officinalis* on Romney Marsh (Edwards & Wakely, *Ent. Rec.*, **70**: 94).

VARIATION.—In RCK are: ab. *edentata* Schwing., "Wye/*l[arva] 7.9.06/L. B. Prout" (1); an ab. with "reddish ground", "Wye/*l[arva] 27.9.06/L. B. Prout" (1).

FIRST RECORD, 1831: Darenth Wood (Stephens, *Haus.*, **3**: 211).

Anticlea badiata Denis & Schiffermuller: Shoulder-stripe.

Native. Bushy-places, hedgerows, woods; on dog rose. In all divisions. "Generally common" (*V.C.H.*, 1908).

The insect is normally out from the beginning of April, but in 1868 was noted in Sheppey as early as March 7 (J. J. Walker, MS.), and in 1911 at Ramsgate as late as May 22 (J. W. C. Hunt).

A. R. Kidner (*Diary*) records finding the larva as follows: Farningham, June 9 (4), July 10 (1), 1926, July 21, 1929; Eynsford Downs, June 15, 1930 (young larvae fairly numerous). D. R. M. Long has had the larva on dog

rose at Lullingstone; and it has also been taken on this at Farnborough (Chatelain *et al.*, *Ent. Rec.*, **81**: 109); and by me at Farningham Wood, on June 8, 1969 (C.-H.).

VARIATION.—In RCK is ab. *impuncta* Lempke, one, "Lewisham Bred 1387".

FIRST RECORD, 1861: Lewisham, April 5, 1861 (C. Cortissos *teste* Fenn, *Diary*).

A. derivata Denis & Schiffermuller: **nigrofasciaria** Goeze: Streamer.

Native. Woods, bushy places, etc.; on rose.

1. Lewisham-Lee neighbourhood, 1845 (Stainton, *Zoologist*, 1089); April 29, May 1861, two, May 19, 1862 (Fenn., *Diary;* idem, *Ent. Rec.*, **6**: 230); one, 1868, one, 1904 (R. Adkin, in *Wool. Surv.*, 1909). Beckenham, 1863 (Leigh, *Week. Ent.*, **2**: 118). Dartford Heath (Jenner, *Week. Ent.*, **2**: 197). Eltham, occasionally on palings (A. H. Jones in Buckell & Prout, *Trans. Cy. Lond. ent. nat. Hist. Soc.*, **1900**: 72). Eden Park, one (L. B. Prout in Buckell & Prout, *loc. cit.*). Plumstead (West, *Ent. Rec.*, **18**: 199). Farnborough; Keston (W. Barnes in *Wool. Surv.*, 1909). Hayes district, 1899 (Carr, *Entomologist*, **33**: 47). Bexley, one, 1898 (Carr, *Entomologist*, **32**, 40). Keston, one, June 1, 1901, in E. Nottle coll. (C.-H.). Bromley (*V.C.H.*, 1908). Dartford (*V.C.H.*, 1908); fairly common (B. K. West). West Wickham (R. F. Birchenough in de Worms, *Lond. Nat.*, **1956**: 97); one, 1958 (C.-H.). Petts Wood, one, 1938, in A. M. & F. A. Swain coll. (C.-H.). Keston, one, May 3, 1964 (R. G. Chatelain).

2. Faversham (H. C. Huggins).

3. Perry Wood (A. J. L. Bowes). Broad Oak, one, May 14, 1938 (C.-H.). Oldridge Wood, larvae beaten from rose, c. 1946 (J. A. Parry). Herne Bay, ♀, May 18, 1947 (D. G. Marsh).

5. Chevening, eleven, April 23-May 16, 1912; May 4, 1913; April 29, 1914 (Gillett, *Diary*). Westerham (R. C. Edwards). Near Cudham, three in a lane, May 3, 1933 (T. G. Edwards, *Diary*).

6. Greenhithe (Farn MS.). Gravesend, May 10, 1911 (F. T. Grant). Otford, June 19, 1915 (Adkin, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1915-16**: 99). Eynsford, larva, June 15, 1930; several larvae, June 1931; several young larvae, May 21, 1934; two larvae, June 19, 1938, Farningham*, larva, July 2, 1929 (A. R. Kidner). Fawkham (E. J. Hare).

6a. Darenth Wood (Stephens, *Haust.*, 3: 238); (H. C. Huggins). Chattenden; Mark Oak Wood* (Chaney, 1884-87). Chattenden, May 16, 1919 (F. T. Grant). Higham* (Porritt, *Entomologist*, **13**: 163).

7. Near Rainham (Chaney, *loc. cit.*). Sittingbourne (H. C. Huggins). Westwell (Scott, 1936). Broad Street, one, at light, April 30, 1955 (E. Philp).

8. Folkestone*, at sallow bloom (Knaggs, 1870). Stowting; Brook; Wye* (C. A. W. Duffield). Elham (W. E. Busbridge). Dover, one, May 12, 1945; April 15, 1949 (B. O. C. Gardiner). Ewell Minnis; Waldershare (E. & Y., 1949). Folkestone Warren, one, April 22, 1939 (C.-H.); one, June 10, 1962 (C.-H., *Proc. S. Lond. ent. nat. Hist. Soc.*, **1962**: 92). Poulton, ♀, May 24, 1903; May 19, 1932 (Stockwell, *Diary*).

10. Sevenoaks* (Hill, *Entomologist*, **19**: 185); (W. E. Busbridge). Brasted Chart, May 3, 1913 (Gillett, *Diary*).

11. Tonbridge (Raynor, *Entomologist*, **6**: 79). Wateringbury (E. Goodwin MS); (*V.C.H.*, 1908). Edenbridge, 1934 (F. D. Greenwood). Ryarsh*, c. 1930 (J. Fremlin). Shipbourne, in P. A. and D. J. A. Buxton coll. (C.-H). Aylesford, one, 1951, one, 1953 (G. A. N. Davis). Sevenoaks Weald, one, May 5, 1959, four, May 7-16, 1960 (E. A. Sadler).

12. Ashford (Scott, 1936). Ham Street (Scott, 1936); one, April 15, 1949, one, May 12, 1951 (C.-H.). Willesborough, one, May 12, 1951 (W. L. Rudland); one, 1960 (M. Singleton). West Ashford, two, 1960 (M. Enfield).

13. Tunbridge Wells (E. D. Morgan). Iden Green, 1951 (H. Boxall). Goudhurst, one, 1955 (W. V. D. Bolt). Ashour Wood, ♂, worn, May 6, 1964 (C.-H).

14. Sandhurst (G. V. Bull). Hawkhurst, 1951 (B. G. Chatfield).

16. Folkestone, one, May 6, 1945, two, 1954 (A. M. Morley).

VARIATION.—In RCK is an ab. of "chestnut tint", "Folkestone/Bred 4.1891" (6).

FIRST RECORD, 1831: Stephens, *loc. cit.*

Mesoleuca albicillata L.: Beautiful Carpet.

Native. Woods, copses; [on bramble, raspberry].

1. Near Woolwich (J[ones], *Ent. week. Int.*, **10**: 187). Since noted in many woods in this division. Recently from: Petts Wood, 2-3 annually, 1947-50 (E. Evans); 1950 (A. M. & F. A. Swain). Joydens Wood; West Wickham (de Worms, *Lond. Nat.*, **1956**: 93). Abbey Wood, 1950, 1952 (A. J. Showler). Joydens Wood, ♂, July 17, 1967 (D. O'Keeffe). Orpington, three (R. G. Chatelain).

3. Den Grove, one 1936, one, 1938 (C.-H).

5. Farnborough* (W. Barnes in *Wool. Surv.*, 1909). Westerham (R. C. Edwards).

6. Greenhithe (Farn MS.). Gravesend; Clay Lane Wood; Birling (H. C. Huggins). Upper Halling (Hards & Gould, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1956**: 79). Trottiscliffe, ♀, June, 10, 1968 (D. O'Keefe).

6a. Darenth Wood (see *First Record*); August 1872 (Etheridge, *Entomologist*, **6**: 196); 1891 (Buckell, *Ent. Rec.*, **2**: 234); 1903 (A. R. Kidner); on tree trunk, 1911; 1912; 1925 (F. T. Grant); fairly common (B. K. West); (E. J. Hare). Chattenden (Chaney, 1884-87); (H. C. Huggins). Mark Oak Wood* (Chaney, *loc. cit.*). Cobham, 1912 (F. T. Grant).

7. Wigmore Wood (Chaney, *loc. cit.*). Westwell (Scott, 1936). Whitehill (Scott, 1950). Boxley (A. H. Harbottle).

8. Raindean Wood (Salwey, *Entomologist*, **15**: 197). Folkestone* (Ullyett, 1880). Elham Park Wood, one, June 18, 1925, one, July 5, 1926, two, July 16, 1927; Haddling Wood, one, July 16, 1932 (W. E. Busbridge, *Diary*). Ewell Minnis; Little Mongham; Whitfield (E. & Y., 1949). Brook*; Wye* (Scott, 1950).

10. Westerham (Gorhom, *Ent. week. Int.*, **7**: 28); one, c. 1957 (C.-H.). Brasted (R. M. Prideaux). Dunton Green, one, 1908 (Kidner, *Diary*). Solefields Wood, 1919 (Gillett, *Diary*). Sevenoaks, one in garden, July 5, 1941 (Busbridge, *Diary*). Knole Park, one, July 22, 1956 (A. A. Allen).

11. Harrietsham (Stephens, *Entomologist*, **1**: 200). Wateringbury

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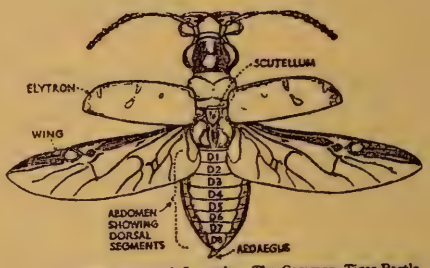

FIG. 2.—*Cicindela campestris* L., male. The Common Tiger Beetle. (Adapted after Gangibauer.)

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Bliddah
Algeria
May. 1904
M.R.P.
Figuré par R. Verity
Rhopal. Palaearctica
1


2


3


Figuré par R. Verity
Rhopal. Palaearctica
4


5


6


7


Bliddah
Algeria
May. 1904
M.R.P.
Figuré par R. Verity
Rhopal. Palaearctica
8


9

On Three North African Species of *Pieris*

P. maura Vty., *P. atlantica* Rothsch., *P. segonzaci* Le Cerf

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

Most collectors of European butterflies know that several "whites" referred to as "*P. napi*" exist in North Africa; they are said to be local and rare and have been given a number of names. That they are distinctly characterized is testified to by the fact that anyone lucky enough to get a few most often has described them as something new and given them a new name, contrasting them with *P. napi* but seldom making much effort to establish how they differ from other local forms. The first real attempt to do so was a paper by the late E. Holl (1914), who as it happens was the only writer who seems to have had an adequate material to work on, but unfortunately he failed to realize the very remarkable nature of the race he was most concerned with. Bernardi (1947), did much to explain Verity's work and established the correct use of the name *maura* Vty. But he was less successful with some other names, having, perhaps, not seen specimens from many localities. He recognized that there are only two species in Algeria, but the signficance of this fact has been largely overlooked by later writers. In all there are three distinct species of this group in North Africa which are easily separable; but oversights and accidents, and of course the determination of many collectors that all forms with green or brown outlining on the neuration of the underside of the hindwings must be "*napi*", have obscured a general appreciation of the existence of these three species. One occurs at various altitudes in Algeria and Morocco; one at various altitudes in Algeria and also in Portugal, where it spreads over most of the country; and one confined to the High Atlas Mountains.

It will be necessary to deal with each in some detail for a variety of names have been used for them, frequently applied in differing senses.

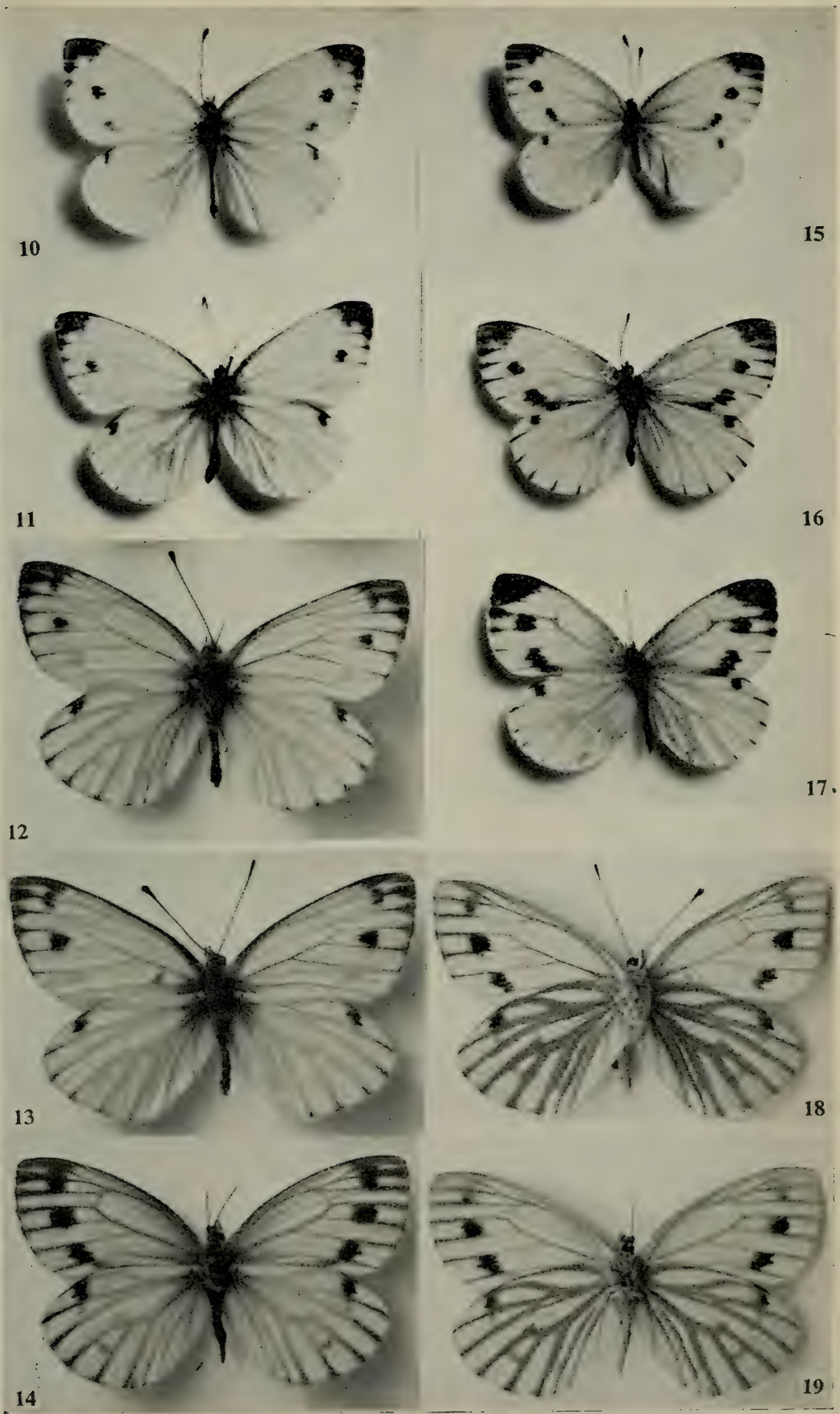
P. maura Verity (1911). (=*blidana* Holl, 1914). Bernardi had demonstrated (1947), that the types of *maura* Vty. were the specimens taken at

EXPLANATION OF PLATE XI

1. *Pieris atlantica* Rths., male, spring generation, Blidah, Algeria, May 1904, M. E. Fountaine. Figured in error as "*P. maura*" by Verity, *Rho. Pal.*, pl. 59, fig. 18.
2. *Pieris atlantica* Rths., female, spring generation, Tenièt-el-Haád, Algeria, May 1904, M. E. Fountaine.
3. *Pieris atlantica* Rths., female, underside, spring generation, Tenièt-el-Haád, Algeria, May 1904, M. E. Fountaine.
4. *Pieris maura* Verity, female, Holotype, spring generation, Blidah, Algeria, May 1904, M. E. Fountaine. Figured by Verity, *Rho. Pal.*, pl. 59, fig. 19.
5. *Pieris atlantica* Rths., male, summer form (monogenerational), Timhadit, Middle Atlas, Morocco, Powell, "eté" 1924.
6. *Pieris atlantica* Rths., female, summer form (monogenerational), Timhadit, Middle Atlas, Morocco, Powell, "eté" 1924.
7. *Pieris atlantica* Rths., female, summer form (monogenerational), Azrou, Middle Atlas, Morocco, Powell "eté" 1924.
8. *Pieris maura* Verity, male, Allotype, underside, spring generation, Blidah, Algeria, May 1904, M. E. Fountaine. Figured by Verity, *Rho. Pal.*, pl. 59, fig. 20.
9. *Pieris maura* Verity, female summer generation (June), Ucanha, Portugal.

Blida by Miss Fountaine in 1904, but Verity also included the specimens she captured at Tenièt-el-Haád that year under the name, as indeed Bernardi himself seems to have done. Holl had figured (1914, plate C, figs. 5 and 6), two specimens from La Tarf, Algeria, as "1st generation of *maura* Vty." Holl's work contained much information that has been of great use, but it was more than questionable if the two specimens from La Tarf which he figured, were the same species as those of Miss Fountaine's that Verity had figured. It was therefore necessary to see Miss Fountaine's specimens, and strange to say it took me over a year to locate Miss Fountaine's collection. After many fruitless enquiries I was told that it was in the Castle Museum of Norwich. Thanks to Mr. McWilliams, the Keeper of Natural History in that Museum, in a few days I received the much-discussed specimens: one female and 2 males from Blidah (I use the spelling of all place names as given by the various authors, they sometimes differ from the present use), and 2 females from Tenièt-el-Haád, Algeria, all spring specimens. It was at once apparent that mistakes or accidents had confused matters about these specimens from the start. The 3 Blidah examples each had two labels. One of Miss Fountaine's and one put on by Verity. On the latter was printed "Figurè par R. Verity, Rhopal. Palaearctica" below which was written "*napi* type of race *algirica* Vty.", in Verity's hand-writing. The specimens and labels are shown on our plate, figures 1, 4 and 8. Having corresponded with Verity for many years and being familiar with his writing on small labels of microscope slides, I can say for certain it is his own writing. As soon as he had had the specimen figured for his work he attached the label before returning it. It is certain he intended to name the race "*algirica*", but when he published the book he changed it to "*maura*", for there is no doubt it was these three specimens he figured as his "types" of *maura*. As I knew Verity sometimes described a name of a species casually in an article dealing with species of some other genus I examined scores of his separates on butterflies and of course the Rhopal, Palaearctica but he never seems to have described a race "*algirica*" of *P. napi*. These specimens of Miss Fountaine's therefore remain his "types" of *P. maura*. But another point remains to be explained. Miss Fountaine's 2 males labelled "Blidah", (the 2 Verity figured) are not both the same species! To which does the name "*maura*" belong? Fortunately there was an obvious answer. Verity had figured only one female as "*maura*", and some years later (*Ent. Rec.*, 1922, p. 133), he states that the female figured on Pl. LIX in his Rho. Pal is the "type" of his *maura*. That figure is taken from the specimen shown on our plate fig. 4, which in consequence I take as the Holotype of *P. maura*. Further, that particular female of Miss Fountaine's was the only female she got at Blidah, so there can be no doubt as to its identity. It follows that the male that agrees with the female must be *maura* also. The other male (figure 1 on our plate), actually is *P. atlantica* Rothsch., and it agrees exactly with the figure of Holl's (Holl pl. C, fig. 5) from La Tarf. That specimen and our figure 1, are both of the spring generation type of markings, so give us the long sought first generation of *atlantis* Obth. of Morroco (this will be dealt with further on).

We are now faced with another very important question. Do both *P. atlantica* and *P. maura* fly together at Blidah, or was there a mistake in the labelling? It must be noted that Miss Fountaine spent a week at Blidah preceding 19th May 1904. She then went to Tenièt-el-Haád, but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there are no males from that locality in her collection, only 2 females (figures 2 and 3 on our plate). These two are also undoubtedly of the spring generation of *atalantica*. I made further enquiries of Mr McWilliams and he informed me there are 5 males in Miss Fountaine's collection, all from Blidah, but no male from Tenièt-el-haád. It seems probable that as Miss Fountaine was particular about both condition and labelling of her captures, having taken, as she thought, 5 males and one female of *P. napi* at Blidah, on going to Tenièt-el-Haád she looked for more females but did not trouble further about the males which may have been past their best. This made me wonder about Holl's material from Blida so I made a further study of his work, which is quite the most detailed paper we have on *P. maura*. He had 30 specimens taken by himself at Blida between the 15th and 25th of June; a few from Tala Rana taken in July by his son, and 60 taken in September at Blida, also by his son. In his work he gave the already mentioned plate (1914, pl. C), showing 14 specimens from Blida and 2 from La Tarf (the latter figures 5 and 6), which he said were "*maura* Vty.", and figures 1, male underside; 2 and 8, male upperside; and 7, female upperside; all from Blida which he described as "*napi maura* Vty. gen. aest. *napaeae* Esp., forma *blidana* nova." The remaining figures on the plate he held to be a 3rd generation from Blida, taken by his son.

Now there are several mistakes in all this. Briefly, the figures 5 and 6, from La Tarf are not, as we have already noted, the 1st generation of *maura* (which Holl took as the 1st generation of his *blidana*), but the 1st generation of the species that has long been known as "*atlantis*" Obth. in Morocco. This insect has only one generation in Morocco which is of the summer generation form, such as is usually known as the "2nd generation". As Holl thought the La Tarf insects were the 1st generation of his *blidana*, he selected from his 100 specimens the largest June specimens from Blida as the "2nd generation" of *blidana*, and figured four (l.c.pl.C, figures 1, 2, and 8, male, and 7, female). He also described these specimens quite exactly and refers to the figure 7, as "*napaeae-blidana*" (l.c.p.38); which is the nearest he got to marking a type. It is most unfortunate that all the specimens on his plate are reduced to 5/6 the natural size, which obscures the fact that all summer specimens of *maura* are relatively small, some exceedingly so, though occasionally slightly larger specimens occur. The known reduction of the plate has caused this fact to be lost sight of. Holl took the very small September specimens as a 3rd generation of *blidana* which though he described he did not name. Thus readers have in general ignored the small size of all summer *maura*, accepting it as just the reduction of Holl's plate. The characteristic development and emergence of this insect in summer are points of importance, they will be described later in this paper. Holl was therefore intending to name the 2nd generation of *maura* as "*blidana*", not realising that the fine, large Blida specimens he was illustrating and describing were the true spring generation (i.e. the 1st), which flies from March to June at Blida (and probably earlier). All the late-June, July, August and September specimens are of the 2nd generation (or summer), type. Further it is certain that all these summer generations overlap in North Africa, as they will be shown to do in Portugal, and are indistinguishable. So in actual fact Holl described the fine 1st generation from Blida as 2nd generation "*blidana*", the same insects Verity had named

"*maura*" in 1911.

I was still considering these facts when I chanced to get in touch with Mr Fernando Carvalho of Lisbon, who obtained a series of "*P. napi*" from Portugal for me from Mrs Silva Cruz of Oporto. I am very greatly indebted to both for all the trouble they took for me in the matter. Mrs Cruz's series of specimens came from a wide range of localities and were taken between June and September. She also sent me very valuable data derived from over 100 specimens in her own collection, taken between February and November; while Mr Carvalho also supplied me with extracts from a paper by Mrs Cruz (1943). All this material was of the greatest assistance to me in understanding the somewhat complicated data I had already amassed concerning the North African species. Comparison of the Portuguese specimens and data with Holl's work and plate soon convinced me that both dealt with the same species, i.e. *P. maura*. In Portugal the 1st generation (that emerging from over-wintering pupae), flies at any time between late February and mid-May; during the following months it is practically continuously-brooded from June to November, and the specimens mostly much reduced in size, some to a very remarkable extent. (See figures 9, 10, 11, 15, 16 and 17, on our plates and contrast them with figures 4 and 8 of the spring generation). All this corresponds exactly with Holl's Algerian specimens and data. Throughout the summer occasional larger specimens appear and there is much minor variation in size. The markings of both sexes, upper and underside, also correspond very nearly in both the Algerian and Portuguese insects. That both are *P. maura* there can be little doubt, indeed it mostly would not be possible to separate them without labels. I have not as yet seen records of *P. maura* in October or November in North Africa, but this is probably because collectors have not looked for them in these months.

Examination of the androconial scales gave very unexpected results. The normal androconial scale of *maura* of all generations from Portugal or Africa is of a typical *P. napi* type, the majority could not be separated from that species, though when seen in numbers it appears that the *maura* type is slightly shorter. There is no indication whatsoever that *maura* is of hybrid origin, but a very strange fact remains. I have often emphasised that the large, primitive type of scale so characteristic of the

EXPLANATION OF PLATE XII

10. *Pieris maura* Verity, male, with two discoidal spots forewing, summer generation (June), Serra da Arestal, Portugal.
11. *Pieris maura* Verity, male, summer generation (September), Abrantes, Portugal.
12. *Pieris segonzaci* Le Cerf, male, monogenerational, High Atlas, Morocco.
13. *Pieris segonzaci* Le Cerf, male, monogenerational, High Atlas, Morocco.
14. *Pieris segonzaci* Le Cerf, female, monogenerational, High Atlas, Morocco.
15. *Pieris maura* Verity, female, summer generation (August), Serra da Estrela, Portugal.
16. *Pieris maura* Verity, female, summer generation (August), Serra da Estrela, Portugal.
17. *Pieris maura* Verity, female, summer generation (June), Ucanha, Portugal.
18. *Pieris segonzaci* Le Cerf, male, underside of fig. 13.
19. *Pieris segonzaci* Le Cerf, female, underside of fig. 14.

All exactly natural size *Photos. by E. J. M. Warren.*

bryoniae and *melete* groups of *Pieris*, does not exist in *P. napi*, but it occurs in *P. maura* in typical and modified forms. When describing the Scottish form *thomsoni* of *P. adalwinda* I noted that in it this primitive type of scale occurred occasionally (Warren 1968). That *napi* has evolved from a *thomsoni*-like ancestor is more or less certain. I am encouraged in saying this by the knowledge that Mr Bowden, judging from his breeding researches, agrees with me that *thomsoni* has considerable affinity with *P. adalwinda* (Bowden *in litt.*). If pure *napi* has lost this type of scale one can scarcely suppose that after ages during which the species spread over Central and Southern Europe, on attaining North Africa it reproduced this long lost relique of primeval times. Further, a high-level race of *P. napi* which has crossed the Pyrenees into Spain is still without this scale. I owe specimens of this race to Herr Hesselbarth of Quakenbrück who collected them near Ordesa in Huesca at something over 3,900 feet altitude. It also occurs further east in the Catalonian Pyrenees. It is, therefore, scarcely possible to accept *P. maura* as a form of *P. napi*, even though the primitive scale may not appear in every specimen of *maura*. One must remember that even in *P. bryoniae* one finds specimens in which it seems to be wanting, but with such a scale that is always a rarity in comparison with the numbers of the ordinary scale that are present, it may often be that one simply has failed to find it. There remain, however, still further facts that isolate *maura* as a very distinct species. Throughout the Palaearctic Region the species of *Pieris* of all groups, follow a constant order in the seasonal development of their annual cycle.

The generation emerging from overwintering pupae is small in size, compared with those generations that follow it. Everyone knows that the normal spring *P. napi* is always somewhat smaller than the summer generations, the latter are often very much larger. As an example in the *rapae*-group that collectors of continental butterflies will be familiar with one can mention *P. manni*, its small, frail, spring generation in April and the robust and large second generation in June followed by an equally large form in August. In the *melete*-group in Asia the difference can be so great between the small, early generation and the great second generation in *P. ajaka*, that they have been held to be different species. It is not necessary to give further examples, every observant collector will be familiar with such. But turning to *P. maura* we find the established annual, generational cycle of seasonal development completely reversed. The early generation from overwintering pupae is finely developed, as large as many summer generation of *P. napi*, followed by a number of overlapping generations, the individuals of which are greatly reduced in size: compare figures 4 and 8 (first gen.), and figures 9, 10, 11, 15, 16 and 17 (summer gens.), on our plates. My figures of the summer generations are all Portuguese specimens, the spring ones are Algerian. But Holl's plate (1914), shows the characteristics of the summer generations are identical in Algerian specimens. The reduction in size of the figures on Holl's plate has obscured the fact that the normal, annual cycle of development in *Pieris* is reversed in *P. maura*, it was assumed that the specimens were of normal proportions. When I first noticed the existence of this reversal in *P. maura* I thought it might be in some way the outcome of Algerian ecological conditions, but the realisation that it is the normal cycle of development throughout Portugal also, even to the extreme north of that

country, proves it to be a constitutional phenomenon. This fact, as well as the presence of the primitive *bryoniae*-type scale together with an advanced type of androconial scale of another species, points to *maura* as being derived from some Asiatic ancestor and isolated from the other European species. It may well be a survivor of some extinct strain of *Pieris* and of greater antiquity than the other European species with which we are familiar.

There is a certain resemblance in the summer generations of *maura* to × *P. dubiosa,* but of course none in the spring generation. I therefore think it was *P. maura* that Querci sent out as "*dubiosa*" in past years to his customers. Many of the *maura* I have seen actually came from localities in Portugal where Querci obtained his specimens; but we must remember that Querci had probably never seen the spring generation; and of course he had no knowledge of the scales. I have not yet seen a specimen of × *P. dubiosa* from Portugal.

There is yet one more characteristic that emphasises the specialised nature of *P. maura;* this is to be seen in the neurational markings of the underside of the hindwings. In the true spring generation these are sharp but narrow, without any tendency to spread on each side of the nervures (see figure 8, on our plate), this is more as in the *melete*-group species than in *napi* etc. In the summer forms of *maura* these markings get darker and heavier over the basal half of the hindwing while often disappearing completely over the outer area. Holl's plate showed examples of such underside markings. In some specimens in the late season (September or October), these markings can be heavy and dark over the entire length of the nervures as in some first gen., *P. bryoniae neobryoniae.* Altogether there is much variation throughout the year in *P. maura* on the underside, actually one can find a mixture of the spring markings of *melete* and the summer forms of *napi* in a single specimen; suggestive of a form that might have existed before these two groups had developed individuality, which again points to *maura* being a race of considerable antiquity, as we have been led to think by the development of the androconial scales. Müller also held this view (1939, pp. 75 and 113), stating "*blidana*" was one of a group of preglacial north-west African forms one of which might have advanced into Portugal. He gives no further data merely citing "var. *lusitanica* Sousa" in Portugal.

Bernardi (1947), accepted Holl's *blidana* as the summer generation at Blida, but we know Holl's "second gen." of Blida was the form captured by Miss Fountaine in May; i.e. the true 1st gen. already named by Verity, so *blidana* was a synonym of *maura.* Still one cannot feel it was necessary to give the true 2nd gen. a name, as it would be impossible in some cases to say if a given specimen was of the 2nd or 3rd gen. (or even of the 3rd or 4th generation).

The name "*lusitanica*" de Sousa (1929), can only be regarded as a nomen nudum, for it is only casually mentioned in an unintelligible description of a new aberration in which some spot of the forewings is said to be rounded not "comma-shaped" as in the "typical species", the latter referred to as "fig. 2b". The figure consists of two separated forewings indistinctly marked, not corresponding with the description. No locality is given but as the note refers to "Portuguese Lepidoptera" one can only assume the specimens are some form of *P. maura.* I am indebted to Mr. Carvalho for a photo copy of de Sousa's article.

We now come to *P. atlantica* Rothschild.

Synonymy: *P. napi atlantica* Rothsch. 1917; Bollow 1930 (correctly separated from *blidana* Holl); *P. napi blidana* Holl (in part), 1914; *P. napi blidana* Bernhardi, 1947; *P. napi atlantis* Obth. 1925; Zerny 1935; *P. napi mauretaniae* Rothsch. 1925.

(Note: the name *mauretaniae* applies to the spring generation of *P. atlantica,* but as both names have been used in various senses it is less confusing simply to refer to "1st generation" *atlantica*).

Rothschild attached the name "*atlantica*" to the summer generation from Blida, taken in June. There have been so many conflicting statements about this name it is best to give Rothschild's original description; noting that he of course did not know that two species existed at Blida, any more than did those others who have written about the species since.

"*Pieris napi atlantica* sub. spec. nov. The form found at Blida les Glacières and in the Kabylie is very distinct. It differs from European specimens by being very white above, as the veins are not marked with black or grey and the black spots on the forewings are very much larger, and below there is hardly any trace of the green on and around the nervures of the hindwing. We ourselves have only taken it at Blida les Glacières, but Dr Nissen has taken it in the Kabylie, and I have one said to have been taken by Faroult in Tunis. My single Moroccan specimen has more pointed forewings and is more yellowish above, but I cannot judge from one specimen. Mr. Gibbs records *napi atlantica* also from Blida. We have of this 17 at Tring."

This description is clear and definite, it abolishes a number of false impressions which probably have only arisen because later writers have not seen actual specimens, and were only attaching the names to localities. For the same reason Rothschild (1925), placed *atlantica* as a synonym of both *blidana* Holl and *maura* Vty. His description and later actions show he had never seen true *maura.* The features of the June specimens Rothschild described (probably late June but he gives no exact date), are those of the 2nd generation; the "very white above" without any "black or grey" on the veins, the equally white underside of the hind wings showing "hardly any trace of green on or around the nervures", prove this, and taken together with the "very much larger black spots on the forewings" (above), leaves no doubt his Blida specimens were the same insect later named *atlantis* by Oberthür from Morocco. Compare our figures 5, 6 and 7, from Morocco with the description and this fact will be obvious, even though the Moroccan race is monogenerational it is the same seasonal type; i.e., the 2nd or summer generation. This not only proves that *atlantica* and *atlantis* are the same species, but that *atlantica* and *maura* both exist at Blida, *atlantica* being the more localized. Rothschild's specimens must all have been of the summer generation, the one male captured at Blida by Miss Fountaine is of the spring form (see our figure 1). There can now be no question that Miss Fountaine's label of "Blidah" was correct. I have no photograph of the underside of figure 1, but if it is compared with figure 5, on the same plate, the darker (blacker) markings on the upper side forewings of that figure and the distinctly seen marking on the neueration of the underside hindwings in figure 1, showing through on the upperside in the photograph, demonstrates beyond all possibility of mistake that figure 1 is the spring form of figure 5. It is equally obvious that the spring females from Teniet-el-

Haád (figures 2 and 3), and the summer females from Morocco (figures 6 and 7), are the spring and summer generations of the same species. Again the difference between the spring female of *atlantica* (figure 2), and the spring female of *maura* from Blida (figure 4), is so obvious that it is impossible Rothschild could have mistaken a spring female *maura* from Blida for his *atlantica* and still less a summer female of *maura* (such as our figures 9, 15, 16 or 17). It must also be noted that though *atlantica* and *maura* are the same size in the spring generation there is no tendency to any reduction in size in *atlantica* in the 2nd generation and so far we have no record of *atlantica* producing further generations later in the summer. Rothschild recorded the capture of a few specimens of *atlantica* by other collectors including one specimen from Tunis and one from Tamarouth in Morocco, we can therefore take it that *atlantica* spread from Morocco to Tunis.

It may be that the February specimens recorded from La Calle, Algeria, by Verity (1922, p. 133), were probably *atlantica* also, for he stresses the very large discoidal spots above. This spot frequently is triangular in shape (as in figures 1 and 5), a form that occurs in *dubiosa* but not in *maura*, where the tendency is for this spot to be diamond-shaped. The triangular spot is of course also normal in *segonzaci*, but as La Calle is but little above sea level it is unlikely that Verity's specimens were that species. The extreme, shining white of the underside of the hindwings in *atlantica* in summer (or in the monogenerational race), is quite unlike the effect in any other species of the group that I have seen. Rothschild noted that "below there is hardly any trace of the green on and around the nervures of the hind wings", but actually in some specimens there is absolutely no trace of it at all. These features emphasize the isolated nature of *atlantica* and leaves one amazed how it (any more than *maura* with its unique cycle of seasonal developments), can ever have been supposed to be races of *P. napi*. The presence of two such specialized species between Tunis and the Atlantic shows that neither *P. napi* nor any of the hybrid races (*dubiosa, balcarica, pseudorapae, meridionalis* or (?) *persis*), ever attained North Africa; just as the presence of *maura* in Portugal and *dubiosa* in Central and Southern Spain go to show that *P. napi* was never able to acclimatise itself even in the southern half of the Iberian peninsula.

We must now consider the androconial scales of *atlantica*. These are a somewhat variable form, best described as more an Asiatic type than European, for very similar formations occur in Asiatic hybrid races but of course in these there exists extensive malformation which does not appear in *atlantica* though the scale is variable in length and breadth. I have long thought an Asiatic species, now either unrecognized or extinct, must have existed, in which a scale somewhat similar to that of typical *P. bryoniae* but less developed, may have been constant.

A *Pieris* race exists at great altitudes (over 8,000 feet), in the Elburz Mountains and some districts of the Causasus, but which is unquestionably a hybrid form, has a scale of this type. This insect, so far as I know, has not been described or named, unless indeed it is a monogenerational form of the insect named "*persis*" by Verity (1908), which was said to occur in Persia but of which only the 2nd generation was known (I have never seen it). In the mountain hybrid race the *bryoniae* primitive-type scale occurs; but not in *atlantica* which of course is not a hybrid. But in

general the most frequent scale forms in *atlantica* suggest a connection with this Alpine hybrid, or rather its Asiatic element, for this "very distinct" form as Rothschild calls it, has no obvious affinity with the known European species when one removes the *bryoniae* elements.

It remains to consider that magnificent species *P. segonzaci*. How Müller and Kautz (1939), can have thought it was a "var." of *blidana* (which they held to be a "subsp." of *P. napi*), will always be a mystery. Others have connected it with *atlantis* of Morocco without pausing to consider that two such different forms of one species could scarcely have arisen in the Atlas Ranges of Morocco, one above 2,000 m. the other below it, both monogenerational yet of different seasonal forms, both flying in July. Had they been the same species it would be strange that the first generation type that occurs at the higher levels should be the generation to be lost at the lower levels, for *atlantis* in Morocco is of the 2nd generation form, although it normally has two generations in Algeria.

The scales point to these three remarkable North African insects being distinct species. *P. maura* and *P. atlantica* fly together in both generations and must be distinct from each other, and as has been shown from any other European species also. The scales of *P. segonzaci* are the most specialised of the three. I have described and illustrated them before (Warren 1961, p. 53, pl. 2). Here again we find a distinct Asiatic connection, this time with the *melete*-group species; the scale of the spring *P. ajaka* and that of *P. segonzaci* being very similar. The summer generation scale of *P. ajaka* is extremely specialised and markedly typical of the *melete*-group type (see Warren, 1961, pl. 3, figures 54, 55, and compare with figure 53, the spring generation). It will be seen that the spring type is so close to *P. segonzaci* that it is only separable by the larger size of the scent cell in *P. ajaka ajanta*—the spring form. The robust form of the *segonzaci* scale separates it from most European species. In it, however, there not infrequently appears a definite deformity in one of the two basal prongs, but a great number are perfectly developed. Whether this curious deformity is the result of hybridisation in a remote past, or not, must remain an open question. It looks like it, but it always appears in only one of the prongs, and might also result from some unknown influence in the development of the scales at a certain period, for there is never any sign of haphazard fluctuations of form in other areas of the scales as might be expected if this was a hybrid effect. Another remarkable character of the *segonzaci* scale is the terminal expansion, which often exceeds the width of the neck. It is, however, not absolutely constant.

Superficially, the somewhat pointed forewings and large size seem to disassociate the species from the usual European species and further suggest an Asiatic origin. Although located at considerable altitudes (2,000 to 2,800 metres according to Zerny 1935), the size remains constant. Kautz, in his classification (Müller & Kautz 1939), places "var." *segonzaci* as a mountain form of *napi* "subsp." *blidana* (by which he meant *atlantica*), an impossible jumble, but which must be read in the light of his remark on p. 163 (l.c.), that with few exceptions they knew no more of the non-European forms "than that they existed".

Such facts as we have been able to accumulate seem to support the conclusion that these three widely-separated North African species are most closely connected with the Asiatic branch of the genus.

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Zygaena (*Zygaena*) *trifolii* Esper (Lep., Zygaenidae) in the Middle Atlas, Morocco

By Hugo Reiss and Günther Reiss, Stuttgart

In the monographic work on the Zygaenids of Morocco, Reiss (1944) wrote on *Zygaena trifolii* Esper which, in 1944, was known in that country only from the Rif. The races of the Rif are ssp. *diffusemarginata* Rothschild (1933), typical from Hauta Kasdir, 1750 m, 15. and 19.vii., and from Izilan, 6.vi.1931, A'faska, 22.vi.1931, leg Reisser, Vienna, and the Djebel Laxchab, 1700-1800 m, end vi.1941, leg Marten; and ssp. *lucida* Reiss (1944) from Ketama, 1500 m, beginning vii.1941, leg. Marten. These races have the forewing spots separate and only rarely are spots 3 and 4 joined to form a single spot. The ssp. *lucida* Reiss shows especially a strong increase in the width of the hindwing border, and in extreme examples the red is completely missing (ab. *corax* Reiss). The types of ssp. *lucida* Reiss (in coll. Reiss) were illustrated (Reiss, 1944). The type ♂ (wingspan 32 mm) of ssp. *diffusemarginata* Rothschild was figured by Tremewan (1961).

In the ssp. *tizeragis* Wiegel (1965) from the High Atlas, Djebel Anngour region, typical from Tizerag, 2700 m, 29.vi. to 2.vii.1961, leg. H. and L. Wiegel, and from the Djebel Anngour region, Ait Slimane, 2600 m, 3., 5., 6. and 15.vii.1961, leg. H. and L. Wiegel, which, according to the description, differs from ssp. *diffusemarginata* Rothschild in the generally smaller build, more slender antennae, and the darker carmine red; only 1 ♀ is known, in which the forewing pairs of spots 1, 2 and 3, 4 are lightly

joined by red scaling while spot 5 remains separate. Confluence of spots 3 and 4 is not rare according to Wiegel. In this race the height of the localities is remarkable.

Further references are quoted in the systematic catalogue of the genus *Zygaena* Fabricius by Reiss & Tremewan (1967).

Dr Hans Eckerlein, Coburg, sent us 13 ♂♂, 4 ♀♀ of a race of *trifolii* which he found in the Middle Atlas in a locality along the road from Midelt to Azrou, ca 15 km from Midelt, 15.v.1970. The moths were collected amongst rushes in a marshy area on granite. All specimens differ from all known races of *trifolii* Esper from North Africa and Europe through the confluence of the forewing spots. Wingspan, ♂♂, 27-30 mm, ♀♀, 29-32 mm. The antennae are slightly more slender than in *diffusemarginata*. The legs are blue-black. The colour of the head, thorax and abdomen, and the ground colour of the forewings is black with a light bluish or greenish sheen. The fore- and hindwings are narrower and more pointed at the apices than those of the larger and more robust *diffusemarginata*. The red of the forewing spots and hindwings is lighter than in *diffusemarginata*, being a warm carmine red; on the hindwings somewhat less warm. Forewing spots 3 and 4, in comparison with those of *diffusemarginata* in which they are small and separated by the dark ground colour, are enlarged and always broadly confluent with red scaling. In 7 ♂♂, 4 ♀♀ spot 2 is broadly confluent with spot 4; spot 5 is connected with the spot area 1, 2, 3 and 4 in 5 ♂♂, 1 ♀; in 2 ♂♂, 3 ♀♀, however, spots 1, 2, 3 and 4 are confluent as in *trifolii palustris* Oberthür ab. *confluens* Oberthür. The type of this form is figured by Tremewan (1961). In 6 ♂♂ there is only a narrow red connection of spots 2 and 4 along the vein, the somewhat smaller spots 3 and 4 are confluent, spot 5 remains free.

On the hindwings the blue-back border, which is less broad than that in ssp. *diffusemarginata* and ssp. *tizergis*, is absent on the inner part of the wings.

On the underside, the forewing spots are often more strongly confluent than on the upperside; in *diffusemarginata* the spots on the underside are, like the upperside, separate. The hindwing or border on the underside is similar to the upperside.

We name this characteristic race **mideltica** n. ssp.

Holotype ♂, allotype ♀, and paratypes in coll. Reiss. The figures will be published in a later paper.

We thank Dr Hans Eckerlein for his kindness in sending us the specimens and for information on the biotype.

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Addresses of the authors:—
Hugo Reiss, 7 Stuttgart 1, Traubenstrasse 15 B;
Dr Günther Reiss, 7 Stuttgart-Vaihingen, Barchet 23.

Heterocerus hispidulus Kies. (Heteroceridae), a Beetle New to Britain

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

On 6th August 1969, in the course of collecting at the edge of a flooded sand-pit half a mile or so inland from Rye Harbour, East Sussex, with my friend Mr G. Shephard, I took two specimens of a small *Heterocerus* in the damp sand, whose facies was unfamiliar and which, even then, I strongly suspected must be a species new to our fauna. Such, indeed, proved to be the case, the specimens—both males—readily running down in Hansen (1938) to *H.* (*Littorimus*) *hispidulus* Kies. Other works available, notably Reitter (1911), tended to confirm the identification. Not long after, Mr Ernest Lewis sent me for inspection a *Heterocerus* he had taken recently in the same area and named tentatively from Joy (1932) as *marginatus* F. It turned out to be a female of the same species as mine, differing only in its larger size and broader form—a point sufficiently accounted for by its sex. On 9th September we were again at the place, but not a single *Heterocerus* was to be found.

Meanwhile I submitted my examples for confirmation to Mr R. O. S. Clarke, who has for some time been interested in this difficult genus and is engaged in revising the British species. He agreed provisionally with the above determination, and a good series of the species obtained by him at the original spot on 20th May of this year enabled him finally to verify it.

H. hispidulus belongs to that section of the genus (subg. *Littorimus* Gozis) wherein the coxal lines (stridulatory file) on the first abdominal segment are complete, i.e. curve inward to reach the coxa instead of stopping short at the hind margin. To see this important character properly it may be necessary to push forward one of the hind legs so as to expose the whole of one side of the first sternite. Hansen (1938) illustrates it very clearly. Besides the present one, our sole known species possessing it is *H. maritimus* Guér. (=*britannicus* Kuw., *sericans* auct. Brit.).[1]

[1]I follow the synonymy of Champion (1917), whose note seems to settle the vexed question of the correct name for our very small *Heterocerus* (cf. Fowler, 1891). Probably in ignorance of the former, Joy (1932) calls it *sericans* and wrongly ascribes the synonym *britannicus* to Kiesenwetter instead of Kuwert. Kloet & Hincks (1945) list the true *sericans* Kies. as British in addition to *maritimus;* I believe, however, as I understand Mr Clarke does, that only one species exists in our collections under these names.

From *H. maritimus*, *H. hispidulus* is very easily distinguished by a number of features:—

Very small (L. 2·4-3 mm.), narrow; pronotum in ♂ broader than, in ♀ about as broad as, elytra, its hind angles nearly rounded off, its hind margin near these only indistinctly or very finely bordered; elytra with lighter (reddish) markings, if any, more or less vague or obscure, with no trace of striae except for the sutural one, upstanding hairs short and thickly placed, the very dense punctures clearly of two sizes, surface duller ..... *maritimus*.

