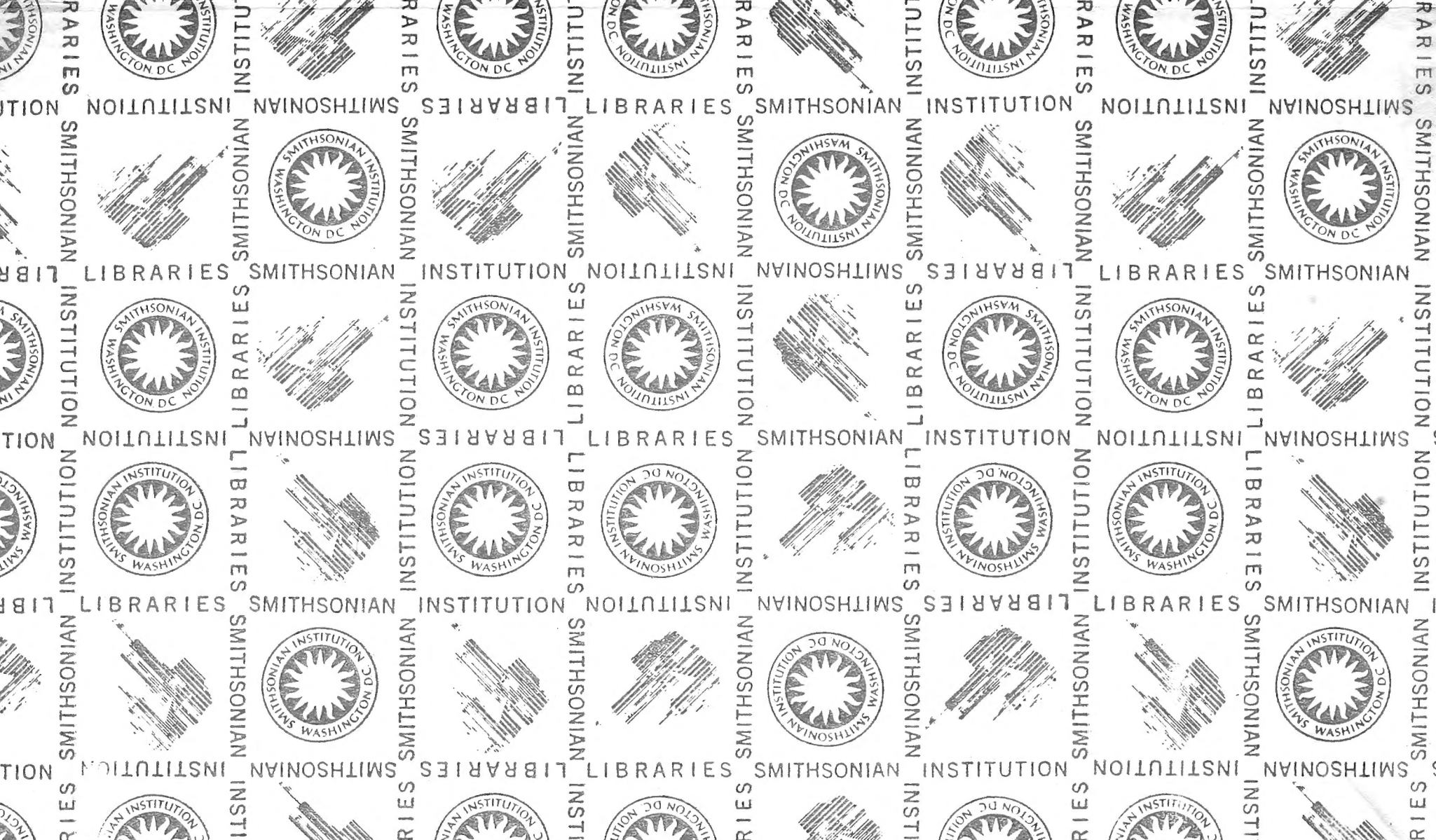
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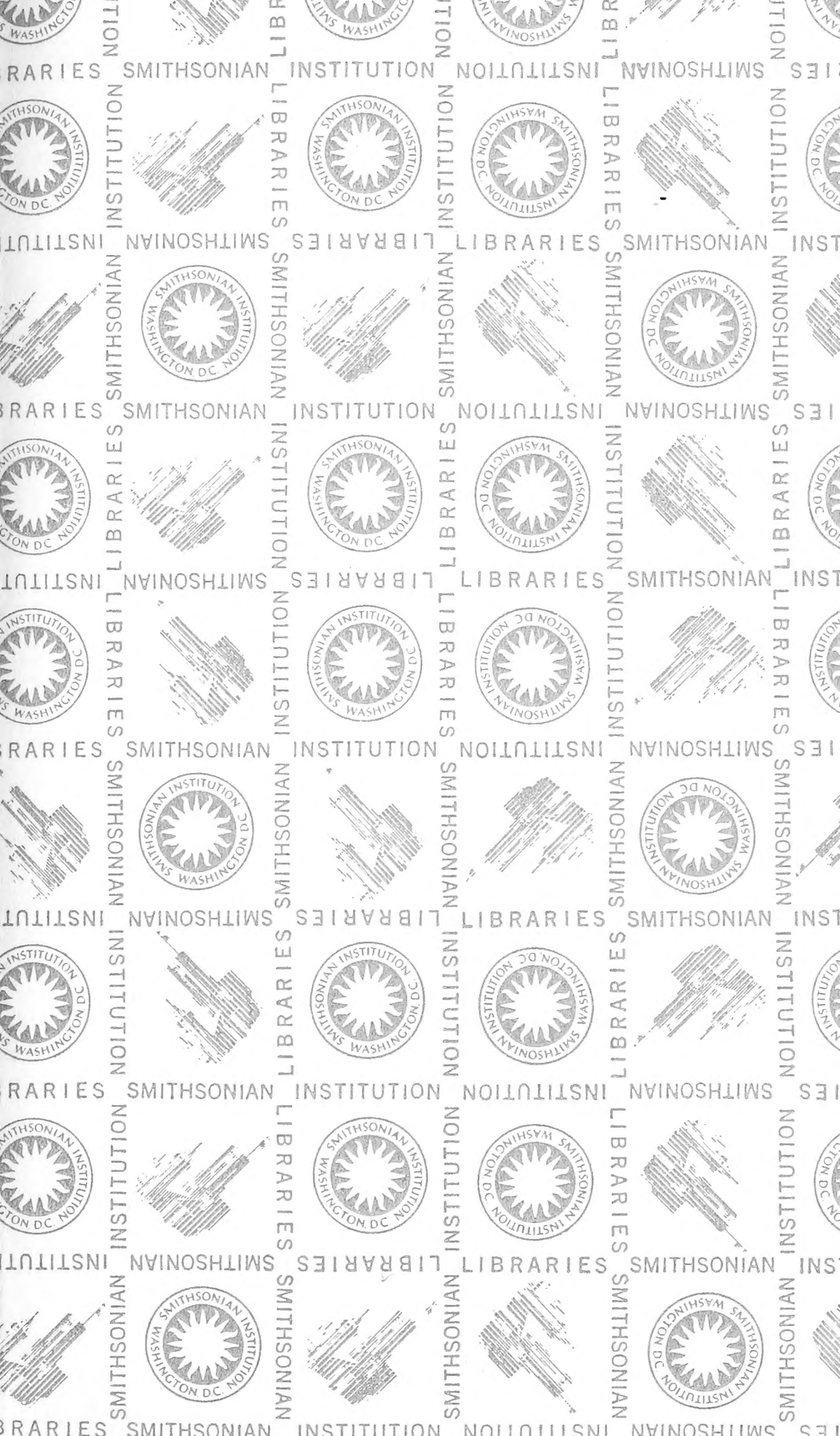
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Microlepidoptera found near the Estuary of the River Conway, North Wales, 1964/68

By H. N. Michaelis

The Conway flows northwards to enter the sea between the Great Orme's Head on the east and Penmaenbach headland on the west. Though the river is tidal for about ten miles, these notes relate to the valley between the estuary and Glan Conway on the east bank and a point about one mile south of Benarth on the west bank. Much of the river divides the Ordovician rocks of Snowdonia from the Silurian rock of Denbighshire though the formation differs on the Creuddyn peninsula, i.e., the Llandudno-Deganwy area. The latter is more complex being comprised of the carboniferous limestone of the Great Orme, another hilly limestone area comprising Marl, Gloddaeth, Pydew and Penrhyn-side and a hilly outcrop of Ordovician at Deganwy. There are coastal sandhills at the mouth of the estuary at Deganwy on the east and at Conway Morfa on the west. There is a fine saltmarsh stretching from Llandudno Junction to Glan Conway and a smaller one near Conway, these are often covered at high tide and have a rich flora though there is an increasing encroachment of *Spartina* grass. The rising ground on both banks south of Llandudno Junction and Conway is mainly agricultural with a few small mixed woods in which oak predominates. The major and minor roads are lined by mixed hedges, often grown on raised banks, of hazel, scrub, oak, sloe, hawthorn, spindle, elm, holly, rose, etc., which carry a varied flora on the hedge banks. Conway Mountain and Penmaenbach, which form a background to Conway Morfa, are foothills of the Carneddau range and have mainly a moorland flora and fauna so species from these upland areas are omitted. Instead of listing all species seen during 1964/1968, a few of the more interesting have been selected and short notes on varied habitats are included. Very little work has been done on the Welsh "Micros" in recent years and many more species will be found than I have so far observed.

Pterophorus spilodactylus Curt. This plume moth, which otherwise has a south of England distribution, has long been known to occur on the Creuddyn. The larva feeds on the leaves of *Marrubium vulgare* L. (White Horehound) and is full-fed by early July when it pupates on the upper side of a leaf, usually on the midrib. It occurs in four separate localities which have also historical and botanical interest. In "Weeds and Aliens", Sir Edward Salisbury suggests that the presence of White Horehound on the Great Orme was due to cultivation by the monks of the now ruined Gogarth Abbey as a remedy for bronchial afflictions. There are two stations for the plant on the inland limestone, namely at Gloddaeth Hall which was built in the 17th century and near Llanrhos Church, which can be traced back to the 6th century. The fourth locality is on the two Ordovician hills on which stand the ruined castle of Deganwy, one of the important strongpoints of mediaeval north Wales. The original castle dates from the 6th century and the site was used as a fortress until the 13th century when it was destroyed by Llewelyn the Great. The moth is established in each of these localities being more widespread on the Orme. It is interesting to speculate whether the moth was originally native or if it was brought with the plant from southern Britain. *Marrubium* also grows on the Little Orme's Head but so far I

have not seen the moth there. The only other North Wales record is a moth found in a friend's car in Anglesey and enquiry showed that it could have been transported from the Great Orme.

Cacoecimorpha pronbmana Hübn. A *Tortricid*, originally found on the coast of southern England in the early part of this century, which has spread northward to become established in the home counties. The larva feeds on a variety of shrubs and plants including *Euonymous*, Privet, Rose and a number of garden plants. In 1956, a single moth was found by the late C. M. Jones in a nursery garden on Wirral, Cheshire, and both he and I thought it might have been imported with plants from southern England. In September 1965, a female came to light in my garden at Glan Conway; in May 1967, several larvae were found in spun shoots of *Euonymus* in a Deganwy car park and later bred; in September 1967, two cocoons were found in my garden and several moths were seen flying among roses; recently, larvae were found and moths bred from carnations from a Llandudno garden. The appearance in different localities suggests the insect has been established for a number of years.

Clepsis rurinana L. This local *Tortricid* was included by Gresley-Jones in his list of lepidoptera from Creuddyn, 1910. When compiling a list of North Wales *Tortricoidea* in 1953, I had doubt as to the authenticity of the original record as all specimens produced as this species proved to be pale or worn *Pandemis cerasana* L. A specimen found on the Great Orme in 1964 and a few records from Glan Conway in 1965/68 confirm the original record. A few larvae were found on roses in my garden.

Clavigesta purdeyi Durr. This species on pine continues to spread. Though uninformed of its status in the Midlands and Yorkshire, I have authentic records from Lancashire and Cheshire, 1950/1963. Two worn specimens were taken at light at Glan Conway and presumably came from a nearby screen of *Pinus sylvestris* L. (Scots Pine).

Coleophora serpylletorum Hering. New to the British Isles, this moth was found by the late Robin Mere, E. C. Pelham-Clinton and myself on the Great Orme in 1964. In May 1966, a search by E. C. P.-C. and myself produced larval cases on *Thymus drucei* Ronn., (Common Wild Thyme). The erect dark brown case, built from leaves of Thyme, is usually found on the underside of a leaf towards the tip of a spray where a few brown leaves may indicate its presence. The larva, which ceases to feed about mid-June, is best reared on a potted plant kept out-of-doors. The first and last dates on which the moth has been seen were 3rd July and 15th August. The species is common on the Orme but, so far, has not been found on the inland limestone. It is not easily disturbed during the day and occasionally a few may be seen at sunset resting on grass or Thyme.

Other species will be discussed under localities or habitats and it seems proper to begin with the Great Orme which is the most prominent feature of the estuary. This cape of carboniferous limestone, 610 feet high, is about five miles in circumference and, though well cropped by sheep and a fine herd of feral goats, the flora and insect fauna is very rich. In addition to species already mentioned, the following are of interest. *Mecyna asinalis* Hübner has long been known to occur where *Rubia peregrina* L (Madder) grows and though local, the window feeding habit of the larva on the larger leaves is easily seen; it also occurs on the inland limestone at Pydew. *Pterophorus tetradactylus* L. is common

among Thyme growing on steep slopes and is also on the limestone at Pabo and Pydew. There is a strong flight at sunrise in July. *Ancylis comptana* Frol., is found in similar situations in May and is not easy to see as it flies just above the herbage. Seedheads of *Carlina vulgaris* L. (Carline Thistle) gathered in autumn and winter contained larvae of *Metzneria carlinella* Staint. The larva hibernates and later pupates in the seedhead and the centre of an infested head is slightly raised above the surrounding seeds. The seedheads must be kept out-of-doors until June to ensure the emergence of the moth. Heads from other parts of the Creuddyn so far examined contain larvae of a *Trypetid* only. *Elachista subocellea* Steph. occurs only on the Orme while the commoner *E. triatomea* Haw., occurs on limestone throughout. *Coleophora lixella* Zell., which feeds in the early larval stages on Thyme and later on grasses, is uncommon. The thin black cases of *Coleophora albitarsella* Zell., are local and a pale blotch mine in May on leaves of *Origanum vulgare* L. (Marjoram) usually indicates a larva on the underside. Large brown blotch mines on leaves of *Marrubium vulgare* L. (Horehound) in May and June indicate that the broad hairy flattish case of *C. lineolea* Staint., (*crocogramma* Zell.) will be on the underside. *Pyrausta cingulata* L., occurs sparingly here and on other local limestone formations. As *Salvia* (Sage) is infrequent, presumably it has other foodplants.