Moderately small (L. 3-3·5 mm.), broader (shape about as *marginatus* F. and its allies); pronotum in ♂ as broad as, in ♀ slightly narrower than, elytra, its hind angles nearly right-angled, its hind margin near these with a very distinct shining border; elytra with well-defined testaceous markings (or the lighter colour may prevail) and fine striae or at least distinct traces thereof, upstanding hairs long, diffuse, subseriate, the less dense punctures more uniform, surface shinier ..... *hispidulus*.

In the new British species the sutural region is all dark and the side margins pale; the markings are not very variable, the dark pattern consisting typically of a broad triangular basal area, an irregular dentate central fascia, and a smaller posterior one—the latter of which, but not as a rule the former, may be isolated from the sutural stripe. The lighter parts are thus less broken up than in any of our other species. Reitter (1911) gives a quite good coloured figure of a female, showing well the distinctive pattern.

Aside from that of the coxal lines, most of the characters given above will prevent confusion with any of our three smallish species, *marginatus* F., *fenestratus* Thunb., and *fusculus* Kies.; notably the different and brighter markings, long *diffuse* suberect golden hairs, shallow but traceable striae and 6-segmented antennal club[2]. The really close ally of *hispidulus* should be *H.* (*Littorimus*) *intermedius* Kies., but that species has a 7-segmented club like the three just named and elytra otherwise marked; it has not yet been found in Britain.

Actually this is not quite the first mention of *H. hispidulus* in our literature. Mr Clarke informs me that G. R. Waterhouse (*Trans. Ent. Soc.*, 1860) mentioned it as not unlikely to be found in England and gave certain characters to distinguish it from 'sericans' (i.e., *maritimus*). On the Continent it seems to be widespread but not generally common, and to affect the sandy margins of water, both fresh and salt. Much material of *Heterocerus* has been collected at various times in the Camber/Rye/Hastings area, but probably always in saline or brackish localities; the failure, therefore, to find *H. hispidulus* amongst it might perhaps be due to a local preference of the species for freshwater habitats; or it may be a recent colonist, not yet fully acclimatized.

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[2]It can be very hard in these species to make out the true number of segments to the antennae except in a balsam mount. Champion, in his note already cited, refers to *sericans* as having "the same number of joints to the antennae as *maritimus*, viz., eleven, seven of which form the club"; in the context this seems to imply some contrast with the latter species as regards the club, but is not explicit on the point.

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63 Blackheath Park, London, S.E.3. 29.vii.70.

New Records of *Limnephilus nigriceps* (Zetterstedt), *Rhadicoleptus alpestris* (Kolenati) and *Ironoquia dubia* (Stephens) in Britain

(Trichoptera—Limnephilidae)

By Peter Hiley

Zoology Dept., Newcastle University.

Adults of *Limnephilus nigriceps* were found in the early evening on the shores of Pyewipe Lake near Lincoln, on 15th and 16th September 1968. (Grid reference 956714 sheet 113). This species has also been recorded from Loch Awe, Argyll (Morton 1923), Delamere Forest, Cheshire (Moseley 1933) and Tarn Lodge near Carlisle (Routledge 1933), and could therefore be assumed to be very local in Britain.

A single larva of *Rhadicoleptus alpestris* was found in a tiny peat-pool on the top of Dent, near Ennerdale Water, in April 1968, and subsequently reared to the adult. (Grid reference 040130 sheet 82). An extensive survey yielded only one other definite record for this species, which was Malham Tarn where it was said to be frequent (Holmes 1963). Searches for larvae in this area were unsuccessful.

A single larva of *Ironoquia dubia* was taken from a small stream running through the Pamber Forest near Reading in March 1969. Crichton and Baker (1959) recorded adults of *I. dubia* from Milbarn Pond, Wokefield, and three larvae were found by me at this site. The type specimen is said to have been taken near London. No other British records of this species were found in the literature survey.

Acknowledgements

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Aerial photograph of the east end of Canna and Canna harbour, showing Canna House and garden, site of the m.v. trap; the Haligary gulley; Compass Hill; Coroghon; and most of the plantations mentioned in this article. Scale is approximately 12 inches to the mile.

Heiskeir (sometimes misspelt Oigh-sgeir) Island lying 6 miles south of the west end of Canna. Site of an important lighthouse. Although the highest elevation is only 32 feet, this island has colonies of *P. icarus* and *O. limitata*, and other species of lepidoptera have been seen or taken there

MACRO-LEPIDOPTERA CANNAE
The Butterflies and Moths of Canna

By J. L. Campbell

(Continued from p. 214)

HABITATS

These may be summarized as follows:

1. Gardens.
2. Plantations (about 16 acres in all).
3. Arable ground (crops and rotation grasses), amounting to about 40 acres in all each year.
4. Permanent grass, formerly cultivated, now only grazed, about 80 acres.
5. Cliffs and steep slopes. Where these are south-facing and are inaccessible to sheep, they provide good habitats for lepidoptera, including interesting species like *E. irrorella*, *H. caesia*, *N. zonaria*, and *Z. purpuralis*.
6. Sandhills. Restricted here to a small area at the north-west end of Sanday, where the vegetation characteristic of the Outer Hebridean 'machair' is found.
7. Moorland. Where this is grazed by sheep all the year round, it is poor entomologically.
8. The fresh-water lake on Sanday, described already.
9. A small salt-marsh on Rubha na Doirlinn.
10. Heiskeir. This small island, six miles south of the west end of Canna, has potentialities as a station for observation of bird and insect migration, which I hope may be realized in the near future. The island has certainly supported colonies of *P. napi* and *P. icarus*, and former lighthouse keepers have sent me specimens of *A. caja*, *P. arcuosa*, and *H. pennaria* at various times. Owing to transport difficulties, no expeditions were made to Heiskeir between 1958 and 1969, but contact has been resumed, and with the light now much more powerful than formerly, interesting results are hoped for.

BUTTERFLIES

I have taken fifteen kinds of butterflies on Canna, but of these one, *C. croceus* Fourc. is an exceptional migrant which has not been seen here since 1947, while another, the Peacock, *V. io*. has not been seen here since 1961. Of the remainder, two species, *V. cardui* and *V. atalanta*, are, like the puffins and razorbills, regular immigrants that come here nearly every summer to raise a generation which I believe flies south in September and October. Another species, *P. brassicae*, is a resident reinforced by immigration from time to time; and another, *P. aegeria*, has occurred a very few times, presumably as a wanderer from Rum or Morar or Knoydart, where there are known to be colonies.

Pieridae

1. *Pieris brassicae* L. (Large White). Resident, reinforced by immigration. The local race appears to be single-brooded. Larvae have been

found feeding on broccoli in my garden as late as the end of November, in 1952; one of them pupated on 3/12/52, and the butterfly emerged on 10/7/53.

The larvae of *P. brassicae* are very seldom parasitized here, and are often a severe garden pest. In 1968 the butterfly was very numerous, and its larvae stripped the charlock growing in the neighbouring corn-field. In 1969 the butterfly was even more numerous, and its larvae ruined the cabbages.

2. *P. napi* L. (Green-veined White). Common, even throughout the bad years 1960-65. Double brooded, found in many places on the island. On 11/8/52 a 'snowstorm' of this butterfly was observed on a bog in Sanday. In 1966, 1968 and 1969 it was particularly common over cultivated ground.
3. *Colias croceus* Fourc. (Clouded Yellow). On 19/8/45 a lady visitor saw a 'yellow butterfly' at Garrisdale near the west end of Canna, which may have been one of this species. In 1947 the butterfly was seen several times at the east end of Canna, as follows: 19th August, three seen by my wife near Coroghon; 20th, another; 21st, one seen by myself (Caslum); 27th, another (taken); 1st September, my wife saw one in the garden; 6th, I saw one near the post office. We have not seen *croceus* here since.

Nymphalidae

4. *Vanessa urticae* L. (Small Tortoiseshell). This was fairly common (abundant in 1947) until 1959, thereafter became extremely scarce owing to a series of bad summers, but fortunately revived in numbers in the glorious summer of 1968. Larvae are fairly frequently found. Local specimens of the adults are strongly marked.
5. *V. io.* L. (Peacock). The Peacock was first seen here in early June 1939 (*Scottish Naturalist* 1939: 133), and was common in August 1947. The next year (I think) I found a large batch of larvae on nettles outside my garden, and reared them. The last time I saw the Peacock on Canna was on 21/9/61. The story of its rise and decline here was told in the *Record* of 15/IV/69. (**81**: 117).
6. *V. cardui* L. (Painted Lady). *Cardui* comes fairly regularly in May or June and lays its eggs on the thistles, on which the larvae can be found in July and early August. These produce butterflies which emerge in late August and early September and apparently leave the island for the South soon afterwards. An experiment in marking these butterflies is described in the *Entomologist* of January 1951. This was carried out in the autumn of 1949, a year when larvae were very plentiful.

   In 1952 the butterfly appeared around veronica blossoms as early as 24th March. (None had been seen in 1951).

   In recent years *cardui* has not been quite so common, but it was present in 1968. Only two or three seen in 1969.
7. *V. atalanta* L. (Red Admiral). The habits of this species are similar to those of *V. cardui*, the larvae being found on nettles, but it is a more constant visitor. In 1947 it was particularly abundant, and two specimens of the very rare aberration *klymene* or *merrifieldi* (Standfuss) were taken on 26th and 27th August, and a specimen intermediate between this and the normal type on 27/8/47.

Drawings of these butterflies by Mr A. D. E. Russwurm appeared in the *Nature Lover*, Vol. V, p. 74, and a photograph of one of them appeared in the *Record* of 15/V/55 (opposite p. 140).

8. *Argynnis aglaia* L. (Dark Green Fritillary). Not very common and indeed scarce from 1960 until the summer of 1968. The chief localities are Tallabrig on Sanday and the Haligary gully. In 1968 and 1969 *aglaia* was seen also over low ground at Coroghon at the east end of Canna. A very battered but active specimen appeared in my garden on 11th September 1952, unusually late, and probably a vagrant.
9. *A. selene* L. (Small Pearl-bordered Fritillary). The presence of this butterfly was unknown until a small colony was discovered on an inaccessible cliff above the southern shore on Sanday in 1957 by Dr. Michael Harper. The butterfly has been observed there regularly since. In June 1969 it appeared for the first time on the protected ground of the Haligary Gully, below Compass Hill. As this spot is regularly watched for lepidoptera, *selene's* appearance there is of some interest.

Satyridae

10. *Satyrus semele* L. (Grayling). This used to be common in rocky places along the southern shores of Canna and Sanday. It became scarcer after 1959 but its numbers revived again in the fine summer of 1968. This butterfly has been seen flying some distance off-shore at times.
11. *Pararge aegeria* L. (Speckled Wood). Two taken below the plantation behind my house on 20/7/45, and another seen on 25/8/45 in Tighard garden. Another was taken on 8/9/51, in the same place. Not seen again until August 1968, when single specimens were seen for several days, one in the plantation behind my house, and the other in that behind Tighard. One seen on 1/8/69, in the identical former spot.

    There probably is sufficient woodland on Canna now for the species to become established; specimens seen hitherto have probably been wanderers from the colony on Rum or from the Mainland. But so far there is no evidence that a colony exists here; no one has ever seen two specimens together.
12. *Maniola jurtina* L. (Meadow Brown). Formerly common, became scarcer after 1959, until the summer of 1968. Many dark specimens occur but the local race is not uniformly dark. On 28/6/53 a partially bleached specimen was taken on Sanday, figured in the *Record* of 15/V/55.
13. *Coenonympha pamphilus* L. (Small Heath). Common, all over the island, including the moorland. Flies from about May 20th until the end of July. The local specimens are often large and brightly coloured.

    [*Coenonympha tullia* Mull. (Large Heath) reported from Canna in H.H.1 and H.H.2, has not been observed by any other entomologist on Canna. This record requires confirmation. See J. D. Bradley, *Entomologist*, Vol. 91, p. 9].

Lycaenidae

14. *Callophrys rubi* L. (Green Hairstreak). I thought I saw *rubi* in May 1938, but its presence was not confirmed until a small colony was

discovered above the Haligary gully (where it now also occurs) on 29/5/51. I have since also found it near the east end of Sanday and at the north west end of Canna (Garrisdale). Specimens can usually be seen around the blossoms of protected native willows above the Haligary gully in May. Once or twice the butterfly has been noticed in my garden.

[H.H.1 reported that, 'in spite of prolonged sweeping operations . . . no larvae of this species were noted in Soay, Rhum, Canna, or Eigg'. In H.H.2 the presence of *rubi* on Canna is reported without reference to my records in the *Entomologist* of July 1951 or the *Scottish Naturalist* in 1954. *Rubi* certainly also occurs on Eigg, where I found a strong colony not far from Dr. MacLean's house in May 1969].

15. *Polyommatus icarus* Rott. (Common Blue). Common in sheltered sunny places, particularly in Haligary gully and along the south shore of Sanday, from midsummer until the end of August. Canna specimens are not so strongly marked on the undersides as those from Pabbay, near Barra. There is a small colony on the South side of Sanday which tends to produce specimens with a reduced number of black spots on the undersides.

Moths

Before 1951, moths were caught at sugar, and at the blossoms of veronica, ragwort rocket, and sallow, and by 'mothing'. In the early summer of 1951, a mercury vapour lamp moth trap was obtained, and was first used on the night of 22-23 May of that year. Since that time the trap has become the chief means of collecting, and has added more than 70 species to the list that was published in the *Scottish Naturalist* in 1954, some of them very interesting and unexpected.

The trap had been used, and all the catches counted, every year since 1951, the catches varying from 626 moths on 23 nights in 1961 and 661 moths on 15 nights in 1954, to 11,173 moths on 76 nights in the wonderful summer of 1968, and 12,272 moths on 90 nights in 1969. It is difficult to make a close comparison between the years over this whole period, as such factors as improvement in lighting plants, differing weather conditions, and personal absences have to be taken into consideration. For such reasons the trap was not used at all in September 1954, August 1959, and July 1961, and was only on for one or two nights in June and August 1954, June and July 1960 and 1962, and June 1961. October is also a month liable to be interfered with by personal absences and bad weather, but under favourable conditions can sometimes produce interesting species.

The trap has always been used in my garden, which is walled and of about 2 acres. Behind it stands a steep slope planted with ash, alder, rowan, sycamore, wych-elm, larch, and pine; hawthorn and poplar are within the rays of the light, as well as the usual fruit trees and bushes in the garden. Although the nearest cliffs are about a quarter of a mile away, and the nearest sandhills on Canna about half a mile away (on Rhum, two and a half miles away), cliff and sandhill species are regularly caught in the trap (I wonder how many entomologists can get *H. caesia* in traps in their gardens!)

Up to the end of the 1969 season, 76,524 macro-moths had been caught in the trap, of which fifteen common species accounted for 48,479. These were:

T. pronuba L., 15,794; *X. monoglypha* Hufn., 5,776; *T. ianthina* Esp., 4,095; *A. secalis* L., 3,219; *H. micacea* Esp., 3,205; *M. oleracea* L., 3,009; *C. graminis* L., 2,363; *T. stabilis* View., 1,713; *N. xanthographa* Fabr., 1,668; *A. strigula* Thunb., 1,545; *A. exclamationis* L., 1,295; *P. chrysitis* L., 1,267; *D. conspersa* Esp., 1,227; *T. gothica* L., 1,162; *P. pulchrina* Haw., 1,141.

On the other hand, about fifty species have not been caught more than three or four times; some of these are well enough known in the islands, and would probably occur more frequently if the trap could be used in different situations; others, such as *T. crataegi* L., *T. fimbria* L. ,*A. aprilina* Haw., *L. unipuncta* Haw., *P. lapidata* Hübn., and *P. fluviata* Hübn., have been most interesting and unexpected captures.

With the exception of a few species like *L. testata* L., *C. truncata* and *citrata* L., and *B. repandata* L., the trap is considerably less attractive to geometers than it is to noctuids; I have found that this is partly a function of the weather, even a slight breeze reducing the catch of geometers considerably as compared with a dead calm.

The best catches are made when there is a high pressure system with a slight breeze from the north-east. Most of the unusual and interesting moths have been taken under such conditions. Dead calm foggy weather such as sometimes occurs in July is also favourable. On the other hand, vary few moths are caught on cold clear nights in May and June, when the nights are anyway very short.

The largest number of macro-moths caught in the trap on one night was 1,672 on 14th August 1969, when 63 species were involved, probably also the largest number on a single night. Of this 1,672, 976 were *C. graminis*, 200 *T. pronuba*, 136 *X. monoglypha*, 39 *T. inathina*, and 35 *A. secalis*. The next highest number was 828 on 27th August 1968, of which 441 were *T. pronuba*, 201 *H. micacea*, 55 *T. ianthina*, and 25 *N. glareosa*. On this occasion only 26 species were present. On several occasions there have been more than 600 moths in the trap, and on 16/8/69 there were 731. The largest number of any micro ever taken was 379 *U. martialis* on 22nd September 1966. These large numbers are only approximate, for it was impossible to prevent some escapes when counting (which is done indoors).

Trap records suggest that some species may have disappeared from the island in recent years, and, too, that others may have come in and established colonies. Examples:

Disappeared

D. sanio L., not taken since 1964.
C. haworthii Curt., not taken since 1957.
N. typica L., not taken since 1964.
A. lota Clerck, not taken since 1965.
M. albicillata L., not taken since 1953.
C. vittata Borkh., not taken since 1957.

This, although the trap has been used more intensively since 1965; during 1966-1969 inclusive it was used on 318 nights and 37,806 moths were taken, nearly half the grand total of 76,524. It has been pointed out that the Peacock butterfly (*V. io*) has not been seen here since the autumn of 1961; amongst birds, the yellowhammer has disappeared from Canna since 1945.

New Appearances

C. lutosa Hübn., single specimens in 1960, '61, '67.
L. carpinata Borkh., one in 1964, five in 1969.
E. silaceata Hübn., one in 1968 and one in 1969.
E. prosapiaria L., three in 1966, one in '67, five in '68, two in '69.

It is interesting that *C. lutosa* was taken on the Isle of Rum in 1959, and *E. silaceata* there in 1968, while *M. albicillata* has not been seen there since at least 1956. Experiments with the attempted introduction of the Cinnabar Moth *H. jacobaeae* into Canna suggest that it is possible for a small number of fertilized females to start a colony of moths on the island which can last for at least two or three years; there seems no reason why this should not happen under natural conditions if the weather is favourable and food plants are available. Lepidoptera have wings, and even small species like *P. fluviata* Hübn. and *N. noctuella* can fly or be carried considerable distances by wind currents; land bridges are not necessary for this.

Sphingidae

16. *Smerinthus populi* L. (Poplar Hawk). This has become even commoner since the planting of so many poplars and willows here, the catches in the trap for 1966 being 93; 1967, 77; 1968, 94; whereas the highest previous total was 15 in 1964. Larvae have always been often observed, and sometimes could damage young poplar or willow cuttings I had planted.
17. *Acherontia atropos* L. (Death's Head Hawk Moth). Specimens were found in the house on 9th and 11th September 1956, the year of the great invasion (see the *Record* for that year, *passim*).
18. *Herse convolvuli* L. (Convolvulus Hawk). This turns up in the trap every four or five years, the records being 24/8/55; 26/8/55; 12/9/60; 11/9/64; 12/9/68; 19/9/69. All the specimens except one are worn.
19. *Macroglossa stellatarum* L. (Humming-bird Hawk). Two specimens seen on Canna in July 1947, one by Dr. E. B. Ford and one by myself, the latter on July 18th.

Notodontidae

20. *Cerura furcula* L. (Sallow Kitten). One taken in the trap on 24/6/69.
21. *Dicranura vinula* L. (Puss Moth). Larvae much more frequently encountered than adults, and are often a pest on young poplars and willows when these are first planted out. Trap, earliest, 24/4/64; latest, 20/6/55; best year, 16 in 1969, second best 4 in 1953, '57, '58.
22. *Pheosia tremula* Clerck (Swallow Prominent). One only, on 26/8/55.
23. *Pheosia dictaeoides* Esp. (Lesser Swallow Prominent). Three only, on 23/7/57; 24/5/65; 28/5/68.
24. *Notodanta ziczac* L. (Pebble Prominent). While the planted poplars were still small, eggs and larvae could be found quite often. It is more difficult to do this now the trees have grown. Taken once or twice in the season in the trap in 1953, '54, '56, '62, '63, '64, '66, '67, '68, most 3 in the last year.
25. *Notodonta dromedarius* L. (Iron Prominent). Uncommon. A few larvae were beaten from the alders before 1954, but it took a lot of time to find any. One only in the trap, on 17/7/56.

26. *Lophopteryx camelina* L. (Coxcomb Prominent). Larvae have been beaten from poplars. The moth was first taken in the trap on 29/6/53, and turned up in 1956, '63, '65, '67, '68 and '69. Most, 21 in 1968, second most 6 in 1967, '69. The increase in poplars is favouring this species.
27. *Phalera bucephala* L. (Buff-tip). Larvae have been found on planted willows, and on birch, and the moth occurs occasionally in the trap, 1952, '53, '56, '57, '63, '67, '68, '69. Earliest, 17/5/52; latest, 16/7/67; most, 6 in 1959, 5 in 1968.

Thyatiridae

28. *Thyatira batis* L. (Peach Blossom). Taken at sugar occasionally in the trap in 1938 or 1939, since then in the trap in 1953, '56, '58, '63, '64, '65, '66, and '68. Earliest, 11/6/66; latest, 4/8/58, '66; most, 4 in 1966.
29. *Palimpsestis or* L. (Poplar Lutestring). Taken in the trap in 1954, '55, '61, and '68. Earliest, 27/5/68; latest, 18/6/55; most, 2 in 1968.
30. *P. flavicornis* L. (Yellow Horned). One only, on 2/4/65. (Wrongly recorded as *P. or* in the *Record* of 15/VI/65.)

Lasiocampidae

31. *T. crataegi* L. (Pale Oak Eggar). One only, in trap on 15/9/69.
32. *Lasiocampa quercus* v. *callunae* Palmer. (Northern Eggar). Larvae often seen, and adult males sometimes flying in the sunshine in July or August. A few specimens, mostly females, have been taken in the trap. Earliest, 22/6/53; latest, 28/8/51; most, 8 in 1953.
33. *Macrothylacia rubi* L. (Fox Moth). Larvae often seen on moorland, not quite so common here as *callunae*. A few specimens caught in the trap. Earliest, 30/5/64, '68; latest, 9/7/64; most, 3 in 1964.
34. *Cosmotriche potatoria* L. (Drinker). The first specimen taken here was picked up dead on the road in the summer time of 1949. Since then, single specimens have been taken in the trap on 2/7/63 and 19/6/69. All three are males. No trace has been found of the eggs, larvae, pupae, said in H.H.1 to have been 'taken freely' on Canna, not even in the most likely places for the larvae (which I know well) to be found. I regard the moth here as a vagrant from Rum.

Saturnidae

35. *Saturnia pavonia* L. (Emperor). Larvae found at times on native willows or brambles. Very few specimens, all females, taken in the trap (1952, two; 1959, one; 1969, one). The males are to be seen flying over the moorland on fine days in April and early May.

Nolidae

36. *Nola confusalis* H. Schäff. (Least Black Arches). First taken in the trap on 27/5/56, and has occurred in 1959, '60, '63, '64, '65, '66, '68 and '69. Earlist, 1/5/66; latest, 22/6/69; most, 12 in 1959, 8 in 1966.

Arctiidae

37. *Spilosoma menthastri* Esp. (White Ermine). Common. Earliest in trap 5/5/53; latest, 31/7/58; most, 182 in 1968; 175 in 1969.
38. *S. lubricipeda* L. (Buff Ermine). Not quite so common as the preceding; appears always slightly later. Earlist, 22/5/61; latest, 31/7/68. Most, 141 in 1956; 75 in 1969.

39. *Phragmatobia fuliginosa* L. (Ruby Tiger). Only taken three times in the trap, on 22/6/53, 4/6/54, and 15/7/69. The specimens in my cabinet are labelled 1945, and were mostly taken on the brae east of my house, which was planted with trees in the winter of 1956-7. Larvae sometimes seen in the autumn.
40. *Parasemia plantaginis* L. (Wood Tiger). Adults seen flying over wet places in the moorland sometimes in June and July in the moorland in the day time. Never taken in the trap.
41. *Diacrisia sanio* L. (Clouded Buff). Five specimens, all males and all except one worn, have been taken in the trap, on 12/7/54, 8/7/56, 11/8/62, 26/6/63, and 24/6/64.
42. *Arctia caja* L. (Garden Tiger). Abundant in 1956, when larvae swarmed and 253 moths were taken in the trap; less common since. Earliest, 17/6/56; latest, 1/9/56; most, 253 in 1956, 42 in 1952. An aberrant specimen taken in the trap on 21/7/52 is figured in the *Record* of 15/V/55, p.140.
[*Hypocrita jacobaeae* L. (Cinnabar). This species was introduced, by liberating mated females, in order to discourage the ragwort. The first liberations were made at Coroghon in June 1949. On 18/7/49 I noted that 'introduced *H. jacobaeae* larvae flourished this month'. More moths were liberated in 1950, and on 5/8/50 I noted '*jacobaeae* larvae quite common'.On 1/6/51 the first moths were seen, at the same place. Again in 1952, when a specimen was taken. Larvae were noticed again on 22/6/55, 7/7/56, 16/8/56 and 19/8/56, and on 28/6/56 a specimen of the moth was taken in the trap; but the colony died out since, and other efforts to introduce the moth in the Haligary gully and in Tighard garden have been failures.]

Lithosiinae

43. *Endrosa irrorella* L. (Dew Moth). Found in sunny places along the south shore of Canna and Sanday, especially where lichens grow on the boulders, including some of the wildest spots in the south-west part of Canna. I found two larvae at Sgorr nam Ban Naomh on 29/4/56 which shortly afterwards pupated. The moths emerged on 17/6/56. Only once in the moth trap, 14/6/58; day flier.
44. *Lithosia lurideola* Zinck. (Common Footman). Found here on 16/7/57 by Dr. Michael Harper, who presented the specimen that is in my cabinet. I have not encountered it here yet, but remember it in North Knapdale, Argyllshire.

Noctuidae

45. *Demas coryli* L. (Nut-tree Tussock). Two only, in the trap, 15/6/61 and 23/5/68.
46. *Acronycta psi* L. (Grey Dagger). Adults sometimes seen outside, and larvae in the autumn. In the trap, earliest, 16/5/59; latest, 16/8/69; most, 17 in 1955, 16 in 1959.
47. *A. menyanthidis* View. (Light Knot-grass). Comparatively uncommon; not so frequently encountered as on Barra in 1936 and 1937. Trap, earliest, 17/5/52; latest, 18/7/56; most, 4 in 1952; caught only in 1952, '56, '59, '63, '64, '66, '68. Larvae sometimes noticed.
48. *A. euphorbiae* var. *myricae* Guen. (Sweet-Gale Moth). One only in trap on 18/5/52.

Notes and Observations

THE PENCHANT OF APATURA IRIS L.—This is sometimes a greenhouse, lean-to, summerhouse, or even the bonnet of a car. A novel lodgement occurred the other day. Returning to my car, an *iris* was to be seen; as soon as I moved to one side, it appeared to go to the other. Presently it was flying no more, and treading carefully round the car I could see no sign of it: had it soared to the oak-top? For want of a further place to search, I glanced inside the car, and there it was on the windscreen. Gingerly opening the door, the side window was wound up: as I jumped quickly into the car, it left the screen and settled on the steering wheel from whence it was easily urged into a pill-box. — JOHN N. MARCON, Raydale, Sandy Lane, Fittleworth, Sussex. 14.vii.1970.

HADENA CONSPERSA SCHIFF., HAPALOTIS VENUSTULA HÜBN. AND OTHER RECORDS AT VIRGINIA WATER, SURREY.—While collecting with a mercury vapour light in my sister's garden at Virginia Water on 6th June 1970, I was surprised when one of the visitors proved to be *Hadena conspersa* Schiff., an insect usually associated with downland and shingle beaches, and not with heathland. I have since heard that a few others of this species have also been taken on terrain with which they are not normally associated. Another interesting arrival on 19th June was *Hapalotis venustula* Hübn. This little noctuid seems to be spreading its range rapidly in Surrey and has appeared in several localities in this area where no one expected it. On another occasion on 9th May, *Odontosia carmelita* Esp. came to light in the garden, though I had not seen it before in that part of Surrey.—C. G. M. de WORMS, Three Oaks, Working, Surrey. 27.vii.1970.

A VARIETY OF STRYMONIDIA W-ALBUM KNOCH.—A young friend of mine, Shane Smy, recently showed me a variety of *S. w-album* which would seem to be similar to the variety mentioned by Sandars, of which he says there is one record. The upper wings of the insect, which is a female, have the white line replaced by two indefinite white dots. The lines on the hindwings are replaced by white wedge-shaped blotches and the w is reduced to two dots. The insect was caught on 6th July this year in the neighbourhood of Hadleigh Castle. A number of other specimens were caught then and a few days later, but all were normal and were released.—ERIC J. CRANE, 49a Marine Parade, Leigh-on-Sea, Essex. 27.vii.1970.

NIDITINEA PIERCELLA (BENT.) (LEP.: TINEOIDEA).—The first specimen that occurred to me of this apparently scarce little moth, came to light in a wood near Fawley, Bucks., on 3rd July 1966. I took a second specimen on 11th July 1970, which was at rest on the wooden structure at the base of the windmill in Wicken Fen, Cambridgeshire. I wish to thank Dr. J. D. Bradley for kindly confirming the identification.—J. M. CHALMERS-HUNT. 9.viii.1970.

CELASTRINA ARGIOLUS L. IN KENT.—After a long spell of scarcity it is very pleasing to report that following a gradual revival during the past few years, *argiolus* has again become common.

First brood examples appeared frequently in my garden and the second brood is common at the moment of writing. Yesterday it was very common in Kew Gardens, and I watched some of them fluttering along an ivy covered wall, presumably females looking for egg laying sites.—D. O'KEEFFE, 51 Parkhill Road, Bexley, Kent. 3.viii.1970.

ADELA CROESELLA (SCOP.) (LEP. INCURVARIOIDEA).—I took a male specimen of this local moth at mercury vapour light near Chepstow, late at night on 13th June 1970. Is this the first record of *croesella* for Monmouthsire?

The insect normally flies in sunshine, at least that has been my experience in Suffolk, where I have occasionally seen it flying plentifully over elm, but am not aware that it takes to the wing naturally at night, so suspect this particular one was disturbed.—J. M. CHALMERS-HUNT. 9.viii.1970.

VANESSA CARDUI L. AT WATERLOO BRIDGE.—I saw a large rather pale specimen of the painted lady, which was flying in a southerly direction over Waterloo Bridge at about 12.30 p.m. on 1st August 1970. On the previous day Col. Emmet and I watched a much deeper coloured example flying back and forth in a wood near Saffron Walden, Essex.—J. M. CHALMERS-HUNT. 9.viii.1970.

EPINOTIA RUBIGINOSANA (H.-S.) (LEP. TORTRICOIDEA) IN THE ISLE OF WIGHT. —On the afternoon of 28th May 1969, I beat from *Pinus* in Parkhurst Forest a blackish-grey and white moth of unfamiliar appearance, which Dr. Bradley of the Imperial Institute of Entomology at South Kensington, kindly confirmed as *Epinotia rubiginosana* (H.-S.). Mr. B. Goater tells me this is the first record of this species for the Isle of Wight.—J. M. CHALMERS-HUNT, St. Teresa, Hardcourts Close, West Wickham, Kent. 9.viii.1970.

HABITS OF APATURA IRIS L.—I was interested to read Major-General C. G. Lipscombe's note (*Entomologist's Record*, **82**, June 1970, pages 159-160) in which he refers to the frequency with which *Apatura iris* Linn. enters houses at Blackmoor Copse, Wiltshire, either through curiosity or because it is attracted by the reflective surface of windows. The same habit has been observed near Nomansland, Hampshire, where a colony of Purple Emperors was present in 1964.

General Lipscombe says that only male Purple Emperors behave like this and that no females have been seen near houses, but the following incident seems to indicate that a female may also find a polished surface attractive.

On 12th July 1970 I parked my car on the eastern boundary of the nature reserve at Blackmoor Copse near an oak-tree on which a male Purple Emperor had taken up his territory. For about ten minutes my son and I watched him chasing other males away, and he once made a determined attack on a coal-tit that flew past his resting-place on a spray of foliage. Then a female arrived and his aggressive behaviour changed instantly; he shepherded her gently towards the spray on which they both settled. She soon left the tree and glided down for forty feet to my car which was standing in bright sunlight. After inspecting the bonnet closely she eventually settled on a bramble shoot near the wing-mirror and I was able to pick her up between my finger and thumb.—MICHAEL BLACKMORE, 72 Woodfield Road, Ealing, W.5 15.vii.1970.

NEW FOREST RECORDS.—The genitalia of the specimens referred to in my note in the June issue (antea: 160) have now been examined and it is confirmed that they are *Plusia festucae* L. and not *gracilis* Lempke as recorded. This emphasises the importance of Heath's remarks "confirmation by examination of the genitalia is desirable" (*Ent. Gaz.*, **20**: 94).—L. W. SIGGS, Sungate, Football Green, Minstead, Lyndhurst, SO4 7FQ, Hants.

Obituary

IAN ROBERT PENICUICK HESLOP (1904-1970)

With the passing of Ian Heslop on 2nd June 1970, within a few days of his 66th birthday, British field lepidopterists—and particularly those who confine their interests to our butterflies—have lost yet another of their leading and keenest devotees. Ever since his schooldays he made an intensive study of British butterflies, their habits and habitats and, above all, their past history in this country on which he became probably the foremost authority of his day. He had himself collected no less than 65 species which included all the indigenous ones and several of the rare migrants. This is doubtless an all-time record for a single individual. He had, too, a very wide knowledge of natural history in general. In this sphere he was often invited in recent years to participate in Country Parliament, a very popular B.B.C. programme in which his contributions to the discussions were always most informative and entertaining.

He was born in India in 1904, the son of Septimus Heslop, an engineer, and when he was quite young he came to Bristol which was to be his spiritual home for most of his life, for it was at Clifton College that the spark of enthusiasm for collecting our lepidoptera was lit and remained with him ever since. He got to know all the best haunts round the Bristol district and caught his first prize, a Camberwell Beauty, in the Forest of Dean during this period. When he went up to Corpus Christi College, Cambridge, he intensified his interest in the butterflies and often accompanied the writer to Wicken Fen and the Huntingdon Woods. He was an excellent rifle shot and was awarded his Blue in the University Eight. The Heslop Cup is still competed for annually between Oxford and Cambridge for small bore rifle shooting.

On leaving the University in 1928 Ian Heslop went straight into the Colonial Service and for the next near 25 years served in Nigeria as a District Commissioner, finally being in charge of Owerri Province, an area the size of Wales. While in this part of West Africa, he made a very thorough study of the local butterflies and also of the wild game of which he used to bring home special trophies which fell to his rifle. He had the distinction of discovering the Pygmy Hippopotamus in Nigeria which proved to be a new race of this rare animal and he presented the prototype to the national collection at South Kensington.

When he came home on leave he used to visit many parts of the British Isles in search of new habitats, especially of the Large Blue which was one of his favourite species. He discovered it in several previously little-known localities such as the Quantocks in Somerset. It was on such a visit in that amazing summer of 1945 that he found his home ground at Burnham-on-Sea alive with Bath Whites. Later that year he caught a Queen of Spain Fritillary and a Long-tailed Blue simultaneously in the West Country. His last rarity was a Milkweed he

took at Burnham in September 1958.

When he left the Colonial Service in 1952 he did not go into retirement since he had a young family to bring up and educate. He at once threw himself wholeheartedly into teaching at private schools which were providentially situated in areas where the Purple Emperor flourished both in Wiltshire and Sussex, and, finally, near Romsey, since this fine insect was by a long way his most admired species and he had a great thrill in his last collecting season in 1969 in securing a perfect male ab. *iole*, the very rare form with the white band absent. His great interest in this butterfly was embodied in "Notes and Views on the Purple Emperor" written in collaboration with George Hyde and R. E. Stockley which appeared in 1964 and dealt with every aspect of this splendid insect and his experiences with it.

But probably an even greater monument to his memory was his "Check List of British Lepidoptera", first published in 1947 with a revised edition in 1959 in the "Entomologists' Gazette." It comprised the scientific names of over 2000 species with supplements annually. Though the classification and nomenclature may not have been in line with those of some authorities, yet this list has virtually remained the standard one in recent years and has been almost universally adopted by authors.

His somewhat large stature with a short beard gave him a somewhat benign and indeed learned appearance. He was, above all, of the most genial and kindly nature, always ready to help *bona fide* naturalists. He was in harness to the very end lecturing at the Weston Technical College and to the Royal Entomological Society on our lost butterfly habitats within a few weeks of his untimely end which was hastened by a severe fall which broke his hip and necessitated a major operation, much to the dismay and grief of all who knew him. Their sympathy goes out to his widow, his two sons and his daughter in their irreparable loss.

C.G.M.deW.

Current Literature

The Physiology of Insect Reproduction by **Franz Engelmann, Ph.D.,** ix+307 pp.+2 col. pl. Pergamon Press, 140/- or $18.75.

The title of this work is self-explanatory, and to quote from the first paragraph of his preface: "During several years of intensive reading I became acutely aware of pertinent published results contained in a great number of scattered journals and books. Many of the original papers are not available to many scientists at various colleges, universites and research institues throughout the world. The need to summarize the principal findings thus became even more compelling. Topics of this monograph range from aspects of sex determination to means of control in insect societies. The book is an attempt to cover all aspects related to the propagation of the species; it is indeed a biology of the insects." . . .

Chapter 1 on the genitalia sets out the main features, external and internal, of the male and female organs illustrating details of the ovaries. Chapter 2 deals in great detail with sex determination, illustrated by charts and tables. Chapter 3, on parthenogenesis gives a list of 105 named species of insects in which pathenogenesis has been noted; they are arranged by orders, with an author's note stating that the list is incomplete. Chapter 4 deals with sex differentiation, and Chapter 5 is headed: Gonadal

Development, and is very well illustrated by micro-photographs, diagrams and tables.

Chapter 6 on Mating goes very thoroughly into many aspects of mating behaviour with clear line drawings illustrating interesting habits of some species. Factors that affect Egg Production and Fecundity is the title of Chapter 7, and this contains a long list of insects together with their average and maximum number of eggs, and a selected list of autogenous species. Other tables show the effects of various factors. Hormonal control of egg maturation is dealt with in Chapter 8 and the subject is discussed from many angles, citing the results of many experiments. Chapter 9 is entitled Endocrine Influence on Reproduction in the male Insect, and mentions experiments with bugs and locusts. Chapter 10 on oviposition cites interesting ovipositing habits of many insects. Chapter 11 deals with Heterogeny in Aphids and certain gall wasps, with illustrative charts, while Viviparity is the subject of Chapter 12, and hermaphroditism in Chapter 13. Chapter 14 on Insect Societies raises interesting points on various social breeding habits in some Hymenoptera and Isoptera, illustrated graphically.

There follow a short glossary and a list of something over 1500 references. An index completes the work. The illustrations by Miss G. Beye and Mr. K. Pogany, and the excellent micro-photographs round off this very detailed work. The book should be available to all students of the subject as a monograph which will be most helpful to advanced study; it is bound in boards, and well printed on good paper.—S.N.A.J.

Proceedings and Transactions of the British Entomological and Natural History Society, Vol. 3, part 2 (July 1970), 13/-.

This part contains a coloured plate of eight figures illustrating T. S. Robertson's paper on Homoeosis and related Phenomena in the Small Copper Butterfly, *Lycaena phlaeas* L., which appeared in the 1969 volume. The Annual General Meeting is reported with the President's speech, in which is included a very useful list of 108-micro-lepidoptera added to the British list since L. T. Ford's list of 1947. Reports of the Council, Curator, Librarian, Editor and Treasurer follow. Accounts of 1969 field meetings from 19th July to 27th September are given and the Proceedings include indoor meetings from 22nd January 1969 to 12th March 1969.—S.N.A.J.

From **Dr. H. G. Amsel** I have received two important papers:
Afghanische Pyraustinae from *Beitr. naturk. Forsch. Südw. Dtl.*, **29**: 25-66.

This gives an account of some species taken by the first and second expeditions of the Landessammlungen fur Naturkunde of Karlsruhe. Firstly the author lists the places visited by Klapperich in 1952-53, Dr. Kasy in 1962, 1963 and 1965, Ebert in 1957 and 1961 and himself in 1956 and 1966.

After setting out the districts worked by each of the above entomologists, Dr. Amsel gives an analysis of the zoogeographical groups represented stating the percentage of each. He then lists 91 species including 32 new to science and 5 new subspecies; he also sets up two new genera: *Phlyctaenomorpha* and *Dentifovea*. The paper is illustrated by genitalia drawings of the new species and four good photographic plates illustrating the new species with 62 figures.—S.N.A.J.

Afghanische quadrifine Phycitinae, *ibid*: 67-89.

In this paper **Dr. Amsel** mentions 31 known species, 15 new species and one sub-species with three new genera, *Divona, Rhinogradentia,* and *Anjumania* while he sets up *Culcitaria* in place of his *Culcita* (1959) which is preoccupied by *Culcita* Agassiz (1836). There are good male and female genitalia figures and a photographic plate of 16 figures of type specimens of the new species.—S.N.A.J.

From **Dr. Gerrit Friese** I have **Beiträge zur Insekten-Fauna D.D.R.: Lepidoptera-Argyresthiidae.** *Beit. Ent.*, **19**: 693/752.

The author deals with two genera, *Blastotera* Ratz. and *Argyresthia* Hübn. enumerating the species to be found in East Germany; 8 species of the former and 19 of the latter: these include two species which, although they have not yet been recorded from the country, are likely to be present.

The 27 species are listed with their synonymy, followed by a key to the species. The biology and oecology are discussed and the species are tabulated against their foodplants. There is a list of 32 collections from which the relative material has been examined, the species are tabulated against their foodplants; there is a map showing the provinces each marked with a graphical representation of the number of species recorded and the number of specimens represented, and on the opposite page these figures are tabulated showing the species represented in each province with the total number of species shown at the foot of each province column, and the number of specimens of certain species are listed together with the number of localities recorded for each. After this the species are treated systematically.

There are summaries in English and Russian, a list of 72 titles of literature consulted, and an index of the species giving page, and also figure on the two excellent coloured plates on which 24 of the species mentioned are illustrated. I am sorry not have been able to find mention of the artist's name, but his work is worthy of praise. The text is illustrated by genitalia drawings and also wing-pattern figures.—S.N.A.J.

Tropical Aquariums by **Neil Wainwright**, illustrated in colour by **Ernest C. Mansell** and by line drawings by **Baz East.** 110 pp. + 24 plates (12 in colour) Frederick Warne & Co., Ltd., 18/-.

This is a companion volume to Fresh Water Aquariums and should be of great interest to those occupied with keeping these beautiful and interesting fish. The ten chapters deal with most aspects of the subject and in an appendix the scientific names of some popular tropical fish are set out, followed by a bibliography of 33 titles and three periodicals, and an index: the book is well printed on good paper.—S.N.A.J.

Mammal Charts, published by The Mammal Society of Great Britain and F. Warne, small 10/-, large 7/- each.

These six charts illustrate 59 animals to be met with in the British Isles, including some escapes which are locally established. The three artists concerned with these good illustrations are **Rita Parsons, Barry Driscoll** and **Maurice Wilson.** The charts are available in large (20 in. x 30 in.), and small (8½ in. x 12 in.), and should be particularly useful for the class-room wall, and also for the country lover for recognition of animals seen on outings.—S.N.A.J.

(*V.C.H.*, 1908); one, July 4, 1959 (C.-H.). Hoads Wood (Scott, 1936); c. 1952 (P. Cue *teste* E. Scott). Tonbridge (H. E. Hammond). Sevenoaks Weald, one, July 7, 1959 (E. A. Sadler).

12. Ham Street (Scott, 1936); Orlestone Wood, one, July 28, 1955 (R. F. Bretherton); two, 1960 (M. Singleton & D. Youngs). [Wye] larva" feeds on bramble and raspberry . . . in the autumn" (Theobald, *J. S. E. Agric. Coll. Wye*, **1904** (13): 130).

13. Millers Wood (Weir, *Zoologist*, 5208; idem, *Ent. week. Int.*, **1**: 124). Tunbridge Wells (E. D. Morgan); one, 1958 (L. R. Tesch *teste* C. A. Stace); 1955 (C. A. Stace).

14. Tenterden, common (Stainton, *Man.*, **2**: 99). Sandhurst (G. V. Bull).

16. Folkestone, one, 1951 (A. M. Morley).

Variation.—In RCK are the following named abs.: *impuncta* Lempke, one, "Huggins/Gravesend CL/24/6/03"; *lacticolor* Lempke, four, "Bexley/Bd. 4.7.1903"; *rectangulata* Cockayne, holotype o, Folkestone (*Ent. Rec.*, **65**: 164, plt. 12. fig. 18); *venata* Cockayne, holotype o, Folkestone, bred Blackall 1881 (*Entomologist*, **83**: 52; Barrett, *Lep. Br. Isles*, **8**: plt. 339, fig. 1a); also, an ab. "near *vestata* Dadd but single postmedian and outer markings suffused", one, "Brasted, Kent/B.6.vi.22", one, "Kent/B.vi.22" (both in R.M. Prideaux's handwriting.—C.-H.).

I have three ab. *lacticolor* Lempke, from West Wickham, bred from ova as a second generation in August in the hot summer of 1947, but a number of others (from the same batch of ova) which remained in pupa and emerged in April 1948 were typical (C.-H., *Proc. S. Lond. ent. nat. Hist. Soc.*, **1954-55**: 21).

First Record. 1797: Taken "in Kent particularly". "Our specimen was taken in June, 1797, in Darenth Wood" (Donovan, *Nat. Hist. Br. Ins.*, **6**: 52).

Pelurga comitata L.: Dark Spinach.

Native. Waste places (particularly in towns), saltmarsh borders, neglected gardens, bombed sites; on *Chenopodium album*.

1. Lee, July 25, 1861 (Fenn, *Ent. week, Int.*, **10**: 196). Since noted from many parts of this division. Recent records are: Sidcup, three, 1938-39 (A. R. Kidner, *Diary*). Petts Wood, several annually 1946-50, except 1949 (E. Evans); 1950, 1952, common (A. M. & F. A. Swain). Blackheath, not uncommon in garden and at light (A. A. Allen). Orpington, 1948-49 (L. W. Siggs); (R. G. Chatelain). Abbey Wood, 1951-52 (A. J. Showler). West Wickham, (C.-H.); 1951 (E. J. Trundell). Bromley, in m.v. trap, 1959 (4), 1960 (5), 1961 (7), 1962 (6), 1963 (1), 1964 (7), 1965 (4), 1966 (1), with earliest dates July 22, 1959 and 1961, and latest date September 9, 1962 (D. R. M. Long). Bexley, fairly common, 1966-68 (D. O'Keeffe).

2. Rochester* (Chaney, 1884-87). Chatham, larvae (Matthew, *Entomologist*, **25**: 292). Strood, larvae abundant (Ovenden, *Ent. Rec.*, **16**: 294; idem, *Ent. Rec.*, **21**: 33). Greenwich Marshes (West, *Ent. Rec.*, **18**: 199). Plumstead Marshes (J. W. Tutt, in *Wool. Surv.*, 1909). Gravesend; Sittingbourne; Faversham (H. C. Huggins). Dartford (B. K. West).

3. Herne Bay, August 4, 5, 1931, August 1, 1933, August 8, 1936 (A. J. L. Bowes). Broad Oak; (C.-H.). Canterbury, larvae common on bombed sites, c. 1945 (J. A. Parry).