The inland limestone. The first of the two ridges which are divided by a broad valley, rises to about 250 feet and is comprised of a large area of cropped turf and the wooded hills of Gloddaeth and Bryn Maelgwyn. The more southerly ridge rising to 300 feet has uncropped slopes with scrub oak, hazel, whitebeam, sloe, juniper, ash, yew, etc., with an expanse of limestone pavement at Pydew, a fine wooded hill at Marl, disused quarries and a treeless hill with a most interesting flora at Pabo. Much the greater part of collecting has been done on the southerly ridge. *Hypochalcia ahenella* Schiff., is uncommon in the Pabo quarries. Larval cases of *Thiotricha subocellea* Steph., hidden among seedheads of *Origanum* (Marjoram) are local at Pabo though the plant is plentiful. The heads are best gathered in March and should be kept exposed to the weather until June to obtain good breeding results, emergence dates are from 29th June to 21st July. The plume moths *Oidaematophorous osteodactylus* Zell., and *Adaina microdactylus* Hübn., both occur at Marl and Pydew; the former among *Solidago* (Golden-rod) and larvae and pupae of the latter in a swelling in the upper part of the stem of *Eupatorium cannabium* L., (Hemp Agrimony). The stems of the *Eupatorium* should be gathered in April when the swelling and small exit hole are easily seen. The long mines of *Elachista cinereopunctella* Haw., are plentiful in the leaves of *Carex flacca* Schreb., from March to May and the reddish pupa is later found attached to the mid-vein on the upperside of a leaf of the *Carex*; mined leaves are more common where the *Carex* grows in the shade of trees or bushes. Among other *Elachista* are *freyerella* Hübn., (*nigrella* Haw.) and *subnigrella* Doug., the last, which is a typical limestone species is abundant. A sunrise visit in early July with E. C. Pelham-Clinton to Pydew produced large numbers of a species which I believe to be **E. dispunctella* Dup. A single specimen of *Scythris fletcherella* Durr., was taken among *Helianthemum* (Common Rockrose) on 14th

*A letter from E.C.P-C. indicates that this is a species other than *E. dispunctella.*

July 1965 and a few *Stomopteryx taeniolella* Zell., occurred among *Lotus* and *Anthyllis* in mid-July 1968. Larvae of *Zellaria hepariella* Staint., are fairly common in June spun in the upper leaves of stunted Ash bushes growing in a limestone pavement and, as is usual, the moths may be disturbed from Juniper and Yew later in the year. Birch is local throughout but two small areas on the limestone produced leaves mined by *Caloptilia betulicola* Hering, *Lithocolletis ulmifoliella* Hübn., and *Parornix betulae* Staint. Small areas of *Calluna vulgaris* L., (Ling) growing in leached ground supported *Neofaculta betulea* Haw. *Grapholita dorsana* F., is common where *Lathyrus* and *Vicia* grows and is also common on the sandhills and rough ground throughout.

Sandhills. On either side of the river is a narrow strip of sandhills each with golf links immediately behind. Except at West Shore, Llandudno, there is little high dune and the vegetation on the east bank is richer and more varied than on Conway Morfa owing to shelter from the north and east provided by the Great Orme and Deganwy hills. A few specimens of *Chionodes fumatella* Dougl., were seen in July 1964 on the Morfa but have not occurred again. *Notocelia incarnatana* Hübn., is common among *Rosa pimpinellifolia* L., (Burnet Rose) on both banks of the river. An unusual occurrence is *Blastobasis lignea* Wals., at Deganwy among Gorse and Sea Buckthorn; the larva feeds on fallen leaves and other decaying matter and I do not recall previous records from sandhills. *Acrolepia granitella* Treits., often rests on Ragwort flowers in August at Deganwy and as *Pulicaria dysenterica* L. (Fleabane) does not grow nearby, it is presumed there is an alternative unknown foodplant. A few blotch mines in leaves of *Atriplex hastata* L. (Hastate Atriplex) from Deganwy and Conway proved disappointing for only *Scrobipala seminella* Pierce were bred. While many of the common sandhill species are present, further collecting, especially on Conway Morfa, is desirable.

Saltmarshes. The main saltmarsh of the eastern bank is at its widest at Llandudno Junction becoming narrower up-river until it is almost marginal at Glan Conway. The railway to Betws-y-Coed which follows the east bank of the river, divides the littoral from the inland habitats. *Phalonidia affinitana* Dougl., and *P. griseana* Haw., are common among their respective foodplants, *Aster tripolium* L., (Sea Aster) and *Triglochin* (Sea Arrow-grass). In Autumn, seedheads of *Daucus carota* L., (Wild Carrot) contain many larvae of *Laspeyresia gallicana* Guen., and in June, a few *Depressaria* larvae were found in rolled leaves but unfortunately not bred. Stems and roots of *Artemesia vulgaris* L. (Mugwort) of the previous year's growth gathered in the spring were occasionally mined by larvae of *Epiblema foenella* L. Full grown larvae of *Microsetia stipella* Hübn., mine leaves of *Atriplex hastata* and *A. littoralis* L. (Grass-leaved Orache) in September. *Scrobipalpa plantaginella* is common from June to August and can be bred from roots of *Plantago maritima* L. (Sea Plantain). Larvae of *Scrobipalpa seminella* Pierce are abundant on seeds of *Beta maritima* L. (Sea Beet) and species of *Atriplex* and occasionally mine the leaves of the latter. In July and August, the moths fly abundantly at sunset and often settle on the flowers of Chamomile growing nearby. Several species of *Coleophora* have been noted which appear to have a wider distribution than has previously been recorded. *Coleophora adspersella* Ben., first recorded by Col. C. W. Mackworth-Praed at Burley, Hants., in 1957, is plentiful among *Atriplex littoralis* and *A. hastata*

from mid-June to mid-July and the cylindrical larval cases, typical of several *Atriplex Coleophora*, are common on the seeds of both plants in September and October. The plants grow just above the average high tide mark so it appears that immersion by higher than average tides and river flood does not affect the hibernating larvae to any great extent. The collected cases were wintered out of doors and examination indicates that pupation takes place in May. Occasional specimens of *C. sternipennella* Zett., and *C. versurella* Ben., were netted among *Artemisia vulgaris* L. (Mugwort) in 1965 but so far no cases have been found. Both species are recorded only from southern England. Larval cases of *C. obtusella* Staint., are easily obtained by gathering heads of *Juncus maritimus* Lam., in April and May though individual cases enclosed in a dead flower are very hard to find. It is also locally common in Anglesey and must have a much wider distribution than shown in Meyrick's Handbook, i.e., "Kent to Devon and Lincoln, local"; the late L. T. Ford found larvae in North Lancashire in 1940. *C. adjunctella* Hodg., is taken occasionally among a *Juncus*, possibly *gerardii* Lois. White silken cases of *C. glaucicolella* Wood are uncommon here on heads of *Juncus maritimus* but are fairly common on the west coast of Anglesey. The dark brown, almost cylindrical cases of *C. virgaureae* Staint., are common near Glan Conway in autumn on heads of *Aster tripolium* and prefer this plant to *Solidago virgaurea* L. (Golden Rod) which grows on the nearby railway bank. In fact, larvae are scarce on *Solidago* in the area. I have not taken *C. asteris* Hodgk. which also feeds on *A. tripolium* in either North Wales or Cheshire for specimens bred from Wirral, Cheshire, proved to be *C. virgaureae*. I am indebted to J. D. Bradley and R. W. Uffen for identifying or checking my identifications of the above mentioned Coleophora. In their early stages, larvae of *Bucculatrix maritima* Staint., mine the leaves of *Aster*, changing to "window feeding" in the last stage, during June, August and September. The white shuttle-shaped cocoons, which often produce a *Braconid* parasite, are attached to grasses adjacent to the food plant.

The rising ground south of Conway and Deganwy. The terrain in the neighbourhood of Glan Conway is close to my home and has been covered more than other parts of the district. A m.v. trap was used from time to time in my garden over the past four years. A long list of species has been recorded of which only a small sample is mentioned below. The following were recorded in the m.v. trap: *Scoparia cembrella* L., *Hypocholacia ahenella* Schiff., *Phycita roborella* Schiff., *Ephestia parasitella unicorella* Staud. (*woodiella* R. & T.), *Homoeosoma cretacella* Rossl., *Eurhodope marmorea* Haw., *E. advenella* Zinck., *Epagoge grotiana* F., *Laspeyresia aurana* F., *L. splendana* Hübn., *Grapholita dorsana* F., *Eucosma tripoliana* Barr., *E. fulvana* Steph., *Zeirapheria ratzeburgiana* Sax., *Lobesia littoralis* Westw., and *Apotomis semifasciana* Haw. The most interesting of the above are the two specimens of the *Ephestia* taken in July 1968, which feeds on dry vegetable refuse including dry berries and dead stems of ivy. The common *Stellaria holostea* L. (Stitchwort) is the food of the following: *Caryocolum tricolorellum* Haw., in mined leaves and later in spun shoots in March and April; *C. maculeum* Haw., feeds in spun flowers and seeds in May and June; *Coleophora olivaceella* Staint., is occasional on the underside of leaves from March to May indicated by a white blotch mine; in June 1968, a single *C. striati-*