4. Deal (Fenn, *Ent. Rec.*, **2**: 203); common, August 6, one, August 16, 1892 (Fenn, *Diary*). Sandwich, one, August 3, 1954 (W. D. Bowden). Ick-

ham, 1954-59, common (D. G. Marsh). Worth, one at m.v.l., August 9, 1969 (T. W. Harman).

5. Farnborough* (W. Barnes, in *Wool. Surv.*, 1909). Westerham (R. C. Edwards). Downe (de Worms, *Lond. Nat.*, **1956**: 89); July 24, 1957 (C.-H.).

6. Gravesend, common (F. T. Grant). Pinden, common (E. J. Hare).

8. Folkestone*, not scarce (Knaggs, 1870). Dover, rare (E. & Y., 1949); common 1944, others since to 1952 (B. O. C. Gardiner).

9. Ramsgate, one, 1910, several 1937 (J. W. C. Hunt). Margate (H. C. Huggins); singletons at light 1930, 1931, 1933 (H. G. Gomm.). Northdown, one, July 20, 1920 (B. Embry).

11. Aylesford (G. A. N. Davis). Hoads Wood (P. Cue *teste* E. Scott).

12. Ashford (Scott, 1936); August 17, 1954 (P. Cue *teste* E. Scott). Chartham (P. B. Wacher). Willesborough, five, August 11-31, 1954, one, August 15, 1956; Wye, one, September 4, 1954, August 19, 1956 (W. L. Rudland). Willesborough, four, 1957-59 (M. Singleton). West Ashford, one, 1958 (M. Enfield). Ham Street, August 15-20, 1960 (C. R. Haxby and J. Briggs).

13. Pembury, common (Stainton, *Man.*, **2**: 116).

15. Dungeness, two in m.v. trap, August 6, 1962 (R. E. Scott). Lydd Town, August 1965 (D. W. H. ffennell). Boulderwall, three, August 11-17, 1966 (R. E. Scott).

16. Folkestone Town (A. M. Morley).

VARIATION.—The following named abs. are in RCK: *unicolor* Lempke, one, "Herne Bay/*0 14.7.06/L.B.Prout"; *zonata* Wahlgren, one, Bexley, July 26, 1903, J. Greenwood; trans ad *zonata* Wahlgren, one, Bromley, 1929; *tangens* Lempke, Lewisham, one bred, 1892, Bromley, one, 1905, Bexley, one, 1903, one, 1902.

FIRST RECORD, 1859: Stainton, *loc. cit.*

Lampropteryx suffumata Denis & Schiffermuller: Water Carpet.

Native. Woods, bushy places, etc.; foodplant unknown.

Apparently very local and much scarcer nowadays than formerly.

1. Lee, May 4, 9, 10, 1860, common in lanes (Fenn, *Lep. Data* MS.); April 25 (2), 29 (2), 30 (4), May 1 (1), 20 (1), 1861, April 23 (2), 28 (1), May 8 (1), 9 (1), 1862, April 24 (9), 27 (4), 1863 (Fenn, *Diary*). Bexley district (L. W. Newman, in *Wool. Surv.*, 1909). Eltham (A. H. Jones, in *Wool. Surv.*, 1909). Abbey Wood, one at m.v.l., May 5, 1953† (A. J. Showler).

5. Sevenoaks*, 1886 (Hill, *Entomologist*, **19**: 185). Downe, a few, 1906 (W. Barnes, in *Wool. Surv.*, 1909). Chevening, May 23, 1914 (Gillett, *Diary*).

7. Wigmore Wood; Chatham-Maidstone Road; not common. April 29—May 29 (Chaney, 1884-87). Woods between Chatham and Maidstone, May 27, 1899 (Tutt, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1899**: 84). Maidstone neighbourhood* (Green, *Ent. Rec.*, **53**: 118) Sharsted, two or three each visit, 1925-26 (H. C. Huggins). Long Beech Wood, May 15, 1936 (Scott, 1936). Richards Wood, Westwell, several, May 1947, one, April 22, 1949 (E. Scott); which latter specimen I have (C.-H.).

8. Dover-Folkestone district.—(Ulyett, 1880); April 1881 (Eadle, *Entomologist*, **14**: 116); May 1890, taken by W. Purdey (South, *Entomologist*, **24**: 171); April 9, 1894 (Hills, *Entomologist*, **27**: 199). Poulton Wood, one, May 13, 1895; Green Lane, Dover, one, May 10, 1895; Coombe Wood, one, May 17, 1896; Alkham Road, Dover, two, April 21, 1900; Whitfield, one, April 20, 1901 (H. D. Stockwell, *Diary;* Stockwell, *Entomologist*,

34: 26). Dover, two, April 21, 1910, in H. D. Stockwell coll. (C.-H.). Betteshangar; Ewell Minnis (E. & Y., 1949). Folkestone Warren, at dusk, May 18 (2), 24 (2), 1929 (Morley, 1931). Lyminge Forest, one on a tree trunk, May 26, 1956 (P. Cue).

9. Margate, one in garden, 1930 (H. C. Huggins).

11. Wateringbury (*V.C.H.*, 1908).

13. Langton Green, most years, first seen 1913, locally common at dusk (E. D. Morgan). Bayhall (Morgan, *Lepidoptera of the Tunbridge Wells District* MS.). Tunbridge Wells, near the High Rocks, several, 1947 (B. K. West).

16. Folkestone Town, ♂ on fence in garden, May 3, 1958 (A. M. Morley).

Variation.—An aberration known as the "Dover form", intermediate between the type and ab. *porrittii* Robson & Gardner, was it seems fairly frequent in the area between Folkestone and Dover during the latter half of the 19th century. True *porrittii* also occurred there during this period, but only very occasionally (cf. *Entomologist*, **19**: 143, **24**: 171, **25**: 217, **42**: 64-65; *Proc. S. Lond. ent. nat. Hist. Soc.*, **1891**: 119; *Young Nat.*, **7**: 120).

Fenn (*Diary*) writes that on August 5, 1890, he and J. W. Tutt visited W. J. Austen at Folkestone, who showed them "beautiful varieties of *suffumata* from the Warren".

In RCK is a fine series of the "Dover form" from Kent, as well as a number of Kentish *porrittii* as follows: Ab. *porrittii* Robs. & Gard., one, "Purdey/Folkestone/1895"; one, "Purdey/Folkestone/1893"; one, "Dover"; two, "Blackhall/Folkestone"; one, "W. Purdey/Dover/18 June 1894"; two, "Purdey/Dover/1893". "Dover form, heterozygotes", twenty-four from "Dover" and "Folkestone" with various dates between 1883 and 1914, and including one, "Dover/16.iv.1912", one, "W. Purdney/Dover/18 June 1894", and one, "Folkestone/May 1914". Also in RCK are a number of typical *suffumata* from the Dover-Folkestone area: "Blackhall/Folkestone" (3); "Folkestone/1923/(Purdey coll.)" (2); "Dover" (4) "Dover/South" (1).

First Record, 1861: Fenn, *Diary*.

Cosmorhoe ocellata L.: Purple Bar.

Native. Woods, bushy places, hedgerows; on *Galium mollugo*. Fairly frequent and found in all divisions. "Generally distributed" (*V.C.H.*, 1908).

D. O'Keeffe found a larva on *G. mollugo* at Eynsford in August 1969, from which he bred the moth.

Variation.—Kettlewell and Goodson (*Proc. S. Lond. ent. nat. Hist. Soc.*, **1951**: 41) exhibited bred abs. as follows: "three extreme bandless forms, more extreme than *costimacula* Cockayne, shown with one typical example from the same brood, Ham Street, bred 27-28.vii.61 (A. L. Goodson)".

In RCK is one transitional to ab. *robiginata* Dannehl, "Eynsford 1903/J. Greenwood".

First Record, 1831: Stephens, *Haust.*, **3**: 222.

Eulithis prunata L.: Phoenix.

Native. Mainly town gardens; foodplant unrecorded.

1. West Wickham, one, August 18, 1968, and two others same year (D. S. Burrows).

3. Blean, one, August 2, 1906, in J. P. Barrett coll. (C.-H.). Canterbury*,

one, August 1920, in F. A. Small coll. (C.-H.).

4. Deal Town*, one on a lamp, August 19, 1890; one at light, August 19, 1892, (Fenn, *Diary*). Deal*, often common (*V.C.H.*, 1908). Worth, two, July 21, 1967; two worn in m.v. trap, August 1968 (Harman, *Ent. Rec.*, **80**: 188, **81**: 82); several in 1969, mostly worn (T. W. Harman).

6. Greenhithe*, one in moth trap, 1898 (Farn MS.).

7. Faversham* (Morris, *British Moths*, **2**: 32). Westwell (Scott, 1964).

8. Folkestone* (Ullyett, 1880). "Folkestone/S. G. Hills", one; "Folkestone/Bred 1885", several (RCK). "A few specimens come to light annually in Dover" (E. & Y., 1949). Dover, "once only in 1938" (Gardiner, *Ent. Gaz.*, **10**: 10).

10. Brasted, in garden, not common (R. M. Prideaux). Sevenoaks, two, bred July 1908, in F. A. Small coll. (C.-H.); August 25, 1919, July 31, 1920 (Gillett, *Diary*); several, 1906, bred Raynor (RCK).

12. "Common in Ashford" (Scott, 1936). Ashford, two or three annually, about 1951-52, in garden and in lane adjoining the market gardens and orchards (P. Cue). Ham Street (Scott, 1950). Willesborough, one in garden, July 18, 1961 (M. Singleton).

13. Tunbridge Wells, 1891 (Beeching, *Ent. Rec.*, **2**: 230); common in kitchen gardens (Knipe, 1916; Given, 1946); one from G. V. Bull coll. and in E. D. Morgan's writing labelled, "2329. Bred/1909-10/Ova ♀ Tun. Wells" (C.-H. coll.).

16. Folkestone Town, one at street lamp, August 28, 1932 (A. M. Morley); one taken August 23, 1949 (Morley, *Trans. Folkestone nat. Hist. Soc.*, **1949-50**: 18).

VARIATION.—In RCK is ab. *juncta* Lempke, one, "Sevenoaks/Br. ov. 7.7.05".

FIRST RECORD, 1862: Morris, *Br. Moths*, **2**: 32.

E. testata L.: The Chevron.

Native. Marshes, carr. wet heaths and woodland; foodplant unrecorded. "Generally common" (*V.C.H.*, 1908); but would appear to be appreciably less frequent now than formerly, and has certainly become extinct in much of div. 1.

1. West Wickham (see *First Record*); August 10, 1861 (Fenn, *Diary*). Lower Camden (Cockerell, *Entomologist*, **18**: 20). Sydenham (Sellon, *Ent. Rec.*, **2**: 164). Lee Swamp; Bexley; Eltham; Lewisham; Hither Green; Farnborough (*Wool. Surv.*, 1909). Bromley (W. A. Cope). Pauls Cray Common (*Wool. Surv.*, 1909); June 3, 1911 (2 larvae), August 2, 1913 (2), August 30, 1936 (1) (Kidner, *Diary*). Chislehurst, six, August 1904, one, August 25, 1906 (S. F. B. Blyth); one, August 31, 1912 (Kidner, *Diary*). Sidcup, one, August 29, 1915 (Kidner, *Diary*). Beckenham, one, August 4, 1926; Petts Wood, one, August 18, 1946 (A. M. and F. A. Swain). Bromley, one, August 24, 1959 (D. R. M. Long).

2. Luddenham (H. C. Huggins).

3. Bysing Wood (H. C. Huggins).

4. Deal (E. & Y., 1949). Ham Fen, six at light, August 6, 1950 (C.-H.). Worth, one, August 10, 1969 (T. W. Harman).

5. Chevening, August 17, 1913 (Gillett, *Diary*). Westerham (R. C. Edwards).

6a. Chattenden (Chaney, 1884-87); (H. C. Huggins).

8. Warren (Knaggs, 1870); common (Morley, 1931). Coombe Wood,

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AND JOURNAL OF VARIATION
(Founded by J. W. TUTT on 15th April 1890)

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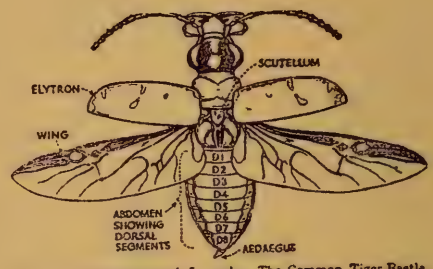

FIG. 2.—*Cicindela campestris* L., male. The Common Tiger Beetle. (Adapted after Ganglbauer.)

Illustration reduced

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T. R. E. Southwood, Ph.D., B.Sc.

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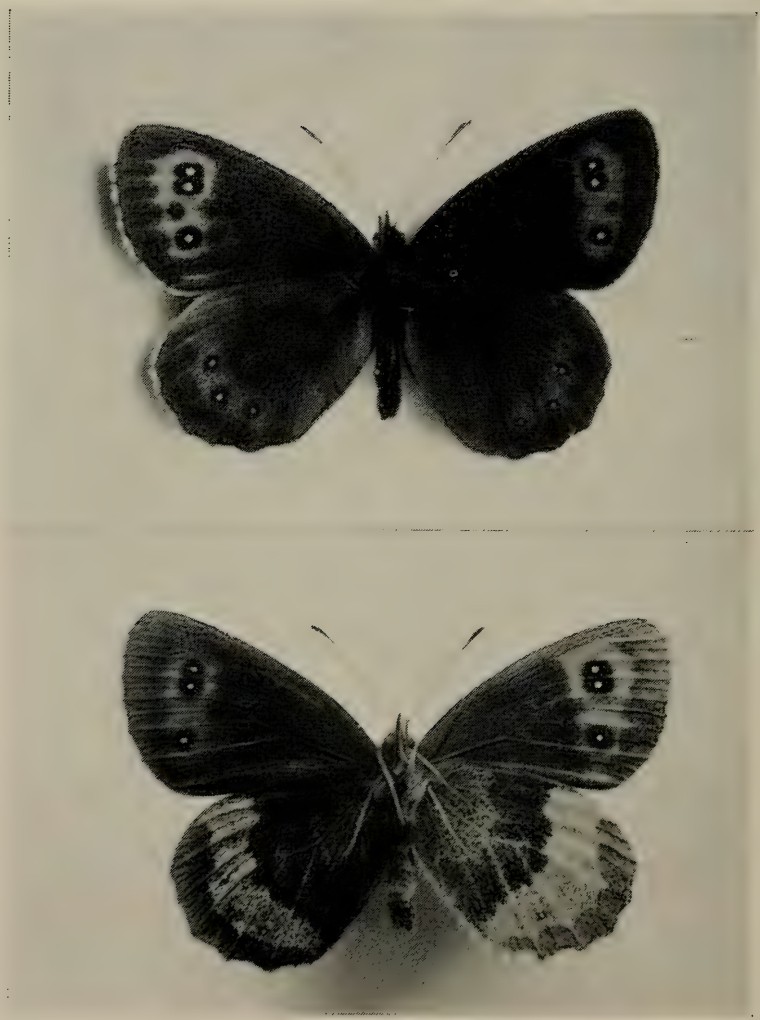
Erynnis tages L. ab. *radiata* (ab. nov.)
×2·25 (P. 253)



Photographs by J. F. Kimber.

Erebia aethiops Esp.
bilateral gynandromorph (×1¼) (P. 252)

Melanargia arge Sulzer and other Spring Butterflies in Central Italy, May 1970

By C G. M. de Worms, M.A., Ph.D., F.R.E.S.

The southern half of Italy, that is in latitudes south of Rome, seldom seems to have been visited by British lepidopterists for collecting. Certainly the number of species of butterflies declines considerably the further south one ventures in that delightful country. In fact only some half of the total of 228 species for continental Italy are apparently occurring south of the Capital. But one insect in particular merits a special visit, that beautiful Marbled White, *Melanargia arge* Sulzer which is virtually confined to the southern regions of Italy, though it used to be found in the vicinity of Rome. So far as I am aware, only two British collectors have seen this fine butterfly in its native haunts since the last war. The late Dr. Ernest Scott obtained a series in 1945 at the end of the campaign in Italy and in more recent years, in 1967, Lt.-Col. and Mrs Manley saw this species in some numbers between Rome and Naples and kindly indicated the special region in which it occurs in a very restricted type of terrain.

As I considered it well worth a visit to see and obtain this very localised insect as well as other species flying at the same period, I set out from London by air on May 12, 1970, reaching Rome airport by lunchtime. Here I hired a small Fiat and at once sped southwards by the coast road via Ostia and Anzio to Sebaudia where there is a big forest nature reserve, then on to Gaeta where a fairly new main road skirts the rocky coastline with a series of tunnels. I completed the 100 miles to Formia by the early evening. The very well-appointed and comfortable Miramare Hotel by the side of the main Rome-Naples road was to be my haven for the next three weeks which proved to be a period of almost unbroken sunshine and warmth.

At this part of the west coast the foothills of the Appennines come down almost to the sea. Very rocky slopes largely covered with the esparto grass growing in large hanging panicles were to be my chief hunting ground for the Marbled White, since it is likely that this prolific grass is its larval foodplant. On the morning of May 13 I set out on a voyage of discovery, as I was not fully aware of any exact locality for *M. arge*. I struck inland along the road towards Ausonia which eventually links up with the autostrada from Rome to Naples, but the only insects seen in quantity were *Glaucopsyche cyllarus* (Poda (*alexis* Rott.)) and *Polyommatus icarus* Rott. in this low-lying country, but I was surprised however to take quite a fresh *Philotes baton* Bgstr. at this somewhat late date for the first brood which was probably accounted for by the very late spring up to that period. That afternoon I motored north of Formia to Itri and over the very picturesque mountain road leading down to the coast road at Sperlonga, but virtually nothing of note was on the wing in spite of the warmth and sunshine. But on returning to my hotel I was pleased to see *Iphicledes podalarius* L. sailing about the garden with *Pyrameis cardui* L. On the 14th I again set out early in another day of quite intense heat. I went in the same direction as on the previous day when I suddenly noticed a big hillside below the small town of Castellonorato covered with broom and esparto grass. This area looked very promising when I wended my way up the steep winding hill.

G. cyllarus was again well to the fore with females flushed with blue. Among the Pierids I took some diminutive *P. manni* Mayer and *Euchloë ausonia* Hübn. Suddenly about midday a Marbled White appeared on some flowers by the roadside. On netting it, it proved to be a lovely *M. arge* male which was very encouraging, but this was a solitary specimen for the day and I made my way to the nearby locality of Spigno Vecchio which is also reached by a twisty road leading to a high slope underneath the mountain. On approaching the small village there was quite an extensive wood of oaks with a very attractive clearing near a dried up watercourse. This spot was to be almost my daily venue since it harboured a lot of woodland species not seen elsewhere. As I drove up a *Limenitis rivularis* Stichel sailed round the car, an early appearance for this Nymphaline. *Leptosia sinapis* was in plenty together with *Anthocharis cardamines* L. Among the Lycaenids were *Cupido minima* Fuessly and *Aricia agestis* Schiff. with many *Pararge aegeria* and a single *Issoria lathonia* L. but no sign of the Marbled White. On returning to Formia via Castellonorato I came across a portion of road bordering a rough slope where the chief Pierid fluttering along this stretch turned out to be *Pieris ergane* G.-H. in rather a small form with its curious female with blurred black markings. On the morning of May 15 I followed the same course as on the previous day, seeing only one more *M. arge*, but also a good many fresh *Papilio machaon* L. careering about the hillsides while on the 16th after revisiting the customary localities near Formia, I struck inland via Ausonia as far as Pontecorvo which is within sight of Monte Cassino, but I saw little new of note, except a *Eublemma ostrina* Hübn. The 17th, Whit Sunday, was yet another very fine and warm day which brought out a few more *M. arge* in the original locality where I also took a fresh female *P. baton* with several *C. minima*. The glorious weather continued without interruption for the next four days when I followed the usual routine of visiting the slope for *M. arge* in the morning, but on each occasion only a handful were seen. They suddenly would appear from apparently resting well down in the tall esparto grass. The first *Pararge maera* L. was seen on May 19 in a large and very dark form. This insect became increasingly common in the subsequent week. On the 21st *Pieris ergane* was much more numerous on the road to Trivio. As May 22 opened somewhat dull, I decided to make a long-distance trip to explore the country south of Naples, which I reached by joining the autostrada at Capua and after skirting Mt. Vesuvius and the main part of the city, I went via Castellamare along the famous Amalfi drive which continues for nearly 40 miles along the south of the Sorrento Peninsula with a very narrow and tortuous road hanging on the cliff edge, but with glorious scenery, especially in the vicinity of Positano. The island of Capri is just offshore. But in spite of fine conditions very little was on the wing and there was no sign of any Marbled Whites. I rejoined the southern autostrada near Salerno, but missed the turning off to the one going direct to Rome and found myself in the heart of Naples, eventually returning to Formia by the coast road after a round trip of some 200 miles.

On May 23 the first male *Maniola jurtina* L. and *Melitaea didyma* Esp. were noted together with a single *Gegenes pumilio* Hffmsg. next day. The most surprising capture on the 25th at Spigno Vecchio was a solitary *Syntarucus pirithous* L. (*telicanus* Lang), the only one I saw.

That evening I was joined by Gen. Sir George and Lady Ida Johnson at the Hotel Miramare and they stayed the final week there. On the morning of May 26 we all worked the slopes of Castellonorato where *M. arge* still remained only very sporadic and the following day in the afternoon I toured again the area near Itri penetrating along the old Via Appia as far as Fondi. But though the rugged slopes of the local pass looked ideal for Marbled Whites and other butterflies, they were virtually devoid of insect life. The last days of May were very warm culminating with a violent thunderstorm on the afternoon of the 30th. The previous day had been extremely hot when I ascended part of the very rough mountain road just above Manorula, a few miles inland from Formia. Here *Pieris ergane* was particularly numerous together with a good many *C. cyllarus*. June opened with the continuance of the warmth and on the 1st which was our last day in this delightful region, we saw virtually the first of the females of *M. arge* which gave the impression that species was far from fully out. On the 2nd after setting out early from Formia and following the Via Appia I found myself involved in a great traffic block on the circular road round Rome and was forced to make a detour to the coast, eventually reaching the airport from Ostia without much time to catch the plane to London that afternoon. Thus ended a very pleasant and on the whole profitable three weeks in this most attractive part of italy, but in spite of the prolonged warm spell the general impression was that butterflies at this period were not too thick on the ground while *M. arge* was only observed in one very restricted locality.

I have thought it of interest to append a complete list of 43 butterfly species seen in this area between May 12 and June 2.

Papilio machaon L. Was seen sporadically in the Formia area.
Iphiclides podalirius L. Only a few near Formia and near Minturno.
Leptidea sinapis L. Numerous, especially near Signo Vecchio.
Anthocharis cardamines L. Fairly common in the more wooded areas.
Euchloë ausonia Hübn. Only occasional in the district.
Pieris brassicae L. By no means common in the region.
Pieris rapae L. Fairly common and widely distributed.
Pieris mannii Mayer. Sporadic in a very diminutive form.
Pieris ergane G.-H. Quite plentiful in rocky spots over a wide area.
Pieris napi L. Distinctly scarce, only a very few seen.
Aporia crataegi L. Fairly numerous in several localities.
Colias crocea Fourc. A good many seen including *f. helice*.
Gonepteryx rhamni L. A few at Spigno Vecchio.
Gonepteryx cleopatra L. Both sexes fairly common in the wooded areas.
Limenitis rivularis Stichel. Only a few noted at Spigno Vecchio.
Melitaea didyma Esp. A few in low-lying ground.
Melitaea phoebe Schiff. Not common in meadows.
Issoria lathonia L. Only one seen, at Spigno Vecchio.
Vanessa cardui L. Occasional in the region.
Melanargia arge Sulzer. Only observed near Castellonorato where it was by no means plentiful.
Pararge aegeria L. Numerous in the wooded parts in a fairly orange form.
Pararge megera L. Not very common in the same localities as the

previous species.

Pararge maera L. Fairly common in a large and dark form.
Maniola jurtina L. Abundant in meadows from late May.
Coenonympha arcania L. Only one observed, at Spigno Vecchio.
Coenonympha pamphilus L. Fairly common in most areas.
Callophrys rubi L. A few worn specimens noted.
Syntarucus pirithous L. (*telicanus* Lang.). A single example taken at Spigno Vecchio.

Cupido minima Fuessl. A few seen in several localities.
Lycaenopsis argiolus L. Only one late female observed.
Philotes baton Bgstr. One of either sex taken near Formia.
Glaucopsyche cyllarus Rott. (*alexis* Poda). By far the commonest Blue and widely distributed. Females partially blue.

Aricia agestis Schiff. Not common in the area.
Cyaniris semiargus Rott. One male seen at Spigno Vecchio.
Polyommatus icarus Rott. Quite common and widespread.
Erynnis tages L. A few in wooded regions.
Carcharodus alceae Esp. One taken near Itri.
Pyrgus malvoides El. & Ed. A few, mainly at Spigno Vecchio.
Spialia sertorius Hffmsgg.—Several observed on low ground.
Adopaea flava Brunnich. Appearing in the last days of May.
Thymelicus acteon Rott. A few seen in late May.
Ochlodes venata Brem & Grey (*Sylvanus* Esp.) Fairly common in the woods.

Gegenes pumilio Hffmsg. A few seen near Castellonorato.

The few moths noted by day and night included *Arctia villica* L., *Leucania vitellina* Hübn., *Heliothis peltigera* Schiff., *Minucia lunaris* Schiff., *Eublemma ostrina* Hübn., *Aspitates ochrearia* Rossi and a species of Procris.

Three Oaks, Woking. 8.ix.70.

A Gynandromorph *Erebia aethiops* Esp. (Lep. Satyridae)

By A. D. A. Russwurm

A bilateral gynandromorph *Erebia aethiops* Esp. was captured on Arnside Knott, Westmorland, on August 4th, 1970, and the accompanying photograph shows the specimen well.

The female of this species has a brief and rather weak flight, passing most of its time at rest on the grasses. The gynandromorph, when captured, was flying briskly in the manner of the male. When examined in the pillbox, the specimen appeared much distorted, being pulled round in a curve by the smaller female side.

Coridon, Ober Road, Brockenhurst, Hants.

A New Aberration of *Erynnis tages* L. (Lep Hesperiidae)

By A. D. R. Brown, F.R.E.S.

In May, 1965, I captured a somewhat unusual variation of this species while collecting on Walton Hill, near Street in Somerset. Since that occasion, I have come across only one other similar specimen, which is in Mr N. A. Watkins's collection. An examination of the extensive collections at the Tring Museum in 1967 revealed nothing. From that time I have been repeatedly asked to put forward a formal description of the specimen, and to decide upon a suitable name for it:

Erynnis tages L., ab. *radiata* (ab. Nov)

The ground colour is the normal fuscous-brown as in typical specimens, although the broken grey transverse band in the centre of each forewing is absent. The dark brown wedges on either side of this band have become extended as to join each other, thus producing a series of broad radiations. The hindwings and underside are normal. Although the average wingspan of the species is 29 mm., this specimen only measures 24 mm.

The description is of the paratype, which is a male caught on 30th May, 1965, by the author.

9 Stoke Park Road, Bristol 9. 23.vi.1970.

Discovery of the Probable Feeding Habits of the Larva of *Scoliaula quadrimaculella* Boheman (Lep. Nepticulidae)

By Lieut.-Col. A. M. Emmet, M.B.E., T.D., M.A., F.R.E.S.

Early this year Mr S. N. A. Jacobs suggested to me that I should try to solve the riddle of the life-history of *Scoliaula quadrimaculella* Boh. This species received its name in 1851 and is widely distributed, both in this country and on the continent; it has, however, seldom been recorded here in recent years. I welcomed the challenge of Mr Jacob's suggestion, but expected that two years at least would be needed to find the answer, the first to discover a locality for the moth, which I had not hitherto taken, and the second to search for the larvae in the spring.

All the evidence suggests that *quadrimaculella* is associated with alder: during the past hundred years it has been beaten from alders, ,swept from alders, and netted while flying round the lower branches of alders. I therefore assessed my neighbourhood for a good alder locality, and concluded that Chippenham Fen was probably the best bet. Accordingly to implement the first part of my two-year plan, I went there on the 12th July and duly set about beating alders over my tray. I persisted in this rather tedious task for perhaps a couple of hours, and was rewarded at about half-time when a pair of *quadrimaculella* in cop. fell into the tray. It was not until I had moved to other trees that I realised what an opportunity I had missed: the female of the pair most probably had never flown and there was a very good chance that the evidence of her larval feeding would be there in the branch from which I had tapped her. Perhaps my two year programme could be completed in a single

afternoon. By the time this elementary deduction had resolved itself in my mind I had progressed some way, and it was too late to re-identify the branch in question. I continued beating, but saw no further *quadrimaculella* that day.

I did not get the opportunity to revisit Chippenham Fen until the 22nd July. On that occasion, too, I devoted almost my whole attention to tapping the alders. I soon beat out several single specimens of *quadrimaculella*, but a thorough search of the branches from which I had dislodged them showed no trace of larval feeding. Nevertheless I persisted, though with diminishing hope of success, and my persistence paid off, for in due course another pair of *quadrimaculella* fell into my tray. An examination of the branch revealed a small mine at the point where two leaf stalks spring from their common stem.

I must admit that I have no definite proof that this mine is the work of *quadrimaculella*, but there is little doubt in my mind that it is so. First, my expectation that copulation would take place before the female's first flight appears to have been fulfilled. Secondly, the chamber of the mine is lined with silk; this, according to Hering, is a sure sign that the mine is lepidopterous, since the larvae of other orders use

silk only in conjunction with pupation. In the third place, there is general agreement that *quadrimaculella* is associated with alder. Meyrick, who is echoed by Ford, states, "larva probably in bark of shoots of alder". For a member of the family of the Nepticulidae, *quadrimaculella* is a large moth, and its larva might be too bulky to feed as Meyrick suggests. My mine, which occupies the diameter of the petiole, could accommodate a larva of the appropriate size. Tutt quotes Warren's conjecture that the larva occurs in "flowers and flower-stalks of alder, in spring", a guess apparently nearer the mark than Meyrick's. Lastly, if the mine was not the work of *quadrimaculella*, what other insect was responsible?

Mr Jacobs's drawing is a faithful reproduction of an object which lacks conspicuous features. After all, if *quadrimaculella's* feeding-place had been obvious to the eye, it would have been discovered long ago. There is a slight distention of the stem where the mine occurs just at a bifurcation. The natural green is somewhat blackened and there is some reddish frass adhering externally. A diligent search in June at a known locality should produce further examples of the mine and, if the moth were then reared, final proof of the feeding-habits would be established.

As far as I am aware, my capture of *Scoliaula quadrimaculella* Boh. at Chippenham Fen constitutes a new county record for Cambridgeshire. Another interesting moth which I beat from the alders at the same locality was *Stathmopoda pedella* L. According to the Victoria County History for Cambridgeshire *pedella* was fairly common at Chippenham Fen in 1892, but has been scarce subsequently. It appears that it is still scarce, since I took only single specimens on each of my visits.

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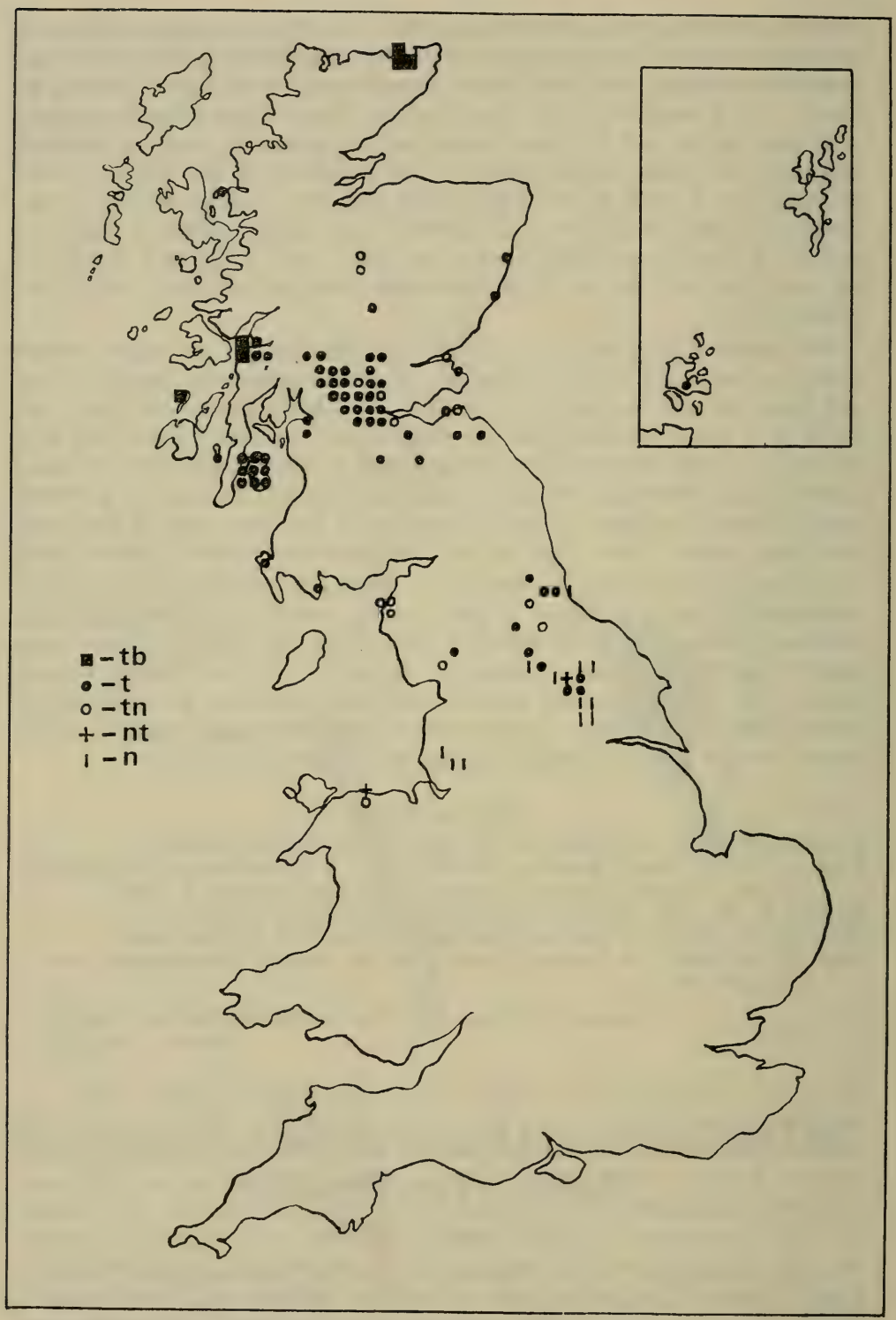
The Distribution and Nature of *Pieris napi thomsoni* Warren (Lep. Pieridae)

By George Thomson

Since publication of the description of the *adalwinda*-type race of *Pieris napi* (L.) called *thomsoni* by B. C. S. Warren (*Ent. Record* 80, p. 299), I have undertaken some work on the butterfly in Scotland, north England and north Wales. The scope of this paper is limited to recording the distribution of *thomsoni* in the British Isles as far as I have been able to find out (Map I), and outlining a few of the problems which the butterfly presents with a few notes on its nature. It is not intended as an exhaustive dialogue on the insect but as a guide suggesting lines along which future work and discussion could develop.



The distribution of the *Pieris* forms *napi* and *thomsoni* in Great Britain (localities sampled)

tb—*thomsoni* with primitive *bryoniae*
t —*thomsoni*
tn—*thomsoni* but mixed with or intermediate to *napi*
nt—*napi* but with a few *thomsoni*
n —*napi*

The relationship between *thomsoni* and the Scandinavian *adalwinda* is as important and interesting as it is real. Both have a proportion of females in which the ground colour is some shade of yellow—particularly in the spring brood—the number in the British Isles and Scandinavia decreasing as we go south. I have been told that there are localities in the Scottish Isles where the entire female population of the second generation are yellow but I have yet to have this confirmed. I took a single yellow female of the second brood near Callander this year—the very first I have seen. Unlike the Scandinavian insect, *thomsoni* is everywhere at least partially bivoltine, although it is frequently the case that very few are to be seen in August or September. This happens at heights over 600 feet in central Scotland and probably elsewhere at altitude. July specimens could well be univoltine individuals, but it is not unusual in very warm years to see the butterfly in late September at least as far north as the southern slopes of the Grampians. These could represent either a partial third brood or the usually single brooded specimen producing a second. These are nearly always small. There is an interesting problem with these yellow specimens which makes it difficult to obtain accurate results for analysis. The fact is that the great majority of these dark females emerge earlier than the white ones. Furthermore, the proportion within a population varies considerably from year to year. Such fluctuation occurs also in the degree of dark or black scaling on the upperside, particularly on the forewings. I therefore wonder to what extent this is environmentally controlled and whether the relative proportions of the yellow and dark females in different localities has any significance other than in the very broad sense that they occur only rarely in *napi* proper.

There is a problem too of representing the various grades of yellow and their proportion as numerical values for the purpose of analytical comparison. However, Table one shows results obtained using a method which gives a good indication of the nature of both the dark scaling and the ground colour of the females in a sample. Both the B and Y characters (representing the suffusion and the yellowness of the ground colour) are divided into four gradations thus:

Character B:—1—light
2—moderately dark (normal in southern *napi*)
3—dark but not strongly suffused
4—very dark and strongly suffused

(The actual colour of the 'black' marking is ignored for the purposes of the analysis. It could be, for example, light grey but so extensive that it was classed as B4.)

Character Y:—1—white
2—very slightly yellow
3—clearly yellow
4—very yellow

The samples would have to be taken from the same brood as it would not be useful to compare the first brood from one area with the second from another as the broods differ markedly within the same populations. The B or Y value is the sum of the percentages of specimens with each character multiplied by the character number (1, 2, 3 or 4) less 100.

$$B=(\%B1\times1)+(\%B2\times2)+(\%B3\times3)+(\%B4\times4)-100$$
$$Y=(\%Y1\times1)+(\%Y2\times2)+(\%Y3\times3)+(\%Y4\times4)-100$$

Therefore B=0 would mean that the whole sample consisted of light specimens or Y=300 would mean that all the females in a sample were very yellow. The presence or absence of the 'Bryo-streak' (the dark scaling along the rudimentary vein A1) characteristic of both *P. bryoniae* Ochs. and *adalwinda*, but not *napi*, is another useful character and is best represented as a simple percentage.

My female samples did not come from a large enough number of localities to plot the distribution of these characters, though it does appear that populations have a greater proportion of yellow females as we go north and west.

For the purpose of plotting the distribution of *thomsoni* as a race I have used the criterion described by Warren (loc. cit.) in his original description. The presence of four types of androconial scale in the male —*adalwinda, marginalis, narina* and *napi*—is probably the most reliable and consistent method of determining the status of these butterflies, for, once one has learned to recognise the main scale types it is possible to diagnose any specimen quickly, accurately and without damage. I use a Japanese 'Sanwa' pocket microscope (not the pencil type) which has a single×100 lens giving a magnification quite sufficient for scales. There is no need to make permanent slides. I find it a simple matter to slip a thin glass slide between the wings of an unset specimen and rub off a number of scales onto the surface. Wiping the slide clean with the finger is highly unscientific but it gives it a slight stickiness which helps to remove the rather loosely attached androconial scales while leaving the others unmoved. Set specimens require a bit more care but it is possible to get a good scale sample using a similar method without knocking off the antennae or abdomen. A permanent record of an interesting scale sample can be obtained by simply using the slide as a negative and projecting it through a photographic enlarger to make a white on black print.

Four very interesting points arose from the examination of my scale samples indicative of the fact that a great deal of work still has to be done and a great number of questions to be answered.

1. A fifth scale type *kamptschadalis* was discovered on a specimen from Scrabster and I have come across a few scales resembling them in other localities (Aberdeen) though they are more often of an intermediate type.

2. Quite a number of malformed—assymetric—scales were found in the Oban ,Muthill and Denton samples.

3. The large primitive *bryoniae* scales turned up in a specimen from south Rona, several from Oban and one from Scrabster. This is a large proportion as Mr Warren informs me that he has seen only one in *napi*.

4. A few samples in Scotland produced a sizeable proportion of *napi* scales both alone on the one specimen and mixed with other scale types (Newport, some Argyll localities and Torphichin). A similar situation was found in the 'boundary' region of north Yorkshire and north Wales. In this belt of transition there is something between a cline and a mosaic distribution of *napi* and *adalwinda* types some samples showing a clear break between *napi* and *adalwinda*, others with many or mostly intermediates. It is possible that local migration tends to recurrently unbalance what is becoming a stable situation in some of these localities

and the apparent fertility between the two forms introduce an alien element. I do not intend to enter a discussion on the question of race, sub-species or species or whether our Scottish and north English Green-veined White should be called *Pieris adalwinda, P. adalwinda thomsoni, P. napi thomsoni* or *P. napi adalwinda* but it does look as if *thomsoni* in the region where it meets *napi* behaves like a sub-species or race and not a species.

The following is an example of the androconial scales found in the samples examined: the less frequent scales are in parenthesis.

Locality and year(s) in which sample was taken	
1956-1970 Dunblane, Perthshire	*adalwinda, marginalis* (*napi, narina*)
1960-1970 Callander, Perthshire	*adalwinda, marginalis* (*napi, narina*)
1956-1970 Sherrifmuir, Perthshire	*adalwinda, marginalis* (*napi, narina*)
1967 Kilsyth Hills, Stirlingshire	*adalwinda, marginalis* (*napi, narina*)
1967 Carron Valley, Stirlingshire	*adalwinda, marginalis* (*napi, narina*)
— Falkirk, Stirlingshire	*adalwinda, marginalis* (*napi*)
1963 Workington, Cumberland	trans. *adalwinda-napi* (*adalwinda, napi*)
1963 Witherslack, Westmoreland	trans. *adalwinda-napi* (*adalwinda, napi*)
1967 Reivaulx, Yorkshire	*napi*
1968-1970 Scholes, Yorkshire	*napi*
1934 Shadforth, Co. Durham	*adalwinda*
1948-1963 Wolsingham, Co. Durham	trans. *adalwinda-napi* (*adalwinda, napi*)
1940 Leyburn, Yorkshire	*adalwinda, marginalis*
1962 Philipston, West Lothian	*adalwinda, marginalis* trans. *adalwinda-napi*
1964 Garlieston, Wigtownshire	*adalwinda*
1964 Newport, Fife	trans. *marginalis-napi*
1963 Gifford, East Lothian	*marginalis*
1968 Carstairs, Lanarkshire	*adalwinda* (*marginalis, narina, napi,*
1963 South Rona, Inverness-shire	*adalwinda, marginalis* (*napi*)
1964 Colonsay	*adalwinda* (*marginalis, narina,* napi, primitive *bryoniae*
1969 Kendal, Westmoreland	*adalwinda* (*marginalis, narina*)
1969 Gartmore, Perthshire	*adalwinda, marginalis* (*napi*)
1969 Muthill, Perthshire	*adalwinda, marginalis* and a large number of assymetric scales
1969 Trossachs, Perthshire	*adalwinda*
1969 Aberlady Bay, East Lothian	*adalwinda, marginalis* (*narina, napi*)
1969 North Berwick, East Lothian	*marginalis, napi* (*adalwinda*)
1963 Dollar, Clackmanan	*napi, marginalis*
1969-1970 Oban, Argyll	*adalwinda, marginalis* (*napi, narina,* primitive *bryoniae,* and assymetric)
1969-1970 Loch Nell/Kilmore, Argyll	*adalwinda, marginalis* (*napi, narina*)
1969 Crianlarich, Perthshire	*adalwinda, napi* (*marginalis*)

1969 Denton, Co. Durham	*adalwinda, marginalis* (*narina, napi* and number of assymetric)
1969 Orphir, Orkney	*adalwinda, narina* (*marginalis*)
1969 Scrabster, Caithness	*adalwinda, narina* (*kamtschadalis* and one primitive *bryoniae*)
— River Nant, Argyll	*adalwinda, napi* (*marginalis*)
— River Awe, Argyll	*adalwinda, napi* (*marginalis*)
— Lammermuir, East Lothian	*adalwinda, marginalis*
— Kincardineshire	*adalwinda*
— Kirknewton, East Lothian	*adalwinda, marginalis*
— Arran	*adalwinda, marginalis*
— Loch Lubnaig, Perthshire	*adalwinda, marginalis*
— Wigtownshire	*adalwinda*
— Aberdeen, Aberdeenshire	*adalwinda, napi* (*marginalis*)
1969 Wigan, Lancashire	*napi*
1969 Torphichen, West Lothian	*marginalis, napi*
1969-1970 Blackness, West Lothian	*adalwinda, narina* (*napi*)
1969 Helperby, Yorkshire	*adalwinda, marginalis* (*napi*)
1969 Humberton, Yorkshire	*adalwinda, marginalis*
1969 Raskelf, Yorkshire	*adalwinda*
1969 Ripon, Yorkshire	*napi*
1969 Masham, Yorkshire	*adalwinda* (*napi*)
1969 Asenby, Yorkshire	*marginalis*
1969 Eisingwold, Yorkshire	*adalwinda, marginalis* (*narina*)
1969 York, Yorkshire	*napi*
1969 Finghall, Yorkshire	*napi*
1969 Peebles, Peebleshire	*marginalis* (*adalwinda, napi*)
1969 Cara Island, Argyll	*marginalis, adalwinda, napi*
1970 Kingussie, Inverness-shire	*adalwinda, napi* (*marginalis*)
1970 Calvine, Perthshire	*adalwinda, marginalis* (*napi*)
1970 Glen Lonon, Argyll	*marginalis* (*narina*)
1970 Turlum Hill, Perthshire	*adalwinda*
1970 Ben Vorlich, Perthshire	*adalwinda*
1970 Torrie Forest, Perthshire	*adalwinda, marginalis* (*narina, napi*)
1970 Gilmerton, Perthshire	*adalwinda* (*marginalis*)
1970 Braco, Perthshire	*marginalis* (*napi*)
1970 Stirling, Stirlingshire	*adalwinda*
1970 Sherrifmuir, Stirlingshire	*adalwinda, marginalis*
1970 Pilmoor, Yorkshire	*napi, marginalis*
1970 Durham, Co. Durham	*adalwinda* (*marginalis, napi*)
1970 Creuddyn, Denbighshire	*napi* (*adalwinda*)
1970 Colwyn Bay, Denbighshire	*adalwinda* (*napi*)

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1.ix.70. 98 George Street, Dunblane, Perthshire.

TABLE 1

The relative values of the black markings (B), the ground colour (Y) and the 'bryo-streak' in *Pieris napi napi* and *P. napi thomsoni*

Locality	value of B	value of Y	b-s
Kingussie, Inverness-shire	133	55	100
Oban, Argyll	117	94	50
Glen Lonon, Argyll	117	17	100
Gilmerton, Perthshire	140	70	50
Callander, Perthshire	186	85	57
Torrie Forest, Perthshire	150	30	80
Sherrifmuir, Perthshire	150	75	63
Sherrifmuir, Stirlingshire	172	7	71
Shalford, Surrey	56	0	11

On the Nature of *Maniola jurtina splendida* B.-White (Lep. Satyridae)

By GEORGE THOMSON

I have always been concerned about certain aspects of the generally accepted descriptions of the north-western sub-species called *splendida* by Dr Buchanan-White and of many specimens identified as such. Since publication of my paper (1969) in which I first made evident my reservations about the nature of this race a considerable amount of material has been put at my disposal, enough for me to make this contribution which should at the very least give rise to certain questions, not only about *splendida*, but it is hoped that it will invite discussion on the whole aspect of quantitative analysis of butterfly populations—a subject much neglected in our Entomological publications.

As it is some years since the publication of Buchanan-White's description (which might not be at any rate readily available south of the border) and forty years since the redescription by Graves in the Entomologist, it will be necessary to quote here what appeared in the Scottish Naturalist (1871-1872). It is also important that I outline Graves' redescription from the Entomologist (1930). I would suggest that anyone who is interested in following up my arguments, or who is interested in the question of *jurtina*, should make themselves familiar with the excellent colour plates published with Graves' redescription.

The taxonomic history of the name *splendida* itself is a simple one as there are no synonyms laying claim to the race. There has been, however, an unfortunate and erroneous habit of calling some southern European specimens *splendida* and indeed Buchanan-White himself in the original description said:

'Var. (and ab.) *splendida*.—Larger and brighter coloured; the apical spot of the forewing with two white dots. Found by Mr A. Davidson in the island of Longa, on the west coast of Ross-shire. Mr Davidson informs me that it is very plentiful on the island, and that it is the only form occurring there. Occasionally in Aberdeenshire (J. W. H. Traill). I have taken this variety in the island of Capri near Naples.'

The taxonomic simplicity is somewhat tainted by the fact that the types do not appear to exist. Graves simply said that the types

could not be found in the Perth Museum where a number of Buchanan-White's types still are housed. I visited the museum in an attempt to find the whereabouts of the *splendida* types and was shown all the cases of Buchanan-White's specimens Regrettably those containing *jurtina* had only one albino and a south European specimen, without data, but obviously *hispulla* Hb. The remainder of the case had nothing to show but a series of holes as evidence of a long series of *jurtina*. It would seem either the specimens have been damaged in the museum or elsewhere, and thrown out, or some unscrupulous curator in the past has quietly disposed of them for material gain or to enhance his son's collection. It is regrettable that such valuable material should have been housed in the vaults of a provincial museum where they are rarely looked at and seldom appreciated.

The most important landmark in the history of *splendida* was the redescription by P. P. Graves in the Entomologist (1930). There are too few entomologists who publish their descriptions and analysis in so much detail as did Graves and it would be well if I illustrated this by quoting the essential parts of his redescription:

'Male: Average expanse 50·3 mm.; largest 52·5 mm., smallest 45 mm.

Upperside.—. . . Ocelli sometimes bipupilled or doubled . . . "Ochraceous tawny" or "orange" scaling in interspaces 4 to 1b very variable in extent and definiteness, mixed with dark scaling and broken by the veins.

Underside.—. . . Discal area "ochraceous buff" to "ochraceous orange" mixed with dark scaling . . . The hindwings abundantly sprinkled with small black or fuscous striae, especially in their basal half; their ground colour occasionally "deep greyish olive" mixed with dark scales which give it a smoky appearance, but usually much darker, approaching "bistre" or "sepia", the post discal band being completely or almost completely veiled by dark scaling and the medial band very indistinct . . . Ocelli from 0 to 4 in number, small and indistinct when present.

Female: Average expanse nearly 54·2 mm.; largest 61·5, smallest 49 mm.

Upperside.— . . . Forewings with the post discal band usually well developed . . . The band invades the discal area, making a wide breach in its own discal border . . . Subapical ocellus bipupilled in nearly 60% of specimens examined, and extended on one or other surface to vein 4 (1st median) in nearly 40%. Hindwings with "raw sienna" post-discal band often partly suffused ,and with a mixture of dark scaling, occupying from 2 to 4 interspaces. This band is present in over 90% of 89 specimens examined . . .

Underside.—Forewings: . . . The curved discal line usually distinct without being strongly marked. Hindwings heavily sprinkled with black or fuscous striae on a ground colour of "dusky brown", . . . the discal band usually fairly well marked and paler than the remainder of the wing, in colour more or less approaching "light violet plumbeous", the medial line distally bordered in most specimens by a well-marked though narrow and often broken yellow band, in colour varying from a dirty "mustard yellow" to "cream buff" and in situation and shape resembling the band shown in Hübner's figure of *M. jurtina hispulla* (Hübner) . . .'

In the continuation of his paper at page 77 he further analysis the characters of *jurtina*, and tabulates them thus:

'Male Characters.

Upperside of forewings.

A. Without fulvous scaling (*suffusa*, Tutt), or with fulvous scaling confined to a ring around the ocellus (*janira*, L.).

B. With fulvous scaling in the form of ill-defined and inextensive interneural smears, more or less mixed with and suffused by dark scaling.

BC. With fulvous scaling in the form of a submarginal band extending from below the ocellus towards the tornus, veiled more or less considerably by dark scaling and broken by the neuration.

C. With a well-marked submarginal fulvous band broken by the neuration as in BC, but otherwise largely or entirely free from dark scaling, *cf.* ssp. *iernes*, *or* with a fulvous ill-defined patch extending towards the cell, *cf. Maniola telmessia* Z. This second form of C when compared with the first form is referred to as c1.

Female Characters.

Upperside of hindwings.

D. With no fulvous scaling.

E. With a fulvous point or patch in one interspace only.

F. With fulvous points or patches in two but not more than two interspaces.

G. With a fulvous band suffused or not suffused by dark scaling in more than two interspaces.

Forewings.

H. With one or both of the subapical ocelli of the forewing bipupilled in either surface.

Both wings.

J. With the dark scaling of the subapical ocelli of the forewing extended to vein 4 (1st median), or connected therewith by dark scaling on either wing on either surface.

HJ. Presenting both the above characters H and J.

Underside of hindwing.

Y. In which the medial line of the underside of the hindwing is distally bordered with a streak, broken or complete, of bright yellow or orange. The streak represents the unsuffused remnant of a bright discal and post-discal band . . .'

I do not believe that such distinctions as those between characters B and BC or between F and G prove to be useful in a butterfly so variable as *jurtina*, nor do I believe that the extent of fulvous in general is a good character on which to depend except where major differences are detected. Graves' figures for *splendida* (from Ross and Sutherland) compared with a few English localities and the average of all his English material (except Devon and Cornwall) are given in Table One.

I have expressed my doubts about this redescription of *splendida*. Let me now be more specific. Of the many specimens which I have seen (probably well in excess of 1500) from the area in which the north western race differs basically from those specimens further south in general only a few fit well into Graves' description and in particular only three females agree *in all respects* with that described by Graves,

those being from Orkney from where he never saw *jurtina*! In short the description of this sub-species is both misleading and quite unrepresentative of the north west Scottish race. It does not agree with my analysis of the proportion of *hispulla*-like specimens in general, and in his description of the underside forewing of the female in particular. His words, 'distinct without being well marked', apply to a very few north western *jurtina*. A number of features listed in his description occur too frequently in other South British populations to be of any real value. In particular I would mention the bipupillation of the apical eyespot and its extension to vein 4 (H, J and HJ) which is present in a large proportion of maritime *jurtina* as well as a few inland colonies. Furthermore the underside hindwing of the male, though dark, frequently has a well marked medial band on which stand often comparatively large ocelli. Clearly we must try to find out why this is the case, particularly when one cannot question the competence and integrity of Graves or the size of his sample. This leads us to look at the nature of geographical variation in *jurtina* which results from two main factors:

1. It is *completely* non-migratory (Ford 1964) and forms *distinct colonies* isolated by very minor but real barriers such as unsuitable pasture, cultivation, rivers, etc. The idea that *jurtina* has a more or less continuous distribution from the south of England to its northern limit in Britain with free gene flow creating no more than a gradual cline north/south/east and west is totally false. Anyone who disputes this need only try collecting the butterfly in central or north Scotland, or even in Yorkshire to see how isolated its colonies are. I have observed this over many years here in Dunblane where there are four populations of the butterfly, each measurably distinct from the other. Details of this have been omitted from this paper as I consider Prof. Ford's evidence quite adequate. Furthermore, he has shown that *jurtina* is capable of sympatric evolution which, even without geographical isolation could facilitate the development of district populations.

2. The variation of many of the superficial markings of *jurtina* is wide within a single population in one year, but a colony of the butterfly can be quite different one year from another. One cannot rule out the possibility that this is partly environmentally controlled, but observations have shown that its inconsistency would tend to indicate that it is more likely to be genetic, probably almost totally. It is not sufficient to write off *jurtina* variation as being the result of temperature, humidity and host plant association. Here I will quote Graves:

'The theory that the Atlantic climate is the cause of the modification of *jurtina* in the direction of *hispulla* or of *hispulla* in the direction of *jurtina* is arguable, but it does not explain why maritime conditions produce such dissimilar results in Jersey and Brittany on the one hand and the Scilly Isles on the other, or why the humidity of Cumbria and Merioneth has affected variation quite differently from the humidity of Tyrone.'

More often than not a *jurtina* population is numerically strong but subject to major fluctuation in numbers. This obviously can speed up that process of development of individual races and indeed a sudden break up of a stable pattern was observed by Ford (1964).

Let me illustrate this by comparing populations on which I have worked.

Cramond Island on the Firth of Forth is inhabited by a sizeable population of *jurtina*. Being an island largely covered in long grass and isolated from the mainland by almost a mile of water (sand at low tide), the butterflies can safely be said to belong to a single race measurably distinct from colonies on the adjacent mainland. I first collected there in 1969, and this year I took a further sample. Using Graves' own characters I analysed the samples of the two years. The result is shown in Table One along with the difference between the percentages of specimens showing each character (d_1) and the percentage change in the character (d_2) which is this figure expressed as a percentage of the larger to give a better idea of the difference in the two years. The average change in the characters is 37·8% which means that on average of every three individuals taken in 1970 less than one would show the characteristics of the race as determined by the 1969 sample. Whether or not this variation was due to environmental conditions or genetics does not matter, as the important fact is that such variation in the nature of the population exists.

Thus we have a situation in which *jurtina* is represented by numerous 'mini-races' or *demes* (Mayr, 1963) each actually or potentially distinct from the other. *Splendida* is not a single homogeneous race but a group of differing populations related by several characters present in all of them. Indeed, the whole sub-species concept, as I have said before, is somewhat questionable when applied to *jurtina* unless one is refering to very broad groupings of heterogeneous populations. As will be seen in later papers we have a situation in Europe where the geographical variation of the species breaks up into race-groups, race-forms and demes rather than a number of simple sub-species. For the moment we are concerned with the differences between the race *insularis* Thomson and *splendida* and no further reference need be made to continental *jurtina* at this point. What we read in Mayr (1969) is probably very relevant here and provides one point of view of the problem. He says (p. 42):

'A sub-species may consist of many local populations all of which, though very similar, are slightly different from each other genetically or phenotypically; a subspecies is therefore a collective category. Every local population is slightly different from every other local population . . .'

It is clear, in the first place, that Graves did not fully appreciate the complexity of *splendida* (nor indeed did Buchanan-White!) as his redescription covers only one of these 'mini-races' to which I have refered. There is however, a further factor which detracts from the value of Graves' statistics. As I have said *jurtina* varies from year to year even within the one locality. Furthermore, those specimens which come out in the latter part of the emergence—particularly with its long flight period of up to three months—can differ quite markedly from those which are first on the wing. There is no information about the time of capture in Graves' paper but it is almost certain that the majority of the specimens on which he based his redescription were taken in one year only—perhaps a very exceptional one. This I gather from the statement that: 'It was not until this summer (presumably 1929) that I (P. P. Graves) was able through the kind assistance of Mr A. McPherson, of Kemnay, Aberdeen, and of Lord Rothschild to obtain a long series of 'topotypes' from Longa Island and from the shores of Gairloch, in which the island is situated.'

As he based his description on 43 males and 89 females in the Tring Museum and in his own collection and the British Museum it is likely that the vast majority were taken in that year. If we take the hypothetical case where in one year the percentage change in each of the characters in Graves' *splendida* series and in his 'English' *jurtina* was the same as that observed at Cramond in 1969 and 1970 and that change was in opposite directions in each case we would have the interesting situation in which five of the twelve characters 'overlapped' in some cases to a considerable degree (Table One). Such a situation though possible is, admittedly, unlikely but it gives one a good indication of the relative value of each of the characters.

It is becoming clear that the material on which any description of this (and possibly many others) species is based should consist of a numerically balanced sample taken:

1. over several years — sufficient for the purposes of the analysis and
2. throughout the flight period of the insect.

It should go without saying that the sample should be collected at random (unbiased), but it is not so obvious that the rejection of worn or damaged specimens could adversely affect the accuracy of the analysis, as, often forms which diverge considerably from the norm (and thus, per specimen have a greater effect on the statistics) suffer at the hands of their predators long before 'favourable' forms within the population. It would seem, therefore, that the material on which Graves based his redescription was biased for the reasons stated to the extent that it did not represent the race.

Let us now look at the situation with *jurtina* in the north west. It would appear that the *splendida* complex covers the area from the Orkney Islands, most if not all of the Western Isles, the mainland to just south of the Caledonian Canal and most of Argyll. The population further south and east occasionally approaches *splendida* and individual specimens turn up within these communities as exceptions. The limit of this transition zone, as it must be, is the Spey Valley to the east, swinging down as far as South Perthshire and the Clyde estuary. Within the 'true *splendida*' range the butterfly manifests itself in the following forms:

Male forms.

1. larger forms
   (a) with well developed fulvous and lighter underside (Harris, Raasay, Skye);
   (b) not so well marked fulvous but with a very dark underside (mainland Sutherland and parts of Argyll).
2. medium sized forms usually lighter on the underside but very contrasty (Colonsay, Ulva, Mull).
3. small forms usually *very* dark and well marked with fulvous (Eigg, Rhum, Barra and its associated islands).

Female forms.

1. larger forms with a rather brown but very contrasty underside (Colonsay, Raasay and Staffa).

2. moderately large forms

   (a) with very dark fulvous markings (almost red) and a very dark underside hindwing (Harris, Orkney — fulvous lighter—and Skye);

   (b) lighter fulvous and with a very contrasty underside, not so brown.

3. smallish specimens with fulvous rather light (Mull, Eigg).

This is of necessity a very broad generalisation and there is every likelihood that differing populations are found even on the smaller islands. It should be noted, however, that the character mentioned by Graves — the fulvous below the apical eyespot of the female breaking through the ground colour to meet up with the patch in the basal area— is in no way consistent and in fact specimens showing this character are not found infrequently in other Atlantic races. Also I have as many *splendida* without the character as those with it.

Thus these 'mini-races' (or variants of them) occur in a mosaic distribution over the whole area in which the race is found. The only consistent traits which can be given to identify *splendida* froms are:

Male.

Fulvous on the upperside of the forewings more extensive on average than in *insularis* of south Britain. Underside darker than *insularis* often suffused by dark scaling, but a form also occurs which displays a fair degree of contrast in markings. Both these forms, however, almost always have the colour of the underside forewings outer margins, termen and medial transverse band (dividing the lighter sub-apical and basal areas) considerably darker than in the southern form.

Female.

Fulvous areas extensive but very variable in extent, colour and form. Underside hindwings very variable nearly always with the medial line distally bordered with a streak of bright yellow or orange. These are the only consistent characters and could be applied to south European forms, (*hispulla, miscens*) but the ground colour of British *jurtina* females is considerably darker in tone as is the colour of the fulvous on average.

To summarise, therefore:

1. *Splendida* is not a simple race but a heterogeneous collection of local populations each having been isolated long enough to produce measurably distinct characteristics but all being linked by characters typical of the whole.

2. *Splendida* is linked to the southern race *insularis* by an area of transition in which both intermediates and individuals of the two races are found flying together in greater or lesser proportions.

3. *Splendida* is probably not a *direct* result of environmental conditions *only* but probably has arisen as a result of selection within the strictly isolated populations.

	approximate % of each character									
	Surrey	Kent	East Anglia	England	Ross and Sutherland (*splendida*)	Cramond 1969	Cramond 1970	d_1	d_2	pop. diff.
males A	43·8	25·5	32·2	30·6	1·9	27·8	36·8	2·1	3·3	3·5X
B and BC	54·0	70·0	64·5	66·8	66·0	61·1	63·2	9·0	24·4	10·7
C	2·2	4·5	3·3	2·6	32·1	11·1	0·0	11·1	100·0	7·4
females D	51·3	43·2	54·2	54·5	2·9	73·6	90·6	17·0	18·8	17·6
E	31·9	36·2	27·7	28·6	7·9	15·8	3·1	12·7	80·4	4·7X
F	11·5	14·2	13·9	12·9	39·6	5·3	3·1	2·2	41·5	22·3
G	5·3	6·4	4·2	4·4	49·6	5·3	3·1	2·2	41·5	40·8
F and G	16·8	20·6	18·1	17·3	89·2	10·6	6·2	4·4	41·5	63·1
H	44·2	41·8	43·9	47·6	57·4	63·2	81·3	18·1	22·3	26·4X
J	19·5	21·3	22·2	25·0	33·7	36·8	53·1	16·3	30·7	23·9X
HJ	15·0	17·7	20·1	22·6	32·7	26·3	50·0	23·7	47·4	37·3X
Y	10·6	14·9	9·7	9·6	79·2	0·0	0·0	0·0	0·0	69·6
	figures from Graves (1930)									

TABLE ONE

d_1 = the difference between the percentages for each character in the Cramond samples in 1969 and 1970.

$d_2 = d_1$ expressed as a percentage of the larger percentage of the Cramond samples in 1969 and 1970, i.e. $d_2 = \frac{d_1}{1} \times 100$

where 1 is the larger percentage.

pop. diff. = $(L - d_1) - (S + d_1)$ for each character where L is the larger of the two percentages for 'England' and Ross and Sutherland and S is the smaller. Where the resulting figure is negative it is accompanied by the letter X, representing an 'overlap' in the character.

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98 George Street, Dunblane, Perthshire. 14.viii.70.

MANIOLA JURTINA F. HYPERANTHOIDES. — The forms comprising this unusual butterfly as described (*antea*, 189) are, as I said, extremely rare. B. J. Lempke of Amsterdam kindly informs me that he has never seen a second *brevipennis* and that he knows of only two *anommata* Vty. I have another two of this form lacking the eyespots completely and there are two other records, making a total of six. — GEORGE THOMSON, 98 George Street, Dunblane, Perthshire. 16.viii.1970.

On *Zygaena (Agrumenia) occitanica* de Villers (Lep., Zygaenidae) in the neighbourhood of Albarracin, Aragon, Spain

By Hugo Reiss and Günther Reiss, Stuttgart

The occurrence of *Z. occitanica* de Villers in the neighbourhood of Albarracin was until now unknown, and even Zerny (1927) did not record the species in his work on the lepidopterous fauna of the area.

Messrs Jean Bonnin, Lorient, France, and Erik von Mentzer, Täby, Sweden, each sent us 6♂♂, 6♀♀ of *occitanica* which were collected from 9-12.viii.1968 near Villar del Cobo, 1560 m, in the outer neighbourhood of Albarracin, Teruel, on a steep southern slope between the road and a rivulet. Because of the late date, many specimens were already worn; the beginning of the emergence would be about 14 days earlier. A further 12 specimens are in the Mentzer collection.

Mr Bonnin discovered the locality in 1967. Until now, *occitanica* was unknown from such a high biotope in the whole of its range in Spain and France to Savona in Liguria, Italy. The next highest locality for the species is at ca 1400 m in the Sierra de Alfacar near Granada, where a population of the ssp. *vandalitia* Burgeff is found, of which the typical specimens originated from the Darro and Genil valleys near Granada, at 670 m. Ribbe (1912) brought back cocoons from there. The third highest locality, ca 1100 m, is the Sierra de la Pena, Huesca, Spain, from where the ssp. *huescacola* Tremewan & Manley (1965) was described. In the Alps of southern France the known localities in the Alpes-Maritimes are around 570 m and in the Basses-Alpes around 450 m.

The present series of 12♂♂, 12♀♀ from Villar del Cobo represent a high mountain race which we describe as follows:

Wingspan, ♂♂, 24-26 m, ♀, 26-31 mm. The smaller build and the neat, lightly clubbed antennae, especially in the male, are characteristic. The ground colour of the forewings is blue-black, almost without a sheen. The fore- and hindwings are generally narrow and pointed at the apex. The small forewing spots, the hindwings and the abdominal belt, show a warm light carmine. On the underside of the abdomen the belt is open, but on the upperside the belt is three segments broad and in no specimen is the red interspersed with dark scaling. The white edging of the forewing spots 1-5 is strongly represented, the narrow white spot 6 is present in all specimens and not reduced in length. Spots 1 and 2 are separated by the white edging. The white edging of spots 3 and 4 is generally not connected along the veins to the white edging of spots 1 and 2; they are however, sometimes connected. Spot 5 is separate, likewise spot 6. The dark hindwing border is narrow and extends to the tornus on both the upper and underside; in 2♂♂, 4♀♀ it is almost absent. The coloration of the underside of the forewings is somewhat matt compared with that of the upperside; in the spot area is a suffusion of red scaling.

In 2♂♂ the white edging of the forewing spots is reduced, spots 3 and 4 are separated by the dark ground colour and spot 6 is also narrower.

In 1♂, 3♀♀ the white spot 6 is lightly connected to spot 5 by whitish scaling along the veins and in two of the females spots 3 and 4 are similarly connected to spots 1 and 2. Instead of a reduction of white

edging around the forewing spots, which can occur in the male, the females show an increase in this white edging and 1♀ is quite white in the spot area, so that the specimen is very similar to the ab. *extrema* Reiss (1922; 1930) that occurs in ssp. *vandalitia* Burgeff.

We propose for this remarkable race the name **albarracinensis** n. ssp.

Holotype ♂, A ragonien, Villar de Cobo, 10.8.1968, leg. E. von Mentzer, allotype ♀ with the same data, in coll. Reiss.

Paratypes with similar data, 10. and 12.8.1968, in coll. E. von Mentzer and coll. Reiss; 9. and 11.8.1968, Albarracin, Villar del Cobo, leg. Bonnin (including 2♂♂, 3♀♀ damaged through rain), in coll. Reiss.

The figures will be published in a later paper.

Subspecies *albarracinensis* n. ssp. differs from all the known races of *Z. occitanica* de Villers (1789), including the nominate subspecies which is considered to have been described from Peyrelau, Aveyron, southern France. Compared with the following three subspecies, it differs as follows:

The typical ssp. *vandalitia* Burgeff (1926); Reiss (1930), from the slopes of the Darro and Genil valleys near Granada (670 m), Andalusia, that flies as early as June, is larger with broader forewings than ssp. *albarracinensis* n. ssp., and always has whitish suffusion of scaling on the ground colour of the forewings;

ssp. *eulalia* Burgeff (1926); Reiss (1930), from Santa Eulalia, 400 m, Sierra de Espuña, Murcia, is likewise larger with broader wings than *albarracinensis* n. ssp. and also flies in June. The red coloration of the forewing spots and hindwings is darker, somewhat more mixed with vermilion, while the darker hindwing border is stronger. In the male the red abdominal belt is sprinkled with dark scaling, less so in the female, a character which is absent in *albarracinensis* n. ssp. Specimens with whitish suffusion of scaling on the forewing ground colour are not unknown;

ssp. *valenciaca* Reiss (1965) from Torres, Sagunto, 250 m, which flies in June, is also broad-winged, it has carmine-red forewing spots and hindwings. Compared with *albarracinensis* n. ssp. spot 6 is sometimes reduced, the abdominal belt is sprinkled with dark scaling and the dark hindwing border is stronger. Specimens with a strong suffusion of whitish scaling on the forewing ground colour, a character which occurs in *albarracinensis* n. ssp. and the two above mentioned subspecies, are unknown in ssp. *valenciaca*.

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HUGO REISS, 7 Stuttgart 1, Traubenstrasse 15 B;
DR. GÜNTHER, REISS, 7 Stuttgart-Vaihingen, Barchet 23.

Puliciphora sp. (Diptera : Phoridae) Parisitising Pupae of the Cutworm *Cirphisloreyi* Duponchel (Lepidoptera : Noctuidae)

By V. C. Kapoor, S. L. Gupta and N. S. Bhattacherjee
Division of Entomology, I.A.R.I., New Delhi-12 (India).

The parasitic nature of the larvae of some species of Phoridae accords this family some economic importance. Species of *Puliciphora* Dahl, *Aphiochaeta* Brues and *Phora* Latreille are such parasites. *Puliciphora rhodesiana* Schmitz was reared by Jack (1934) from the eggpods of *Nomadacris septemfasciata* (red locust) in Southern Rhodesia. Creighton (1936 a, b) reared *Puliciphora* sp .from *Albama argillacea* in Florida and also recorded species of the same genus parasitising *Cosmophila* (*Anomis*) *erosa* Hb. Blanchard (1937) reared out *Puliciphora pectinata* from eggs of *Schistocera paranensis* Burm. in Argentina.

While the nature of parasitisation of these flies on insect pests has thus been observed in other countries, there is only one record of a Phorid fly (not named) parasitic on *Chilo zonellus* Swinhoe in India (Butani, 1957). The authors observed some field pupae of *Cirphis loreyi* Dup., severely infested with maggots in March 1968. The publication was delayed because the fly was not identified earlier. These maggots were reared out in the laboratory. The flies that emerged have been found to belong to the genus *Puliciphora* Dahl.

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Notes and Observations

Trisateles emmortualis Schiff. in Kent.—On Friday, the 26th June, my son Christopher and I went to Dungeness and put up a mercury vapour light at the Observatory. At the same time we left an actinic black light on a sheet in the sallows near the Long-Pits. We collected the black light at the end of our stay, and found on the sheet a moth in fresh condition which appeared to be *Trisateles emmortualus* Schiff., but dismissed this as an impossibility. However, the moth has been seen by Michael Chalmers-Hunt who confirms it beyond doubt as the Olive Crescent. He also mentions that this is the first confirmed record for the County of Kent.—P. J. Renshaw, 53 Links Road, West Wickham, Kent. 2.ix.1970.

SPHINGID LARVAE FEEDING.—I can parallel Mr. O'Heffernan's experience with *A. atropos* and *C. fulvinotata* (1970, *Entomologist's Record,* **82**: 152).

Some ova of *Hippotion eson* Cr. were found in the Shimba Hills on *Amorphallus* sp. (Araceae) and the newly hatched larvae started feeding on this. Bad weather prevented me getting further supplies—it entails a drive of thirty miles each way over appalling road—so the larvae were transferred to a local Aroid, which they accepted. A few days later larvae of this species were found feeding in my garden on *Pentas* sp. (Rubiaceae), a new foodplant record, so the Shimba Hills larvae were given this, which they accepted. Later my wife complained at the defoliation of her *Pentas* plants, and the larvae were then given *Cissus* sp. (Ampelidaceae), which they accepted readily, and I have no doubt that if any *Impatiens* (Balsaminaceae) had been available they would have accepted that as well.

Coelonia fulvinotata Btlr. should now be known as *C. mauritii* Btlr., *fulvinotata* being a synonym of *C. solani* Bsd. from Madagascar (vide Carcasson, *Revised Catalogue of the African Sphingidae,* Nairobi, June 1967).

As a matter of interest I give below a complete list of foodplants of the three species in question so far as they are known to me.

Acherontia atropos L.—Bignonia, Millingtonia hortensis, Podranea brycei, Spathodea, Tecoma, Tecomaria (Bignoniaceae), Ipomoea batatas (Convolvulaceae), Hoslundia, Pogostemon cablin, Salvia (Labiatae), Gossypium (Malvaceae), Jasminum, Ligustrum, Olea sp., Schrebera alata (Oleaceae), Sesamum indicum (Pedaliaceae), Datura, Lyceum austrinum, Nicotiana glauca, Physalis, Solanum spp., Withania (Solanaceae), Clerodendron, Duranta, Lantana, Verbena (Verbenaceae).

Coelonia mauritii Btlr.—Acanthus spp. (Acanthaceae), Cissus (Ampelidaceae), Bignonia, Markhamia platycalyx, Millingtonia hortensis, Spathodea, Tecoma, Tecomaria (Bignoniaceae), Cordia (Boraginaceae), Dahlia (Compositae), Convolvulus, Ipomoea (Convolvulaceae), Coleus, Pycnostachys, Salvia (Labiatae), Buddleia, Lachnopylis (Loganiaceae), Jasminum (Oleaceae), Hebe speciosa (Scrophulariaceae), Lycopersicum, Nicotiana, Solanum (Solanaceae), Clerodendron, Duranta, Lantana, Stachytarpheta indica (Verbenaceae).

Hippotion eson Cr.—Ampelopsis, Cissus, Vitis (Ampelidaceae), Amorphophallus, Caladium, Colocasia, Richardia (Araceae), Impatiens (Balsaminaceae), Fuchsia (Onagraceae), Coprosma baueri Pentas (Rubiaceae), Paullinia pinnata (Sapindaceae).

What is the common factor in these long and varied lists?

I am afraid that I must point out one or two printing errors, *Bigonia* and Bigoniaceae should read *Bignonia* and Bignoniaceae, and *Coloscasia* should be *Colocasia.*—D. G. SEVASTOPULO, F.R.E.S., Mombasa. 10.vii.1970.

FORESTRY COMMISSION CHARGES.—Mr George Hyde's note in the June issue (page 183) raises some interesting issues. We are told that the Forestry Commission is endeavouring to levy a charge on entomologists who visit forests to indulge in their hobby, as part of a policy of requiring permits for visits for "special purposes."

What is a special purpose? Mr Hyde says that his interest is primarily in photography. Now presumably visitors who merely wish to

photograph the scenery of forests are not to be penalised. What if they photograph specific trees? Where is the line to be drawn, and why? How are visits for special purposes to be distinguished from other visits?

I happen to be interested in plants, and in insects other than Lepidoptera, particularly in Diptera. Should I be required to pay a fee for helping to rid the forests of clegs and mosquitoes? Surely this would be laughable. Again, as a family man I take my children to a forest area, where they can presumably amuse themselves (without payment) in a number of different ways; but if to pass the time I decide to list the mosses growing on logs, then I suppose I risk incurring a fee. But in such circumstances could the Commission maintain that the family visit was for a "special purpose"?

The whole situation seems absurd and impracticable, and one would indeed like to see a rationale of the Commission's policy towards naturalists and other visitors.—R. M. Payne, 49 Galton Road, Westcliff-on-Sea, Essex.

[I am in agreement with Mr Payne, and suggest that it is illogical to charge naturalists for following their hobbies in woods normally open free to the general public. After all, the naturalist is considerably more interested in the preservation of such places than are members of the general public.

The Commission has something of a case where their dreary funereal plantations of eternal conifers are concerned, for here the fire danger is not inconsiderable, and it is not desirable that the public should be admitted to such places, even if they should so wish. Special permits to bona fide naturalists could be issued on payment of a reasonable fee, to cover all Forestry Commission plantations (unless there were special circumstances such as newly planted land which prevented the admission of anyone other than Commission staff being desirable).

Perhaps the Commission will find this suggestion worth consideration].—Ed.

Oria musculosa Hubn. and Hadena compta Schiff. in North Bucks.—Although migrants have been very scarce so far this year—*Plusia gamma* L., a bare dozen, when last year they were here in scores, one *Nomophila noctuella* Schiff. while last year they arrived in May and continued until October; I have not yet seen a *Vanessa atalanta* L. here this year. British tourists have been far more enterprising and very welcome, a fresh female *Hadena compta* Schiff. appeared in my mercury vapour light trap on 8th July, the only previous record of this species in this area which I have is a very worn male on 23rd July, 1963; on 4th August a fresh *Oria musculosa* Hübn. appeared, a complete newcomer to the district. Another welcome visitor on 7th August was the Pyraustine moth *Loxostege stictalis* L., which I am pretty sure has not been recorded from Bucks. before; Beirne gives its headquarters as the Breck district, and although it occurs locally elsewhere, its habitat of bare sandy fields does not fit in with Buckinghamshire. — Capt. John Ellerton, Granborough Lodge, Granborough, Bletchley, Bucks. 30.viii.1970.

ZYGAENA LONICERAE SCHEVEN IN SCOTLAND.—As a result of correspondence between us Mr George Thomson has asked me to add a correction and some comments to his note in the July/August number (*Ent. Rec.*, **82**: 210), in which he records the capture near Corstorphine Hill, Edinburgh, of an example of *Z. lonicerae* which was thought to have flown into a stationary car which had come from Yorkshire.

This is not, as he claimed, "the first specimen of *Z. lonicerae* to be taken in Scotland." Between 25th June and 6th July 1961 I bred over 50 from pupae collected in the Isle of Skye, which I had expected to yield *Z. filipendulae;* and it was independently discovered as an adult in the same locality by Mr Austin Richardson in August 1961. These specimens, very different from the *Z. lonicerae transferens* Verity of southern England, were described as a new sub-species, *jocelynae*, by Mr W. G. Tremewan (*Ent. Gaz.*, **13**: 10). He has since found it in other localities in Skye, and has bred it *ab ovo*. (*Ent. Rec.*, **76**: 149-153, *Ent. Gaz.*, **16**: 87; **18**: 1-9).

Further, as Mr Tremewan has recently shown, (*Ent. Gaz.*, **21**: 65-71), the *Z. lonicerae* of northern England belong to two distinct sub-species. *Z. l. transferens* exists inland in Yorkshire in many localities, reaching to some way north of York. But on the coasts of Yorkshire, Durham and Northumberland the numerous colonies consist of *Z. l. latomarginata* Tutt; and in Durham this sub-species also occurs inland as far as the Pennines, thus interposing between *Z. l. transferens* and the Scottish Border. The most northerly place from which *Z. l. latomarginata* is yet known is Holy Island in Northumberland; but the possibility that one of an unknown colony of it in Berwickshire or Lothian might have strayed to Edinburgh was worth considering.

It therefore seemed desirable to establish to which sub-species the Edinburgh specimen belongs. Mr Thomson kindly sent it to me, and Mr Tremewan and I are agreed that it is an undoubted male *Z. l. transferens*. Mr Thomson gave the additional information that the car in which it was caught had started from Helperby, near Boroughbridge, and had driven non-stop to Edinburgh. Helperby is within ten miles of several of the proved localities for *Z. l. transferens*. Thus, although, as with so many published records of lepidoptera in strange places, there can be no certainty, the presumption is very strong that this Edinburgh *Z. lonicerae* was transported from England and is not of Scottish origin.—R. F. BRETHERTON, Folly Hill, Birtley Green, Bramley, Surrey.

LITHOSIA QUADRA L. IN WESTMORLAND.—While checking the insects resting on the house wall near my mercury vapour light trap, at about 4.30 p.m. on August 1st, I found a male *Lithosia quadra* L. in perfect condition. On August 3rd there was another in the same situation, and taken about the same time of day, again a male in perfect condition. A third specimen of the same species, a rather worn male, was also found inside the trap of my friend Mr C. Scott, at Carr Bank near Arnside, on August 1st.

As far as I can ascertain, the only previous record of this species in Westmorland is one by the late Mr C. H. Wilson, near Kirby Lonsdale, 23.vii.1935. Dr Lowther took the species at Grange-over-Sands, North Lancashire in 1936 and 1938.—J. BRIGGS, Frimley House, Deepdale Close, Slackhead, Beetham, nr. Milnthorpe, Westmorland. 28.viii.1970.

L414 PLATYPTILIA ISODACTYLA ZELL. (PTEROPHORIDAE).—On 27th July 1969, I noticed signs of larvae feeding in stems of ordinary ragwort (*Senecio jacobaea*) growing on some waste ground near to Par beach. I gathered some of the stems and reared the larvae to produce moths of *isodactyla* during August. A further search in the same locality on 19th July 1970, realized a few more larvae in the same food-plant (but not so many as in 1969), and I was able this year to photograph the larvae, pupa and imago.

Searches in ragwort stems in other parts of Cornwall have so far proved negative for this species, and it looks to me as if the Par colony is very localised and diminishing in numbers. According to Beirne's British Pyralid and Plume Moths the food plant for *P. isodactyla* is *Senecio aquaticus*, and I would be very interested to hear of any other record of it in *S. jacobaea*. Thanks are due to Lieut. Col. A. M. Emmet for confirming my identification of the insect.—JOHN L. GREGORY, Lepidoptera House 17 Grove Road, St. Austell, Cornwall. 12.ix.1970.

WASPS ATTACKING MOTHS.—When I emptied my moth trap this morning, I found some half a dozen wasps together with the usual selection of moths. The season here seems to have favoured wasps and in recent weeks we have seldom been without them.

However, on this occasion, two of the wasps were attacking the moths. One inside the depression in a papier mache egg box was stinging a small moth to death. Then I found another attacking a Large Yellow Underwing (*Noctua pronuba* L.), much larger, of course, than itself. The wasp hung on to one of its forelegs and sought to improve its attacking position when possible. Eventually the moth threw the wasp off, which then went round the trap box attacking the moths and even beetles—the latter without noticeable success.—A. G. M. BATTEN, Littledale, Cedar Road, Hook Heath, Woking, Surrey. 4.ix.1970.

Current Literature

A field Guide to the Butterflies of Britain and Europe, by **L. G. Higgins** and **N. D. Riley.** 380 pp. + 60 coloured plates by **Brian Hargreaves.** Collins. 42/-.

With the increase in travel facilities, each year sees a rise in the popularity of studying and collecting the butterflies of the countries visited. As its title indicates, the present work covers Europe as far as the Russian frontier; it also includes the Azores, the Canary Islands, and Madeira, and also palaearctic North Africa (to the southern slopes of the Atlas Mountains). The book is so arranged that it may be of use to the serious student, the beginner or the casually interested traveller.

The highly qualified authors need no introduction, and they have consulted with leading lepidopterists in Spain, France, Holland, Germany, Finland, Denmark, Yugoslavia and Morocco as well as in this country.

The first two pages are headed "How to use this book" and explain its system; the Introduction follows, setting out the apparatus required and technique for collecting. On the next five pages is a checklist of the butterflies concerned arranged according to genera. There follows a glossary of terms used and a list of abbreviations. Before the treatise,

there is a full page map showing the countries covered with the exception of the Atlantic islands.

The treatise follows with a short account of each genus preceding the species contained in it. The scientific name is followed by the English vernacular name and any vernacular names known to be used in the various other countries. The scientific name, author and type locality and any relevant synonymy follow. The description is reasonably brief. with comments on seasonal and geographical variation; other headings include flight dates, habitat, distribution, variation, these headings being in heavy type, and similar species are also mentioned. After the treatise there are 371 small distribution maps, 16 to the page, with an explanatory note preceding the maps.

The indices include a list of English vernacular names giving plate and page numbers, an index of scientific names arranged in genera (the genera being in alphabetical order) again with plate and page numbers. This method of indexing tends to focus the reader's attention on genus, but a fully alphabetical index of specific and generic names would, in my opinion, facilitate reference. There is, however, a practical help in assessing the genus, for on the four cover papers are illustrations of butterflies typical of eight out of the nine families represented in Europe, for the ninth, the Danaidae, the reader is referred to Plate 14. In all 35 genera are thus illustrated.

The sixty plates are superb, and one cannot speak too highly of Brian Hargreaves's work, and the reproduction of his paintings has been handled exceedingly well in Denmark by F. E. Bording. Each plate has a caption page facing it, giving, in addition to the names, brief notes of distinguishing features separating the species from its near neighbours.

The authors are to be congratulated on this excellent handbook which brings to the hand of the lepidopterist a volume suitable for inclusion in one's luggage for a foreign trip, and, what is very much to the point, at a price within the reach of practically anyone interested. That two authors so well qualified should have collaborated in its production is a piece of great good fortune for all in need of such a work. I have heard criticism of the order in which the genera have been placed, but this is a very minor matter which in no way hampers the usefulness of the book.

The book is well printed on good paper, and is bound in blue cloth boards.—S.N.A.J.

CONTENTS, Vol. 82, Part X

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)

EXCHANGES AND WANTS

Wanted to Purchase.—Entomologist's Monthly Magazine. A run of this periodical including the first thirty volumes.—*J. M. Chalmers-Hunt*, 1 Hardcourts Close, West Wickham, Kent.

Wanted Urgently, for a study of migration, any unpublished records of the following lepidoptera outside their normal areas of residence: *Eurois occulta* L. (Great Brocade), *Enargia paleacea* Esp. (Angle-striped Sallow), *Lithomia solidaginis* Hübn. (Golden-rod Brindle), *Plusia interrogationis* L. (Scarce Silver Y), *Itame brunneata* Thnb. (Rannoch Looper). Exact dates, sex, and circumstances of capture wherever possible.—*R. F. Bretherton*, Folly Hill, Birtley Green, Bramley, Surrey.

Urgently Wanted for laboratory experiments, larvae (or pupae later) of *Biston strataria.*—*Dr H. B. D. Kettlewell*, Dept. Zoology, Parks Road, Oxford.

For Sale.—Extensive range of good second-hand entomological equipment at very reasonable prices. Send S.A.E. for list.—*A. D. R. Brown*, 9 Stoke Park Road, Stoke Bishop, Bristol, 9.

For Sale or Exchange.—Butterflies and moths. Many species from Africa, Madagascar and other countries, also Europe. Sometimes livestock. List on request by sending International Postal Coupon.—*Robert Keiser*, Frederick Van Eeden Plein 3, B-2050 Antwerp, Belgium.

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Wanted to Purchase.—Large or small collections of Tropical Butterflies. —Write to *C. P. Sturgess-Lief*, Gymindge Brook Cottage, Sellinge, Nr. Ashford, Kent.

For Sale or Exchange some Asian Lepidoptera and Coleoptera surplus to personal requirements. Mainly Malaysian and Japanese origin. AI Quality in papers. Please write to *G. Hanrahan*, 20 Riverbank Drive, Marlow, Bucks.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION
(Founded by J. W. TUTT on 15th April 1890)

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Butterflies in Central Greece, June 1970

By R. F. Bretherton, C.B., M.A., F.R.E.S.

My wife and I paid our fourth visit to Greece in the last half of June 1970. This time we had the great advantage of being accompanied for part of the time by Mr John G. Coutsis, of Athens, who has been energetically studying the Rhopalocera and Zygaenidae of Greece for the past ten years (*vide* his list in *Entomologist*, **102**: 264-268). He had advised us on our itinerary, and he now led us to rich collecting grounds which we should never have found for ourselves, as well as sharing with us his wide knowledge of their birds and animals.

We flew from London to Athens on the evening of 15th June. Next day, having picked up our hired Volkswagen, we drove a distressingly hot hundred miles to Delphi, which for four nights was our base for collecting on Mt. Parnassos. On 20th and 21st June, with a night on the way, we moved 150 miles north through Thessaly to Kalambaka, on the edge of the Pindos Mountains, where we stayed five nights, and we then went eastwards to Larissa, whence we visited the Vale of Tembi and the slopes of Mt. Olympus. We were thus able to see something of the butterflies of three very different mountain areas and also, on the way back to Athens, of the by then very desiccated coast of Attica.

John Coutsis drove out from Athens early to meet us on both 17th and 19th June. On the first day he led us up the indifferent dirt road which leads from Arakhova across the *massif* of Mt. Parnassos at about 1,000 m., and then by a track through the fir forest to between 1,450 and 1,650 m. on the southern slopes. We spent the middle of the day collecting around and just below the tree-line, descending in the afternoon to explore some damp ground beside the dirt road which was particularly rich in Argynnids and Lycaenids. On the second day we crossed by the dirt road to villages on the other side of the *massif* and then drove up another track on the northern side of the mountain to about 1,800 m., working downwards through the forest to a spot where it merged into orchards and gardens beside a stream. Parnassos consists of limestone, and the ground vegetation is mostly sparse except where there are springs or streams, the north side being much richer in this respect than the south. On both days there was intermittent shadow from clouds which formed round the summits, but despite this the collecting was rich and varied.

Above the tree-line we found that here, as later on the Pindos and Mt. Olympus, few butterflies had yet emerged, so that my hopes of seeing early specimens of *Erebia melas* or *Pseudochazara mamurra* were disappointed. But a little lower *Aricia anteros*, a new species to me, was common, flying with the magnificent *Colias aurorina heldreichi*, *Parnassius mnemosyne*, *Plebejus pylaon*, *Pyrgus serratulae* and *P. armoricanus;* we also took single examples of *Thersamonia thersamon*, *Lycaeides argyrognomon*, and a *Cupido osiris* among the nice local form of *Cyaniris semiargus* which has traces of orange spots on the hindwings underside. Lower down, beside the dirt road, a giant race of *Lysandra amanda* was common, with *Fabriciana niobe*, *Melitaea didyma*, *M. trivia* and *M. cinxia*, and a single *Pandoriana pandora*. In the orchard zone on the north side at 1,160 m. we found a large colony of *Mellicta athalia*, the females of which were very large and heavily marked with black on

the upper side. This colony on Parnassos probably marks its southernmost limit in Greece. *Coenonympha pamphilus* was also common here. The latter presents a problem. Those which I have seen at low levels on this and previous visits to Greece belong to ssp. *marginata* Ruhl, bright brown and with heavy black margins on the upperside of all wings. But all those seen above about 800 m., on Parnassos and again in the Pindos and on Mt. Olympus, are pale and lightly margined, very like those found in Britain and northern Europe. Further investigation of the relationships of these two forms in Greece seems desirable in this very complex group.

The *Pyrgus serratulae* of Parnassos are remarkable for their great size—up to 35 mms.—and strong white markings upperside; they are probably referable to ssp. *balkanica* Warren. The *Plebejus pylaon* are, like those which I took in 1968 on Mt. Chelmos in the Peloponnese, very large, and some of the females are heavily suffused with blue on the hindwings upperside. We did not see the species further north, and it seems that this fine southern Greek race is widely separated geographically from the smaller and duller *P. pylaon sephyrus* Friv. which is found in Yugoslav Macedonia. It probably deserves a name as a good sub-species. The *P. mnemosyne* of Mt. Parnassos also agree with those in the Peloponnese in having a row of white spots in translucent area on the outer margin of the forewings (ssp. *athene* Stichel): they differ sharply from the race which we found further north on Pindos and Olympus, which lack this feature and seem to belong to ssp. *bureschi* Bryk.

At Delphi itself, which is only 550 m. above the sea, the ground vegetation was very desiccated. Nonetheless, butterflies were numerous and interesting, especially in the upper part of the ruins near the stadium, and round the Castalia spring. *Melanargia larissa* was abundant, with some enormous females which measured up to 74 mms., and several *Pseudochazara anthelea amalthea* were caught, *Satyrus ferula* being also much in evidence. The summer brood of *Gonepteryx farinosa* was just emerging in numbers, and a single *Pterourus alexanor* was identified, probably the last of the single brood, which we had found just beginning here in April 1967. There were also fine second brood specimens of *Pieris krueperi*, which we also saw in large numbers flying along the rocky side of the dirt road above Arakhova. The minute second brood *M. trivia* were also interesting: some of them were only half the size of the presumably first brood specimens higher on Parnassos. I also took a single large second brood example of *Philotes vicrama*, which, in contrast to *M. trivia*, is very much *larger* than the first brood specimens seen here in April.

My wife and I saw our last of the Parnassos area on the following morning when we took the now excellent road from Delphi through Amphissa to Brallos, as the first stage of our journey north into Thessaly. This road climbs to about 950 m. on the Gravia Pass, and there we added *Agrodiaetus admetus*, *Erynnis tages* and *Thymelicus actaeon* to our list, bringing the total for the area to 72 species. After the descent from the pass a patch of thistle-covered ground near a stream gave me a second *T. thersamon*, several *Kirinia roxelana*, and many newly emerged *Melitaea didyma* and *M. trivia*. We climbed again on the Lamia road over the bare Pournaraki Pass above Thermopylae, and when we stopped for a

drink at the inn beyond the summit we found the giant plane trees tenanted by a swarm of the moth *Lymantria dispar*, and the bramble blossom across the road brightened by a concourse of newly emerged *Argynnis paphia*. We spent that night in the attractive but sulphur-smelling little spa of Ipati, beyond Lamia. But the weather broke with thunderstorms in the evening, and when we continued our northward journey next morning we met blinding rain storms on the Othrys mountains and cloudy weather as we drove across the great plain of Thessaly, through miles of ripening corn, to our next base at Kalambaka, in the foothills of the Pindos mountains.