pennella Tengst., (apicella Staint.) was taken. *Coleophora spissicornis* Haw., netted in a lane, caused a fruitless search later for the case on *Trifolium arvense* L. (Hare's-foot Clover). Likewise a search for the mine in leaves of *Circaea lutetiana* L. (Enchanter's Nightshade) following the capture of a single hibernated *Anybia epilobiella* Roem., was unsuccessful. Among the *Oecophoridae, Schiffermuelleria tripuncta* Haw., and *Borkhausenia tinctella* Hübn., both associated with dead wood, occur in old hedgerows. *Argyresthia glaucinella* Zell., is scarce in the oakwoods of the Caernarvonshire bank and only a few patches of reddish brown bark indicating larval infestation were found. The larva of *A. semifusca* Haw., is found in May in short drooping shoots of hawthorn as is *A. mendica* Haw., in shoots of *Prunus spinosa* L., (Sloe) in April and May. The genus *Lithocolletis* is well represented by L. *klemannella* F., and L. *froelichiella* Zell. in mined leaves of *Alnus; L. nicelli* Staint., in *Corylus; L. geniculella Rag.*, in sycamore; *L. heegeriella* Zell., and *L. lautella* Zell., in *Quercus.* A form of *L. lautella* having black ground colour on the forewings similar to one which occurs in Scotland, mines the leaves of the hedgerow oak but is uncommon. *Pseudoswammerdamia combinella* Hübn., is common among *Prunus spinosa* L., and *Yponomeuta cognatella* Hübn., is common where *Euonymus europaeus* L. (Spindle) grows in hedges. Of the *Tineidae,* the most noteworthy are: *Infurcitinea argentimaculella* Staint., on one mossy outcrop of rock; *Nemapogon arcella* L., from decayed wood from Hazel and Oak hedges; *Tinea trinotella* Thunb., probably from birds' nests. An unusual record for North Wales among the *Lamproniidae* is *Teichobia filicivora* Meyr., which feeds on the underside of fern fronds; one was taken in a damp lane and the other at light. Mines of *Nepticulidae,* usually vacated, have been noted in leaves of *Quercus, Ulmus, Prunus spinosa, Salix, Rubus, Crataegus, Rosa, Fagus* and *Corylus.* The species bred so far are: *Stigmella rosella* Schrank, *S. oxycanthella* Staint., *Nepticula aurella* Staint., *N. marginicolla* Staint., and possibly *N. plagicolella* Staint.

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PLUSIA NI HÜBN. (LEP. PLUSIIDAE) BREEDING IN ENGLAND.—Whilst on holiday in Dawlish, Devon, I found a Plusiid larva sitting on sea rocket (*Cakile maritima* Scop.) on 25th August, 1968. Two days later the larva spun up and a fine male *Plusia ni* Hübn. emerged on 19th September.

I understand that Mr, Terry Dillon also found a larva a week earlier than mine, at Teignmouth, about three miles from the spot where I found mine. He also bred a moth about a month later.

These two records would seem to be the first of *P. ni* breeding in the wild in this country.—D. O'KEEFE, 29 Arcadian Avenue, Bexley, Kent. 13.xi.1968.

Maniola (Epinephele) jurtina (L.) (Lep. Satyridae) and its Forms

By George Thomson

Introduction

I vividly remember the summer of 1958 as it produced an abundance of *Maniola jurtina* L. in South Perthshire. Whether this profusion was purely a local phenomonon or more widespread I have not been able to find out, but for something like two weeks the insects swarmed the fields in a park near Dunblane and in that period I collected the butterflies, often well into the evening. On examination I was very surprised to notice that a number of specimens resembled the sub-species *splendida* B. White of North West Scotland. A small number of specimens was sent to the British Museum (Natural History) where Mr Goodson compared the specimens with those in the British Museum collection. His conclusion was that all but two of the specimens were of the *splendida* form, though not as dark, on average, as those from some of the Western Isles. The two others he thought were intermediate, representing a cline between *splendida* and the typical *jurtina*. This same year produced a number of forms including *addenda* Mousley, *fracta* Zweigelt and many albinos. Following years showed that the appearance of *splendida* like butterflies was not unusual in this area, but just a dozen miles to the south (between Stirling and Falkirk) the population consisted of very typical British *jurtina*. From this beginning I became involved in a study of this butterfly throughout its range and this paper is the culmination of some ten years' work.

Literature was, at first, difficult to come by, as were specimens, but this was by no means the main problem. Perhaps few butterflies have suffered so much from the name wielding entomologist. Numerous names have been used to indicate similar forms, often these being the result of excessive exposure to sunlight (a fault also evident in the naming of some varieties of *Lycaena phlaeas* L.). However, the works by Lempke (1935, Lambillionea **35**: 71-78, 101-108, 147-153, 172-185), Graves (1930 Entomologist **63**: 49-54 and 75-81 and Verity (1953, Le Farfalle diurne d'Italia vol. **5**: 260-271) made this paper possible, and I would like to pay tribute to these entomologists for their work on this butterfly. The 1935 paper has been the 'springboard' for this present work which I hope will both bring our information on *jurtina* up to date and tie up many of the loose ends which surround it. However, there are still great gaps in our knowledge, and I would like to appeal to entomologists not to neglect this interesting species, as has been the case in the past, and the fact that we still have a great deal to learn about the eastern forms of *jurtina* shows that there is still ample scope for work on this insect.

Of necessity, I have kept my descriptions as brief as possible. However, I hope that if anyone wishes to read the original descriptions or follow up the many references which I have cited he will search it out for himself. I have been careful to avoid ambiguity, and, in the case of the races, descriptions are inevitably more lengthy.

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T. D. Fearnehaugh, Prof. E. B. Ford, D. C. Hulme, Guido Lanfranco, Prof. C. H. Landroth, B. J. Lempke, Dr. M. Opheim, M. P. Peerdeman, E. C. Pelham Clinton, T. S. Robertson, Sir Robert Saundby and members of the Amateur Entomologists Society; also the British Museum (Natural History), Royal Scottish Museum and Edinburgh Central Library.

Maniola jurtina L.

(*Maniola* Schrank, 1801, Fauna Boica, 2, 1: pp. 152 and 170. Type: *jurtina* L.

Epinephile Hb., 1818, Verz. bek. Schmett. p. 59. Type: *jurtina* L. See Hemming, 1934, The Generic Names of Holarctic Butterflies, 1, 42-43.)

Synonymy:

jurtina L. 1758, Syst. Nat., X, p. 475, No. 104 (female).
janira L. 1758, loc. cit., No. 106 (male).
pamphilus Hoefn. 1766, Berl. Mag., 11, p. 39.
monoculus Goeze. 1779, Entom. Beitr., 3, 1, p. 285.
mirtyllus Fourcroy 1785, Entom. Par., 11, p. 239.
janirus Herbst. 1796, Natursyst. Schmetterl., 8, p. 168.
lemur Schrank 1801, loc cit., 11, 1, p. 175.
telmessia Zell. was considered to be a sub-species of *jurtina* but has been found to be a distinct species. (See: Le Cerf, 1912, Bull Soc. Ent. France, pp. 225 and 231.) The forms previously ascribed to *jurtina* which should now be placed with *telmessia* are—*kurdistana* Ruhl., *oreas* Le Cerf and *maniolides* Le Cerg.

Distribution

Europe (rare north of 62° in Sweden), the Canary Islands, Africa north of the Atlas Mountains, most of the Western and Central Mediterranean Islands to Western Siberia and North Persia. I have no accurate information about how far the species penetrates the Soviet Union but I am sure that Verity's 'Russia orient' does not refer to eastern U.S.S.R. It does reach Leningrad, however. It is not uniformly common throughout its range, as we might assume from current books, but pretty well abundant in most of Central Europe up to about 4,000 ft. It becomes much more local in the North West of Scotland and, in the south, it is missing from large areas of the Alps and the interior of the Iberian Peninsula. In Portugal and the Mediterranean Islands it becomes a shade-loving insect, becoming rarer as one goes eastward.