Kalambaka, where we stayed for five nights in the comfortable Xenia hotel, is finely placed between the wide bed of the Pinios river and the contorted rocks of the Meteora. These rise sheer for a thousand feet or so behind the town, and are crowned by more than a dozen mediaeval monasteries, each one on its separate pillar of rock. Some of them are still occupied, and we found them well worth the two visits which we gave them, both as architectural curiosities and because of the very fine early wall-paintings which some of them contain. Other features were some interesting rock plants, and a number of Griffon and Egyptian Vultures which circled continuously among the rocks and over the town. But the Metora did not seem to be rich entomologically, at least at this season; for the better butterflies one must go further and higher into the Pindos.

John Coutsis arrived from Athens on the morning of 22nd June, and took us on that day and the next to the magnificent forest of Tripotamos, which covers the slopes of the 2,000 m. mountains behind the village of Kastania, some 20 miles north west of Kalambaka. In contrast to Parnassos, this is a country of moisture, rushing streams and flowery alpine meadows; and the forest contains beech and oak as well as fir, and on the lower slopes round Kastania fine groves of chestnuts were in full blossom. It often rains there, but on these two days we were fortunate, though there was the usual nuisance of intermittent cloud from mid-morning onwards. On the first we drove up forest tracks to the upper edge of the forest, where *Aricia anteros, Erebia medusa, Pararge petropolitana* and *Hamearis lucina* were the most conspicuous insects—but the last two were unfortunately almost all in rags. Going a little further, to about 1,400 m., we found that butterflies were still few on the grass slopes, so we descended quickly to a flowery meadow beside a stream at about 1,000 m. which proved to be rich in sub-alpine species. We ate our sandwiches there and collected for much of the afternoon, and we returned to it for a similar period on the second day. The most interesting capture here was *Pyrgus sidae sidae*, which John Coutsis had not previously found in Greece, and which was a new species to me; but it seemed to be both very local and rare as between us we only obtained two males on the first day and a female on the second, all in the same spot. The latter has a wing expanse of 40 mm., which is much larger than specimens of ssp. *occidentalis* Vty. from the south of France. Other interesting species here were *Colias australis* (small and pale), *Coenonympha arcania, Strymonidia acaciae, Heodes alciphron, Syntarucus pirithous* (worn), *Plebejus argus, Lycaeides argyrognomon;* and there were no less than eight species of Fritillaries, including some *Melitaea cinxia* with extremely melanic females. On the way back to Kalambaka on both days we paid some attention to the lower ground around and below Kastania. The high chestnut blossom was attract-

ing many Hairstreaks and big Satyrids of the *Hipparchia fagi* group. But they were easier seen than captured, and we were unable to make sure whether the former included *Thecla quercus*, which is an elusive insect in Greece, or whether the latter were *H. fagi* or *H. syriaca* or both. Lower down, as we approached the Pinios, several fresh second brood specimens of *Leptidea duponcheli* were secured from a colony previously discovered by John Coutsis. This has otherwise been recorded in Greece only from near Thessaloniki and in the north Peloponnese, though it occurs in Yugoslav Macedonia and in south east France: an extraordinary distribution in Europe. Finally, to crown the day's collecting, a single *Spialia phlomidis* was spotted as it flew beside the car and was duly captured after an emergency stop.

On the following day, John Coutsis having returned to Athens overnight, my wife and I went up the Joannina road, which climbs to 1,700 m. on the Katara Pass a little before the hill-town of Metsovon. This road used to be bad and even dangerous, but its reconstruction is now nearly completed and we had no difficulties, though it is a rather long and tedious drive of 45 miles to the pass, whence there was a fine view of the higher Pindos, still partly covered with snow. An hour's walk to a minor summit above the road enabled us to photograph a fine yellow lily, which seems to be *Lilium carniolica* ssp. *jankae;* but there were no particularly interesting lepidoptera. But between the pass and Metsovon hay-fields running up to beech woods were full of butterflies, including great numbers of *Parnassius mnemosyne, Aricia anteros, Plebejus argus* and many worn *Pararge petropolitana.* Lower down, *Nymphalis polychloros* and many *Aglais urticae* and *P. napi meridionalis* were settling on damp mud, and on the way home we found in a culvert under the road the curious pear-shaped nests of the Red-rumped Swallow (*Hirundo daurica*).

Our last day at Kalambaka was largely spoiled by rain, and on 26th we moved our base to the Xenia just outside Larissa, where John Coutsis again joined us. We had an afternoon in the Vale of Tembi, and he drove us twice across the *massif* of Mt. Olympus. On the first day we went up the motorway nearly to Litokhoron and then turned westwards on a dirt road, bad at first but quite good later, which climbs to magnificent forests and then crosses cultivated plateau to join the western main road through Elasson, by which we returned to Larissa. On the second day we reversed the process, but also diverged up the military road which climbs to a ski-training centre and meteorological station at about 1,800 m. We were told that there had been snow there the day before, and the collecting both above and below the station was rather disappointing, as the high-level butterflies had not yet emerged, though there were plenty of *Parnassius mnemosyne, Erebia medusa,* and *Aricia anteros.* The highest peaks of the mountain were masked by cloud, as is apparently usual: the legendary activities of the Olympians perhaps require such cover! But on both days collecting the forest, at about 850 m., was very rewarding. The specialities were the Skippers *Tuttia tessellum* and *Pyrgus cinarae,* the Blues *Scolitantides orion, Maculinea arion,* and *Lycaeides idas baloanica* Zûllich, and a large race of *Hyponephele lupinus,* of which only the males had yet emerged. The forest Nymphalines were also much in evidence: *Nymphalis antiopa, Inachis io, Polygonia c-album* and *P. egea, Fabriciana adippe* (always lacking silver on the underside), *F. niobe, Pandoriana pandora,*

and no less than ten other species of Fritillaries. Among the Blues *Aricia agestis* was accompanied here, as also on Mt Parnassos, by another obviously separate species, which may be either *A. montensis* or *A. allous;* and *Lysandra amanda, L. escheri, L. dorylas, L. bellargus* and *Meleageria daphnis* were all flying together. But the most important discovery was a very localised colony of *Aphantopus hyperantus.* This appears to be the first record of this species in Greece. Our specimens have brighter and more coffee-coloured undersides than those found in Britain and northern Europe. We found them only in one spot, where a spring had caused the growth of rushes and low bushes in the forest; but there it was plentiful. It is said to be not uncommon in Yugoslav Macedonia, but this colony on Olympus probably marks its southern limit in Europe.

Orazio Querci and his wife collected extensively on Mt. Olympus from May to August 1935 and 1936, and his captures were analysed, mainly for their racial affinities(by Verity (1936, 17). He listed about 118 species of Rhopalocera from the area, including all of the 86 which we recorded in our two and a half days there, *except* for *Aphantopus hyperanthus, Thersamonia thersamon, Lycaeides argyrognomon, Adopoea lineola* and *Pyrgus cinarae* (which Querci reported only from the Vermion Mountains, further north). Verity was clearly puzzled by the *Aricia agestis* complex. After mentioning *A. agestis pallidefulva* Vty. as occurring in both generations up to 1,500 m., he goes on to describe, and to name as a new race, *A. montensis macedonica* Vty., the larger, blacker and more pointed-winged insects which flew with it, though more rarely. But in a supplement to his article he shifted his ground somewhat and attached the new race to *A. allous.* I did not bring home enough specimens for a decisive comparison, but I am inclined to favour his first opinion, though it is still not certain that *A. montensis* and *A. allous* are specifically distinct. It is, however, quite clear that on Mt. Olympus, as on the Pindos and other Greek mountains, there is at least one other *Aricia* species which is sympatric with *A. agestis* but very different from it. It is also worth noting that Verity ascribes Querci's *Maculinea arion* from Olympus (850 to 1200 m.) to race *obscura* Frey, saying that they differ in no way from the typical *obscura* of the Alps. This is certainly not true of our specimens, which are much less blackened than *obscura.*

We did not attempt any night collecting in any of these places, but by day we gave some attention to the *Zygaenidae,* which were numerous but not all easy to identify. With some much appreciated help from Mr W. G. Tremewan, I find that I brought home eight species of Burnets; and John Coutsis captured at least three more, and also four species of Foresters. Perhaps the most interesting is a form of *Zygaena viciae* D. & S. taken in the Forest of Tripotami, which has traces of a sixth spot on the forewings and a broad black border to the hindwings. *Z. brizae* Esp. was taken in the same place, which was particularly rich in this family of moths. A spectacular, casual, find in the Vale of Tembi was a full-grown larva of *Saturnia pyri* Schiff.: it was bright-orange and fully four inches long. It pupated immediately and will, I hope, produce a specimen next spring of what is probably the largest European lepidopteron.

My wife and I turned south from Larissa on 29th June, going down the motor way as far as Thermopylae and then turning inland over the

Pournaraki Pass to Orkhomenos and Thebes, where we spent the night. But the weather was very hot, and I did little collecting: *Hyponophele lycaon*, taken below the pass, was the only addition to our list of species. Next day we wandered mostly on by-roads to Marathon, where I caught *Hipparchia syriaca* (distinguishable from *H. fagi* only by dissection), and on to Cape Sounion on the tip of Attica, where we watched a splendid sunset from the classical temple on the headland. But all this limestone country by the sea was completely desiccated. At Sounion itself literally the only butterflies were many large Satyrids which played hide-and-seek around the pine trees, on which they could be seen in profile when they rested. They proved to be *Hipparchia fatua* with smaller numbers of *H. statilinus*, neither of which we had seen elsewhere and which I was very glad to have.

On 1st July we spent part of the morning at Sounion and then drove into Athens, where we were very kindly entertained to lunch by Mrs Coutsis and her family and spent some time in the afternoon looking through John's fine collection of Greek butterflies. We had booked seats on the evening B.E.A. 'plane to London. But after we had turned in our car at the airport we discovered that the flight had been cancelled because of a strike of cabin staff, and our departure was therefore postponed until the following morning, after a night in an Athens hotel. The day flight along the Gulf of Corinth did however enable me to inspect from the air the mountains of the northern Peloponnese, where we had been two years before and hope to go again.

A list of 115 species of Rhopalocera and 15 of Zygaenidae seen on this most profitable expedition is appended.

RHOPALOCERA AND ZYGAENIDAE NOTED IN GREECE, 16th JUNE TO 1st JULY 1970

abbreviations:

gen.	seen in all three mountain areas, Parnassos, Pindos and Olympus
Par.	Mt. Parnassos
Trip.	Forest of Tripotamos, Pindos
K.	below Kastania, Pindos
Met.	Meteora
Kat.	Katara Pass, Pindos
Ol.	Mt. Olympus

PAPILIONIDAE: *Papilio machaon* L.: gen, with full-grown larva at Delphi. *P. alexanor* Esp.: Delphi, one. *Iphiclides podalirius* L.: gen. and widespread at low levels elsewhere. *Parnassius mnemosyne* L.: gen., locally abundant, mostly above 1,500 m., on Par., ssp. *athene* Stitchel, on Pindos and Ol., ssp. *bureschi* Bryk.

PIERIDAE: *Leptidea sinapis* L.: gen. *L. duponcheli* Stdgr.: Kast. only, one of 1st generation and a few of 2nd, among bushes by the roadside. *Anthocaris cardamines* L.: Trip., many still fresh at 1,000 m. *Euchloe ausonia* Hb.: Par., a few very small, of the summer form. *Pontia daplidice* L.: gen., but much commoner on low ground elsewhere. *Pieris brassicae* L.: Trip., Ol., but few. *P. krueperi* Stdgr.: Par., locally common above Arakhova and at Delphi; Ol., at 50 m. in the Vale of Tembi. *P. rapae* L.: gen., and common almost everywhere *P. mannii* Meyer: gen., fairly common. *P. ergane* G-H.: Par., Ol., both spring and summer forms. *P. napi* L. Kat.,

1,500 m., common; Ol., few. All seemed to be of the 2nd generation, with black scaling on hindwings underside almost absent: ssp. *meridionalis* Heyne. *Aporia crataegi* L. gen., locally common, but worn. *Colias australis* Vty: Trip., 1,000 m., few. *C. crocea* Fourc.: gen., and widespread elsewhere. *C. aurorina heldreichi* Stdgr.: Par., on both north and south sides, just emerging at around 1,500 m., but not numerous. *Gonepteryx rhamni* L.: gen. *G. farinosa Zell.* Par., up to 1,500 m., but commonest at Delphi *G. cleopatra* L. Delphi, Met., Vale of Tembi, but only at low levels.

NYMPHALIDAE: *Limenitis reducta* Stdgr. (*anonyma* Lewin): gen., but not numerous. *Melitaea didyma* Esp.: gen. *M. trivia* Schiff.: gen., up to 1,500 m.; also Met., Brallos, etc. Large 1st generation specimens in the mountains, small 2nd generation low down. *M. cinxia* L.: Trip, males mostly worn, females melanic and fresh. *M. phoebe* Schiff.: gen., but mostly worn. *M. athalia* Rott.: Par., north side, at 1,160 m., probably its southern limit in Greece; Trip., Ol. *Clossiana euphrosyne* L.: gen., from 900 to 1,600 m. *Brenthis daphne* Schiff.: K., Ol., common and fresh at 800/1,000 m. *Issoria lathonia* L.: gen., but not common. *Fabriciana niobe* L. gen., common. *F. adippe* Rott. ssp. *olympena* Vty, entirely without silver spots.: Ol., frequent at 900 m., but commonest in the Vale of Tembi. *Mesoacidalia aglaja* L.: gen., common. *Argynnis paphia* L.: Pournaraki Pass, abundant on bramble blossom; Trip., Met., Ol. *Pandoriana pandora* Schiff.: Par., one or two seen at 1,300 m., Ol., at 850 m. *Vanessa cardui* L.: gen., and elsewhere, numerous. *V. atalanta* L.: gen., but mostly singly. *Polygonia egea* Cramer.: Par., Ol., to 900 m., common. *P. c-album* L.: gen., overlapping with *P. egea*, but going up to 1,700 m. *Nymphalis antiopa* L.: gen., in the forest, 800/1,700 m. *N. polychloros* L. Par., Trip., Kat., not common. *Inachis io.*: Ol., 900/1,700 m., fairly common. *Aglais urticae* L.: gen., and common above 1,500 m.

LIBYTHEIDAE: *Libythea celtis* Laich: Par., 1,500 m. one fresh.

RIODINIDAE: *Hamearis lucina* L. Trip., 1,500 m., many worn.

SATYRIDAE: *Melanargia galathea* L. gen.; small and very black upperside, but several females of *F. leucomelas* on Ol. 800 m. upwards. *M. larissa* Hb.: gen., to 1,000 m., and elsewhere; below K., many with basal areas of all wings wholly black. *Pararge aegeria* L.: gen., in the forest. *P. megera* L.: gen. *P. maera* L.: K., 800 m., fresh. *P. petropolitana* F. Trip., Kat., 1,500 m. common but worn. *Kirinia roxelana* Cramer.: gen., to 900 m., also Pournataki Pass, Tembi, etc., locally common among plane trees. *Hipparchia ?aristaeus* Bon.: Ol., Pournaraki Pass, seen but not caught. *H. ?fagi* Scop.: Trip., Ol., Pournaraki Pass, seen but not caught. *H. syriaca* Stdgr.: Marathon Lake, one caught and identified by genitalia. *H. statilinus* Hb.: Sounion, many among pine-trees. *H. fatua* Freyer: Sounion, with the last species, but commoner. *Chazara briseis* L.: Trip., Ol., few. *Pseudochazara anthelea amalthea* Friv.: Par., Delphi, 500/1,500 m., few. *Brintesia circe* F.: K., Met., Ol., many. *Satyrus ferula* F.: Delphi. *Maniola jurtina* L.: gen., and elsewhere, many. *Hyponephele lycaon* Kuhns: Pournaraki Pass, 600 m., several. *H. lupinus* Costa: Ol., 850 m., fresh males common in one spot. *Aphantopus hyperantus* L.: Ol., 850 m., common in one spot in damp forest; probably

the first record for Greece. *Coenonympha arcania* L.: Trip., Kat., Ol., from 1,000 m. upwards, in meadows. *C. pamphilus* L.: Delphi, Brallos, Trip., Kat., Ol., at low level ssp. *marginata* Ruhl, above 800 m. apparently typical. *Erebia medusa* Schiff. ssp. *euphrasia* Frhst.: Trip., Ol., 1,000/1,800 m., plentiful.

LYCAENIDAE: *Strymonidia ilicis* Esp.: gen., 800/1,000 m., common. *S. acaciae* Esp.: Trip., Ol., 800/1,000 m., few. *S. spini* Schiff.: Delphi. *Callophrys rubi* L., gen., at high levels, worn. *Heodes tityrus* Poda: gen., not common. *H. alciphron* Rott.: Trip., Ol., 800/1,000 m., fairly common. *Lycaena phloeas* L.: gen., not common. *Thersamonia thersamon* Esp.: Par., 1,500 m., one; Brallos, 400 m., one; Ol., 900 m., one. *Syntarucus pirithous* L.: Trip., Ol., 800/1,000 m., scarce and worn. *Cupido minimum* Fuess.: Ol., 1,800 m. *C. osiris* Meigen: Par., one. *Lycaenopsis argiolus* L.: Trip., Ol., 800/1,000 m., fairly common. *Scolitantides orion* Pall.: Ol., 850 m., few on a damp bank among *Sedum*. *Philotes vicrama schiffermuelleri* Hemming: Delphi Par., Ol., a few very large, of 2nd generation. *Maculinea arion* L.: Ol., 700/900 m., few. *Lycaeides idas* L.: Ol., 850 m., few. *L. argyrognomon* Bgstr.: Trip., 1,000 m., Ol., 900 m., few. *Plebejus argus* L.: Trip., 1,000 m., Kat., 1,500 m., abundant. *P. pylaon* Frhst.: Par., 1,500/1,700 m., common. *Aricia agestis* Schiff.: gen., up to c. 1,200 m. *A. allous* G-H. or *montensis* Vty.: Par., Ol., flying with the previous species, but going much higher. *A. anteros* Freyer: gen., locally abundant above c. 1,500 m. *Cyaniris semiargus* Rott.: Par., Trip., Kat., 1,500 m., common. *Polyommatus icarus* Rott.: gen., and widespread elsewhere, common at all levels. *Lysandra thersites* Cant.: Par., Ol., few. *L. escheri* Hb.: Ol., 850 m., just emerging. *L. amandus* Scheven: gen., common 800/1,200 m. *L. dorylas* Schiff.: gen., common 800/1,200 m. *L. bellargus* Rott.: gen., common 800/1,200 m. *Agrodiaetus admetus* Esp.; Gravia Pass, 900 m., a small colony. *Meleageria daphnis* Schiff.: Ol., 800 m., just emerging.

HESPERIDAE: *Erynnis tages* L.: Brallos, Trip., Kat., Ol., fairly common. *Carcharodus alceae* Esp.: gen., and common elsewhere at low levels. *Reverdinus orientalis* Rev.: gen., also at low levels elsewhere, fairly common. *Pyrgus sidae* Esp.: Trip., 1,000 m., three. *P. malvae* L.: Trip., Ol., not common. *P. serratulae* Rambur: gen., from 900 m. upwards, common. *P. armoricanus* Obth.: gen, with *P. serratulae*, not common. *P. cinarae* Rambur: Ol., 800/900 m., about a dozen seen in two spots. *Spialia orbifer* Hb.: gen., to 1,500 m., common. *S. phlomidis* H-S.: below K., 600 m., one. *Tuttia tessellum* Hb.: Ol., 850 m., about a dozen seen in one place. *Adopoea lineola* Ochs.: Trip., Ol., 900/1,000 m. *A. flava* Brunnich: gen., common. *Thymelicus actaeon* Rott.: Gravia Pass, 900 m., Ol., 900 m., locally common. *Ochlodes venata* Brem. & Grey: Trip., Ol., fairly common.

ZYGAENIDAE: *Procris globulariae* Hbn.: Trip., one male; *P. notata* Zell.: Trip., one male; *P. subsolana* Stdgr.: Par., c. 1,200 m., one male; *P. manni* Led.: Trip., one male; *Zygaena punctum* Ochs.: Par., Gravia Pass, Trip., many; *Z. brizae* Esp.: Trip., three; *Z. purpuralis* Brunnich: Trip. one; *Z. loti* D. & S.: Par., 1,000/1,200 m., Trip., several; *Z.*

carniolica Scop.: Trip., two; *Z. viciae* D. & S.: Trip., three; *Z. trifolii* Esp., Trip., one male; *Z. lonicerae* Schev., Trip., Par., several; *Z. filipendulae*: L. Par., Trip., common; *Z. angelicae* Ochs; Par., c. 1,200 m., Trip., several; *Z. ephialtes* L.: Trip., several.

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Folly Hill, Birtley Green, Bramley, Surrey. October 1970.

Trans Alpine Insect Safari, 1970

By George Thomson

We knew that the inhabitants of several places claim that their local cave was that in which Robert Bruce watched the spider. We were aware that a number of towns claim to be the geographical centre of Scotland. But we didn't know that several passes lay claim to being the highest in Europe, nor were we aware of the fact that we had, inadvertently landed on one of these, the Stilfserjoch, until it was too late to turn back and were destined to force our little car over the top of a nine thousand foot ridge.

It was the tenth day of what we had come to call the 'Trans Alpine Insect Safari'—for publicity reasons more than accuracy—which was to take Mr Ian Macdougall and myself on four thousand or so miles of Europe's most scenic roads in weather conditions ranging from sub-arctic to sub-tropical to the three main mountain regions of the Continent, the Swiss and French Alps and the Italian Dolomites. Our main aim was to sample the butterfly fauna of these areas as far as conditions would permit, but we also had the specific tasks of collecting a series of *Maniola jurtina* (L.) from a set of chosen localities in France and Italy, to fix the testes of this species from various localities for later chromosome work and to send live specimens back home as stock for breeding experiments. Our equipment included nothing which would startle the entomological world although my hypodermic syringe and bottle of alcohol could have made our fellow campers wonder what our country was coming to! We packed two large kite nets, a supply of boxes, papers, polythene bags, forceps, disecting equipment, specimen tubes, collecting bag, compass, maps, cameras and ice-axe, together with our 'survival pack' of several dozen each of packet soup, tinned baked beans and ravioli (bound for Italy) which is an interesting new angle on the theme of 'coals to Newcastle'!

We left home on the morning of July 10 in fine weather and collected a few *jurtina* at Tow Law, County Durham, before stopping overnight at a small village near Leeds. Next day two further localities were sampled, Colsterworth, Lincolnshire and Watford, Hertfordshire, on the way to London, crossing from Newhaven to Dieppe on the 12th. For the first time in my life I saw the north of France in sunshine and we took

advantage of this by beginning our *jurtina* sampling in a field near Le Quesney. Very little else was flying apart from *Aphantopus hyperanthus* (L.), *Coenonympha pamphilus* (L.), *Aglias urticae* (L.), *Pieris napi* (L.) and *Adopoea flava* Burnnich. On the outskirts of the wood beside which we were collecting was a sign which was to feature prominently in our French collected localities—CHASSE RÉSERVÉ—which we ignored, of course, assuming that lower forms of life were exempt! We arrived at Beauvais in time to collect a little before settling for the night in a campsite overlooking the bombed Cathedral, but the only new species was *Agapetes galathea* (L.). In the morning, however, having collected the *jurtina* sample together with *Pyronia tithonus* (L.) and a single *A. lineola* Ochs., just as we were leaving a single *Araschnia levana* (L.) settled on the ground close to the car and I quickly netted it. That day we travelled to Chaumont, Haute Marne, via Compeigne and Châlons s/ Marne where the now customary *jurtina* samples were taken. We had been collecting in a field outside Chalons for about two hours and on our way back to the car, when a rather officious Frenchman approached us and asked for our collecting card. We pretended not to understand a word he was saying (the most effective way out of such situations) and, as we had taken all required, found the situation rather amusing while he became more and more frustrated at our non-comprehension and eventually took himself off.

Chaumont the next morning proved to be our best locality of the trip up to that point, though the eleven species we took, including *C. arcania* (L.), *iphis* Schiff. and *Palaeochrysophanus hippothoë* (L.), were nothing to get excited about. Besancon only added *Gonepteryx rhamni* (L.) and *Carchardous alceae* Esp., but Pontarlier, our last stop in France, made up for earlier disappointments. On a grassy slope high above a valley we collected amongst other things *Lepinga achine* Scop., *Brenthis ino* Rott., *Euphydryas aurinea* Rott., *Aporia crataegi* (L.) and *Cupido sebrus* Hb. I had never taken *achine* before and the eighteen cleg bites were a worthwhile ordeal to suffer.

That night the weather, which had been perfect, broke as we reached Interlaken and our two day stop was to give us a rather unfavourable impression of this attractive spot. A trip to Grindelwald on the second day only demonstrated the worthlessness of spending six pounds on a return ticket to the Jungfraujoch—a one-hour journey to get a close look at the clouds which plagued our stay. The drop in temperature was noticeable and confirmed by the discovery on our way to Brig that the Grimsel, Furka and Susten Passes were closed because of snow. Following the example of Swiss drivers we went through the 'Route Barée' signs to get a closer look at our demon. Even the bravest driver would have had second thoughts about going very far through the blizzards and freezing temperatures and we made a detour of about one hundred and twenty miles to get to Brig which should have been barely an hour's drive. The weather at Brig was considerably better, and had been for some time even although the two areas are close to each other.

The 17th July was a rather windy day, but we considered it a worthwhile proposition to make a day's visit to the top of the Simplon. We looked for a sheltered spot below the summit of the pass, but in general were disappointed with the lack of *Erebias* which we had expected to be common as I had found was the case in the French and Swiss Alps on

previous visits. We took *euryale* Esp., *epiphron* Knoch., *tyndarus* Esp., and *eryphile* Freyer. The commonest species was *E. debilis* Obth. which was very variable with individuals approaching *aurinea* in size and colour. *Clossiana euphrosyne* (L.) and *Boloria napaea* Hffmsg. too were common as were the two alpine *Colias palaeno* (L.) and *phicomone* Esp. We saw only a single *Pieris bryoniae* Ochs and *Euchloë ausonia* Hb. and three *Synchloe callidice* Esp. *Parnassius apollo* (L.) and *phoebus* Fabr. were about in roughly equal numbers, but only one *Papilio machaon* L. turned up. Amongst the 'blues' were *Vacciniini optilete* Knoch., *Agriades glandon* de Pr., *Maculinea arion* (L.) and *alcon* Schiff. with one or too very late *Callophyrs rubi* (L.). *Oenis aello* Hb. was in evidence but at a distance close by some large boulders into which disappeared what looked like an otter. A pasture at about 5,000 feet on the way back to Brig was swarming with *euryale*, but other species were poorly represented other than *E. alberganus* de Pr., *Lasiommata maera* (L.) and *Aricia allous* G.-H. We collected again on the summit on our way to Mandello del Lario the next day. This time we caught a couple of the illusive *aello*. At about 4,500 feet a rather difficult slope from the collecting point of view was alive with a good variety of insects. New to our list was *L. petropolitana* Fabr. (the two specimens taken were the only ones we were to see on our expedition), *C. titania* Hb., *Fabriciana niobe* (L.), *Melitaea diamina* Lang. *Heodes tityrus* Poda and *virgaureae* (L.).

Mandello, on the shores of Lago Como, was only an overnight stop on our way to Merano. Our first collecting spot was near Sondrio where I was able to get the first series of *jurtina* since we left France, together with *E. adippe* f., *cleodoxa* Ochs., *M. didyma* Esp., *H. alciphron* Rott., *tityrus*, *allous*, *A. agestis* Schiff., *C. croceus* (L.), *Leptidea sinapis* (L.), *Iphiclides podalirius* (L.) and several more widespread species. Unfortunately the navigator of our party made a slight cartographical 'faux-pas' which was to take us over the Stilfserjoch. We survived, but several of the tunnels on the pass were in such poor condition and presented all the hazards one could imagine that we had our doubts on more than one occasion. At the summit I took a single *E. pandrose* Borkh. but several stops on the other side were fruitless. I was rather surprised to find that *jurtina* was not flying at Merano the type locality of Fruhstorfer's *phormia* though I was able to take it at Bolzano some sixteen miles to the south. This area turned out to be an interesting one in which we saw our first *Hipparchia fagi* Scop., *Argynnis paphia* (L.), *Thecla quercus* (L.), *Strymon w-album* Knoch., *Everes alcetas* Hffsg. and *P. mannii* Mayer.

We were to run into more bad weather on our way to Cortina d'Ampezzo on the spectacular road over the Pso. di Costalimga, Pordoi and Falzarego in the heart of the Dolomites. I didn't expect to get *jurtina* at Cortina but turned out to be the commonest species, even at a height of 4,041 feet. It was a pity that the weather did not favour our visit to this interesting region around the Olympic town and we took no more than half a dozen species all of which were common elsewhere.

The sun shone on our way back over the Falzarego where the commonest species was *pandrose*. I also took *E. medusa alpestris* Warren (or a race related to it) and *C. satyrion* Esp. which were welcome additions to the list. A single *jurtina* at 4,000 feet was a surprise, and a little lower down we found our first *Plebicula escheri* Hb. As we had

planned to pass the Bolzano area, we took advantage of this by paying a second visit to the locality we had visited a few days before. This time we added *Pararge aegeria* (L.), *Polygonia c-album* (L.) and *machaon* and then travelled overnight to Ivrea some fifty miles to the north of Turin where I had collected two years before. It had been so dry for weeks that the number of butterflies flying was far less than on my previous visit. *M. trivia* Schiff. is common here replacing its close relative *didyma*, and other species worth noting were *Satyrus bryce* Hb., *Minois dryas* Scop., *Erynnis tages* (L.), *C. hyale* (L.) and *Limenitis camilla* (L.). After a rest in the scorching sun of Ivrea we made our way towards the Maritime Alps, stopping for lunch at Vernente about midway between Cuneo and the Franco-Italian border. On what looked like a disused and overgrown coal 'bing' the most common butterflies were the 'coppers' *virgaureae*, *H. alciphron* Rott. and *hippothoë*. New to us was *Hyponephele lycaon* Kuhns., *C. dia*, *L. ananyma* Lewin, *Lysandra coridon* Poda and other 'blues'.

We did not anticipate a stop before the French side of the border, but so many butterflies—including *apollo*—were flying across the road on our way over the Col du Tende that we stopped in 'no man's land' to sample the fauna. I have never seen so many butterflies flying together as were swarming close by a spring trickling out of the dusty hillside and settling on the damp soil closeby. Most were *coridon*, *P. amandus* Scheven, *escheri* and *sebrus*, but there were also quite a few *Meleageria daphnis* Schiff., *alcon* and *arion* and a single *Polyommatus eros* Ochs. The *Melitaea* and *Mellicta* included *phoebe* Schiff., *didyma*, *athalia* Rott. and several others while *sinapis*, *duponcheli* Stdgr., *crataegi*, *C. australis* Vrty. and *croceus* accounted for most of the Pierids. *Apollo* was fairly common but the two *Pterourus alexanor* Esp., although very worn, were most satisfying to take after failing to find the species two years ago. The Satyridae were in no way spectacular though they included *E. meolans* de Pr., *bryce*, *Brintesia circe* Fabr. and the female f. *leucomelas* of *galathea*, but to find *jurtina* at 4,300 feet exceeded all expectations. I knew that the butterfly was found very locally at such levels (up to 5,000 feet) in the Apennines and rarely in north east Italy, but it will take some research to find out if there is a higher locality in other parts of Europe.

The long windy road from the Tende took us through dry, rocky hillsides many completely barren, others showing signs of serious bushfire, thence to Cannes, Nice and Grasse where we spent the night.

I had collected at St Vallier in 1968, but on the south side of the town. This time we chose a clearing in a small wood to the north. *Fagi* and *circe* were the commonest satyrids. The most interesting Nymphalidae were *M. parthenoides* Kef., *B. daphne* Schiff. and *hecate* Schiff., although a fine female f. *valesina* Esp. of *paphia* was worth the hundred yard dash to capture it. *Adippe* and *niobe* were flying together with *dia*, *quercus* and the common 'blues' were sitting around the flowers while *napi*, *australis* and *rhamni* flew along the roadside. Varages and Fayence added nothing new to our collection.

This was on our way to Apt which we thought would be a convenient centre from which to visit Fountain de Vaucluse, the Luberon Mountains and around Apt itself. The drought had dried the area to such an extent that the only places where butterflies were flying in any number were

lavender fields when we could wait for the insects to visit the sweet smelling flowers. Fountain was disappointing as it had been so rich in insect life in 1968. This year the only species we had not collected elsewhere was *P. bathseba* Frhst. Bonnieux, in the Luberon Mountains, was more prolific with *circe, daphne, M. cinxia* (L.), *dejone* G.-H., *Lampides boeticus* (L.), *ausonia* and *G. cleopatra* (L.). Also flying were the two hawkmoths *Macroglossa stellatarum* (L.) and *Haemorrhagia fuciformis* (L.) which created an interesting diversion from catching comparatively slow flying Rhopalocera.

I had been looking forward to my visit to Mont Ventoux in Vaucluse for many months. From the plateau the 6,430 foot mountain could best be described as a bald head. The top in the bright southern sun is of a bright biscuit colour, while the lower slopes are greenish with small oaks and vegetation. Before ascending the slopes from the west we stopped for a short while at Malaucene where *dorus, S. actaea* Esp. and *Arethusana arethusa* Schiff. were flying. It was about three hundred feet from the summit that our car, which had behaved impeccably until then, began to have trouble on the steep inclines, cutting out from time to time, but we made it to the top to find that almost every vehicle was in the same predicament. The intense heat and altitude was obviously having some effect on the usually reliable internal combustion engines. The top of Ventoux is covered by a vast area the surface of which is littered with boulders and virtually no flora. No butterflies were seen until we descended to about 4,000 feet where what had come to be the most familiar European satyrids were flying commonly—*galathea, maera, bryce, fagi, lycaon, arcania, dorus, semele* and even another 4,000 foot *jurtina*. Very few fritillaries were about, but they included *Issoria lathonia* (L.) and *daphne*. *Apollo* is represented by a magnificent race with a wingspan of nearly 100 mm—we took three. Only two *Erebias* came our way, *ligea* and *scipio* Bdv. The 'coppers' were common together with *Strymon spini* Schiff. and *ilicis* Esp. *Cleopatra* is interesting on the mountain, the males having an extremely large orange patch on the forewings and a very bright green underside. *Circe* was flying a little lower (about 3,000 feet), but at that level we had returned to drought conditions and not so much was about.

Digne was our next stop, but it was an uncomfortable two days as the heat had become oppressive. *Jurtina* was obviously between the two emergences (not broods) which take place in the south of Europe, and our hunt for the species produced only three individuals. We collected a sizeable number of specimens but only *P. thersites* Chpn./Cantener and *E. argiades* Pall. had not been taken elsewhere.

We had intended staying a week at La Grave in the Hautes Alps, but our planned call there was terminated by quite a different sort of 'Col'—the Lautaret. Two severe storms within twenty-four hours had caused two landslides blocking the pass for several hundred yards. For how long the road had been blocked we did not find out, but we hoped that in a couple of days it would be reopened and we camped overnight on the hillside above the pass. We succeeded in getting in some collecting between showers, but the weather was against us. However, we took the *Erebias alberganus, cassioides* Hohenwarth, *pharte* Hb. and *euryale*, form *eris* Meigen of *niobe* and the three *Parnassius* — *apollo, pheobus* and *mnemosyne* (L.); also *palaeno, napaea* and several Lycaenidae. It became

obvious on the second day that the weather was worsening and that work on clearing the pass would be postponed, so we decided to cut short our trip and make for home. This, we discovered later, was a timely decision. On reaching Grenoble a violent thunderstorm broke out presenting us with all the elements which a meteorologist could dream up. While the lightning flashed continuously, the hail—three quarters of an inch in diameter—bounced off the windscreen and we followed the example of other motorists stopping under a flyover. Within thirty seconds of the start of the storm every vehicle on the busy roads of Grenoble had come to a halt. With the storm moderating we drove out of the area as quickly as possible.

On the way through France we collected near Roanne, where our main objective was another good series of *jurtina*, and La Palisse where we saw our only *Nymphalis antiopa* (L.). In the Fôret Domaniale we added *Lycaenopsis argiolus* (L.) to our list of species and to my delight *Heteropterus morpheus* Pall.

The crossing from Dieppe to Newhaven was as smooth as was the outward journey and the passage through customs with two Swiss clocks, an adequate supply of wine and a couple of thousand specimens presented no difficulty. A fuel blockage a few miles north of Brighton held us up a little, but the journey home was uneventful.

I would consider our 'safari' a qualified success, this because the route we took and the season in which we went had greater potential than that realised. Much of this can be explained by the bad weather at Interlaken and Cortina, areas which would be worth re-visiting, the drought in the south of France and the storms in the Hautes Alps. All specimens were papered as caught and packed into polythene bags or boxes. Our totals were remarkably similar to those in 1968—1719 specimens and 141 species, the following being the list at the end of our 4,200 mile journey. Those marked * have still to have their identification confirmed.

HESPERIIDAE

Erynnis tages (L.)
Caracharodus alceae Esp.
**Pyrgus carthami valesiaca* Mabille
* *malvoides* El. and Ed.
* *carlinae* Rambur
Spialia sertorius Hffmsgg.
Heteropterous morpheus Pall.
Adopoea lineola Ochs.
flava Brunnich
Thymelicus actaeon Rott.
Ochlodes venata venata Brem. and Grey
venata esperi Vrty.
Hesperia comma (L.)

PAPILIONIDAE

Papilio machaon bigenerata Vrty.
machaon sphyrus Hb.
machaon alpicola Vrty.
Pterourus alexanor Esp.
Iphiclides podalirius (L.)
Parnassius phoebus Fabr.
apollo (L.)
mnenosyne hartmannia Stdfss.

PIERIDAE

Leptidea sinapsis (L.)
duponcheli Stdgr.
Euchloë ausonia Hb.
Synchloe callidice Esp.
Pieris brassicae (L.)
rapae (L.)
mannii Mayer
napi (L.)
bryoniae Ochs.

Aporia crataegi (L.)
Colias hyale (L.)
australis Vrty.
phicomone Esp.
palaeno europomene Ochs.
croceus (L.)
Gonepteryx rhamni (L.)
cleopatra (L.)

NYMPHALIDAE
Limenitis camilla (L.)
anonyma Lewin
Ephydryas aurinia Rott.
debilis Obth.
Melitaea didyma Esp.
trivia Schiff.
cinxia (L.)
phoebe Schiff.
diamina Lang
Mellicta dejone G.-H.
* *athalia celadussa* Frhst.
veria Meyer-Dür.
parthenoides Kef.
Boloria napaea Hffmsg.
Clossiana euphrosyne (L.)
dia (L.)
titania Hb.
Brenthis hecate Schiff.
ino Rott.
daphne Schiff.
Issoria lathonia (L.)
Fabriciana niobe (L.)
niobe f. *eris* Meigen.
adippe Rott.
adippe f. *cleodoxa* Ochs.
Mesoacidalia charlotta Haw.
Argynnis paphia (L.)
paphia f. *valesina* Esp.
Araschnia levana (L.)
Vanessa cardui (L.)
atalanta (L.)
Polygonia c-album (L.)
Nymphalis antiopa (L.)
Inachis io (L.)
Aglias urticae (L.)

SATYRIDAE
Agapetes galathea galathea (L.)
galathea procida Herbst.
galathea f. *leucomelas*
Pararge aegeria (L.)
Lepinga achine Scop.
Lasiommata megera (L.)
maera maera (L.)
maera adrasta Hb.
petropelitana hiera Hb
Oenis aello Hb.
Hipparchia semele (L.)
fagi fagi Scop.
fagi aturia Frhst.
Arethusana arethusa Schiff.
Brintesia circe venefica Frhst.
Minois dryas Scop.
Satyrus bryce Hb.
actaea Esp.
Maniola jurtina insularis Thomson
jurtina phormia Frhst.
jurtina miscens Vrty.
Pyronia tithonus (L.)
bathseba Frhst.
Hyponephele lycaon Kuhns.
Aphantopus hyperanthus (L.)
Coenonympha iphis Schiff.
arcania (L.)
satyrion Esp.
dorus Esp.
pamphilus pamphilus (L.)
pamphilus lyllus Esp.
Erebia ligea carthusianorum Frhst.
ligea pomagna Frhst.
euryale isarica Heyne
euryale ocellaris Stdgr.
euryale adyte Hb.
eriphyle Freyer
epiphron aetherius Esp.
pharte thynias Frhst.
triarius de Pr.
medusa alpestris Warren
alberganus alberganus de Pr.
alberganus tetra Frhst.
tyndarus Esp.
cassioides Howenwarth
scipio Bdv.
meolans stygne Ochs.
pandrose Borkh.

LYCAENIDAE

Thecla quercus (L.)
Strymon ilicis Esp.
acaciae Esp.
spini Schiff.
w-album Knoch
Callophrys rubi (L.)
Heodes virgaureae virgaureae (L.)
virgaureae montana M.-D.
tityrus tityrus Poda
tityrus subalpina Speyer
alciphron alciphron Rott.
alciphron gordius Sulzer
Lycaena phlaeas phlaeas (L.)
phlaeas eleus Fabr.
Palaeochrysophanus hippothoë (L.)
Lampides boeticus (L.)
Everes argiades Pall.
alcetas Hffsg.
Cupido minimus Fussl.
sebrus Hb.
Lycaenopsis argiolus (L.)
Maculinea arion obscura Christ.
alcon Schiff.
Lycaeides idas haefelingeri Beuret
idas calliopis Bdv.
idas australissima Vrty.
argyrognomon Bgstr.
Plebejus argus (L.)
Aricia agestis Schiff.
allous G.-H.
Eumedonia chiron Rott.
Agriades glandon de Pr.
Cyaniris semiargus Rott.
Vacciniina optilete Knoch.
Polyommatus icarus Rott.
eros Ochs.
Plebicula thersites Chpn./Cantener
escheri Hb.
amandus Scheven
Lysandra bellargus Rott.
coridon Poda.
Agrodiaetus damon Schiff.
Meleageria daphnis Schiff.

98 George Street, Dunblane, Perthshire. 24.viii.70.

MACRO-LEPIDOPTERA CANNAE

The Butterflies and Moths of Canna

By J. L. CAMPBELL

(*Continued from page 242*)

49. *A. rumicis* L. (Knot Grass). Fairly common, larvae often noticed. In trap, earliest, 29/4/56; latest, 11/8/62; most, 25 in 1964, 22 in 1965.

Trifinae

50. *Agrotis* (*Euxoa*) *segetum* Schiff: (Turnip Moth). Two only, in the trap on 5/10/60.
51. *A. vestigialis* Rott. (Archer's Dart). First caught, in the trap, on 16/7/56, others on 13/8/56 and 18/7/64.
52. *A. cursoria* Hufn. (Coast Dart). First taken, in the trap, on 12/8/55, a month on which eight were caught. Only others, 16/8/58, 16/8/65, 28/8/65, until 1969, when 20 specimens were taken between August 9th and 29th inclusive.
53. *A. nigricans* L .(Garden Dart). Some specimens of *nigricans* were separated from *obelisca* in my cabinet by Dr. Michael Harper in 1957, but these are now lost. Specimens taken on 30/7/68 and 1/8/68 were identified by Mr E. C. Pelham-Clinton. Taken on 1st, 14th and 16th of August 1969, 16 specimens in all.
54. *A. tritici* L. (White-line Dart). Common in some years, but less so since 1965. In the early years of the trap not always satisfactorily separated from *A. obelisca*. Earliest, 23/7/65; latest, 25/9/65; most, 162 in 1955 (but this probably includes some *obelisca*); 103 in 1969.

55. *A. obelisca* Hübn. (Square-spot Dart). Not so common as the preceding. Earliest, 11/8/63 and '68; latest, 25/9/62; most, 77 in 1969 (but see under *A. tritici*).
56. *A. exclamationis* L. (Heart and Dart). Very common. Earliest, 17/5/52; latest, 1/8/68; most, 242 in 1969; 185 in 1959.
57. *A. ypsilon* Rott. (Dark Sword-Grass). Numbers fluctuate considerably. None taken in 1953, '56, '57, or '61. Earliest, 16/3/60; latest, 26/10/66, a year when the moth was abundant and 297 specimens were taken in the trap. Otherwise, the latest is one at lighted window on 9/12/63. Next most, 34 in 1964.
58. *A. strigula* Thunb. (*porphyrea* Hübn.). (True-lovers' Knot). Also fluctuates. Earliest, 8/6/63; latest, 25/8/60. In 1956, 313 were taken in the trap, of which 149 on one night, July 18th. Comparatively few during the next six years, and then 264 in 1963, of which 230 on one night, July 31st; and 281 in 1964, of which 153 on July 18th and 92 on July 19th. In 1965 there were 172 of which 58 on July 21st, and in 1966 there were 117 of which 30 were taken on July 30th. 63 in 1967, of which 26 on August 10th and 75 in 1968 on 19 different nights, with eleven the highest number; the other 'surges' are remarkable.
59. *A. praecox* L. (Portland Moth). This sandhill species was first taken in the trap on 18/8/51. Others have occurred on 26/8/55, 28/8/56, and 18/8/63 (two specimens on the last date), and one on 14/8/69.
60. *A. saucia,* Hübn. (Pearly Underwing). Considerably scarcer than *A. ypsilon.* Earliest, 30/3/65; latest, 25/10/58; most, 17 in 1964, 15 in 1966.
61. *A. lucernea* L. (Northern Rustic). Sometimes found in buildings. Seen flying over the northern cliffs near Compass Hill on 15/8/52. In the trap, earliest, 17/6/68; latest, 26/9/66; most, 14 in 1966, 12 in 1969.
62. *A. simulans* Hufn. (Dotted Rustic). One only, inside Tighard House on 1/7/56.
63. *A. agathina* Dup. (Heath Rustic). Uncommon, first taken on 21/8/55 in trap; earliest, 21/7/67; latest, 21/9/66; most, 18 in 1969; 5 in 1956.
64. *Noctua augur* Fab. (Double Dart). Two only, in trap on 18th and 19th July 1968.
65. *N. glareosa* Esp. (Autumnal Rustic). Common. Earliest in trap, 12/8/55; latest, 6/10/64; most, 256 in 1966, 221 in 1968. Var. *rosea* quite frequent.
66. *N. castanea* Esp. (The Neglected). Rare. First taken, in the trap, on 21/8/55. Not taken in 1957-59, '61, '62, '64, '66, or '67.
67. *N. baia* Fabr. (Dotted Clay). Common. Earliest, 28/6/59; latest, 7/9/56; most, 192 in 1966, 95 in 1956.
68. *N. c.-nigrum* L. (Setaceous Hebrew Character). Common. Earliest, 12/6/52; latest, 10/10/62; most, 126 in 1966; 116 in 1969.
69. *N. ditrapezium* Borkh. (Triple-Spotted Clay). Common. Earliest, 22/6/53; latest, 11/9/62; most, 205 in 1956, 65 in 1968.
70. *N. brunnea* Fabr. (Purple Clay). One only, 11/8/65. (I found this quite commonly in the plantation at Northbay, Barra, in 1936).
71. *N. primulae* Esp. (*festiva* Hübn.) (Ingrailed Clay). Fairly common. Earliest, 20/6/66; latest, 3/9/62; most, 40 in 1968; 39 in 1966. Var. *thulei* has occurred.