Flight Period

I had some difficulty in tracing emergence times for *jurtina* in its more distant localities. It appears, however, that in Central Europe the first males emerge about the beginning of June and only exceptionally before then. In north Scotland and Scandinavia they do not appear until early July. In these localities the flight period might be only until the end of August, though in the south and in very warm summers they are still found at the end of September. This is certainly the case on the Isles of Scilly. In Southern Europe according to Verity the butterfly can be found from May until October, but I have information that on the Canaries first males come out towards the end of March. I am indebted to Guido Lanfranco who sent me the following description of the situation in Malta:

"They (*jurtina*) have only one brood, but some come out in April-May, and others in June-July. The last group have paler female colouring than those of the first group, but there is only one brood. They are not seen in December-March normally."

This seems to indicate that the flight period on that island extends from April to November (perhaps longer in some years).

The problem of whether *jurtina* is single or double brooded has been discussed almost as much as any other aspect of the butterfly, but in spite of the unusual 'double emergence' in warm climates there appears to be little doubt about Verity's conclusion that it is univoltine. (See: Verity 1953, loc. cit., p. 265.)

Forms

The practice of naming varieties, aberrations and forms is often criticised, particularly if gradations occur between them and the 'normal' form. Corbet and Pendelbury (1956, Butterflies of the Malay Peninsula, p. 42) state:

"It is undesirable that individual varieties of this nature should receive distinctive names. . . ."

This I cannot accept. There is a great value in many of the names given to variations, even if they only facilitate brevity! However, I do think that in cases of 'normal' variation where there is a very gradual change from one extreme to another it is desirable to name only the extremes—a case in point being the extent of fulvous in *jurtina*. Lempke (1935 loc. cit.) called most named variations of *jurtina* below sub-specific status 'aberrations' though he made some small effort to distinguish 'abs.' from 'vars.' in one or two cases. In his more recent paper (1957, Tijdschr. Ent. **100**: 459-467) he 'lumped' all these under 'forms', while Verity (1953, loc. cit.) tactfully avoided the use of any of these prefixes. I do not like the term 'aberration' as it conjures up a vision of a two-headed Lepidopterous monster (which I am told should be called a 'monstrosity'—heaven forbid!) and I notice Prof. E. B. Ford avoids the term. Although there is a great deal to be said for distinguishing between 'vars.' and 'forms', I can find no criterion which would be applicable to every case. I have therefore followed Lempke's example and used the term 'form' for all varieties below sub-specific status. This clearly is a solution which leaves the situation flexible, so that later authors can make further distinctions if they so desire.

The system of nomenclature employed by Leeds (1950, Proc. Trans. South London ent. Nat. His. Soc. 1948-9) and other papers is admirable in theory, but until taxonomists can spend time revising the varieties of *all* Lepidoptera the present system will have to suffice. I have, therefore, included the names used by Leeds for forms not already described, but not those which are, to all intents and purposes, synonyms.

A. Size

Generally speaking *jurtina* does not vary much in size within each geographical race, but there is a tendency for the southern forms to be much larger than the northern ones. Dwarf forms are therefore more striking when they occur.

f. *nana* Stephen 1923, Iris, p. 23. A dwarf form. Muschamp records a

female with a wingspan of 31 mm. and males of 32 and 33 mm. Small specimens occur frequently in the Swedish race but the smallest female I have seen is an English one of similar dimensions to the one mentioned.

f. (? race) *parvula* Stauder, 1915, Z. wissen Insetenb., **11**, pl. plate 2, fig. 16. Described as a dwarf race of *hispulla* Esp. from Monte Faito and S. Angelo (Sorento) and having a size similar to a female *Coenonympha pamphilus* L. Unfortunately I have been unable to trace any other mention of this form and, as Lempke makes no mention of it, I suspect that it is merely a very remarkable form.

f. *major* Leeds, 1950, loc. cit. p. 107. This name refers to strikingly large specimens (males over 51 mm.; females over 56 mm.).

B. Albinism

Jurtina is particularly susceptible to albinism, so much so that it has led to the ridiculous situation where patches caused by malformation of the scales have been given different names if they have occurred by accident in different areas of the wings. This first form of albinism, which manifests itself in (usually) assymetric patches, sometimes occurs in a symetric form, often covering all of the wings, is is clearly the same aberration. I, therefore, consider it superfluous to give more than one name to these specimens.

f. *brigitta* Ljunch 1799, Vet. Akad. Nya Handl., **20**, p. 147, pl. 2, figs. 6 and 7. The original description refers to a complete form of the above-mentioned aberration, which leaves the wings *very* pale with the fulvous band of a pale yellow/red colour. This name, I suggest, should be applied to all specimens which have these light patches, as they are merely incomplete forms of Ljunch's type.

= *semialba* Brand 1949, Bull. Soc. Emulation du Doubs, p. 60. In this form only the margins remain.

= *wautieri* Lmbll. 1905, Rev. Mens. Soc. Ent. Nam. p. 19: 1932, Lambillionea, pl. 11, fig. 2. Patches on both wings.

= *dextro-albescens* Tutt, 1908, Ent. Rec. **20**, p. 221, refers to a form with a patch on the right wing.

= *leucothoë* Cabeau, 1923, Rev. Mens. Soc. Ent. Nam, p. 24. This is the ultimate form of this aberration in which even the legs. head and antennae are pale.

A second form of albinism is that which produces a greyish dusting on the wings. Once again names have been used to describe degrees of this form and I have grouped some of them together. I was tempted to include the 'metallic' types in this group but as yet I am not convinced that they are caused by the same factor.

f. *cinerea* Cosm. 1892, The Naturalist, p. 264. This name is used to describe the form with an ashy scaling on all wings. I suggest that this should be used to describe any variant of this.

= *grisea-argantacea* Obthr. 1909, Lep. Comp., III, p. 385.

=*grisea-aurea* Obthr. 1909, loc. cit.

= *cinerascens* Fuchs. 1892, Jahrb. Nass. Ver., **45**, p. 85. The hind only are dusted with grey in this form.

I have examined specimens of f. *cinerea* and compared them with those specimens which have a somewhat similar scaling but have, in addition, a metallic sheen and I am not convinced that they are the same. I have, therefore, separated the following forms from *cinerea*.

f. *illustris* Jach. 1895, Soc. Ent., **10**, p. 65. Lempke (1935 loc. cit. p. 77) states that this form is intermediate between *cinerea* and the type, but the original description mentions a metallic sheen which would separate it from that form. This name should be applied to specimens which have a greyish or grey/blue scaling combined with metallic sheen.

= *uhryki* Aigner 1898, Rev. Lapok, V, p. 93, approaches *illustris*—from Hungary.

= ♀ *marmorea* Lmbll. 1903, Rev. Mens. Soc. Ent. Nam, p. 66, has a marbling or grey/blue, and with the underside medial band well marked.

= *commacula* Leeds, 1950, loc. cit., p. 102.

f. *glabrata* Leeds, 1950, loc. cit., p. 103, is perhaps identical to *illustris* —described as having a 'greasy look'.

f. *radiata* Frohawk, 1938, Var. Brit. Butterfl., pl. 9, fig. 1. I am not sure which group this falls into (if any). It is an albino form with the ground colour retained around the nervures.

f. *testacea* Schille, 1922, Z. Oest. E.V., **7**, p. 19, is a form which has the forewings chocolate brown, whitish towards the apex, on which the androconial mark stands out strongly. Hindwings pale with darker veins and margins. This is a very peculiar form of albinistic *jurtina*.

f. *subtis-albida* Silbernagel, 1943, Acta Soc. ent. bohem., **40**, p. 4, from Bohemia. The male type of this form is described as having the underside forewings of a very pale yellowish colour through which shines the upperside markings. The margins, upperside and underside hindwings remain normal.

Another albinistic tendency is that on the fulvous band on the upperside, thus—

f. *pallens* Th.-Meig. 1889, The Naturalist, **11**: 74, was a race described from the Pyrenees. Lempke (1935 loc. cit., p. 101) points out that Rondou (1932, Ct. Lep. Pyr., p. 33) does not mention this race. The apical patch is pale yellow in this form.

= *tincta* Blackie 1920, Entomologist, **53**: 277.

= ♀ *alba* Blackie 1920, loc. cit.

= ♀ *intermedia* Blackie 1920, loc. cit., p. 278, is the form in which this patch is of a creamy yellow colour. This is the typical form in many areas.

=*frohawki* Blackie, 1950, p. 87, refers to the form in which the normally fulvous band is replaced by anything from pure white to pale yellow.

Clearly the distinction between 'pale yellow' and 'creamy yellow' is a slight one and very similar specimens of these forms can be obtained by exposing normal specimens to excessive sunlight. Old specimens are, therefore, more likely to be f. *intermedia* than freshly emerged ones. The name *pallens* should be reserved for specimens in which the fulvous is much paler than normal because of some structural or genetical reason and not through exposure to sunlight.

f. ♀ *semi-intermedia* Lempke, 1935, loc. cit. refers to a specimen with only part of the fulvous patch changed to white. This is obviously the result of some different factor from that which produces the partial *pallens* forms.

C. *Variation in Ground Colour*

f. ♂ *nigro-rubra* Lmbll. 1903, loc. cit., p. 66. In this variety the ground colour is blackish brown (*Erebia*-like) with reddish brown sub-apical

blotches. This colouration is normal in many parts of the insect's range.

[f. *occidentalis* Poinneau 1924, Bull. Soc. Sc. Nat. Ouest., series IV, pl. IV, p. 58, referred to a variety of *jurtina* from Brittany which is 'reddish brown'. Lempke (1935, loc. cit. p. 176) suggested that this might be a race but it is now almost certain that it is a synonym of *phormia* Frhst.]

f. *nigrianira* Forsyth-Johnstone, 1941, Entomologist, **74**: 243, is a female with the upperside forewings dark greyish brown, the fulvous patch almost absent, hindwings of a similar colour. Margins and transverse band on the underside forewings much extended and very dark, the whole having a blackish suffusion. Hindwings black with central area a shade lighter.

f. ♀ *huenei* Krul., 1908, Soc. Ent., **23**: 3, has the fulvous band considerably darkened because of a dusting of dark scales (? ground colour).

f. *antiultrafulviscens* Leeds, 1950, loc. cit. p. 101. This is a form in which the basal part of the underside forewings is distinctly darkened—sometimes reddish. This is normal variation.

f. *concolorata* NEW. This very attractive form has the part of the underside forewings from the medial transverse line to the base of the very same dark colour as the upperside ground colour, leaving the subapical band (which is somewhat lighter than usual) in striking contrast. A specimen of the form was taken by myself near Dunblane, Perths., 15.vii.1965 and is in my own collection.

f. ♂ *suffusa* Tutt, 1896, Brit. Butt. p. 404, is a male without orange on the upperside forewings.

f. ♂ *hertha* Heinrich 1909, Berl. E.Z., 54, p. (3), is a male with the orange of the forewings forming a band, broken or not by the nervures.

= *rufocincta* Fuchs. 1900, Jahrb, Nass., V, 53, p. 37.

= *fulvopincta* Heinrich, 1923, Deutsche E.Z., p. 247.

= *ierniformis* Graves, 1930, loc. cit., p. 63.

f. ♂ *feminea* Graves, 1930, loc. cit., p. 54, is a male with the fulvous markings on the hindwings.

f. ♀ *pseudomas* Ckll., 1889, Entomologist, **22**, p. 26, is a female with only male fulvous markings.

f. ♀ *rufocincta* Fuchs, 1900, loc. cit., is the normal form of the female which has fulvous marks on the hindwings.

f. ♀ *nuragiformis* Vrty. 1916, Ent. Rec. **28**, p. 169. This is an extreme form of the normal variation which occurs in the south of Europe in which the fulvous marks of the female are so highly developed that only the margins remain on both wings, and the base of the hindwings as in the related species *Maniola nurag* Ghil.

f. *tithoniformis* Vrty. 1916, loc. cit., has these characters further developed. Apical eyespot very large. This form has been recorded from Corsica, Sardinia and North Africa.

f. ♀ *antifulva* Lempke, 1957, loc. cit., p. 461, has the fulvous greatly extended on the forewing only—no fulvous on the hindwings.

D. Variation in the Apical Eyespot

f. *anommata* Vrty. 1904, Entomologist, **37**, p. 56, is a very rare form in which the apical eyespot is completely lacking on both upperside and underside. Verity's name really refers to specimens without the oceli 'or almost so', but as Leeds (1950, loc. cit., p. 104) has described a form with a greatly reduced eyespot it would be best to reserve the name *anommata* for specimens without the spots.

=*oblitescens* Schultz, 1908, Ent. Z., **21**: 279.
= *obliterans* Seitz 1908, Seitz 1, p.140.
=*inocellata* Kiss, 1909, Rev. Lapok, **14**: 153.
= *anomala* Rol., 1910, Berge Rebel: p. 52.

f. *antiparvipuncta* Leeds, 1950, loc. cit., has the apical eyespot considerably reduced. This form is very much more common than *anommata* Vrty.

f.*anticrassipuncta* Leeds, 1950, loc. cit., has the apical eyespot greatly enlarged.

f. *caeca* Rebel, 1910, loc. cit. This form is common in the male and rare in the female having the apical eyespot without the white 'pupil'.
= *coeca* Rocci, 1911, Contr. Lep. Piemonte, **1**, p. 27.
= *caeca* Ksns., 1911, Trav. Soc. Volb., p. 50, pl. 1, fig. 3.
= *caecoides* Strand, 1925-7, Arch. für Naturg, **91**, A.12, p. 281.

f. *erymanthoides* Strand, 1919, Arch. für Naturg, A.4, p. 16. This form is one in which the apical eyespot is split due to an encroachment of the ground colour.
= *biocellata* Lempke, 1935, loc. cit., p. 148.

f. *bioculata* Rebel, 1910, loc. cit., p. 52, is the very common form of the female with two white 'pupils' in the apical eyespot. Very rare in the male.

f. *addenda* Mousley, 1903, Ent. Rec., **15**, p. 160, can be applied to any form which has from 1 to 4 additional eyespots behind the apical eyespot or towards the apex on the upper or underside.

f. *erymanthea* Esp., 1783, Eur. Schmett., **1**, p. 180, combines the characters of *addenda and ocellata.*

f. *subhispulla* Strand, 1912, Ent. Z., **25**, p. 254. This form was figured by J. Th. Oudemans in Tijdschr. v. Entom. **48**: 13, pl. 4, fig. 4 (1905) and refers to a combination of *erymanthoides* and *rufocincta* with *huenei* colouring. Lempke (1957, loc. cit., p. 463) mentions a specimen combining *erymathoides* and *antirufa* and calls it *subhispulla.*

E. Spotting on the Underside Hindwings

This interesting feature of *jurtina* was used by Prof. E. B. Ford and his colleagues for their work on the butterfly in the South of England and the Isles of Scilly, the results of which can be read in Ford (1945, Moths, pp. 215-222) and Dowdeswell, Ford and McWhirter (1960, Heredity, **14**: 333-364). Their research showed that a sudden ecological change is sufficient to change the frequency of the spotting on the underside hindwings in a very short time. Clearly if this is the case it is possible that a series of *jurtina* taken in one year could be quite different from that taken in the same area in following years. Perhaps much of the confusion which has arisen around the races of *jurtina* has been caused by entomologists describing forms or races from specimens caught in one or two years, even although they might have examined a considerable number of specimens. The *jurtina* type has three spots in the male and an unspecified number in the female (*janira*).

f. *infra-pupillata* Lempke 1935, loc. cit., p. 150, is a form which has one or more white pupilled black spots on the underside hindwings.

f. *biocellata* Tutt, 1910, Ent. rec. **22**: 158. Of this form Lempke writes: '. . . Described after a male from the Sarnthal in Tirol, and having "one small apical eye on the upperside and underside of the forewings, and two very marked ones on the underside of the hindwings". The name denotes

a very special case of *infra-pupillata* and should therefore be suppressed.'