72. *N. dahlii* Hübn. (Barred Chestnut). 14/7/68; latest, 19/9/66; most, 35 in 1968. First record, 16/8/65.
73. *N. rubi* View. (Small Square-Spot). Not common in the trap. Earliest, 6/6/59; latest, 2/9/65; most, 9 in 1965, 8 in 1968.
74. *N. sexstrigata* Haw. (Six-Striped Rustic). Identified by Mr E. C. Pelham-Clinton amongst small specimens of *N. baia* taken in the trap in 1969.
75. *N. xanthographa* Fabr. (Square Spot Rustic). Common. Earliest, 20/7/52, '65; latest, 16/10/60; most, 404 in 1955; 207 in 1960.
76. *N. plecta* L. (Flame Shoulder). Moderately common; double brooded. Earliest, 5/6/69; latest, 1/9/58; most, 30 in 1968; 27 in 1966.
77. *Axylia putris* L. (The Flame). Rare. Four only, on 15/7/56, 9/7/62. 21/7/65, and 31/7/69.
78. *Triphaena comes* Hübn. (Lesser Yellow Underwing). Moderately common. Var. *curtisii* occurs. Earliest, 13/7/53; latest, 20/10/62; most, 174 in 1966; 104 in 1969.
79. *T. pronuba* L. (Large Yellow Underwing). Abundant, by far the commonest moth in the trap, sometimes making nearly 30% of the total catch of the season. Extended period of emergence. Earliest, 6/6/54; latest, 19/10/69; most, 3,246 in 1968; 2,696 in 1966.
80. *T. fimbria* L. (Broad Bordered Yellow Underwing). Only four specimens, on 14/8/55, 13/8/68, 14/9/68 (two), all those taken in 1968 were worn. Unexpected.
81. *T. ianthina* Esp. (Lesser Broad Border). Abundant. Earliest, 21/6/67; latest, 4/10/62; most, 1,034 in 1966; 551 in 1968.
82. *Eurois prasina* Fabr. (Green Arches). First taken on sugar in 1939, a surprise; first in trap on 16/7/56, thereafter in 1957, '59, '63, '65, '66, '68. Earliest, 25/6/59; latest, 29/7/68; most, 6 in 1968.
83. *E. occulta* L. (Great Brocade). First found dead in a building on 17/8/60; later taken in trap on 14/8/64 (two), and on 21/8/66. All the specimens are of the dark grey form and were worn.
84. *Aplecta nebulosa* Hufn. (Grey Arches). Uncommon. Taken first in trap on 8/7/52. Occurred in 1956, '57, '58, '59, '64, '65, '66, '68, '69. Earliest, 8/7/52; latest, 4/8/58; most, 9 in 1968, 6 in 1965.
85. *Mamestra oleracea* L. (Bright-line Brown Eye). Abundant. Double brooded. Earliest, 3/5/57; latest, 18/9/57; most, 598 in 1968; 492 in 1956.
86. *M. thalassina* Rott. (Pale-shouldered Brocade). Fairly common. Earliest 5/5/69; latest, 20/8/61; most, 45 in 1966; 44 in 1968.
87. *M. pisi* L. (Broom Moth). Common. Earliest in trap, 12/5/59; latest, 22/7/56; most, 168 in 1959; 68 in 1968. Larvae often noticed.
88. *M. glauca* Hübn. (Glaucous Shears). Quite common. Earliest, 5/5/69; latest, 23/6/52; most, 70 in 1964: 43 in 1952.
89. *M. dentina* Esp. (The Shears). Common. Earliest, 5/5/69; latest, 10/8/69; most, 183 in 1969; 116 in 1968.
90. *Dianthoecia caesia* Borkh. (The Grey). First taken, in the trap, on 25/5/52, the first recorded instance from Scotland. Taken in small numbers every year except 1951, '54, '60, '62. Earliest, 5/5/53; latest, 25/8/66, '67; most, 19 in 1956, 16 in 1964, '66.
91. *D. conspersa* Esp. (Marbled Coronet). Common. Long period of emergence. Earliest, 2/5/55, '69; latest, 8/10/53 (this was probably a partial second broad, the last before was taken on 20/7/53. Otherwise the latest is 2/9/56). Most, 215 in 1956; 161 in 1964.

92. *D. capsincola* Hübn. (The Lychnis). Occurs regularly. Earliest, 12/5/57, '59; latest, 16/8/51. Most, 35 in 1964; 28 in 1959; (but see next).

93. *D. cucubali* Fuessl. (The Campion). Not adequately separated from *capsincola* in the earliest trap records. No doubtful specimen since then referred to expert scrutiny has ever been identified as *cucubali*. I have only two Canna specimens. Much rarer here than it was on Barra.

94. *Tholera cespitis* Fabr. (Hedge Rustic). Rare. Only taken in 1955, '58, '61, '66. Earliest, 3/8/55; latest, 11/9/61; most, four in 1961.

95. *Cerapteryx graminis* L. (The Antler). Fluctuates, sometimes very common. Earliest, 7/7/57; latest, 20/9/61; most, 236 in 1952 until 1969, when 1,274 were taken ,including the unprecedented number of 976 on a single night, that of August 14th.

96. *Eumichtis adusta* Esp. (Dark Brocade). Occurs in most years. Earliest, 5/5/53; latest, 18/7/56; most, 40 in 1969; 25 in 1966.

97. *E. protea* Borkh. (Brindled Green). Two only, 25/8/55 and 30/8/66.

98. *Bombycia viminalis* Fabr. (Minor Shoulder-Knot). Five only, in trap on 1/9/58, 30/8/66, 27/8/68; and a fine dark specimen on 10/8/69, a pale one on 14/8/69.

99. *Luperina testacea* Hübn. (Flounced Rustic). Fairly common. Earliest, 13/7/67; latest, 31/9/68; most, 78 in 1956; 30 in 1968.

100. *Cerigo matura* Hübn. (Straw Underwing). Two caught at sugar on a steep grassy slope above sea near Coroghon on 24/7/45. One in the trap, 30/7/66.

101. *Celanea haworthii* Curt. (Haworth's Rustic). Rarely in trap. Ten caught in trap in 1955 between 14th and 25th August, and one on 18th August 1957; only records. Specimen seen on Sanday on 17/9/56.

102. *Hama furva* Hübn. (The Confused). Fairly common. Earliest, 6/6/54; latest, 9/9/56; most, 38 in 1969; 25 in 1966.

103. *Apamea gemina* Hübn. (Dusky Brocade). Less common than *furva*, from which its typical form is sometimes difficult to distinguish. Earliest, 8/6/64; latest, 11/8/52, '62; most, 17 in 1969; 15 in 1959. A very fine specimen of var. *remissa* was taken in the trap on 6/7/68.

104. *Apamea secalis* L. (Common Rustic). Abundant, very variable. Earliest,11/7/68; latest, 27/9/66; most, 617 in 1969 (of which 62, 79 and 106 on July 31st, August 1st and 2nd); 440 in 1956 (of which 83, 108, 63 on nights of 7th, 9th, 10th of August). This moth is one of the most punctual in its appearance; in 1952, '53, '55, '57 and '58 it first appeared on July 20th; eleven times it has first appeared between July 15th and 22nd.

105. *Miana fasciuncula* Haw. (Middle-barred Minor). Occasionally at sugar, 1938, '39, '45, later occasionally in the trap, none in 1951, '54, '56, '57, '60, '61, '62, '65; earliest, 24/6/64; latest, 10/8/68; most, 9 in 1969; 8 in 1968.
[*M. bicoloria*, Vill. recorded in J.L.C.2 and J.L.C.3 was an error; the specimens were eventually identified as *T. fulva*.]

106. *Xylophasia rurea* Fabr. (Clouded-bordered Brindle). Fairly common, both the typical form and var. *alopecurus* in about equal numbers. Earliest, 24/5/64; latest, 11/8/62; most, 100 in 1966; 29 in 1967.

107. *Xylophasia lithoxylea* Fabr. (Light Arches). Turns up regularly in small numbers; none caught in trap in 1952, '53, '60, '61. Previously

caught at sugar. Earliest, 14/6/68; latest, 24/8/67; most, 18 in 1956; 11 in 1968.

108. *X. monoglypha* Hufn. (Dark Arches). Abundant, both dark and light forms. Earliest, 5/6/65; latest, 28/9/67; most, 1,224 in 1969; 1,063 in 1968.

109. *Aporophyla lutulenta* Borkh. (Deep-brown Dart). Taken in the trap most years, in small numbers. The majority of specimens are var. *sedi* Guen. Eerliest, 12/8/55; latest, 22/9/68; most, 23 in 1969; 20 in 1968.

110. *A. nigra* Haw. (Black Rustic). Commoner than *A. lutulenta*. Earliest, 14/8/55; latest, 16/10/60; most, 79 in 1960; 55 in 1966.

111. *Dasypolia templi* Thunb. (Brindled Ochre). Taken in small numbers in the trap, 1953, '56, '57, '62, '64, '68. Sometimes seen at the lighted windows in the spring. Earliest, 27/3/56; latest, 25/10/66 (before hibernation); most, 10 in 1969 (of which 3 in March and April); 6 in 1955. The local form of this moth is distinctly handsomer than that figured in the pre-1961 editions of South.

112. *Polia chi* L. (Grey Chi). Taken fairly regularly in the trap (none in 1953, '54, '57, '63, '64). Earliest, 14/8/69; latest, 6/10/65; most, 17 in 1966; 14 in 1969.

113. *Agriopis aprilina* L. (Merveille du Jour). One only, on 25/9/68, a great surprise. (The alternative generic name *Griposia* appears to be only an anagram of *Agriopis;* can anyone explain its meaning?).

114. *Euplexia lucipara* L. (Small Angle-shades). Occurs regularly in the trap in small numbers. Aparently partially double-brooded. Earliest, 3/5/57; latest, 3/9/58 (before which there were none after June 26th). None in 1969.

115. *Phlogophora meticulosa* L. (Angle-shades). Occurs regularly in the trap, more commonly than *E. lucipara*. Also seen on veronica blossoms in spring and autumn. Earliest in trap, 9/4/59; latest, 13/11/62; most, 62 in 1956, 56 in 1966. A specimen was found on a tree in my garden on 17/12/66, taken indoors, fed, and released.

116. *Naenia typica* L. (The Gothic). Rare. Once or twice at sugar in 1938, '39, '45; only two in trap, 3/8/52, 15/8/64.

117. *Helotropa leucostigma* Hübn. (The Crescent). Rare. Singly in trap in 1955, '56, '61, '63, '66, and '68; three in 1964. Earliest, 11/8/63, '64; latest, 24/9/66. The Canna specimens are distinctly smaller, darker, and more strongly marked than those taken on Barra.

118. *Hydraecia lucens* Freyer, group. (Ear Moth). The very similar species in this group cannot be told apart without a microscopic examination; I can only give figures for the whole. These fluctuate considerably. Earliest, 9/8/55; latest, 4/10/51; most, 221 in 1955; 141 in 1960. None were taken in 1964 or '65, only 12 and 18 in the very good years 1966 and 1968. *Lucens* has been identified by Mr W. H. Tams, who has also confirmed:—

119. *H. paludis* Tutt. (Saltern Ear) (also confirmed by Mr D. S. Fletcher), and

120. *H. crinanensis* Burrows (Crinan Ear).

121. *H. micacea* Esp. (Rosy Rustic). Abundant. Earliest, 26/7/55; latest, 25/10/58; most, 885 in 1955; 852 in 1968.

122. *Tapinostola fulva* Hübn. (Small Wainscot). Sometimes seen flying over moorland in the autumn. Some in the trap from 1953 onwards,

except 1959. Earliest, 23/7/54; latest, 16/10/56, '60; most, 51 in 1966; 35 in 1969.

123. *Calamia lutosa* Hübn. (Large Wainscot). Three only, in trap on 25/9/60, 9/10/62, and 13/9/67.

124. *Leucania pallens* L. (Common Wainscot). Rare; five only, in trap, 18/7/56, 1/8/63, 15/8/64, 21/7/65, and 14/8/69.

125. *L. impura* Hübn. (Smoky Wainscot). Occurs regularly; earliest, 12/6/68; latest, 28/8/67; most, 79 in 1969; 34 in 1956.

126. *L. unipuncta* Haw. (American Wainscot). Three only, in trap, first on 1/10/64, a great surprise; also 6/10/64 and 10/5/66. All three specimens are very worn. Confirmed by Mr D. S. Fletcher.

127. *L. lithargyria* Esp. (The Clay). One in m.v. trap on 10/8/69.

128. *L. conigera* Fabr. (The Brown-line Bright-eye). Common (in spite of what South says!). Taken at sugar. In the trap, earliest, 2/6/68; latest, 29/8/51; most, 196 in 1969; 60 in 1952. One of the first species I encountered on Canna that I had not seen on Barra.

129. *Stilbia anomala* Haw. (The Anomalous). Uncommon in the trap. None in 1953, '54, '57, '59-63. Earliest, 11/8/66; latest, 25/9/65; most, 14 in 1966, 5 in 1965, '69. Sometimes seen on the moorland in the autumn.

130. *Caradrina alsines* Brahm. (The Uncertain). *C. alsines* has been confirmed by Mr W. H. T. Tams. Numbers are uncertain, owing to some having been confused with the next species.

131. *C. taraxaci* Hübn. (=*blanda* Treitsch) (Uncertain). Common. Usually very dark. Earliest, 19/7/64; latest, 3/9/66; most, 70 in 1969; 21 in 1956. One or two Canna specimens are in the Tring museum.

132. *C. quadripunctata* Fabr. (Pale Mottled Willow). Often seen around haystacks, and in buildings. Not so common in the trap. Earliest, 27/4/64; latest, 25/10/58; most, 15 in 1969; 13 in 1966.

133. *Laphygma exigua* Hübn. (Small Mottled Willow). First taken, in the trap, on 3/8/52. It did not occur again until 1966, when ten specimens were taken, the first batch on June 8th (one), 9th (two) and 14th (four). All these were worn. The moth must have bred here as perfect specimens were taken in the trap on August 13th (one) and September 18th (two) the same summer. One of these is now in the Royal Scottish Museum.

134. *Petilampa arcuosa* Haw. (Small Dotted Buff). A single specimen was taken by one of the lighthouse keepers at Heiskeir in 1945, and identified by Mr W. H. T. Tams.

135. *Rusina tenebrosa* Hübn. (Brown Rustic). Three only, all males, in trap on 21/7/55, 5/6/64, and 1/7/65.

136. *Amphipyra tragopogonis* L. (Mouse Moth). Taken in small numbers in the trap most summers, and previously at sugar; sometimes in buildings. Earliest, 14/8/55; latest, 13/10/62; most, 19 in 1960; 15 in 1958.

137. *Pachnobia rubricosa* Fabr. (Red Chestnut). Common. Earliest, 22/3/53; latest, 29/5/59; most, 193 in 1964, 148 in 1969.

138. *Taeniocampa gothica* L. (Hebrew Character). Common, var. *gothicina* also occurring quite frequently. Earliest, 22/3/53; latest, 2/6/68; most, 287 in 1969, 164 in 1966.

139. *T. stabilis* View. (Common Quaker). Common. Earliest, 15/3/60; latest, 11/6/68; most, 364 in 1969; 168 in 1966.

140. *T. incerta* Hufn. (Clouded Drab). Common, very variable. Earliest, 9/3/53; latest, 2/6/65, '67; most, 255 in 1969; 136 in 1964.
141. *T. munda* Esp. (Twin-spotted Quaker). One only, in trap, on 31/5/65.
142. *T. gracilis* Fabr. (Powdered Quaker). Uncommon. None in 1954-56, '58, '60-'62, otherwise only in ones or twos. Earliest, 21/4/59; latest, 27/5/68; most, four in 1952.
143. *Calymnia trapezina* L. (Dun-bar). First on 9/8/56; four more in 1966, 25th and 27th August, 3rd and 9th September. One on 30/8/69.
144. *Cirrhoedia xerampelina* Hübn. (Centre-barred Sallow). Two only, 8/9/58, 31/8/66.
145. *Omphaloscelis lunosa* Haw. (Lunar Underwing). Common, numbers fluctuate .Earliest, 24/8/55; latest, 5/10/53; most, 172 in 1966; 149 in 1968.
146. *Amathes lota* Clerck. (Red-line Quaker). Uncommon. At veronica blossoms in 1938. First taken in trap on 20/9/56, occurred in 1958, '62, '64, '65. Earliest, 8/9/58; latest, 9/10/56; most, three in 1956 and '62.
147. *A. macilenta* Hübn. (Yellow-line Quaker). First taken, in trap, on 7/10/56, not again until 1962. Earliest, 18/9/66, '68; latest, 11/11/62, '65; most, 45 in 1966; 15 in 1969.
148. *A circellaris* Borkh. (The Brick). Taken at veronica blossoms in the autumn of 1952. Not taken in the trap until 1955, and absent in '57, '58, '59, '61, '63, '67. Earliest, 19/9/56; latest, 11/11/55, '65; most, 95 in 1956; 29 in 1966.
149. *A. helvola* L. (Flounced Chestnut). Two only, 22/9/60, 13/11/62. (One of these specimens is missing).
150. *Xanthis fulvago* L. (=The Sallow). One taken September 1952. First taken on thyme blossom in my garden in September 1952. First in trap on 1/9/55. Otherwise only in 1956, '58, '66, '68. Earliest, 31/8/66; latest, 22/9/68; most, three in 1968.
151. *X. lutea* Ström. (=*flavago*, Fabr.) (Pink-barred Sallow). First taken, in trap, on 25/8/55, thereafter only in 1960, '63, '68. Earliest, 25/8/55, '60; latest, 20/9/68; most, three in 1960.
152. *Orrhodia vaccinii* L. (The Chestnut). I have one specimen, in good condition, from Canna. Date and circumstances of capture unfortunately mislaid: not in the moth trap; it may have been bred.
153. *Eupsilia satellitia* L. (The Satellite). Two only, on 10/10/56 and 4/4/60.
154. *Cloanthia solidaginis* Hübn. (Golden-rod Brindle). One only, on 29/8/55.
155. *Xylocampa areola* Esp. (Early Grey). Common. Earliest, 20/3/53; latest, 27/5/68; most, 111 in 1969, 87 in 1956.
156. *Calocampa vetusta* Hübn. (Red Sword-grass). Occasionally on veronica blossoms or on ragwort. Only single specimens in the trap, 1951, '52, '54, '56; none again until 1964 since when it has been slightly more numerous. Earliest, 1/3/52; latest, 25/11/60 (before hibernation); most, 13 in 1966, 12 in 1964.
157. *Cucullia umbratica* L. (The Shark). Found at rocket blossoms in the early years; none in the trap until 1956, when three were taken. Regular in small numbers since 1964. Earliest, 2/5/69; latest, 13/8/67; most, 11 in 1964, 10 in 1967.

157a *Prothymnia viridaria* Clerck. One in trap on 9/6/70.

158. *Scoliopteryx libatrix* L. (The Herald). One only, on 29/9/61.

159. *Plusia chrysitis* L. (Burnished Brass). Common. Earliest, 23/6/68; latest, 3/9/62; most, 196 in 1969; 174 in 1968.

160. *P. bractea* Fabr. (Gold Spangle). Occurs regularly in small numbers. Earliest, 2/7/68; latest, 3/9/58; most, 19 in 1966, 15 in 1968.

161. *P. festucae* L. (Gold Spot). Occurs regularly in slightly smaller numbers than *P. bractea*. Earliest, 12/7/68; latest, 4/10/68 (but this is exceptional, a partial second brood; otherwise the latest is 28/8/67); most, 10 in 1956 and 1966.

162. *P. pulchrina* Haw. (Beautiful Golden Y). Common. Earliest, 11/6/62; latest, 21/9/51; (otherwise, one at window on 4/12/62); most, 190 in 1966, 173 in 1968. Specimens of var. *juncta* Tutt have been taken, and others with no gold dot below the "v" mark. This moth occurs in two very distinct forms here, light and dark, which have not been adequately illustrated in any edition of South. [The dark form has been mistaken for *P. iota* L. which must be deleted from the Canna list. The identification was not made by myself.]

163. *P. gamma* L. (Silver Y). Regular migrant. The form that arrives in the spring or early summer is pale, that which emerges in the autumn here is dark. Seasonal dimorphism? *P. gamma* has been taken in the trap in various numbers every summer since trapping began in 1951. Earliest, 15/5/61; latest, 13/11/62. *P. gamma* has been observed here in May in 1951, '54, '61, '64, and '66, and in June in 1945, '49, '50, '53, '55, '56, '59, '65, and '69; most, 283 in 1966; 118 in 1969, when there was a remarkable influx in mid-October; 67 in 1968; 65 in 1955.

164. *P. interrogationis* L. (Scarce Silver Y). One only, 30/8/66.

165. *Abrostola triplasia* L. (Dark Spectacle). Three only before 1969, on 17/5/61, 4/8/62, and 31/7/63. Three more in 1969, on 1st, 2nd, and 9th August.

166. *A. tripartita* Hufn. (=*urticae* Hübn) (Spectacle). Common. Earliest, 6/5/69; latest, 27/8/56; most, 97 in 1968; 53 in 1969. Larvae found on nettles.

167. *Hypena proboscidalis* L. (The Snout). Common. Earliest, 4/7/59; latest, 18/9/66. Often seen amongst nettles (which are spared in some places here in order to encourage lepidoptera). Most, 56 in 1968; 46 in 1966.

(To be continued)

Notes and Observations

LYGRIS MELLINATA FAB. (LEPIDOPTERA: GEOMETRIDAE) IN IRELAND.—A specimen of this geometer, rare in Ireland, was taken at mercury vapour light in my garden at Rathgar, Dublin, on the night of 28th June 1966. In the same year the insect repeated its appearance on 29th June (one specimen), and then on 1st July with two specimens.

In 1967 two specimens were taken at mercury vapour light, one on 4th July, the other on 6th July. Since then, in 1968, 1969 and 1970 none was taken. Baynes (A revised catalogue of Irish Macrolepidoptera, 1964) considers the insect "extremely rare in Ireland, and so far, found only in the Dublin area." During the years 1922, '25, '26 and '29, the late Mr Dudley

Westropp took five moths and one larva at Clonskeagh, Dublin. One further record is of a single specimen taken by E. S. A. Baynes on 3rd July 1953. Clonskeagh, as Mr Baynes points out, is about six miles north of Glenageary, the locality of the 1953 capture. Rathgar, moreover, is only about two miles north of Clonskeagh.—M. JEFFARES, 34 Highfield Road, Rathgar, Dublin 6.

PLUSIA GAMMA L. AND NOMOPHILA NOCTUELLA SCHIFF. IN SOUTH DEVON.—Totals recorded in my mercury vapour light trap during the period 7th May to 15th September 1970 are as under, the 1969 figures being shown in brackets:

Plusia gamma L. The May total was 17 (159), no peaks. The June number was 33 (159), no peaks. The July figure was 121 (1373) with peaks of 13 on 17th and 15 on 22nd. The August total was 473 (10,237) with peaks of 30 2nd, 32 on 3rd, 67 on 5th, 61 on 6th, 20 on 25th and 26th, 33 on 27th, 41 on 28th and 35 on 30th. September showed 23 (15 nights) (576 for 21 nights), no peaks.

Nomophila noctuella Schiff. In May the total was 2 (no 1969 observations). June was 13 (none), July 114 (none) with peaks of 17 on 9th and 19 on 31st. The August figure was 311 (181) with peaks of 16 on 3rd, 40 on 4th, 26 on 5th, 38 on 6th, 22 on 7th, 31 on 8th, 15 on 12th and 12 on 15th. September produced 97 in 15 nights (624 in 21 nights) with peaks of 11 on 5th, 17 on 6th, 12 on 7th and 8th and 11 on 12th.—H. L. O'HEFFERNAN, Home Lea, Thurlstone, S. Devon. 4.x.1970.

DAILY OBSERVATIONS OF THE IMMIGRANT VANESSA CARDUI L., V. ATALANTA L., AGLAIS URTICAE L. AND NYMPHALIS IO L. in South Devon, which I make for the Rothamsted Experimental Station, between 7th May and 15th September 1970 showed a substantial decrease as compared with the totals for 1969, but all local butterfly species showed a welcome increase.

During my annual voyage in September to South Africa, I check on *V. cardui* numbers at Las Palmas whilst taking a walk round the local gardens and parks. For the first time in many years, not a single specimen was observed on 21st September—a calm, hot day—during a two hour period. Usually two or three dozen are present, and one year I counted more than 100 on one small branch of a flowering tree, and they were still flying round the decks of the ship when it was well over 1000 miles south of Las Palmas.—H. L. O'HEFFERNAN, Home Lea, Thurlstone, S. Devon. 4.x.1970.

SONG THRUSH EATING LARVAE OF PIERIS BRASSICAE.—On 4th October 1970, I witnessed a Song Thrush *Turdus ericetorum* remove and eat three larvae of the Large White butterfly *Pieris brassicae* from leaves of the garden nasturtium at Ponteland, Northumberland. In order to reach the larvae the bird had to leap a few inches above the ground partly using its wings. Previously I had always assumed that the larvae were probably protected from bird predation by their habit of disgorging a green evil smelling liquid when grasped and because of this they could with impunity lie exposed on the upper surface of the leaves of their food plant.

Similarly I once thought that white butterflies must be protected by a bad taste from bird predators as one rarely sees a bird attack a white butterfly on the wing. However, in June 1940, while staying on the out-

skirts of Hull, Yorkshire, I watched a pair of House Sparrows catching *Pieris brassicae* imagines, nipping off their wings and feeding their nestlings with the bodies.

In May 1959 I saw a pair of Bullfinches remove caterpillars of the Magpie moth *Abraxas grossulariata* from gooseberry bushes in my garden at Gavinton near Duns in Berwickshire. The hen bird dropped her prey but the cock ate one larva. One wonders just how effective warning colours or bad taste are in protecting caterpillars from bird predation.—A. G. Long, Hancock Museum, Newcastle-upon-Tyne. 5.x.1970.

Remarkable Abundance of Mompha nodicolella Fuchs in London.—On 9th August 1970, I discovered the galls of *Mompha nodicolella* in great numbers. They were in the upper stems of *Epilobium angustifolium* which grows plentifully on some waste ground by the railway near Herne Hill station. Many of the plants examined there contained one or more galls, and one bushy and much stunted specimen bore some 20 *nodicolella* swellings. I collected a fair number of the galls, but only bred two moths, the rest producing several different species of Hymenopterous parasites.

This locality is situated near the place where Mr Wakely found a few *nodicolella* galls in 1969 (cf. *Ent. Rec.*, **81**: 88), and where he again found it in small numbers this year. A curious and interesting fact is that at Mr Wakely's locality the species appears to be relatively free from parasitism. Thus, of three galls only that I had from Mr Wakely's spot this August, these produced two moths and a parasite, and of some twelve others which Mr Wakely and Col. Emmet had during the same period, ten moths emerged and only one parasite.

In August 1970, I also searched many plants of *E. angustifolium* for signs of *nodicolella* at Catford Bridge (Hayes line station yard), as well as a number of plants growing on waste ground at Crystal Palace, and by the highway at Dulwich. At none of these spots, however, was there any sign of galls, which negative evidence may later prove interesting should the species continue its apparent spread and be subsequently found at these places.—J. M. Chalmers-Hunt. 11.x.1970.

Mompha nodicolella Fuchs (Lep.: Tineina) in Kent.—I took a specimen of a *Mompha* at West Wickham on 4th September 1963, and being then uncertain of the moth's identity, put it aside for further examination. Recently, looking again at this specimen and referring to Wakely's *Notes on the Genus Mompha* (in *Proc. S. Lond. ent. nat. Hist. Soc.*, **1944-45**: 81-84), I concluded that it was *M. nodicolella* Fuchs, and Dr Bradley has since kindly confirmed this. Apart from the doubtful record of three specimens stated to be *nodicolella*, taken by Buxton at Westerham, Kent, on 24th June 1915 (cf. Wakely, *op. cit.*, 83), one of which was later confirmed as being *M. subbistrigella* (cf. Cockayne, *Ent. Rec.*, **63**: 82 and Wakely, *Ent. Rec.*, **63**: 116), the above West Wickham capture appears to constitute the first record of this species for Kent. — J. M. Chalmers-Hunt. 11.x.1970.

An Apparently Unrecorded Floral Attraction for Moths and Other Insects in September.—Waste land, especially that disturbed by man, on the North French coast, tends to be over-run by *Polygonum cuspidatum*, a giant alien cousin of the tiny Knotweed. Keble Martin calls it "a persistent

garden escape". It grows up annually from the roots, has slightly zig-zag, hollow stems, and very large leaves, and seems to be a pest, as towards the end of each summer it spreads in a thicket-like mass, often reaching a height of 3 metres, over semi-wild habitats of which it kills off most of the native herbs. I believe it is spreading on the English south coast also, but whether it is known to most naturalists in the British Isles I do not know.

It does not appear to provide Lepidopterous larvae with pabulum but I have noted here in Normandy that its flowers, which only appear in mid-September, are attractive to bees and other day-flying insects and also moths by night. In districts where there are sought-after moths, therefore, its otherwise unwelcome presence may at least please some entomologists by providing a floral attraction effective before ivy-bloom. Its infloresences are usually more easily worked than sallow-bloom in spring or ivy-flowers in autumn.—E. P. WILTSHIRE, Le Havre. 17.ix.1970.

NOTE ON THE RELATION OF AGLAIS URTICAE L. TO DIRECT AND SHADE TEMPERATURES.—13th May 1970, 5 p.m., Maiden Castle by the River Wear, Durham (NZ 24 287415). Warm day but with a cool wind. At this time the sun was low in the sky, and so those banks facing it most directly received the most insulation from it. A few *urticae* were flying along the river bank. I selected one of these for a small experiment.

When a shadow was cast over this specimen, it would—after one to two seconds—move suddenly to a position very close at hand. The insect continually placed itself on the uppermost ground flora or on the bank facing the sun, so that the plane of its wings was positioned at right angles to the incidence of the sun's rays. I repeated this performance at least twenty times; it was interesting to see this specimen readjusting itself so as to gain the maximum advantage of the heat source. On one occasion, when I cast a shadow over it while it was on a sand bank. instead of abandoning the position after a short while, it approximated itself close to the ground, presumably to receive the indirect and direct terrestial radiation in compensation for the solar heat I denied it. On the last occasion I shadowed this *urticae*, it remained in its position on a Butterbur leaf for well nigh 30 secs to 1 min. On rising suddenly, it flapped awkwardly, and immediately vanished beneath the dense ground foliage (mainly *Petasites hybridus*) on which it had beforehand always settled. It took up a position close to the base of the stems on the ground. This of course provided it with a warm microclimate. It then had to be disturbed by rustling the foliage. Rising awkwardly, and again flapping it settled on the grass bank to take up its characteristic mode in the sun. Perhaps it should have taken cover again in the foliage, but as the sun was out and it felt the impact of it, and not the shadow temperatures that sent it below, it obviously enjoyed enough heat to satisfy its metabolic demands.

This was an opportune moment of the day, since direct insulation was enough to bring *urticae* out, but the shadow temperature too cold for it. The specimen must have had to experience a certain drop in temperature before necessity demanded sub-foliage protection, rather than merely to move to a nearby location. It must be stressed that the insect was not concerned by the presence of an alien organism; otherwise it would have moved away more rapidly. It was certainly the shadow and its effects that proved a continual annoyance to it.—R. L. H. DENNIS, 93 Abbey Road, Rhos-on-Sea, Colwyn Bay, N. Wales. 25.ix.1970.

Current Notes

THE I. R. P. HESLOP COLLECTION.—I. R. P. Heslop, M.A., F.R.E.S., died in June, leaving an extensive collection of British and foreign Lepidoptera. His widow has most generously given the entire collection to the City Museum, Bristol, where it can be viewed by appointment with the Curator of Natural History. Mr Heslop was well-known for his knowledge of the Purple Emperor, which is well represented in the collection. The collection includes fine varieties of various British species. The foreign section is strong in Nigerian species and includes a type specimen from Nigeria.—P. F. BIRD, B.Sc., F.Z.S., Curator of Natural History.

TO OUR READERS

The end of the current year is approaching and the Treasurer would ask our readers to assist her by sending their subscriptions for 1971 to her promptly when due. Payment by banker's order is the most satisfactory method and readers wishing to adopt this method of payment should write to Mrs Redgrave who will be pleased to send a standing order form for completion by the subscriber and return to her. It will be understood that prompt payment saves a considerable amount of unnecessary work for the Treasurer, besides saving postages.

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One last word; should any of our readers have decided to discontinue their subscriptions, would they kindly advise the Treasurer **before** the end of the current year, thus saving us the expense of sending out unwanted copies (which, alas, are seldom returned to us).—Ed.

Current Literature

Proceedings and Transactions of the British Entomological and Natural History Society, Vol. 3, Part 3. Published by the Society, 13/-.

This part opens with an article by S. R. Bowden headed *Pieris napi* L.: Speciation and Subspeciation, in which the author gives his views on the treatment of the many forms, races and subspecies. The author is well known for his breeding experiments, and his views are well argued as set out here. There follows an article by W. G. Tremewan headed *Zygaena* Fabricius (Lep. Zygaenidae) from Turkey, in which he gives an account of the Zygaenid material found during an expedition to the

country in July 1969. Six new sub-species are described. Part IX of "Larvae of the British Lepidoptera not figured by Buckler" carries two more of Mr Haggett's coloured plates and deals with the larvae of *Coenotephria subrosea* Stephens, *Trisateles emortualis* Schiff., *Dysstroma truncata* Schiff. ssp. *concinnata* Stephens, *Zygaena loti* Denis & Schiff. ssp. *scotica* Rowland Brown, and *Zygaena viciae* Denis & Schiff. ssp. *argyllensis* Tremewan.

The Proceedings include an account of the special meeting detailing the regulations governing the fund, initiated by the gift of Frau Hering, which shall be administered by the Society.—S.N.A.J.

Teen International Entomology Group Newsletter, Vol. 5, Nos. 1 and 2.

We are glad to see that this interesting magazine has been able to reappear. This issue contains an article on the rearing of the Saturniid moth *Callosamia angulifera* by Michael D. van Buskirk. The cover illustrates this insect by a photograph by Miss Colleen Seeley, and the article is headed by photographs of the male and female insect. There are also photographs of day-old and final instar larvae. This article is followed by another entitled How to collect and rear *Callosamia angulifera*, by Jeffrey C. Gilbert, and carries photographs of coccoons and ova of this species. There are interesting short articles on many subjects. A section headed "About our Members" mentions various achievements of members, and there is a section of "helpful hints", including papering, the mounting of insects on a stiff data label wrapped in transparent plastic, and tips for collecting Aquatic Insects, with a page of line drawings of some species. Our best wishes to the society.—S.N.A.J.

The Dancing Bees by **Karl v. Frisch,** translated by **Dora Isle** and **Norman Walker,** 3rd edition, xiv+198 pp. Methuen & Co., Ltd., 30/-.

This is the third edition of the translations from the German text of this well-known book, and it includes the author's latest discoveries from his continuous experiments.

The book covers similar chapters beginning with the elementary matters of the Bee Colony, the Bee's Home, How Bees Feed, the Brood and the Swarm, after which it goes on to deal with such matters as the senses of smell, taste and then sight. Here there are new observations on the bee's capacity to appreciate colours. He goes on to the orientation sense. The bee's language as interpreted by the author is discussed in chapter XI, and its sense of time in chapter XII. The author seeks to assess the bee's mental capacity, and the enemies of bees are discussed in chapter XIV. Chapter XV discusses the evolution of the honey bee colony.

The book is plentifully illustrated by photographs, drawings, diagrams and charts. It is well printed, as usual, on good paper and is bound in brown cloth boards.

In his preface, the author points out that he has not included all the aspects of bee-keeping, but has confined himself to the interesting matters which have been the subject of his experiments, to appeal to the general naturalist rather than the bee-keeper, and he may be said to have been exceedingly successful in this task.—S.N.A.J.

Dover, one, July 29, 1899 (Stockwell, *Diary*). Whitfield (E. & Y., 1949). Wye, one, September 9, 1937 (A. H. Lanfear).

9. Sevenscore, one, September 3, 1926 (J. W. C. Hunt).

10. Brasted Chart, August 16, 1913 (Gillett, *Diary*); (R. M. Prideaux). Westerham, larva, May 8, 1937 (Coote and Jacobs, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1937-38**: 37).

11. Wateringbury (V.C.H., 1908); (E. Goodwin MS.). Edenbridge, 1929 (F. D. Greenwood).

12. Ashford district, "common and widely distributed" (Scott, 1936). Ham Street, August 24, 1939 (A. J. L. Bowes); frequent in Orlestone Woods (C.-H.). Ham Street (de Worms, *Entomologist*, **88**: 94). Ashford (P. Cue *per* E. Scott).

13. Tunbridge Wells (Beeching, *Ent. Rec.*, **2**: 229); one, 1957 (L. R. Tesch *per* C. A. Stace). Goudhurst, common (W. V. D. Bolt, *pers. comm.*, 1961).

14. Benenden, at light and bred; Sandhurst (G. V. Bull). Hawkhurst. one, 1953 (B. G. Chatfield).

15. Dungeness (Morley, 1931); very common, August 12, 1938, and since (C.-H.); common, September 1967 (D. O'Keeffe).

16. Folkestone Town, ♂ at m.v.l., September 15, 1958 (A. M. Morley).

VARIATION.—The following named abs. are in RCK: *hedgesaria* Cockayne, holotype ♂, Ham Street (cf. Cockayne, *Ent. Rec.*, **66**: 186, for details of breeding); *achatinata* Hübn., Ham Street, one, 1939, Sevenoaks. one, 1914.

FIRST RECORD, 1860: West Wickham, common, August 1859 (Allchin. *Ent. week. Int.*, **8**: 5).

[**E. populata** L.: Northern Spinach.

Doubtfully Kentish. None of the records is confirmed, and I have little doubt they were based upon misidentification.

3. Faversham* (Morris, *Moths*, **2**: 33).

10. Sevenoaks, June 24, 1920 (Gillett, *Diary*).

13. Pembury; Tenterden, common (Stainton, 1859). Tunbridge Wells. 1891 (Beeching, *Ent. Rec.*, **2**: 229).]

E. mellinata F.: The Spinach.

Resident, perhaps native. Gardens; on currant. Recorded from all divisions, except 2, 6a; once only from 4. "Generally common in gardens" (*V.C.H.*, 1908). H. E. Hammond records finding ten larvae at Tonbridge on currant.

4. Worth, July 22, 1967 (T. W. Harman).

FIRST RECORD, 1859: Pembury (Stainton, *Man.*, **2**: 115).

E. pyraliata Denis & Schiffermuller: Barred Straw.

Native. Hedgerows, bushy places, etc.; on "white-thorn". Found in all divisions. "Generally distributed; formerly abundant" (*V.C.H.*, 1908).

VARIATION.—The following named aberrations are in RCK: *aurantior* Lempke, one, "Sevenoaks/Kent/3.vi.1916"; *fasciata* Loberb., one, "Westwell/July 15, 1934/A. J. L. Bowes", one, "Sevenoaks, vii.1912"; *mediofasciata* Lempke, one, "Brasted Chart/16.vii.1913". Also in RCK, an ab. having the "antemedian and postmedian meeting on inner margin", one, Darenth, 1897, L. B. Prout.

FIRST RECORD, 1720: The larva "was found feeding on *white-thorn* near *Eltham* in *Kent*" (Albin, *Nat. Hist. Eng. Ins.*, Pl. 45, Fig. 75). Werneburgh (*Beitrage z. Schm.*, 91) testifies to this being "*Geom. Pyraliata* L."

Ecliptopera silaceata Denis & Schiffermuller: Small Phoenix.

Native. Woods; on *Chamaenerion angustifolium, Epilobium montanum.*

1. West Wickham, 1859 (Barrett, *Ent. week. Int.*, **7**: 75); larvae on *C. angustifolium*, reared (Machin, *Ent. week. Int.*, **8**: 21). Since noted in many parts of this division. Recent records: Farningham Wood, larva, October 2, 1936, larva, September 11, 1937 (A. R. Kidner). Petts Wood, several, 1947-49 (E. Evans); 1950 (A. M. & F. A. Swain). Well Wood, West Wickham, frequent 1948, and in later years (C.-H.). West Wickham (E. J. Trundell). Bexley, one at m.v.l., May 3, 1952 (A. Heselden). Joydens Wood (de Worms, *Lond. Nat.*, **1956**: 77). Orpington, 1954 (L. W. Siggs); one, 1957 (R. G. Chatelain). Charlton Sandpit, one, May 25, 1946; Shooters Hill, one in Oxleas Wood, May 14, 1948, one in Castle Wood, May 14, 1948 (J. F. Burton). Bromley, in m.v. trap, 1959 (6), 1960 (31), 1961 (9), 1962 (23), 1963 (38), 1964 (100), 1965 (41), 1966 (31); earliest date May 8, 1960, latest date September 10, 1962, with maximum numbers (8), on May 24 and August 3, 1964 (D. R. M. Long). Dartford, several larvae on *E. montanum*, September 1969 (B. K. West).

3. Bysing Wood (H. C. Huggins). Trenley Park, two, 1931 (C.-H.). Pine Wood, a few; Canterbury, occasionally, c. 1946 (J. A. Parry). Eddington, ♂ at m.v.l., May 20, 1953 (D. G. Marsh).

4. Ickham, fairly common, 1954-59 (D. G. Marsh).

5. Farnborough*, one, 1887 (Hope Alderson, in *Wool. Surv.*, 1909). Chevening, June 12, 1914 (Gillett, *Diary*). Westerham (R. C. Edwards). Downe (de Worms, *loc. cit.*). High Elms; Shoreham (R. G. Chatelain).

6. Meopham, May 5, 1923 (F. T. Grant).

6a. Cobham (Pye, *Rochester Nat.*, **1896**: 51); May 21, 1912 (F. T. Grant). Darenth Wood (H. C. Huggins); July 30, 1925 (F. T. Grant); (E. J. Hare); fairly common (B. K. West); common, May 25, 1952 (J. F. Burton). Swanscombe (H. C. Huggins).

7. Cutlers Wood, ♀, May 31, one, June 2, 1915 (H. G. Gomm, *Diary*). Westwell; Long Beech Wood (Scott, 1936). Kings Wood (Scott, 1950). Boxley (A. H. Harbottle).

8. Near Dover (see *First Record*). Folkestone* (Ullyett, 1880). Brook* (C. A. W. Duffield). Dover (B.O.C. Gardiner). Whitfield; Barham; Betteshanger; Ewell Minnis; Little Mongham (E. & Y., 1949). Waltham, one, 1951 (J. W. C. Hunt). Woolwich Wood, one, May 23, 1926 (W. E. Busbridge, *Diary*). Chilham, June 10, 1951 (W. D. Bowden). Betteshanger, July 6, 1957 (R. F. Bretherton).

10. Seal (Carrington, Entomologist, **13**: 76); 1937 (Coote, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1937-38**: 45); 1948 (Howarth, *Proc. S. Lond. ent. nat. Hist. Soc.*, **1948-49**: 71). Brasted (R. M. Prideaux). Sevenoaks (Gillett, *Entomologist*, **53**: 23); 1940, 1946 (F. D. Greenwood); one, ab. *insulata* Haw., May 14, 1947 (Busbridge, *Diary*). Westerham (Jacobs, *Proc. S. Lond. nat. Hist. Soc.*, **1931-32**: 75).

11. Tonbridge (Raynor, *Entomologist*, **6**: 79). Wateringbury; Yalding (*V.C.H.*, 1908). Shipbourne, five, 1910 (P. A. & D. J. A. Buxton coll.). Edenbridge, 1934 (F. D. Greenwood). Sevenoaks Weald, May 10, 17, August 7, 21, 1959, altogether four; twelve, May 12-August 30, 1960 (E. A.

Sadler). Bethersden, August 14, 20, 1960 (C. R. Haxby & J. Briggs).

12. Little Chart, (Scott, 1936), Orlestone Woods, September 4, 1954 (W. L. Rudland); June 2-4, 1950, June 1-2, 1956, July 27, 1956 (R. F. Bretherton); June 10, 1960 (R. G. Chatelain); August 15-20, 1960 (C. R. Haxby & J. Briggs). Ashford (P. Cue *teste* E. Scott). Wye, eleven, August 1953-56; Willesborough, five, August 1954-56 (W. L. Rudland). Potters Corner, common; Willesborough, one, 1959 (M. Singleton).

13. Pembury (Stainton, *Man.*, **2**: 114); (V. M. Sage). Tunbridge Wells (E. D. Morgan); occasionally, 1956-59 (L. R. Tesch *per* C. A. Stace). Goudhurst, common (W. V. D. Bolt, *pers. comm.*, 1961).

14. Benenden; Sandhurst (G. V. Bull). Hawkhurst, two on buddleia blossom, 1950, one at light, 1951, several, 1952-53 (B. G. Chatfield).

16. Folkestone Town, two (A. M. Morley).

Variation.—Ab. *insularia* Haw. in which the median is interrupted by two white lines, is of very frequent occurrence in Kent, especially among first generation specimens.

In RCK is an example of a very pretty ab. with "variegated pattern on ochreous ground", labelled "L. W. Newman/*Bexley/v.1918".

First Record, 1831: "Near Dover . . . I captured many specimens, varying considerably from each other, in August, 1819" (Stephens, *Haust.*, **3**: 226).

Chloroclysta siterata Hufnagel: Red-green Carpet.

Native. Bushy places; on bramble. Mainly Wealden, where it is seemingly local and scarce.

1. Near Chislehurst (see *First Record*). Bickley, one taken by B. A. Bower, on a fence near Grove Park Station (W. A. Cope). Bexley district (L. W. Newman, in *Wool. Surv.*, 1909).

2. Greenhithe*, in moth trap, 1893, 1904 (Farn MS.).

10. Brasted, occasionally (R. M. Prideaux).

11. Edenbridge, 1930 (F. D. Greenwood).

12. Ashford, one, September 1951; Hoads Wood, one† taken at car lights, September 30, 1952 (P. Cue). Wye, one, on the Brook road, September 23, 1934, October 1, 1937 (A. J. L. Bowes). Ham Street, ♂, October 1, 1968 (D. O'Keeffe).

13. Tunbridge Wells, a few at sugar, 1909 and 1915, at Eridge Road and Broadwater Down (E. D. Morgan). Cranbrook*, one†, October 8, 1955 (D. Streeter).

14. Sandhurst, single specimens: October 27, 1928, at sugar; October 17, 1930, at light; October 8, 22, 1934, at light; October 23, 1937, at light; October 15, 1946, at ivy; October 17, 1947 (G. V. Bull).

16. Folkestone* (Ullyett, 1880). Folkestone Town, one in m.v. trap, September 12, 1955 (A. M. Morley).

First Record, 1720: The larva "was taken on the *Bramble* or *Blackberry bush* near *Chisselhurst* in *Kent*" (Albin, *Nat. Hist. Ins.*, facing plt. 50, fig. 86).

C. miata L.: Autumn Green Carpet.

Native. Bushy places; foodplant unknown. Apparently extinct in 1.

Obs.—The moth chiefly occurs in the autumn as the vernacular suggests, but is only very occasionally seen in the spring after hibernation.