I do not understand Lempke's reasoning here. If *biocellata* is a special case of *infra-pupillata* the converse is also the case and and Lempke's name should go. However, I consider them to be two different forms. *Biocellatta* is, therefore a combination of *infra-pupillata* and *antiparvi-puncta.*

f. *infra-impunctata* Lempke, 1935, loc. cit., p. 150, lacks the black spots on the underside hindwings.

F. Other Hindwing Variation

The descriptions of the next three aberrations caused me some concern as they represent stages in a development towards the *hispulla* underside. Faded or worn Scottish females look very much like *grisea* and I suspect this is the case throughout Central Europe.

f. *grisea* Tutt, 1896, loc. cit., p. 404, has the band of the underside hindwings of a pale grey colour.

f. *violacea* Wheeler, 1903, Bull. Sitz. p. 113, has this band tinted with 'heliotrope'. Lempke says that this is not found in cold climates.

f. *luigionii* Rost., 1908, Bull Soc. Zoo. It., series II, IX. The description given of this form refers to two different varieties—a male with greyish yellow band and a female with a bluish white speckled hindwing band. I consider the female description to be similar to *violacea* and suggest that the name *luigionii* should be reserved for the male form.

f. *fracta* Zweigelt, 1918, Z. Oest. E.V., 3, p. 11, fig. 3. This is a female form in which the light hindwing band is interrupted in cell IV by a dark bar.

f. ♀ *rectoformis* NOV. Description: Underside forewing light subapical band crossed by a bar of the same dark colour as the margin and transverse line on vein 3. Underside hindwing with very narrow light band in rather dark brownish ground. The band does not reach the inner margin as in most females but stops before vein 2. The general effect is an underside which resembles the normal upperside. The type was taken in Dunblane 20.vii.1965 and is in my collection.

f. *infrareticulata* Lempke, 1957, loc. cit., p. 462, has the underside hindwings unicolourous grey, dusted with small dark striae which are also present along the margin and apex of the forewings.

G. Other Forms

f. *pauper* Vrty., 1916, Ent. Rec., **28**, p. 169, is a form combining a number of aberrant characteristics. The forewings are more pointed than the type and the hindwings more dentate (f. *costa-cava* Cabeau). The apical eyespot, which is small, has an additional black spot behind it. The yellow marking is very much reduced, sometimes broken by the nervures. Verity states that he has found no intermediate from.

f. *costa-cava* Cabeau, 1904, Rev. Soc. Ent. Nav., p. 66, pl. 1, has the hindwings indented between the veins..

f. *brevipennis* Lempke, 1957, loc. cit., p. 467, has all the wings 'too short'.

f. *latimargo* Peerdeman, 1962, Ent. Berichten 22, No. 3, has the marginal band on the underside forewing distinctly broadened at the inner angle.

Homeosis: Occasional specimens occur which have on the underside hindwings streaks or patches of fulvous scaling.

Gynandromorphs: These are extremely rare but not unknown.

(To be continued)

Death from the Roads

[Although not agreeing with some of the author's contentions we print his article in the hope that it will bring us further opinions on this interesting subject.—EDITOR].

Letters which reached me at the close of last year told a woeful tale about many of our butterflies. "It would be extremely difficult," wrote a correspondent in Scotland, "to find specimens of *A. urticae* here any summer now. Even *M. jurtina* and *semele* have become scarce. *A. aglaia* is restricted to one or two corners, and *V. io* is extinct. Insecticides are not used here except in dipping sheep, which do not graze where the butterflies were most plentiful. Butterflies seem to be decadent everywhere. A friend tells me the same thing from Argyllshire."

Another correspondent reports from the Home Counties north of London: "The butterfly position seems to have deteriorated still further." Concerning the disappearance of the Silver Spotted Skipper from Royston Heath he notes that this butterfly has also completely disappeared from Pitstone Hill, where it was quite common prior to about 1957. "It seems unlikely," he goes on, "that chemical spraying affects virgin tracts of country like Pitstone Hill and Royston Heath, so one is forced to conclude that unknown natural factors are at work. It is a great puzzle, and I don't think it is a normal 'ebb.' So far as I know, there has never been such a marked decline in butterfly life reported in the various journals."

Since weed-killers and pest-destroyers have been mentioned so often in connection with the decline of butterfly populations it is worth while having a look at a list of our indigenous butterflies and see just how many species are likely to have become victims of the farmers' and market gardeners' methods of protecting their crops. Here is a list of the species which breed regularly in our islands.

1. Our eleven species of Satyridae all feed on grasses growing in rough uncultivated places; most of them therefore are unlikely to have been affected by weed-killers or insecticides. But six may sometimes be affected locally (*megera, galathea, tithonus, jurtina, pamphilus, hyperanthus*).
2. Of the eight Fritillaries, five feed on violets and one on cow-wheat, plants that grow in woods and wooded places. One feeds on plantain only in the Isle of Wight, and one feeds on scabious (*aurinia*), which grows usually on uncultivated places though occasionally within reach of sprays.
3. Of the six Vanessids, the Small Tortoiseshell, Peacock, and Comma feed on nettles and may have been subject to weedkillers. The Large Tortoiseshell, which feeds on elm, has been becoming scarcer for a good many years. The Red Admiral and Painted Lady are immigrants; they were more common last year.
4. The White Admiral, Purple Emperor and Duke of Burgundy are woodland species.
5. Of the eight Lycaenids, six feed on papilionaceous plants and may therefore have been subjected to both weedkillers and insecticides. The Holly Blue feeds on shrubs. The Large Blue may have been subject to spraying in some of its haunts. The Green Hairstreak has a wide choice of foodplants (Allan's *Larval Foodplants* lists

eleven), and would not usually occur in places where spraying is carried out. The other four Hairstreaks feed on shrubs. The Small Copper is (to my knowledge) subject to weedkillers sprayed on roadside verges, where sorrels are often killed.

6. The three Garden Whites probably have been considerably reduced by insecticides in home and market gardens. The Orange-tip, though often a woodland butterfly, is undoubtedly affected by the spraying of road and lane verges. The Wood White, as its name implies, inhabits woods; the Brimstone feeds on shrubs. The Swallowtail is a fenland species.
7. Of the eight Skippers, one is a woodland species; the other seven *may* have been been reduced by weed-killers on grass-fields; but most of these small butterflies inhabit rough uncultivated places where neither weed-killers nor insecticides are used.

This list suggests that weed-killers and insecticides have probably been injurious to only 5 species; 24 have possibly been affected, and 28 are unlikely to have been affected at all. What, then, has caused the decline of the populations of the 28 unaffected species, including the woodland ones?

Changes in the seasonal norm in many places? A succession of mild winters? Both these factors have occurred many times before. So what are the 'unknown natural factors' to which my correspondent referred? So far as I know, the climatic records of the Royal Meteorological Society do not provide an answer. *What is that 'something'*?

Here is a suggestion for readers of this journal to ponder over. Every lepidopterist is aware of the marvellous sensitivity to scents which a male moth exhibits when he 'picks up' the scent of a 'calling' female of his species, a sensitivity so acute and so selective that he may pick up the scent half a mile away, and though females of half a dozen other species are 'calling' at the same time he will never make a mistake and respond to a 'calling' female of any other species. It is a sensitivity altogether outside our ken. I can think of no other class of animals which possesses this extraordinarily high degree of sensitivity.

Then what about the exhaust gases of the 9,000,000 motor cars which now ply on the roads of this small country? Can these gases, innocuous to humans out of doors yet so deadly to humans in a confined space, kill infinitely more sensitive organisms, such as the Lepidoptera, wherever they may spread?

Of course it is easy to propound objections to this suggestion. You may say at once, how comes it that the decline in butterfly populations has been noted in the Hebrides and in parts of the British Isles where motor cars are not such common objects of the countryside as they are in England?