1. Lee, two, September 18-October 8, 1863 (Fenn, *Diary*). Charlton

and Lewisham, formerly (C. Fenn, in *Wool. Surv.*, 1909), may refer to the preceding. Bexley district (L. W. Newman, in *Wool. Surv.*, 1909). West Wickham (*V.C.H.*, 1908). Eltham, "at lamps, rather common" (A. H. Jones, in Buckell and Prout, *Trans. Cy. Lond. ent. nat. Hist. Soc.*, **1900**: 73).

2. Near Sheerness, 1871, not rare at ivy bloom (Walker, *Ent. mon. Mag.*, **8**: 184).

3. Canterbury, in the city; Littlebourne (J. A. Parry). Herne Bay (D. G. Marsh). Broad Oak, two, October 14, 1938, one, October 10, 1944 (C.-H.). Eddington, ♀ at light, September 24, 1949, two ♂♂ at light, October 1, 1949 (D. G. Marsh).

4. Ickham, numerous, 1954-59 (D. G. Marsh).

5. Farnborough* (W. Barnes, in *Wool. Surv.*, 1909).

6. Greenhithe* (Farm MS.). Gravesend, at street lamps (H. C. Huggins).

6a. Near Dartford* (see *First Record*). Chattenden (*V.C.H.*, 1908).

7. Darland Hill, not common (Chaney, 1884-87).

8. Folkestone* (Ullyett, 1880). Deal, two, September 24-October 4, 1884 (Fenn, *Diary*). Dover, one at ivy blossom, October 9, 1895, one, October 7, 1897, one, October 31, 1904 (Stockwell, *Diary*); one, 1896, one, 1905 (Stockwell coll.); one in 1935 or 1936 (B. O. C. Gardiner); scarce (E. & Y., 1949). Dover Cliffs, October 19, 1934 (J. H. B. Lowe). Stowting (C. A. W. Duffield). Wingmore (E. & Y., 1949). Elham, one at sallow bloom, April 14, 1934 (Busbridge, *Diary*). Bridge, c. 1946 (R. Gorer).

9. Ramsgate neighbourhood*, c. 1888 (Willson, *Entomologist*, **23**: 140). Minster, one, October 13, 1915 (Gomm, *Diary*). Westgate, one, October 10, 1944 (C.-H.).

10. Brasted (R. M. Prideaux). Sevenoaks, October 26, 1920 (Gillett, *Diary*).

11. Yalding (*V.C.H.*, 1908). Wateringbury (W. A. Cope); (*V.C.H.*, 1908); (E. Goodwin coll.). Edenbridge, 1930, 1931, 1933 (F. D. Greenwood). Shipborne, one, 1911, one, 1912, one, 1913 (P. A. & D. J. A. Buxton coll.). Aylesford, one, 1954, one, September 9, 1955; East Malling, one, October 7, 1957 (G. A. N. Davis). Maidstone, one, 1886, one, 1896 (H. Lamb, in Maidstone Mus.). Near Nackholt Brick pits, very common (E. Scott). Hoads Wood (P. Cue).

12. Brook (C. A. Duffield). Chartham, numerous (P. B. Wacher). Ashford, c. 1953 (P. Cue). Willesborough, five, October 6-21, 1953, five September 27-October 19, 1955, ten, October 8-22, one ♀, May 18, 1956 (W. L. Rudland). Wye, four, October 6-17, 1953, one, March 20, 1954, six, September 13-October 10, 1955 (W. L. Rudland). W. Ashford, several, 1959 (M. Endfield). Willesborough, one, 1959, one 1960 (M. Singleton). Ham Street, one, October 6, 1959 (R. G. Chatelain); two, October 1, 1968, by D. O'Keeffe and B. F. Skinner (Chatelain *et. al*, *Ent. Rec.*, **81**: 113).

13. Tunbridge Wells, 1894 (Beeching, *Entomologist*, **27**: 351). Goudhurst, common (W. V. D. Bolt, *pers comm.*, 1961).

14. Tenterden, abundant (Stainton, *Man.*, **2**: 112). Hawkhurst, one, 1927 (G. V. Bull); one, 1952 (B. G. Chatfield). Sandhurst, one 1926, three, 1928, two, 1931-32, two, 1934-35, one, 1938, one 1946, one, 1954 (G. V. Bull); one, April 2, 1953 (Bull, *Ent. Rec.*, **65**: 144). Newenden, two, 1926 (G. V. Bull). Tenterden, 1960 (C. G. Orpin).

15. Dungeness, one, October 12, 1959 (R. G. Chatelain).

16. Folkestone (A. M. Morley).

FIRST RECORD, 1810: "Dartford Green Carpet . . . met with chiefly in

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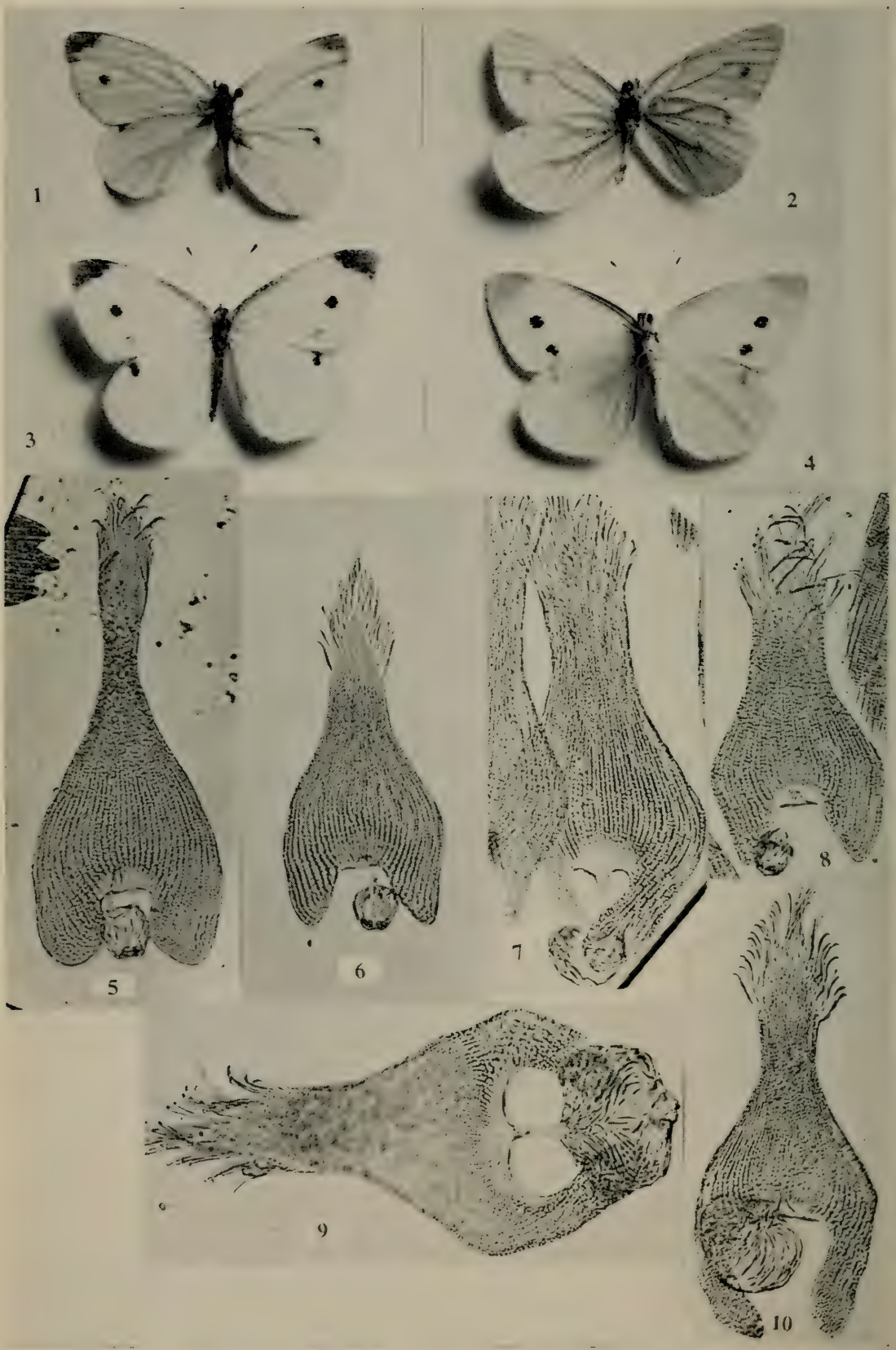

Some Aspects of Hybridisation and their Significance

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

The results of numerous experiments in cross-breeding, or as it would be more accurately described, in unnatural hybridisation, have provided material for many papers in the past. Yet strangely enough the outstanding fact that emerges in the majority of such experiments is in general passed over without comment. This quite unquestionable fact is that most, if not all, congeric species are physically capable of breeding together and further that the resulting hybrids are fertile in varied degrees. I say "congeneric" for usually such experiments are carried out with species of the same genus; but this must not be held to imply that interbreeding stops at the generic level.

The uncertain degree of fertility that may exist in unnatural hybrids seems to be interpreted by experimentalists in an equally uncertain manner. But the important fact is that fertility is possible and the varied degrees are only the result of disturbance in physical development of the individual.

If we contrast these experiments with what occurs normally in insect life in nature, we get a totally different impression of hybridisation and its results. Insects in their natural surroundings display little or no inclination to mix with others outside their own kind. Hundreds are capable of crossing and have every opportunity to do so, but they do not. A natural cross between distinct species is an abnormality in nature, and the presence of specimens that can actually be proved to be hybrids by changes in their anatomical characteristics is an extremely rare phenomenon. Should however, a case of genuine hybridisation be discovered and the two species be involved in the cross be found to persist in their typical appearance in the same locality, this gives us the highest testimony obtainable that specific isolation is a specialised state; an absolutely independent condition that fosters specialisation of identity and that actually repels hybridisation. It is this condition alone that prevents the continual appearance of hybrids everywhere in nature. Should any crossing take place it must be an occurence that is wholly in opposition

EXPLANATION OF PLATE

Butterflies.

1. Hybrid: *Pieris rapae* × *Pieris maura;* upperside, Arestal, Portugal. June.
2. Hybrid: underside of fig. 1.
3. Hybrid: *Pieris rapae* × *Pieris* species (*napi*-group). Altai Mountains, August. Upperside.
4. Hybrid: underside of fig. 3.

Androconical scales.

5. *Pieris rapae.* Formosa.
6. Hybrid: Altai Mountains.
7. *Pieris napi.* Grange-over-sands, Lancashire. 1st generation.
8. *Pieris extensa.* China. Generation uncertain. (? Hybrid; *Pieris melete*-group × *Pieris napi*-group).
9. *Pieris melete melete.* Unzen, Kiushiu, Japan, July 30, 1907, 2nd generation.
10. *Pieris ajaka ajaka.* Pahalgam, N.E. Kashmir, 7400 feet, July 25, 1956. 2nd generation.

Photographs of buterflies all exactly natural size. By E. J. M. Warren.
Photographs of scales, all × 450 magnification. By B. C. S. Warren.

to nature. Whether fertility in any of the resulting hybrids is possible or not is a question of little practical importance, for the opposing natural elements brought into conjunction in such hybrids will tend to repel their mating with either parent, their guiding sense of individuality being disturbed and leaving them as it were in the position of a prematurely emerged specimen awaiting the appearance of the remainder of their kind, which mostly do not materialise, the majority of such hybrids being of the male sex only.

A few cases of natural hybridisation are known and I have had the good fortune to be given or lent specimens to examine of two such occurrences.

The first one was the famous cross between *Erebia flavofasciata* and *Erebia epiphron*. These two species as is well known fly together everywhere that *E. flavofasciata* exists, but in one locality only on the Schafberg at Pontresina in the Grisons, in a very restricted area, hybrids have been found twice. On the first occasion one specimen only, nineteen years later six, all males. I have described and illustrated the intermediate structural formations that resulted. It also happens that *flavofasciata* is a species that has androconial scales and *epiphron* is without them. The hybrids have a few perfectly developed *flavofasciata*-scales, but these are reduced in number to an incredible extent. (See Warren, 1937). Scores of collectors have searched the locality which has been known for over 70 years, but though both species have frequently been taken (probably every year), in their typical form, no further hybrids have been recorded. This cannot just be a case of their being overlooked, for the area of the locality is very limited and to a collector who knows both species the hybrids are unmistakable.

The second case of natural hybridisation I have been able to study is even more striking. It is the Alaskan hybrid *P. passosi*, a cross between *P. oleracea* and *P. hulda* which I described in 1968. In this instance among the captured hybrids were two specimens of the parent species. absolutely normal in every respect, one of each. This proved that the specific nature still persisted, although over 18 hybrids were taken. We cannot say what will follow, but time will show whether the hybrids will become established as a third species, for they were wide-spread over a considerable area and in this case there were a number of females among the hybrids. It is of course an almost impossible chance that there were only two specimens of the parents, one of each, and that both chanced to be captured by the one collector. It would seem more likely that others existed but he did not come on them, for the area of their distribution is an extended one. This example of the presence of a moderate number of hybrids of both sexes is instructive, for it shows the possibility of the evolution of species by means of hybridisation even though this might appear to be opposed to the natural order of development.

This will remind readers of the phenomenon that is known in the *napi*- group of *Pieris*. The species of this group appear to constitute an absolute anomaly in regard to the readiness with which they hybridise in nature. There are actually 3 or 4 hybrid races known in the Palaearctic area of such constant nature, so widely distributed in various countries that they do not differ from normal species in such respects, yet they undoubtedly owe their existence to hybridisation. They are of course intra-group hybrids while *P. passosi* may be said to be an inter-

group one, for *P. hulda* is a member of the Palaearctic *napi*-group, and *P. oleracea* belongs to the great Nearctic-group. It is necessary to explain here that though at the actual moment of the crossing these two species belong to groups that have been separated for centuries, the *oleracea*-group originated by an intra-group crossing of two species of the *napi*-group (*P. dulcinea* × *P. narina*).

It is one of the characteristics of the *napi*-group that the component species incline to split into small groups ,which would be more accurately described as "branches" for they still retain their obvious relationship to the main group *P. bryoniae* and *P. narina* are in this category. Bearing in mind the ages which the *oleracea*-group has existed as such, which is testified to by the vast distribution of its members, it can be said that *P. passosi* is the first inter-group hybrid of which we have any exact details and it helps one to realise that once the barrier of independent individuality has been broken by force of circumstances, time and opportunity are all that stand in the way of the development of the new hybrid, or perhaps even of the new species. The readiness of an *oleracea*-group species to hybridise is doubtless a characteristic derived from its remote ancestors in the *napi*-group.

In the other specific-groups of the genus normal conditions concerning hybridisation prevail. How unusual an occurrence it is in these groups can be gathered by the fact that Müller was only able to record a single case in his book; that of the capture of a specimen by H. Stauder in Calabria in 1921, named later as "Hybrid *rapaeula*". This was of course an inter-group crossing, but Müller apparently felt doubtful about this record for he says that in cases of specimens captured at large the assumption that they are hybrids is always a "daring one" (Müller 1939, p. 113). In this I am in agreement with him if identification rests solely on the appearance of the specimen and there is no anatomical corroboration of the fact.

I am now able to record a natural cross between the *rapae*- and *napi*-groups, and to give some details as to the reaction of the androconial scales. These are very different from what follows in natural (or experimental), crossing of *napi*- or *oleracea*-group species. All the same the results provide a very defienite means of recognising that hybridisation has taken place.

A few years ago I was examining a considerable material of *P. rapae* from all over Europe and Asia when I came on two specimens from the Altai Mountains. The first of these gave a very ordinary type of androconial scale that might have come from any locality in the Palaearctic region. The second, however, gave a type of scale such as I had never found in any species of the genus before. It was something like the scale of *P. extensa* but by no means the same. The scale is shown on the accompanying plate fig. 6, and that of *P. extensa* in fig. 8. The latter species is of course the largest Palaearctic *Pieris* and there is no resemblance between it and *P. rapae*. A normal form of the *P. rapae* scale is shown in fig. 5, the specimen from which this scale was taken came from Formosa. Failing to find any other scales at all like fig. 6, I put the slide aside for the time. The very minute scent cell and the perfect symmetrical formation of the scale were its most noteworthy features.

For a number of years I thought no more about this scale, until last summer (1970), when examining a series of *P. maura* from Portugal sent me by Mr

Carvalho, I came on a strange-looking specimen. It had been badly damaged in the post, but as Mr Carvalho noted it "looked like a hybrid between *napi and rapae*" I mounted the scales. To my astonishment it was at once obvious that these were the same type as that that I had found in the specimen from Altai years before. The specimen is shown in figs. 1 and 2. Not long ago I recorded that *P. maura* is distinct from *P. napi*, though the androconial scales of the two are of the same type, and of course *P. maura* is one of the *napi*-group species (Warren, 1970). The underside of the Carvalho specimen is like a poorly-marked *P. maura* and the upperside is as suggestive as *P. rapae*, when the fact is brought to ones notice. The androconial scale of the Portuguese insect is very closely similar to fig. 6, but just slightly more elongated, it is perfectly symmetrically formed and the scent cell extremely reduced. On comparing the Portuguese specimen and the one from Altai it will be noted that though both resemble *P. rapae* on the upperside they differ on the underside. Fig. 2 (Portugal), is obviously a poorly-marked *P. maura*, while fig. 4 (Altai), might pass as *P. rapae*. But on closer examination it will be seen that the sprinkling of black scales that usually is diffused over the entire underside of the hindwing in *P. rapae* is somewhat restricted and concentrated as broad bands along the nervures, leaving clear strips of ground-colour here and there between the nervures (this will be noticeable if the photo reproduces well). These facts suggest that the two specimens are hybrids, and the remarkable type of androconial scale supports this idea, for when seen between fig. 5 (*rapae*), and fig. 7 (*napi*), fig. 6, can obviously not be connected with either. Considering the small size of the scale, the width and shape of the neck show a resemblance to *P. napi* while the form of the basal prongs and the extremely small scent cell have a look of *P. rapae*. The basal prongs of the scales in both hybrid specimens vary in that they can be rounded off or terminate in a point, but this does not in any way affect the relative lengths of the scales. The absence of any malformation shows that hybridisation between the *napi* and *rapae* groups leads to amalgamation, producing some type of transitional formation. The slight difference in the lengths of the scales between the two hybrids is of course accounted for by the fact that they are not actually the same cross. The Altai one is *P. rapae* × some Asiatic form of *P. napi*, the Portugese one is *P. rapae* × *P. maura*. Small as the difference between the two scales is, it points to the fact that *P maura* though one of the *napi*-group species is distinct from the *napi*-group insect of the Altai, a delicate but definite proof that *P. maura* is distinct from *P. napi* as I recorded previously (Warren, 1970).

It is not to be supposed that the scale of these hybrids is a type that will always appear should other species of these groups chance to cross, but it may be expected that it would be a symmetrically perfect scale as apparently crossing in these groups leads to amalgamation.

The discovery that such a marked check to development, unacompanied by any corresponding loss of symmetry follows hybridisation between species of two different groups, in two cases (for the hybrids we have described are not both the same), shows this phenomenon must be attributed to the same cause in each case. It therefore follows, the characteristics and formation of the *P. extensa* scale (fig. 8), corresponding closely in every respect to the hybrid scale (fig. 6), that *P. extensa* is almost certainly also of hybrid origin. This would be a cross between the *melete*

and *napi* groups, very possibly between *J. japonica* and *P. melete*. Thanks to the kindness of Prof. Shirôzu I have a fine series of bred specimens of *P. japonica*, which is a distinct species and not a race of *P. napi*, the androconical scales though of the *napi*-group-type being very distinct (see Warren 1961, pl. 2, fig. 42). Judging from this series and a couple of *P. extensa* I borrowed and examined in the past, I can say that *P. extensa* on the upperside shows affinity with *P. japonica* while on the underside the sharply-marked outlining of the nervures of the hindwings is almost that as seen in *P. melete*. The underside of the hindwings of *P. japonica* is almost white, with a very pale yellowish tinge and the nervures are practically unmarked with dark scaling.

Years ago I noted that the remarkable variation both in shape and size of the scent cell in the *melete*-group species emphasised how widely these species were separated from those of the other groups of the genus (Warren 1961). The figs. 9 and 10, show characteristic forms of these cells, others are shown in my 1961 work, pl. 3, figs. 48-54. Compared with these figures the minute scent cell in fig. 8, made me feel doubtful of including *P. extensa* in the *melete*-group, but the superficial markings of the insect were so similar to many *melete* races, that there seemed no choice but to place it in the *melete*-group or an altogether isolated group. The photographs on my 1961 plates were reduced for publication but they were taken at the magnification of those on the present plate. In all *melete*-group species the sizes of the scent cells vary greatly but always surpass those in any species of the *napi*-group, or any other group. The formation of the basal prongs in the *melete*-group species is also very characteristic; they are longer and on the whole narrower than in the other groups. It may be noted that *P. japonica* has often been placed as a race of *P. melete*, but this is a mistake for Prof. Shirôzu has recorded (1952 p. 18), that the two fly together in Honshu and of course the scales show they are not even members of the same group.

An examination of more specimens of *P. extensa* will be necessary before we can be certain that the scale-type as fig. 8, is constant. If this were so there would be no doubt it was a race of hybrid origin. If the scale type is abnormal it could only be considered a solitary hybrid. In either case the type would be a reliable indication of hybridisation, for if it were but an aberration of the normal type of scale the chances are it would be deformed in some way and the scent cell, almost certainly, would be of more normal dimensions, for only some unnatural disruption of the normal course of development could have reduced the cell of a *melete*-group species to such a rudimentary condition.

From the data we have been considering it becomes evident that hybridisation is always accompanied by structural irregularities. In the *napi*-group of *Pieris* species when crossed we find varying kinds of distortion in the formation of the androconial scales and not infrequently even incomplete, partially developed forms, among the normal type; the scent cell, however, retains a normal aspect. In crosses between species of different groups in *Pieris*, symmetrically perfect transitional, or specialised, types of scales appear, but the scent cells apparently are almost unable to develop. In the *Erebia* hybrids we get most perfectly symmetrical transitional forms in the genitalia in intra-group crosses, distinctly showing connection with both parent species (see illustrations, Warren 1937). I have seen a photograph of the genitalia of another *Erebia* hybrid,

captured in the Carpathian mountains, in this the structure was totally abnormal and one could only suppose the species involved to have been of extremely different sizes as well as members of different groups. I did not see the specimen and do not know if androconial scales were present. As a further example of distortion in structural development in the genitalia, I may mention the cases that have been recorded of crosses between the highly specialised species *Pyrgus malvae* and *Pyrgus malvoides* (see Kauffman 1955, figs. 2, 3; and Picard 1948). In this instance it should be remembered that in these two species there is also a difference in the structure of the egg (Chapman 1906; Kaufmann 1950), and of course extreme differences in the genitalia of both sexes (see Warren 1957, pls. 2 and 3), four of the structural features that distinguish *P. malvae* being unique in the species of the genus! In spite of such crosses the two species remain unchanged. In the case of the Alaskan hybrid already mentioned, it spreads over a very considerable area, probably much greater than my original data suggested. It seems that the influence of each parent increased as the two got more remote, and finally the hybrid disappears leaving the parents in typical form, one to the south or south east, the other to the west, but now separated by several hundred miles. The hybrid may become constant in its zone, but cannot extend beyond it, fading out as its own advance forces the parents apart.

The facts we have discussed are illustrative of structural resistance to hybridisation, and emphasise the fixity of structural characters in the species and the importance of anatomical changes. The reactions in structure are more extreme than anything that accompanies them in the superficial characters of hybrids. Similarity of type in structure indicates connection; identity of structure implies relationship. It is convenient to group similar-looking forms together, but this does not imply special connection, much less relationship. If two somewhat similar races fly in one locality it is held that they are distinct species; but how often is a claim based on this fact qualified by the remark that "no transitional forms occur"? The chances are that such races are distinct species, but the additional emphasis on "no transitional forms" is at best meaningless, for the *absence* of transitional forms might apply equally to either state; whether they were one or two species. Should it be held to imply that the *presence* of transitional forms is a proof that the two are forms of one species, the data given in this paper prove that to be absolutely false, for the presence of natural hybrids (proved by anatomical fact to be such), is clear proof the races concerned are distinct species. Whether the two species are only slightly characterised in structure, or altogether specialised, this will remain the fact. They can cross and produce hybrids; yet they continue to exist.

Crosses between different races of one species are unlikely to occur in nature; as a rule they are too widely segregated. Should one chance to occur it might be recognisable by superficial differences, but of course not by structural ones, for in fact it is not an hybrid

This is a point experimental breeders should bear in mind, for it might easily occur that in extensive work conspecific races were used unwittingly; this might give rise to erroneous conclusions.

Study of hybridisation does more than display the danger of trusting solely to superficial appearances. The number of hybrids that may be present, whether a single specimen or several dozens, is of no more

account than the degree of resemblance between the parent species.

In the compound developments of structure in the hybrids lie the evidence of their parentage; obviously mixed; for no individual can transmit to its offspring structural formation that it does not normally possess.

The degree of fertility that may appear in the hybrid is no reliable evidence of its nature, for fertility is but a natural corollary of its existence, an attribute of life widely fluctuating in its affects irrespective of parentage, not even always constant in different individuals of the same species (Warren 1958, p. 112). It follows that in question respecting two somewhat similar races, whether they are in reality two or only one species, the decisive answer is the presence of a natural hybrid (if one can be found); fortunately the evidence of its nature will mostly be as obvious and unmistakable as its presence.

In the event of remoteness or specialisation of habitat making a natural crossing between the insects impossible, the data derived from an experimental cross could be accepted with confidence provided it was certain the specimens used were the progeny of wild-bred parents, not parents previously inbred for generations under unnatural conditions.

The facts so far recorded in this paper oblige us to acknowledge that the theory that two races capable of interbreeding and producing hybrids of varying degrees of fertility must be one species, is very questionable. It was convenient and in the past has been the basis of many authoritative (but unjustifiable), statements claiming that two otherwise well characterised species had been "proved" by "experimental examination" to be one and the same species. But it was too convenient. The results of the ever increasing number of experiments made it obvious that practically any two species in a genus could be forced to breed in captivity, and would therefore have to be accepted as one species which was absurd. This man-made type of species could probably be produced even by taking species from different genera. But the danger of this excess of success was recognised and most experimentalists now claim the "proof" they put forward is based on the degree of fertility of the hybrids. This as already noted is an entirely variable factor, even within a species. There can be no definite critierion for a degree of fertility that constitutes a species. A "degree" is no more proof of anything than an "uncertain quantity" would be. It is at best a personal estimation of the portent of such facts as are recorded. The value of interbreeding can only rest on the facts it discloses. So far as one can see three or four irrefutable facts dominate all breeding experiments. Two positive; the hybrid (or hybrids), and the physiological effects apparent in their anatomical constitution; one positive when constant; the chromosome number when it differs; one negative; the barrier of absolute sterility; the latter is seldom mentioned which suggests that it is an exteremely rare phenomenon even between distinct species. In such hybrids as I have examined, or seen illustrated records of, the facts point to separation of the crossed insects; not union. This is what would naturally be expected, when one recalls that interbreeding "tests" are a conception based on the violation of natural order. The extreme rarity of such crosses in nature, when contrasted with the hundreds that would be possible, proves them to be accidental breaches of normal life; this does not suggest the union of related races as it so often claimed for experimental crosses. Many facts relative to the subsequent

life of hybrids have been recorded. But though of considerable interest they are but of secondary importance, relating only to the hybrid and not to the parent and its nature; which was of course the information that breeding experiments were designed to elucidate. For that information we must look to the first generation hybrids.

In conclusion I would again emphasise that in *Pieris*, inter-group hybridisation leads to such close amalgamation that a new type of scale emerges and practically replaces the old; also that it is of perfect development. In intra group hybridisation (in the *napi*-group), the result is frequent disruption of development, causing distortion and even incompletely developed scales, and less obvious defects down to minute imperfections. *Perfectly typical scales occur in all specimens and predominate in many*, which misleads some who do not realise that both extremes and intermediates occur in the same race or brood, and therefore must all be hybrids, for *all* are elementally one. The most elaborate and complicated estimates of breeding results must coincide with the results known to emanate from hybridism in nature, otherwise some factor has been overlooked. (Note: in the *napi*×*adalwinda* cross the *napi* scale reverts to the *adalwinda* type; the two though drawing apart have not become entirely isolated yet).

Such are the known effects resulting on hybridisation in *Pieris;* we have to thank experimental breeding for recognition of these facts, which are both obvious and unmistakable. When similar disturbances occur in nature, no man in his senses could attribute them to some other cause.

The differing results following inter- or intra-group hybridisation are of great interest, for they suggest that *P. rapae* has closer affinity with *P. napi* than *P. bryoniae* has; for a *napi*-group race in some form has been involved in each cross mentioned between both groups.

The extreme reduction of the scent cell in the *napi*-form × *rapae* hybrids is most remarkable and instructive. The perfection of the type of scale developed contrasts strangely with the reduction of the scent cell. It would appear that this might actually be an advance in scale development, an idea supported by what we see in other Families of the Rhopalocera where the cell has been completely lost. The scales in these Families however, are more abundant and show equally constant specific characterisation as is seen in *Pieris*. The development of those "brands", tightly massed accumulations of androconial scales, that are conspicuous in Satyrid and Nymphalid species, proves the loss of the cell can be no defect. It permits a greater concentration of scales in a given area (with an increase in their effect?), and they are certainly more tightly attached to the wing. In *Pieris* they are disseminated over the entire area of the wings, even on the underside, more loosely attached, and consequently more easily lost. In the *brassicae*-group of races, we find a sort of transition between these two methods. The scales are present in immense numbers and come away in masses at the least touch. The cells are reduced to minute tubes, between 2 and 3 microns in diameter and scarcely as long as the depth of the smallest *rapae*-type cell. Were the cells completely abolished the scales would certainly be more effectively connected to the wing.

All we know points to the scale with a cell having been the primeval type. In the large primitive type of scale that sporadically appears in some *Pieris* groups the cell is always larger than that of the normal-type

scale of the species. There is a progressive reduction in the various groups; largest in the *melete*-group, smaller in the *napi* or *bryoniae*-groups, still smaller in the *rapae*-group, ultimately shrinking to the minute tubular formation in the *brassicae*-group. All this points to reduction in cell-development being an advance. Its complete abolition has three obvious advantages: it permits, greater concentration in selected areas, greater numbers, and greater fixity in attachment. It seems probable that the cell will ultimately disappear from *Pieris* as it has done elsewhere in the past.

All readers who take any interest in specific or racial evolution should make a note of the fact that hybridisation has shown *P. bryoniae* is physiologically more remote from *P. napi* than *P. rapae* is.

This is nothing abnormal, it is but evidence of the versatility of evolution which has been displayed, in reverse, in the case of *P. ergane;* shown by the androconial scales to have closer affinity with *P. napi* than *P. rapae.*

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A Correction and an Addition.—In my article on collecting in 1969 (*antea* 128 *et seq.*) on page 134 I reported *Aspitates gilvaria* Schiff. from Trevose Head Cornwall. This was a slip of the tongue/typewriter, the moth being *A. ochrearia* Rossi. Mr D. W. H. ffennell kindly wrote to me to query the record, which was out of keeping with what he knew of the area.

The *Choreutis* species mentioned in the same article on p. 132 turned out to be about half *myllerana* Fab. and half *punctosa* Haw. when I examined the undersides of their forewings.—R. Fairclough, Blencathra, Deanoak Lane, Leigh, Surrey. 19.x.1970.

"Another Last Day"

By H. C. Huggins, F.R.E.S.

I began my customary visit to Dingle a little earlier this year (1970), sailing for Cork on June 2nd. The sea was like glass, but both the train and the boat, although I had both a carriage and a cabin to myself, was exceedingly hot, the hottest journey to Ireland I can remember, and I arrived very limp.

The hot weather continued after I reached Dingle on June 3rd and did not stop until June 20th. Although I have been visiting Ireland on and off for nearly sixty years, I have never known such a heatwave before; it even exceeded July 1952. During this weather insects were abundant but rather late, as spring had been exceptionally cold. I did not set the m.v. trap until the night of June 4/5th, when there were several Taeniocampids in good condition.

The season in Kerry and West Cork is often later than in East Essex or Kent despite the virtual absence of frost. When I left home the hawthorns opposite my house were covered with green berries, but when I reached Dingle, the hawthorn's flower buds were just opening.

After June 20th the weather changed and from then to the end of my stay on September 16th the nights were the coldest I have known in Kerry. This cold weather also ruined my hopes of hill collecting, as the slopes of the Brandon range were almost surrounded in mist.

The cold nights prevented any mountain or coastal insects from wandering; for the first time for three years I saw no *Luperina nickerlii* s.sp. *knilli* Boursin, or *Stilbia anomala* Haw. in the trap.

Although I understand it was a good year for residents in England it was not so in Kerry. Whereas last year *Nymphalis io* L. was in thousands and the larvae devoured every nettle bed, I did not see more than two hundred in all this year, and the small copper (*Lycaena phlaeas* L.) of which I examined about a dozen every day in 1969, did not put in an appearance at all.

Immigrants also were very poor, with one notable exception, I did not see one worth keeping and from June 20th to July 5th I saw none. During the hot weather in June a few *Plusia gamma* L. and *Nomophila noctuella* Schiff. turned up together with a good number of *Agrotis ipsilon* Rott. and a few *Peridroma porphyrea* Schiff. All these were in such shattered condition that I am certain they were immigrants.

My one exception was the night of June 8/9th, when there was a perfect male *Leucania vitellina* Hübn. in the trap. This appears to be the ninth Irish record, of which seven were by the Donovans at Ummera in the late 1920's and early 30's, and one by Mr Pelham-Clinton in May 1961. It was very regrettable that the summer was so cold and wet otherwise there might have been a native brood in September.

At the beginning of August I took four *Lithosia quadra* L., a male on 6th and a female on 7th and another male on 10th; all these were in fresh condition, but I am inclined to regard them as immigrants, for although my trap has been set in the same place every year since 1962, I have never taken *quadra* in it before, my only previous one being on a bar window on the front in August 1967.

I may mention that on the *vitellina* night there were also 12 *ipsilon*, 1 *porphyrea*, 5 *gamma* and 1 *noctuella*.

Of butterfly immigrants I only saw *Pyrameis cardui* L. and *P. atalanta* L. both of which turned up occasionally in small numbers throughout my stay.

Insects worth mentioning appear to have been:

Pieris napi L.: On August 6th I took a very nice lemon cream female, the only one I have seen in Ireland; I have another like it given to me by the late Thomas Greer, who told me he had only found half a dozen like it in Tyrone. Some twenty years ago I saw, but failed to catch a brilliant yellow one, probably the colour Kane called saffron, at Glengarriff.

Euchloe cardamines L.: As I was so early in the season, I resolved to devote some attention to this butterfly. I could, however, find no difference between the many males I examined and east of England ones. Amongst the females I caught was one with the deepest saffron hindwings I have ever seen. She was laying eggs on lady's smock and as both forewings were in tatters and one hindwing badly chipped I released her to go on with the good work.

Celastrina argiolus L.: On August 24th I saw two males of this insect one of which I captured, the other dodged over a high hedge. I set it and brought it home because of the date; it is perfect, but not fresh, and I should say it had been on the wing about a week. Although the myth of the non existence of the second brood of *argiolus* in Ireland has long since been disproved, I have never before seen a specimen after the first week of August.

Cycnia mendica Clerck: On June 6th there were two males in the trap, one of the cream colour usually found in Cork and Kerry, the other the purest white I have ever seen.

Cryphia muralis Forst.: I found my first specimen on a wall on July 6th, after August 4th I saw no more and gave up searching a week later. However, on August 28th, there were two in the trap, one worn and one newly emerged. Apart from the date, a fortnight later than I have ever before seen *muralis* in Dingle, this moth was most interesting as it is the nearest approach to the type I have ever seen at Dingle, though still far from it. *Muralis* becomes rarer and rarer at Dingle as the town becomes more popular and old walls are scraped down or re-painted. I did, however, take a lovely fresh ab. *nigra* on July 24th; it was very extreme, the usual few white spots being reduced to pin-points. This makes, so far as I am aware, the ninth known *nigra;* seven from Dingle including Mr. Bayne's specimen, and Mr Wightman's two from Cork. July 6th is the earliest date I have seen the moth at Dingle, as August 28th was the latest.

Triphaena comes Hübn.: This was very common, but I did not see another with black forewings as in 1968. The form with reddish forewings was, as usual, not uncommon, and I was lucky enough to get one without the lunar marks on the hindwings. Its cilial border was also pale and interrupted. I say lucky because I only boxed it as it seemed unusually large. The forewings were normal reddish and the hindwings, of course, hidden.

Mamestra brassicae L.: The curious small specimens continue at Dingle, where they constitute about 20 per cent of the catch; I have only seen two others this size in all my English collecting.

Cilaena leucostigma Hübn.: This was the commonest I have ever seen it at Dingle, the *fibrosa* form greatly predominating. On August 7th there was a most unusual one in the trap, uniformly deep bronze-black with the

usual *fibrosa* marks threadlined on their boundaries. It was quite fresh but unfortunately a bat or bird had snapped off half one forewing, so I released it.

Orthosia gracilis Fabr.: On June 5th I took a perfect female of this moth, of a bright pinkish-fawn colour. I have bred *gracilis* extensively from the New Forest and Ireland and have most of the colours to deep plum, but I have never seen this tint before.

Plusia festucae L.: Common, still no *gracilis* Lempke.

Perizoma bifaciata Haw.: I have in previous years taken several specimens in which the space between the double line and cilia was buff, but always considered these faded. However, on August 6th I took a fresh and perfect one with this feature, quite new to me, but unhappily as I was about to put it in the cabinet on my return I dropped my forceps on it and smashed it hopelessly. Bartsia is common all round Dingle and if, as I hope, I have "another last day" in 1971, I propose breeding a few. The quotation, by the way, is from "Handley Cross" in which Mr Jorrocks showed such a propensity for "last days".

Cleora lichenaria Hufn.: Very common in 1970. I got a nice melanic male on June 18th.

As will be seen, I did not have a great bag at Dingle, but I have been there too often, I suppose. However, I have so many friends there that I hope to keep on going. The feature of the year was the complete stop of the immigrant flow on June 20th .dare I suggest due to Mr Enoch Powell's increased majority?

Notes on some Lepidoptera in the South-East, 1970

By A. A. Allen

Experience of the season just passed suggests that, for butterflies in this part of the country, it has had something of the quality of the well-known curate's egg. This was so at least in my suburban garden, where good and bad features have been oddly juxtaposed. To begin with the latter, the extraordinary lack of the usual autumnal species was totally unexpected, above all after a year in which they had flourished to an extent unparalleled here for a long time. I do not remember an autumn when at least a few *Aglais urticae* L. were not to be seen on the michaelmas daisies; yet this year, the first in which a brood of its larvae was found on my garden nettles, the only *urticae* seen were a few in the spring and one on 23rd July! In equal contrast with 1969, I can report but one sighting of *Vanessa atalanta* L. in the garden—23.ix.—and one in Greenwich Park three days earlier. Even the three *Pieris* spp., common enough through the summer, were very scarce after August. Whatever the reason for this state of affairs, it seemed impossible to blame the weather.

However, the other side of the picture goes far to redress the balance, with 3 or 4 species definitely on the up-grade and the number of August butterflies really encouraging. *Celastrina argiolus* L., after a very poor season in 1969, made an excellent recovery and, in both broods, was almost frequent. *Polyommatus icarus* Rott., if not much more numerous than last year (cf. *antea*: 61), continued more than twice as long—5 weeks from August 1st, though none earlier; this being well in excess of anything previously observed here with the species. Uniquely in my ex-

perience, it was sometimes possible to see the two blues on the wing simultaneously, and it is interesting to note that there could never be any doubt in practice about which was which: *icarus* would always keep relatively low (or, after rising in the air, return groundwards) whilst *argiolus* almost never does so but frequents the bushes and trees. Moreover, the haunt of *icarus* in the garden is peculiarly circumscribed, but this year it extended its activities from the mint flowers across part of a very rough 'lawn' ('field' might be a better description!) as far as a small patch of *Lotus corniculatus* on whose flowers at least one male was seen feeding. There were females about at the time, and they may have oviposited on this plant; I had supposed there was too little of it in the garden to support a brood, but the sudden upsurge of the last two years makes one wonder. Thistle and knapweed heads round about offer a further attraction to this delightful little butterfly. As before, it was accompanied throughout its period by *Lycaena phlaeas* L., so constantly indeed that one was seldom seen without the other somewhere near—the headquarters of the two species quite coinciding (though *phlaeas*, being a much greater wanderer, may be met with *casually* anywhere in the garden). The blues and coppers would often chase one another, and these aggressive-defensive flights sometimes took the pair out of sight and well out of what I may call the *icarus* territory. The comparative plenty of *phlaeas* through August led me to expect a few in October, as in 1969, but it was not to be. An early one was noted on 24.v., and the last of both Lycaenids on 6.ix.

Almost any suitable August day, except for the last week, a few or several *Pararge megera* L. could be seen — the number exceeding last year's. The first brood too was well represented, so that the species has now (by a steady build-up) apparently recovered the strong position it had reached here by the early 50s. Again *P. aegeria* L. failed to appear in the garden but one was sighted in a grove of elms on the other side of Blackheath (13.vii.). A solitary *Coenonympha pamphilus* L. turned up on 11th July; this is only a very occasional visitor, though why it should not thrive in the garden, as does *Maniola jurtina* L. (not to mention *P. megera*) I have never understood. *Ochlodes venata* B. & G. had another good season, occurring freely almost all over the garden in late June and early July; a larva was swept up on 19th September. A single hibernated *Nymphalis io* (a rarity here for many years), appearing at pear blossom on 2nd May, made the sole noteworthy local record for its family; but a probable *Polygonia c-album* L. was sighted the same day.

Mr D. Collins reports a number of *Anthocharis cardamines* L., the first for some years, in and about his garden at Carshalton Beeches, near Croydon; and mainly in the same period, odd specimens of *Vanessa cardui* L., besides the (with him) usual *Gonepteryx rhamni* L. On Chobham Common, Surrey, he found *Callophrys rubi* L. more than usually plentiful about the broom bushes, and also feeding at hawthorn blossoms. In their season, *Eumenis semele* L. and *Plebejus argus* L. are not uncommon there as a rule. On a visit to the common two years ago (19.vii.68) we met with three notable moths: 2 *Sterrha muricata* Hufn., 2 *Dipsosphecia scopigera* Scop. (*ichneumoniformis* Schiff.), and 1 *Aegeria formicaeformis* Esp. A male *Lasiocampa quercus* L. 'assembled' to a bred female, and *Maniola tithonus* L. and *Aphantopus hyperantus* L. were observed. Talking of 'clearwings' I may add that Mr G. Shephard noted single specimens of *A. vespiformis*

L. at Mitcham Common (Surrey) and Doddington (Kent) in July of this year; and that *A. myopaeformis* Borkh. and *A. tipuliformis* Clk. inhabit my garden, but are only rarely to be seen.

Clossiana euphrosyne L. must have had a good season if its abundance at Red Copse, Halnaker, West Sussex on 28th May was typical. Conditions were ideal and Lepidoptera well in evidence, but the fritillaries outnumbered any other and were spread over a widish area, frequenting not merely the flowery clearings and open coppice but also the sunny edges of paths and tracks. Not for years, if ever, had I met with this butterfly in such profusion. *A. cardamines* seemed curiously localized; *P. aegeria* and *Pyrgus malvae* L. were, I think, seen, but I cannot be positive. My companion, Mr J. Cooter, directed my attention to a *Hamearis lucina* L.; this local butterfly had been noted there by him in the previous year or two, but by me not since 1934 in the New Forest near Brockenhurst. Among day-flying moths, the very distinctive *Pseudopanthera macularia* L. was common, especially along a lane-side; *Anaitis plagiata* L. was put up in some numbers from mixed undergrowth, and over the many bluebells flew *Hysterosia maculosana* Haw. sparingly. No doubt many interesting species were passed over, as we were intent upon other quarry. Unhappily, much destruction had been and was then taking place in the area —of course, for the sake of the eternal and inevitable conifers.

On the North Downs at Betchworth, Surrey, on 31st July, *P. c-album, N. io, V. atalanta* and *A. urticae*—but only one or two of each—all put in an appearance in sheltered places, in some of which Mr Shephard had early in the previous August noticed many of the first-named. A feature that surprised us this time was the relative unattractiveness of the buddleia flowers, which were in fine profusion, to butterflies—or indeed, for that matter, to any insects but bees; not that such insects were by any means absent, and the weather was perfect. A single *c-album* was on a buddleia spray, but that was about all. *P. aegeria* was flying in shady lanes, and a *G. rhamni* was sighted. A colony of *Thymelicus sylvestris* Poda occupied a small area, seeming to favour the flowers of trefoils, etc. The very neat little black and white *Pyrausta nigrata* Scop. turned up everywhere in the net in the course of sweeping for beetles and such like, many rather worn but some quite fresh; but *P. ostrinalis* Hübn., not uncommon on Betchworth Downs on a previous occasion, was not encountered.

To return home once more: an unusually early example of the Small Magpie, *Eurrhypara hortulata* L., made its appearance in the scullery here on 17th May. The bulk emergence of this very common insect takes place a full three weeks later as a rule, and this year was no exception; so it seems likeliest that the above individual resulted from a larva that had strayed indoors to pupate, as was probably the case with Dr de Worms's winter specimen (*antea*: 90). As he there says, the species likes to pupate in crannies, and I often find pupae or pre-pupal larvae under loose bark.

Two female moths attracted to mercury-vapour light here on the night of 26th June may be worth mention: *Hepialus sylvinus* L., not seen here by me for over 40 years if memory serves (*H. humuli* L. and *lupulinus* L. are common enough); and *Zeuzera pyrina* L., of which my only previous local record is of 11 males that came in on the night of 4th July 1960 — surely a most erratic visitor! On 19th September a *Dysstroma truncata* Hufn. emerged from a pupa found at roots of clover in the garden; the

pupa was bright green, the wing-covers deep grass-green and the rest lighter and yellower. The imago is common here, but only at m.v. light.

To conclude these notes with a few 'micros': a recent colonist in the garden, found only from 1969, is the Pyrale *Udea lutealis* Hübn.; it seems confined to the vicinity of the mint-bed, so I assume that is the plant on which it is probably breeding. The striking, boldly-marked little *Laspeyresia aurana* F. appears annually, but very sparsely, flying about its food-plant (*Heracleum spondylium*) in sunshine, or at rest on the umbels; elsewhere I have met with it only once or twice. Three of last year's captures perhaps deserve notice here. The first local example of *Ptycholomoides aeriferana* H.-S. came to light on 1.vii.69, and the second of *Catoptria* (formerly *Crambus*) *pinellus* L. on 26.vii; the first *Pammene aurantiana* Staud. to have come my way was detected by Mr Collins at rest on a shrubby growth of willow in an area not far beyond the garden, with mature sycamores—on which *P. regiana* Zell. breeds freely—quite close by.

63 Blackheath Park, London S.E.3. 11.xi.70.

A New Species of *Thestor* Hübner (Lepidoptera : Lycaenidae) from the Eastern Cape Province, South Africa

By C. D. Quickelberge (East London Museum) and J. C. McMaster (P.O. Box 61, Stutterheim, C.P.)

Although compared here with *Thestor* species *T. dicksoni* Riley, *T. braunsi* van Son, *T. protumnus* (L.), *T. protumnus aridus* van Son, *T. strutti* van Son and *T. montanus* van Son it must be emphasised that this new *Thestor* is quite distinct and cannot be confused with any other known species of the genus. Perhaps its most distinctive feature lies in the general shape of the wings, these being unusually elongate, appearing thus more pointed when compared with those of the above-mentioned allied species. Other unusual characters are the total lack of markings on the male forewing upperside between the base and the quadrate spot closing cell-end and the sex-mark, also the very wide hind-marginal border and the almost clear areas of silvery grey on the hindwing underside. A combination of these features, plus the ground colour, constitutes a character complex not matched by any other species of the "yellow" group of *Thestor*.

Abbreviations used in the text below are:—Up.—upperside; Un.—underside; Fw. and Hw.—fore-and hindwings; UpFw. and UpHw.—uppersides of fore- and hindwings; UnFw. and UnHw.—undersides of fore- and hindwings.

Family LYCAENIDAE

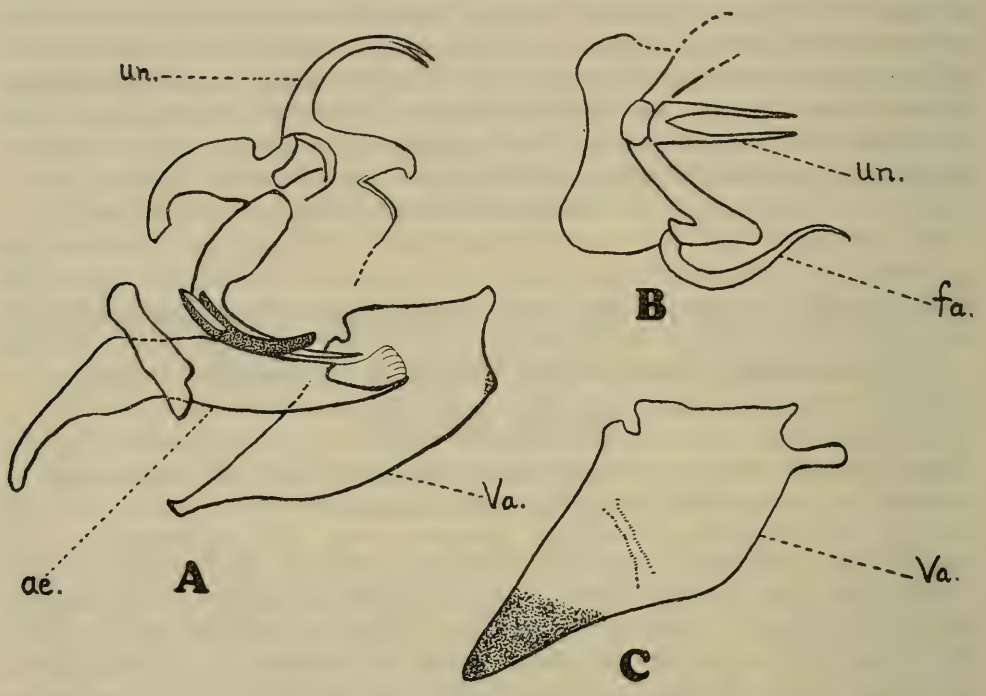
GENUS Thestor Hübner

Thestor compassbergae sp. nov.

Material

Holotype: Male, Compassberg on Sneeuwbergen mountain range near and north of New Bethesda, Cape Province, 14 December 1969 (J. C. McMaster).

Allotype: Female, Compassberg, 14 December 1969 (C. D. Quickelberge).
Paratypes: 23 males and 13 females all from the type-locality comprising 7 male and 8 female paratypes in J. C. McMaster's collection all caught on 14/12/1969 except 2 females caught on 12/12/1967. Also similarly dated are 5 male and 3 female paratypes in C. D. Quickelberge's collection. Two female and 11 male paratypes captured on 4/12/1969 are in the collection of Mr C. Wykeham. The holotype and allotype are in the collection of the Transvaal Museum, Pretoria.



Male genitalia of *Thestor compassbergae* sp.n.
A. Lateral view of complete structure with left valve removed.
B. Partial dorsal view showing clevage of uncus, etc.
C. Valve removed and pressed flat.
Un.=uncus; fa.=falces; ae.=aedeagus; Va.=valve.

Description

Holotype male: Light brownish-yellow (buff) with suggestions of an orange tinge; however, not as clearly orange-suffused as *T. protumnus* and *T. protumnus aridus* nor as pale as *T. strutti* but shows closest approach to *T. montanus*.

Antennae above, dusky grey, scaled with white toward apices; below, mostly whitish, except where the scales have worn off.

UpFw.: Costa smoke-grey from base to about approaches to the dark discal band. There are, however, indications of the ground colour suffusing the more basal parts. Spot closing cell well-defined, black and rectangular. Similarly coloured is the discal band which commences nearly at costal edge, being broad up to vein 4, thence narrowing but still in contact with its lower section which is made up of more or less triangular patches between the fingers of the sex-badge and a further portion projecting into

Thestor compassbergae sp.n.

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

area 1b but not reaching vein 1. Ground colour narrowly surrounds this band distally from areas 1 to 3 and again in areas 4, 5 and 6 but in these last three, reduced to insignficant smudges, especially in area 4 where it is all but absent and in fact only being discernible at all on the right wing. Along vein 4 the discal band makes contact with the broad hind-marginal fuscous border, the latter being just over 3 mm. wide along vein 3 of the right wing and in colour similar to, but not as dark as, the discal band. Only in *T. montanus* of the allied group of species is there a comparably wide hind-marginal border. The colour of this area also tinges the cilia at the vein endings. Otherwise the cilia are white.

UpHw.: Has the ground colour similar to that of the *Fw.* but is slightly more brownish-suffused. Black discal band not well developed except in areas 4 and 5; in area 3 only represented by a small diffuse smudge. Dark bar closing cell fairly well defined.

Costa widely bordered with a somewhat similar colour to that of the *Fw.* hind-marginal band. This border continues beyond apex, fading out gradually along the hind-margin, reaching at least to vein 3. Cilia only clearly white between veins 6 and 7, otherwise mainly dark with small white spots midway between veins.

UnFw.: Ground colour lighter than on *Up.* with spotting also as on *Up.* although discal markings are smaller. There is an additional similarly coloured spot within cell and a further two below it in area 1b of which the lower one is much smaller than the upper. Costa, ochreous-grey from base as far as discocellular spot, becoming much whiter beyond and irrorated with brownish scales. From veins 1 to 6 the hind-marginal border is only represented by a fine dusting of brown scales, its inner edge dentate and faintly scaled with blackish, better defined beyond vein 4.

UnHw.: Generally the same hoary-grey as the distal part of the *Fw.* costa and again irrorated faintly with brownish. The pattern of brownish-edged irregular spots covering most of the wing area is basically much the same as in *T. dicksoni* and *T. braunsi*, the outer discal row more darkly edged inwardly from vein 6 down towards the inner margin. The comparatively clear space of hoary-grey distad of this discal row of markings up to the wing edges is a feature not shared by other species used here for purposes of comparison.

Wing-length (right Fw. from base to apex): 16·9 mm.
Antenna (right): 5·3 mm.

Allotype female: Basically much the same as the male except that hind-margins are more convex, the ground colour more orange-tinged and the cilia are not checkered with white. The antennae apices are also not clearly tipped with white. Differs also in the following respects:—

UpFw.: Ground colour more widely encircles the distal edge of the discal band and the costa is more clearly greyish.

UpHw.: Has an additional dark spot associated with the discal band situated in area 6 but not in contact with the band itself which is only clearly marked in areas 4 and 5.

The greatest sexual difference lies in the virtual total lack on the female *Un.* of the hoary-grey of the male, being replaced by a fairly uniform nondescript brownish colour, perhaps best referred to as dun. Only the extreme tips of the wing apices of both wings are tipped with whitish.

UnFw.: The chevrons or sagittate markings lacing the inner edge of the hind-marginal border are all clearly marked with blackish.

UnHw.: The outlines of the spots are not as well defined as in the male while the colour of the markings themselves does not differ materially from the general ground colour.

Wing-length: 19·0 mm.
Antenna (slightly twisted): 5·1 mm.

Paratypes: Males show little variation and what there is affects mainly the extent of development of the *Up.* discal bands on both wings. In the *Fw.* the penetration of this band into area 1b varies from a very faint blackish scaling to a well developed irregular black marking nearly touching vein 1. The extent of the ground colour surrounding the distal margin of the band also varies from being barely perceptible to a well developed area, especially below vein 4. On the *Hw.* the band is in some males very poorly developed while the spot in area 3 is fairly frequently entirely wanting. Over the *UnFw.* some males have the submarginal chevrons more completely developed, while similar markings similarly placed on the *UnHw.* are visible in a few specimens.

Females vary in much the same way as males except that in *UpHw.* the spot in area 6 may be wanting or only faintly visible. In one or two females the *Hw.* discal band may be all but absent.

Range of variation of wing-length:

Males 15·5-17·2 (16·5) mm. 18 specimens
Females 17·3-19·7 (18·2) mm. 10 specimens

Habits and distribution: Present evidence indicates that *T. compassbergae* is of limited and local distribution. It also inhabits country apparently poor in butterfly life as, when found on the wing in December, it was practically the only species to be seen. It would also appear to be a *Thestor* favouring higher altitudes (±6 to 7,000 feet a.s.l.) although not restricted to mountainsides. It occurs in colonies of limited area mostly about some of the lower slopes and foothills of the Compassberg itself. One strong colony was located in an area of rocks, low bushes and matted tufts of coarse grass (*Danthonia* sp.). It does not seem to evince the partiality to bare patches of ground shown by many other *Thestor* species and males were often seen to settle on rocks. Their inconspicuousness and rapid flight in warm weather also render them somewhat difficult of capture. Females occur at random but especially about grassy patches.

Remarks: No less than three persons were involved in the discovery of this intriguing new species. On a joint trip by both authors on 12th December 1966 it was the senior author who noticed the presence of *Thestor* sp. along the roadside while travelling on the farm "Compassberg", Middelburg district. However, it was to the junior author's credit that two females of *T. compassbergae* were first discovered flying with numbers of *T. protumnus aridus*. Subsequent trips to the locality during October and November in order to procure the male were completely fruitless although *T. protumnus aridus* was abundant. Suspecting then that this new *Thestor* was one of the species which only emerge in mid-summer we had prepared for a further search at this time, only to be beaten to the tape by Mr C. Wykeham who early in December had the great fortune to amass a good series of the eagerly sought-after male. Mr Wykeham observed that the species was just in the process of emerging. Subsequent trips by the authors and Mr Victor Pringle of "Huntly Glen", Bedford,

during the same month were all well rewarded with many fine specimens, although not without some prior diligent searching.

ACKNOWLEDGMENTS

Grateful thanks are due to Mr C. G. C. Dickson of Cape Town for his ever-willing aid with the many problems usually associated with a study of this kind. We are particularly grateful for the loan of many valuable specimens and relevant literature. Mr C. Wykeham must also be mentioned for his generosity with the loan of specimens of this new species and other comparative material. J. C. McMaster provided the photographs of the type specimens.

Butterflies of South Bohemia

By Otakar Kudrna, F.R.E.S.

(Department of Zoology, Downing Street, Cambridge).

This paper was written in the spring of 1968 to be published in Czechoslovakia. The author, however, left Czechoslovakia in 1969. The paper has been translated into English but remains the same as the original.
June 1970.

The serious study of the occurrence and distribution of Lepidoptera in Bohemia dates from the first half of the nineteenth century. The pioneer of faunistic research in Lepidoptera was Professor F. Nickerl, who published the first list of butterflies found in Bohemia in the middle of the nineteenth century. The initial work on distribution is, however, the much later study of Dr J. von Sterneck (57). The work of Professor L. Bata (1), published at the same time, has a similar significance for the Lepidoptera of South Bohemia.

Forty years have passed since the publication of Sterneck's classical monograph, during which time further discoveries have been made, and the importance of pollution has increased. Hence, the publication of a further outline of the Lepidoptera, to extend the earlier studies of Sterneck has become very important. In order to facilitate such a study it seemed useful to analyse the smaller regions within Bohemia from a faunistic point of view. The separate, regional, annotated lists of Lepidoptera, as well as the faunistic monographs may form the basis for a modern account of the Lepidoptera of Bohemia which would be a counterpart to the detailed work of Professor K. Hrubý (22) on the Lepidoptera of Slovakia.

This faunistic study has its origins in both previous works (Bata and Sterneck) and for this reason papers published before 1929 are not mentioned here, but a complete list of more recent work is given.

GENERAL PART

Geography of South Bohemia.

South Bohemia is taken to be an area closely related to the political unit of the same name, except in so far as it is reduced by the exclusion of the south-west corner of Moravia, and extended into the northern

part of middle Sumava. This area does not form a natural unit and the chosen frontier is an artificial one.

A short historical outline of faunistic investigations of Butterflies in South Bohemia.

Faunistic investigation of the Lepidoptera of South Bohemia dates from the middle of the nineteenth century (4). This work was followed up at the beginning of this century by L. Bata and his colleagues. At that time, the butterflies in the area of Nove Hrady were studied by Dr. A. Binder, and those of Sumava by J. Graff, Dr. J. Sterneck, Professor V. Vlach, and others. The work and bibliography up to 1932 has already been set out (4). In the thirties and forties, the results of faunistic research on the butterflies of South Bohemia were published by: Batą (5); J. Bračák (7, 8, 9); J. Soffner (50); J. Levý (37); Stráberger (58), and Troníček (61). More recently the problem has been studied by J. Ebenhöh (12); L. Havel (18); K. Spitzer (51, 52, 53); M. Čoldrich (64); D. Weiss (67, 68) and O. Kudrna (31, 32, 33, 34, 35, 36). Apart from these authors, there are other private collectors who have allowed the author to use their material in this study. These collectors will be cited later. At the present time South Bohemia is well known from the point of view of its Lepidoptera.

The natural environment of South Bohemia.

The natural conditions in South Bohemia are now well known, and have been set out in detail in the published literature. Only the most important works in each field will be listed here: geomorphology:—25, 60; climatology:—56, 59, 60; phytogeography:—11, 45; zoogeography:—38, 39, 40, 47, 59. Further references can be found in the bibliography published by the South Bohemian museum in Česke Budějovice.

Zoogeographical Zones of South Bohemia.

South Bohemia mostly consists of a zone of deciduous forest (*Zona nemorum*), while a smaller part belongs to the mountain area of Sumava (*Zona montium variciorum*). The use of biogeographical criteria (taken from phyto-geographical studies) to divide these areas into yet smaller units cannot be sustained since these smaller territories are not so distinctly divided from a faunistic point of view. Two separate regions can, however be distinguished on mainly ecological grounds. Within the deciduous forest zone there are small enclaves of xerothermic biotypes, lower lying territories which are reminiscent of forest steppes in the composition of their fauna (e.g. Vysenské Kopce, Vidov, Písecká Smolec, Vlkov, etc.) in spite of the fact that they cannot be called either steppes or forest steppes on strict historical, climatological, phytogeographical or zoogeographical criteria. The characterstic and permanent inhabitants of these biotypes are:—*Iphiclides podalirius* L., *Colias australis* Vty., *Lysandra coridon* Poda, *L. argester* Bergst. and *Meleageria meleager* Esp. These biotypes are also occasionally settled by immigrant species from the south, e.g. *Pandoriana pandora* Den. et Schiff, which do not remain permanently because of the unsuitable climate. There are precise and important microclimatic requirements for the formation of xerothermic biocenoses. These biocenoses are therefore formed mainly or almost only on suitable (preferably limestone) hillsides which are open to the south and sheltered to the

north. The other very characteristic type of biotype which is spread more or less sporadically in the lowlands, highlands, and mountains, while forming elsewhere areas of considerable importance is the peat bog. There are differences among peat bogs which depend on their geological origins. The characteristic inhabitants of peat bogs are turphobiont species such as *Colias palaneno* L., *Boloria aquilonaris* Stick, *Proclossiana eunomia* Esp., *Vacciniia optilete* Knoch and others. These are perhaps the most characteristic biotypes in South Bohemia.

Zoogeographical Classification

Species are classified by their distribution and faunistic elements, in general agreement with Hrubý's classification (20, 21, 22). There is one important difference (a semantic one), however. Instead of the term 'oriental' used for species whose centre of distribution is in the Near East and South Eastern Europe, which often reach their north western limit in Central Europe the term 'euroriental' is substituted (70) as a more accurate description of the species' range. Elements such as pontic, ponto-mediterranean, eastern mediterranean and near-Asiatic (22, 70) are included under this heading by many authors.

Thus all the species of butterflies in South Bohemia can be arranged according to the following faunistic elements:—

Holarctic: Species distributed in most of the Palearctic region and at least in a part of the Nearctic region.

Eurosiberian: Species distributed in most of the Palearctic region from Europe to the Far East (mostly Japan) and occasionally in North Africa, usually with the centre of their distribution in Siberia.

Atlantic: Species distributed in North America and in part of the Palearctic region, mostly in Europe.

European: Species distributed in Europe only. It is very difficult to distinguish these species with certainty in the present state of our knowledge of the distribution of certain species in Africa and Asia.

Euroriental: Species distributed in the Near East and South-Eastern Europe. They often reach their western limit in Central Europe.

Mediterranean: Species distributed about the Mediterranean sea (the centre of their distribution), which partly reach their northern limit in Central Europe, if they can get beyond the Alps.

Tropical: Species distributed widely in the tropical part of the Old World. Some of them are regular migrants or occasional visitors to Central Europe, but only rarely settle there indefinitely or survive the winter there.

Cosmopolitan: Species distributed widely in the whole world and in all climates.

Boreo-alpine: Species distributed within separate areas in the mountains in central and occasionally southern Europe and also in the North.

Ecological Classification

Species are classified according to their biotype on the lines of the scheme used by Hrubý (20, 21, 22). The assignment of some species to a particular category may be controversial. There are alternatives, and the choice is affected by both subjective and objective criteria. For this reason, the classification should be looked upon only as a guide. Some species might be considered in two or three categories e.g. *Parnassius*

apollo:—steppe and alpine, or boreo-alpine. There are the following ecological formations in South Bohemia:—

Marsh: Very damp meadows or fens, mostly uncultivated, and mostly undisturbed by man. Vegetation includes water plants.

Meadow: More or less cultivated areas, usually slightly damp, covered by grasses and flowering plants such as *Trifolium* sp., *Vicia* sp. in the lowlands. Highland meadows are also included. They are often used as pasture for cattle and are usually much less disturbed by man.

Steppe. The true steppe biotype does not occur in South Bohemia. But there are biotypes with xerothermic herbs and plants, and climate conditions resembling those of a steppe. Usually, they are grassy and flowery hillsides (limestone) exposed to the south and sheltered from the north. The group includes sandy, rocky, primary and secondary steppes. They can be considered the equivalent of Central European steppes.

Forest steppe: The true forest steppe of the Near East is also not found in South Bohemia. This group is taken to include bushy hillsides, with sparsely distributed deciduous trees and many flowering plants and grasses. In some cases the group also includes parks, gardens and orchards as well. These biotypes too are open to the south, sheltered from the north, warm and dry.

Deciduous forest: This group includes all those areas where deciduous trees are the dominant plants, including natural and artificial forests. Forests of mixed deciduous and coniferous trees are also included.

Coniferous forest: This group includes lowland, artificial coniferous forests (mostly spruce and pine) and the much less disturbed, primary mountain forests of spruce as well.

Peat-bog: This highly specialised group includes all types of peat-bogs with turphobiont and turphophil plant and animal species, usually of a relict origin. They are found in the highlands and lowlands alike.

COLLECTED MATERIAL

The publication of faunistic monographs, especially on well examined territories, cannot be made without the co-operation of many entomologists, collectors and public institutions. The author is very pleased to thank all owners of private collections and keepers of public collections, for their kind permission to use data from the following collections:

Private collections: T. Cihlár, J. Čurda, J. Ebenhöh, L. Havel, K. Kopelent, J. Kubíček, E. Lehečka, J. Levy, F. Neumann, J. Ryklík, V. Sokolt and D. Weiss.

Public cellections: Museum of South Bohemia, in České Budějovice (colls. L. Bata, E. Schack, K. Spitzer, B. Zavadil, etc.), National Museum (Nat. His.) in Prague (colls. G. Grosse, F. Silbernagel, J. Soffner, etc.), Natural History Museum in Soběslav (coll. Balatý) and State Agricultural Museum (previous Schwarzenberg's Museum) in Hluboka nad Vltavou (coll. L. Bata).

Many of the documents used in this study are deposited in the author's collection, which has been located in the South Bohemian Museum since 1969.

The author is pleased to express his thanks for help, advice and discussion to the following gentlemen: C. M. Bate, J. Bodlák, H. Foltin (Austria), B. O. C. Gardiner, J. Kubička, J. Moucha, M. Rivola and J. Soffner (East Germany).

The results of the investigation of butterflies in South Bohemia.

This work is the result of the observation of the butterflies of almost 250 localities throughout the whole of South Bohemia. The author's own studies date from 1951 to 1968. The total number of species of butterflies known to occur in South Bohemia is 122, including migrants and occasional visitors. These species belong to the following families:—

Papilionidae	4 species	3·3%
Pieridae	13 species	10·7%
Satyridae	22 species	18·0%
Nymphalidae	33 species	27·0%
Riodinidae	1 species	0·8%
Lycaenidae	37 species	30·4%
Hesperiidae	12 species	9·8%
Total	122	100·0%

From the point of view of belonging to individual faunistic elements the composition of butterflies in South Bohemia is as follows:—

Holarctic element	7 species	5·7%
Eurosiberian element	83 species	68·1%
Atlantic element	2 species	1·6%
European element	5 species	4·1%
Euroriental element	14 species	11·5%
Mediterranean element	7 species	5·8%
Tropical element	2 species	1·6%
Cosmopolitan element	1 species	0·8%
Boreo-alpine element	1 species	0·8%
Total	122	100·0%

The ecological distribution of butterflies in South Bohemia is as follows:—

Marsh	7 species	5·7%
Meadow	43 species	35·2%
Steppe	23 species	18·9%
Forest steppe	17 species	13·9%
Deciduous forest	24 species	19·6%
Coniferous forest	2 species	1·6%
Peat-bog	5 species	4·1%
Total	122	100·0%

The predominance of species of a eurosiberian origin is clearly related to the geographical position and climate of South Bohemia. The high number of species directly dependent on peat bogs is in accordance with the large areas of this type of habitat to be found in the country.

SYSTEMATIC PART

In the following text there is an annotated list of all the species of butterflies found in South Bohemia. The nomenclature used is a modern one (17) and synonyms have not been given. After the name of every species, the data follow in this order: occasionally the name of a sub-

species, the faunistical element to which the species belongs, the name of the ecological formation to which the species belongs, the time of the appearance of adults (given as a number from 1 to 12 equivalent to the calendar months). A comma divides the life of the species into broods and occasionally there are data about this. The time of the appearance of adults is given roughly depending as it does on differences in the weather from year to year, and the climate in lowlands and highlands. The following text gives some idea of the distribution of the species in South Bohemia. If the species is locally distributed, there is a list of localities after the letter "L" and a list of references after the letter "R". A question mark used with any data always means that the data are uncertain or doubtful.

Papilionidae

Papilio machaon L.

Eurosiberian. Meadow. May-June, July-August. Widely distributed in the country and in the lowlands often common.

Iphiclides podalirius Poda.

Euroriental. Forest steppe. May-June, very rare partial 2nd brood in August. Sporadically distributed in lowlands mainly on warm dry hillsides with bushy vegetation, especially *Prunus* spp. Uncommon.

Parnassius apollo L.

Eurosiberian. Steppe. July-August. Only two specimens have been certainly captured in the Sumava mountains. One male in Zelezna Ruda 22/8/1910 and one female in August 1914 on the Libin mountain.
L.: Libín, Železná Ruda.
R.: 18, 36, 57.

Parnassius mnemosyne L.

Euroriental. Deciduous forest. June-July. The only specimen recorded has been a male found near Jindrichuv Hradec 10/6/1947.
L.: Jindrichuv Hradec.
R.: 52, 53.

Pieridae

Aporia crataegi L.

Eurosiberian. Forest steppe. June-July. In certain years very common, mainly in the south-eastern part of the country, but single specimens are found over most of the country. It seems to have been formerly more abundant than at present. A sudden increase of abundance apparently depends on immigration, possibly from south-eastern Europe.

Pieris brassicae L.

Eurosiberian. Meadow. May-June, July-September. Distributed everywhere and very common, especially in summer.

Pieris rapae L.

Eurosiberian. Meadow. April-September in 2 or 3 broods. Distributed everywhere and very common.

Pieris napi L.

Holoarctic. Meadow. April-September in 3 broods except mountains, where 2 broods only. Distributed over the whole country and very common.

Pontia daplidice L.

Eurosiberian. Meadow. May-June, July-September. Distributed mainly in lowlands and in certain years with unusually warm and dry weather locally common in summer. The spring brood however always very rare. Regular immigrant.

Anthocharis cardamines L.

Eurosiberian. Meadow. April-June. Widely distributed in the country and common.

Gonepteryx rhamni L.

Eurosiberian. Forest steppe. July-May. Distributed everywhere and very common.

Colias palaeno L.

Ssp. *europome* Esp. Eurosiberian. Peat-bog. June-August. Distributed continuously on the peat-bogs in the Sumava mountains and in Trebon basin, where it is usually common.

L.: Antigl, Borkovice, červené Blato, Divčí kámen (?), Dobrá Voda, Hartmanice, Churanská slat, Javorí pila, Jezerní slat, Jindrichuv Hradec, Jiríkovo, Údoli, Kamenice nad Lipou, Koryto, Kovárov, Královská slat, Kunžvart, Lenora, Modrava, Mrtvý luh, Nové Hrady, Petríkov, Plechý, Príbraz, Soběslav, Velká slat.

R.: 1, 9, 12, 18, 36, 46, 52, 53, 57, 58, 61, 64.

Colias hyale L.

Eurosiberian. Meadow. May-June, July-August, partial 3rd brood in September. Widely distributed in the country up to about 900 m. above sea level. Common, locally may be very common in summer.

Colias australis Vty.

Ssp. *calida* Vty. Mediterranean. Steppe. May-June, July-September in 2 or 3 broods, 3rd partial. Distribution very restricted in a few xerothermic biotypes in lowlands, mostly on limestone, where it may be common, occasionally very common.

L.: Ráncice, Rímov, Soběslav, Vidov, Vysenské kopce.

R.: 35.

Colias croceus Fourcr.

Tropical. Steppe. May-June, July-September. Rather widely distributed in lowlands and in years with unusually warm and dry weather the second brood is common.

Colias myrmidone Esp.

European. Steppe. May-June, July-August. Distributed locally mainly in the valley of the river Vltava south from Ceske Budejovice on the warm rough grassy hillsides. It is uncommon or rare in summer, always very rare in spring.

L.: České Budějovice, Kamenný Újezd, Koroseky, Lipno, Rípec, Srubec, Treboň, Veselí nad Lužnici, Vidov, Vyssí Brod.

R.; 1, 12, 57, 58.

Leptidea sinapis L.

Eurosiberian. Deciduous forest. May-June, July-August. Widely distributed over the whole country and common.

(to be continued)

Auction

By Brian O. C. Gardiner, F.R.E.S.

It is many years since a collection of insects has been auctioned in this country and it was therefore with considerable interest that I attended at the Pulborough salerooms of Messrs King and Chasemore when the Library and collection of the late Mr D. A. Odd came under the hammer, together with other valuable items of books, maps and fine art, on November 5th last.

Unlike so many other auctions of Lepidoptera where specimens have been sold singly or in small lots, in this sale they were sold *in situ*, as Mr Odd had them arranged in his cabinets and storeboxes, and the prices realised reflected the worth of these rather than the insects.

The cataloguing of the books often left something to be desired, as they were mostly sold in bundles, and only careful previewing could separate the wheat from the listed chaff. A good example of this was lot 1254 "Migration of Butterflies" by Williams and five others on Butterflies. The five others included the far more valuable "Complete Book of British Butterflies" by F. W. Frohawk and the price of £7 realised reflected this fact. This also makes it difficult to be precise about values realised for any one particular book.

To start with it is perhaps worth commenting on how little regarded and valueless certain contemporary and expensive magazines, both of which contain regular natural history items, are. Twenty years issues of "The Field" could only raise 2/- per year and no bid at all was forthcoming for a similar lot of "Country Life".

At the other extreme was the extremely keen bidding for any nineteenth century books on Topography. Two 1821 books on the County of Surrey made £11 and the Geological section only of Brayley's 1850 Topographical History of Surrey made £22. A map of the same county, about 1770 made no less than £78.

About thirty volumes of Collins' New Naturalist series, sold in lots of 4 or 5 made the very good secondhand price of £1 per volume. Some two hundred loose copies of the "Entomologist's Record" fetched £15; twenty-one nineteenth century volumes of "The Entomologist" £24; eight similar bound volumes plus a box of 'parts' £16.

W. H. Kirby's "European Butterflies and Moths" recently rebound in three volumes fetched the high price of £9. It is only a few years since I could have bought copies of this work for 5/-.

The lot of three books including a late edition of H. Noel Humphries' "British Butterflies and their Transformations" made £11. Another similar lot with the two "moth" volumes and others later went for the cheap price of £10. A lot of five containing Wilson's "The Larvae of the British Lepidoptera" made £9 which leaves the Wilson more or less unchanged in price over the years, as indeed is also Buckler's Larvae which, with one volume absent, went for £20.

The large coloured edition of Barrett, very nicely bound, was an absolute snip at only £54. I have in the past twice seen it catalogued at £95.

Frohawk's "Varieties" was in a lot that fetched £16. By subtracting the published price of the others in the lot, this puts the enhanced figure of about £9 on the Frohawk.

"The Proceedings of the South London Entomological and Natural History Society" for the past twenty-six years was, in view of the published prices for back issues, very reasonable at £22, as also was some £70-80 worth (at published prices) for only £9 of the Royal Entomological Society, which invariably seems to fetch very low prices whenever they come on the market.

A very tattered copy of Frohawk's "Natural History of British Butterflies" was, at £13, distinctly dear in view of its condition.

Mr Odd's collecting and mounting equipment—the usual gear of pill-boxes, setting boards, pins, net, haversack, etc.—were sold as four separate lots and made the utterly astounding total of £18 10 0, which, insofar as I was able to tell from viewing it, must be rather more than the original new cost.

Twenty assorted storeboxes or cases, containing an assortment of insects, mainly duplicates of common moths, but with some beetles, blown larvae, and other orders, fetched an average price of 32/- per box which, at current rates for storeboxes puts a value of about £1 per 100 on the well set and in good condition insects.

Since some of the cabinets were sold complete with their contents of Butterflies and moths—and amongst these I noticed nothing outstanding—one cannot apportion the prices realised between the intrinsic value of the cabinet and the worth of the specimens. If however Lot 1425 was any indication, the specimens themselves were regarded by the bidders as worthless. Lot 1425, a mint condition mahogany Hills Unit of ten drawers sold empty, realised £50. A similar unit was advertised by a dealer last month for only £38 and, unless prices have again risen recently, I believe the new price to be £45.

Lot 1417, a fine pair of mahogany twelve-drawer cabinets and Lot 1419 a fine twenty-drawer mahogany cabinet, both lots full of good condition well mounted Butterflies and moths, fetched £120 and £100 respectively which is exactly the £5 per drawer realised by the *empty* cabinet of Lot 1425.

As was to be expected some smaller and indifferent (and one unglazed) cabinets went for rather lesser amounts, 30/- per drawer although another rather older but good mahogany cabinet of twenty drawers made £64.

The evidence from this sale confirms what I have suspected for some time. Entomologists interested in British insects now collect or breed their own specimens and keep their cheque books for good books and apparatus.

CORRECTIONS.—In the article on *Puliciphora* (*antea* 271) owing to the late arrival of corrected proof from the author, the following corrections must be notified:

First line of title for Parisitising read Parasitising. Ninth line of text for *Schistocera* read *Schistocerca*. Eighth line of references for *eros* read *erosa*.

Notes and Observations

HAPALOTIS VENUSTULA HÜBN. (LEP. NOCTUIDAE) IN KENT.—Five specimens of this very local moth were attracted to mercury vapour light in my garden, which adjoins Joyden's Wood, Bexley, on 30th June (2), 3rd July and 5th July (2) 1970. Three previous records for the county are listed by Chalmers-Hunt in his Lep. of Kent, Vol. **2**: 240. An interesting feature of these is that all three are fairly recent—Westerham in 1937, Otford in 1956 and Willesborough (E. Kent) in 1958.—B. K. WEST, 36 Briar Road, Bexley, Kent. 10.xi.1970.

L265 TELPHUSA PROXIMELLA HÜBN. (LEP. GELECHIIDAE) ON ALDER.—I first discovered larvae of this species near to Par Harbour in August 1965, feeding in folded leaves and shoots of alder (*Alnus glutinosa*), the resulting moths emerging in May 1966. Since then larvae have occurred each year in August and September on the alders in the same locality, even though many of these trees have been felled and destroyed within the past three years to make way for a new road. The published British literature gives the food plant of *proximella* as birch, but my searches on birch trees in and around Par and St. Austell have so far proved to be negative for this species. Furthermore, I have failed to find the larvae in any other part of Cornwall where I have sought it. I would be very interested to hear of any other records of *proximella* found feeding on alder, particularly if birch trees are also in the vicinity. I understand that alder is given as a food plant by continental authors.—JOHN L. GREGORY, 17 Grove Road, St. Austell, Cornwall. 29.x.1970.

L515 GRAPHOLITA MOLESTA BUSK (LEP. OLETHREUTINAE). On the morning of 25th August 1970, I was busy attending to the needs of a batch of hungry caterpillars when a shout from the kitchen brought me rushing in, to find my mother-in-law busy de-stoning some locally purchased peaches. She had found a pink larva in the middle of one of the peaches. As the larva appeared to be almost full grown, I placed it, together with a piece of peach and some crumpled paper in one of my screw-top jars. A few days later, the cocoon was spun in the folds of the paper. On inspecting my pupa jars on about 5th October, I found that the moth had just emerged—a perfect female specimen of *Grapholita molesta* Busk, although rather darker than Dr. Bradley's photograph in *Ent. Gaz.*, **10**, No. 2.—JOHN L. GREGORY, 17 Grove Road, St. Austell, Cornwall. 29.x.1970.

ADELA CROESELLA (SCOP.) (LEP. INCURVARIAIDAE).—Further to the note by Mr J. M. Chalmers-Hunt (*antea* 244) I have taken two specimens of this moth at mercury vapour light between Chepstow and Tintern Abbey in the Wye Valley. They were taken at different places, one on 18th June 1965, the other on 10th June 1966. I have also taken the moth flying in sunshine in Shropshire.

I am inclined to agree with Mr Chalmers-Hunt that the specimens taken at light had been disturbed, possibly by the bright light being near to their resting places. I do not have access to any literature containing Monmouthshire records, so I do not know whether or not any other specimens have been taken.—L. PRICE, Kingscourt, Stroud, Glos. 27.x.1970.

DASYPOLIA TEMPLI THUNB. IN SURREY.—On 29th October 1970 my wife (as usual on these dark mornings) examined the contents of the mercury vapour light trap in the garden. There were 54 insects including an interesting male dark form of *Colotois pennaria* L., and a big surprise—a male *Dasypolia templi* Thunb., the brindled ochre, in perfect condition. In southern England this species is entirely coastal, and I know of no records from this area.—J. A. C. GREENWOOD, The Thatches, Forest Road, Pyrford, Woking, Surrey. 5.xi.1970.

TELPHUSA ALBURNELLA ZELLER IN KENT.—I took a single specimen of this relatively rare moth at rest on a wooden fence at West Wickham, on 26th July 1970. So far as I am aware, this is the first record of *T. alburnella* for Kent. I was able to identify the specimen at once from Mr E. S. Bradford's excellent figure in Col. Emmet's article "Collecting Notes—May 1970" (in *Bull. Amat. ent. Soc.*, **29** (287): 34-36). This article includes an interesting review of the history of *alburnella* in this country since its discovery by A. Smith at Strensall, Yorkshire, in 1927.—J. M. CHALMERS-HUNT, St Teresa, Hardcourts Close, West Wickham, Kent. 11.xi.1970.

SIUM LATIFOLIUM L. AS A FOODPLANT OF DEPRESSARIA ULTIMELLA STT.—In a recent article "Notes on *Depressaria ultimella* Stainton" (*antea*: 14) Mr S. Wakely recorded that when we were collecting together near Appledore, Kent, on the 11th of August 1968 we found larvae which he recognized as *Depressaria ultimella* Stt. feeding in the stems of *Sium latifolium* L., a foodplant hitherto unrecorded in this country. On that occasion we found only three larvae between us and neither of us bred the moth.

On the 21st of August this year, I revisited the spot and collected three pupae and eleven larvae in the stems of this plant. One larva got crushed on the way home (Mr Wakely is of the opinion that both the larva and the pupa of this species are particularly tender), but from the remaining thirteen I reared eleven *ultimella* and two hymenopterous parasites which emerged from the pupae of their host. These have been identified by Mr G. J. Kerrich of the British Museum (Natural History) as *Phaeogenes* sp. Both are males, and I am told that specific determination is based on characters displayed by the female insect.

Mr Wakely's record for *D. ultimella* feeding on *Sium latifolium* in the British Isles is therefore confirmed.—A. M. EMMET, Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 31.x.1970.

PARORNIX SCOTICELLA STAINTON ON APPLE.—In July 1969 I collected apple leaves with folded edges in order to breed *Callisto denticulella* Thunb. (*guttea* Haw.). From this material an *Ornix* appeared on the 15th July, but thinking that *anglicella* Staint. or *torquilella* Zell., which breed close by, might have strayed on to the apple for pupation, I put the moth on one side and forgot about it.

Since I had reared many parasites but only three *denticulella*, I repeated the programme this summer. The same thing happened: an *Ornix* emerged on the 20th of July, leaving its pupa-case projecting from a fold in an apple leaf. I submitted the two to Dr J. D. Bradley of the British Museum (Natural History) who determined them as *Parornix scoticella* Staint. (*scotinella* misspelling).

It is not altogether surprising to find a species usually associated with rowan feeding on apple. Among the micro-lepidoptera, *Phyllonorycter* (*Lithocolletis*) *corylifoliella* Haw., *Lyonetia clerckella* L. and *Stigmella aeneella* Hein. are species which spring to mind as occurring on both these foodplants. Rowan is not a native of our north Essex woods, but there are trees scattered in gardens throughout Saffron Walden, the nearest being just across the road from our apple trees.

Both Ford and Meyrick give *scoticella* as univoltine, the larva feeding in August-September and the moth flying in May-June. My experience of a July emergence of moths suggests that the species is bivoltine, like most other members of the group. L. T. Ford says that *scoticella* pupates in the folded edge of *fallen* leaves. I cannot be sure whether my examples pupated before or after I picked the leaves, but from the short lapse of time between gathering and the emergence of this moth, I suspect the former. If this is so, it may indicate that the two generations behave differently in this respect.—A. M. EMMET, Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 1.xi.1970.

Current Notes

VERRALL SUPPER.—Members of the Verrall Association of Entomologists may like to know that the *next* meeting will be held in the **Senior Common Room, College Block, Imperial College, South Kensington,** on Wednesday, 3rd March 1971, the Coventry Street accommodation being no longer available. Invitations will be posted about the middle of January. — N. D. RILEY.

Current Literature

An Ant is Born by **Harald Doering** and **Jo Mary McCormick,** 96 pp. The Oak Tree Press, 25/-.

This little book forms part of the Sterling Nature Series, and contains a collection of close-up photographs showing various aspects of ant life, mostly magnified from four to eight times natural size. The text is divided under various headings; the birth of an ant, the daily life of an ant, foraging food, mutual feeding, a great variety of ants, ant "cattle", where ants live, and guests and boarders.

Under these headings, many jottings of interesting facts about ants from many parts of the world are assembled. These facts are a little too scattered to be of use scientifically, and are obviously written to interest the uncommitted nature lover.

There is one small error on p. 78 where a Hemipteron is described as a beetle.

The book is well printed on good art paper, and is bound in cloth printed in colour with ant photographs.—S.N.A.J.

Welsh Wildlife in Trust, edited by **W. S. Lacey,** xiv+185 pp.+12 pl. North Wales Naturalists' Trust, 18/-+2/- postage with paper cover, 25/-+3/- postage with hard back.

This interesting volume carries 22 papers by various authors, illustrated by photographs, line drawings, diagrams and maps. After these papers there are three appendices: I. listing participating organisations and also supporting organisations and individuals; II. listing the addresses of organisations with conservation interests in Wales, and III. is a key to the folding map on the inside back cover, showing the location of Nature Reserves, Wild Life Refuges, Bird Sanctuaries and Bird Observatories in Wales. Chapter I. by R. Goodier and W. S. Lacey by way of an introduction describes the environments of Wales, and stresses the need for their conservation, which is followed by Chapter II. in which Dillwyn Miles gives a short history of the Naturalists' Trust movement in Wales, and the details given show how well the organisation of these trusts is progressing. The 94 Nature Reserves and various places of natural beauty which are listed, bear witness to the activity of members of this Trust. Chapters III, IV and V extend the account of the various organisations and their parts in the conservation of natural history interest in Wales.

Chapter VI, by A. T. Sawyer, is on the expansion of education into the countryside, while R. G. Gibbs writes on the role of local working parties which do so much to help in the conservation of their local sites. In Chapter VIII, P. W. Richards airs the problem of footpaths and nature conservation, pointing out the damage done to flora by the trampling of visitors ,and the need for proper paths well sited to avoid steep gradients and too wide deviations. Chapter IX by F. C. Best gives an account of the effects of forestry on wild life and vegetation, and he advocates helping landowners to establish spinneys of hardwood trees to replace the fast disappearing hedges. M. Porter writes on nature conservation in Breconshire and Col. H. Morrey Salmon writes on the history of the preservation of the red kites of Wales, with a photograph of the bird on its nest. R. M. Lockley gives an account of the Welsh island reserves, and E. I. S. Bees an account of the shores and shallow seas around Wales. K. C. Walton writes on the polecat, and C. W. Walker on the otter in Radnorshire.

H. N. Michaelis gives a review of the butterflies of North Wales with a plate of photographs of four species. He points out the danger of extinction of some species and sets out causes for the obvious decline in numbers. He then goes on to give an account of each of the families and subfamilies represented. This interesting account is followed by a note on the marsh gentian (*Gentiana pneumonanthe*) and the pale heath violet (*Viola lactea*) by R. H. Roberts and W. S. Lacey. C. A. Sinker contri-

butes a geological article on quarrying and conservation at Craig Breidden, in Montgomeryshire. An article by Mrs I. M. Vaughan on Towyn Burrows includes notes on the fungi by S. N. Tallowin, and on the insect life by D .Davies. R. H. S. Hatton and H. J. Hambury write on the problems of a naturalists' trust in industrial Wales, with a plate illustrating four rare plants. These problems include such subtitles as amenity and car parks, industry and road transport, recreation and a Nature Reserve, A City's Rubbish Tips and the Flowering Bush (*Butomus umbellatus*), Is everyone against the Badger?, A rarity becomes a Pest, citing the fringed water lily (*Nymphoides peltatum*) which has multiplied too well and has choked Broad Pool, Can Oyster-Catchers and Cockle Fishers live together, and the disasterous effects of an adventitive Plant Species, citing the sea buckthorn (*Hippophäe rhamnoides*).

Chapter XXI takes the Duke of Edinburgh's remarks on the Lower Swansea Valley as a text for the conservationist, and finally P. Schofield gives the Proceedings of the First Conference on Conservation in Wales, organised by the Naturalists' Trusts in Wales and the Nature Conservancy.

The whole is well indexed. The book is well printed on good paper and should have a strong appeal for naturalists of all grades.—S.N.A.J.

Chromosome-Numbers and Relationships of Various Pieris napi and bryoniae Taxons.

In *Bioloski Glasnik*, **21**: 95-136, Dr Z. Lorković summarises and discusses his findings on *Pieris* chromosome-numbers. *Pieris napi* from Zagreb and three other Jugoslav localities, Calabria, Corsica, Seine-et-Oise, England, Ireland, Finland and Moscow invariably had the accepted n=25, as did populations from New Hampshire, Colorado and Oregon. *Bryoniae* from the Julian Alps, Karawanken, Upper Austria, Switzerland and the western Alps very rarely had n=25; the number varied upwards from 26-27, with usually a number of supernumerary univalent m-chromosomes in addition.

A Bosnian population, *balcana* Lork., although of *P. napi meridionalis* appearance, proved to have n=26-28, again often with one or two supernumeraries. Moreover these butterflies paired readily with typical *bryoniae*, but not with typical *napi*. The *bryoniae* karyotype+*meridionalis* phenotype could not be explained by backcrossing of *bryoniae* to *napi*, since such backcrosses obtained experimentally had n=25.

Balcana's "suffusa" underside hindwing was reminiscent of that in *pseudorapae* Vty. of Anatolia and Syria. The karyotype of the latter is unknown, but a "*pseudorapae*" from the N. Caucasus (ssp. *balcarica* W. & N.) had a less pronounced chromosome variation: n=25, sometimes 26, plus 1-3 supernumeraries. On the other hand *balcarica* was not reproductively isolated from *P. napi napi* and must therefore be considered a subspecies of *napi*.

The variable androconial scales of both *balcana* and *balcarica* are illustrated. The taxonomic value of androconia is discussed, and held to be limited at the subspecies-species level. Nor is the karyotype always a reliable criterion, as the example of *balcarica* shows.

The paper is in German with an English summary. It is of course essential reading for anyone at all concerned with these problems.—S.R.B.

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EXCHANGES AND WANTS

Wanted to Purchase.—Entomologist's Monthly Magazine. A run of this periodical including the first thirty volumes.—*J. M. Chalmers-Hunt*, 1 Hardcourts Close, West Wickham, Kent.

Wanted Urgently, for a study of migration, any unpublished records of the following lepidoptera outside their normal areas of residence: *Eurois occulta* L. (Great Brocade), *Enargia paleacea* Esp. (Angle-striped Sallow), *Lithomia solidaginis* Hübn. (Golden-rod Brindle), *Plusia interrogationis* L. (Scarce Silver Y), *Itame brunneata* Thnb. (Rannoch Looper). Exact dates, sex, and circumstances of capture wherever possible.—*R. F. Bretherton*, Folly Hill, Birtley Green, Bramley, Surrey.

Urgently Wanted for laboratory experiments, larvae (or pupae later) of *Biston strataria.*—*Dr H. B. D. Kettlewell*, Dept. Zoology, Parks Road, Oxford.

For Sale or Exchange.—Butterflies and moths. Many species from Africa, Madagascar and other countries, also Europe. Sometimes livestock. List on request by sending International Postal Coupon.—*Robert Keiser*, Frederick Van Eeden Plein 3, B-2050 Antwerp, Belgium.

SEITZ Bombyces (all regions). — Wanted good second-hand bound volumes, Text and Plates. Full details including price asked to *The Butterfly Centre*, "Plummer", Tenterden, Kent.

Urgently Wanted.—SEITZ Vols. 1 and 2 with all supplements; Vols. 5, 6, 9, 10, 13 and 14, either bound or unbound.—Reply Box No. 360, *The Entomologist's Record*, 59 Gurney Court Road, St. Albans, Hertfordshire.

Wanted to Purchase.—Large or small collections of Tropical Butterflies. —Write to *C. P. Sturgess-Lief*, Gymindge Brook Cottage, Sellinge, Nr. Ashford, Kent.

For Sale or Exchange some Asian Lepidoptera and Coleoptera surplus to personal requirements. Mainly Malaysian and Japanese origin. AI Quality in papers. Please write to *G. Hanrahan*, 20 Riverbank Drive, Marlow, Bucks.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION
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