But has it not already been found that land breezes may carry infection far beyond a mainland? For instance, although it is taken for granted that plagues are spread by contagion it has been put forward and not disproved that the pneumonic forms of these diseases may be caused by aerial convection. And do not Small Tortoiseshells Peacocks, Painted Ladies, Red Admirals, Dark Green Fritillaries occasionally fly across narrow seas? What if these travellers are tainted or sterilised and therefore unable to reproduce their kind?

There is another point too. Every female imago bent on egg-laying

finds the correct foodplant by scent alone. Sight does not enter into the matter. Tell me then, if you can, will a female butterfly seeking out a plant upon which to lay her eggs, avoid any plant that is tainted by the exhaust gases of a motor car? Imagine—and I am told that it has happened and not uncommonly—that a queue of stationary motor cars may extend along a main road for more than a mile, each with its engine running and therefore each car continually pumping out its exhaust gases over the adjoining landscape. Do you suggest that all this pollution of the atmosphere and herbage would be welcome to a butterfly out egg-laying or to a larva feeding nearby?

So far as I am aware there is no instrument known to science which can 'pick up', as a male moth can, a few molecules of scent from a mile away. If a male moth can do this—as he can—he has got the whole scientific world beat to a frazzle. The laugh, I think, is with the moth—if you think it is a matter for laughing. Oh you super-confident space-hunters, beaten by a small Geometer, have you the nerve to say that it's quite impossible that a moth or butterfly could be affected by the exhaust of a petrol engine a mile away? How do you know? You haven't any idea of the sensitivity of a lepidopteron. A butterfly might be sterilised or killed by the exhaust gases of only a dozen motor cars several miles away.

The exhaust gases of a petrol engine contain up to 7 per cent. of carbon monoxide (CO). Now listen to this: *one-half per cent. of CO in the atmosphere is fatal to Man.* Who has yet estimated the volume of carbon monoxide, not to mention other deleterious gases, exhaled per minute by 450 motor cars, all with their engines running, head to tail in a queue a mile long—and I am told that at week-ends the queues are sometimes stationary for half-an-hour? Work it out, you brilliant physicists, and then tell us in these pages.

If those who are "set in a little brief authority" over us — "most ignorant of what they're most assured"—*must* deface our countryside in order to rush about at a mile a minute, build autobahns across the loveliest parts of England, destroying thousands upon thousands of acres of rich farmland while others of their ilk urge farmers to grow more and more foodstuffs—why don't they concentrate for a bit on inventing a new form of propulsive power which will be innocuous to wild animals? They seem to be incapable of inventing anything that benefits any other animal in the world but their own ignoble species. *Homo sapiens* did Linne call them? *Homo destructor* would be a wise synonym; for if they are allowed to go on at the present rate it won't be so many years now before they destroy themselves.

—A voice crying in the wilderness? Exactly; for more and more of England is becoming a wilderness so far as lepidopterists are concerned.

THE OLD 'UN.

LIGHT TRAP RECORDS FROM CORNWALL.—The following few moths taken at my mercury vapour light trap here, in an otherwise poor season, may be of interest: 4th September, *Plusia ni* Hübn.; 9th September, *Acherontia atropos* L. and *Plusia limbirena* Guen.; 5th October, *Herse convolvuli* L. (the only specimen seen this year); and 24th October, *Leucania loreyi* Dup. (the third here since 1964).—Col. H. C. ROSSEL, The Old School House, Bodinnick, Lanteglos-by-Fowey, Cornwall. 13.xi.1968.

Notes on *Melitaea cinxia* L. 1945-1968

By Robert W. Watson, F.A., F.B.A.A., F.C.C.S., F.Comm.A., F.R.E.S.

I had started active collecting again in early 1943. As many specimens in my boyhood collection had suffered from various pests, replacements were necessary and I was taking a short series of many species.

In late May 1943 I was collecting at Waterditch, near Christchurch. This is a pleasant green lane which at one point is crossed by the main Bournemouth-Southampton railway line. Within a few yards of the embankment I took a brown butterfly which I thought was *Pararge megera* L. while in flight. I was to find that it was in fact a perfect *Melitaea cinxia* L. It was the first I had seen alive and at this time I was unaware of its existence in the mainland. However more about this later.

In 1945 I decided to visit the Isle of Wight to collect larvae in order to breed a series.

I had no detailed knowledge of localities and consultation with various local entomologists did not produce the required information. However, one sunny morning in early April I set off with my wife from Lymington on the 7.30 a.m. ferry. As no petrol was available we took our tandem. This first voyage up the Lymington river was an occasion never to be forgotten. The sea was dead calm and as the great red ball of the rising sun dispersed the mists over the marshes, thousands of seabirds rose from the mudbanks as miniature tidal waves from the passage of the ferry invaded their territory. As the sun gained power the morning sky changed through the most exquisite tints of pale green to azure blue, flecked with rose and orange tinted clouds set in a pattern which no pen can adequately describe. I have made this journey many times since but the magic of that first visit has never been recaptured.

On arrival at Yarmouth we set off on the north coast road without really knowing where we were going. On taking several looks at the coast through various bridle paths we found a few larvae of *Lasiocampa quercus* L. but no sign of either *cinxia* or the foodplant. It was now mid-morning and as the return ferry was uncertain I decided that more detailed detective work was necessary if the desired results were to be achieved. We therefore enquired at the office of the local newspaper if they had any knowledge of either the butterfly or any local entomologists. They were most helpful and gave me the name of a local naturalist and taxidermist, a Mr. Jefferies I believe. This gentleman was a coleopterist but was able to direct us to Compton Bay where he had seen *cinxia* some years previously.

Our journey continued through green lanes with untrimmed verges on which grew a profusion of flowers. This was before the days of weed killers and tidy fanatics with mowing machines. In due course we arrived at Brook and after parking the tandem we walked to the edge of the cliff and looked over. Never before had I seen so many caterpillars. The foodplant was covered with a black moving mass. I lay on the short turf and picked up a handful. The combination of red head and legs together with the shiny black coat make *cinxia* a delightful larva and one of my favourites.

We collected 800 in a few minutes and could not see where we had taken them from. In either direction, towards Chale and Freshwater larvae swarmed in countless thousands. Adders too were numerous

and we nearly trod on several. Larvae of *L. quecus* L. and *P. potatoria* L. abounded on the low brambles and grass a hundred yards from the cliff edge.

Larvae of *Arctia villica* L., some nearly full grown, were not uncommon. Parisitation was very heavy in this species.

So ended the first excursion after *cinxia* larvae and the return journey by ferry was a fitting climax.

On the return the first problem was to find plantain, which we grow now on our special frames. The plants are dug up with a small fork and placed in the cages at one end. Each day a few more plants are inserted until the first are eaten down.

When collecting larvae it is advisable to take only the largest, the smaller ones seldom grow and many are parasitized. In 1945 there were very few parasites and over 600 adults emerged successfully including a number of good forms, some uppersides being very lightly marked and the black markings in the undersides white band being greatly enlarged.

After emergence the insects had to be returned. We made two journeys successfully and returned over 500. On the third journey we were not allowed to land for some obscure reason and had to consider the fate of a further 100 or so specimens. Our friend F. S. Reeves had a further number which could not be returned. We therefore decided to find a suitable locality on the mainland to release them and eventually decided on the railway embankment between Holmesley and Brockenhurst. Releases were made on some 1½ miles of this embankment and Fred Reeves released his near the derelict keeper's cottage at Stillwells Lane.

The colony on the railway embankment flourished until 1967 when the railway line was removed and a new road built. It appears that the remains of poor *cinxia* now lie buried beneath hundreds of tons of earth and gravel.

The colony at Stillwells Lane did not survive for long owing to the growth of scrub in the clearing.

In 1947 the late C. B. Antram reported a colony of *cinxia* on the railway embankment west of Sway Station on the main Bournemouth-Southampton line; I never saw this colony but understood it was quite strong. I consider that there could well be a connection between this colony and the other specimens mentioned earlier in this paper. The distance is about 8 miles and there are probably other colonies hitherto undiscovered between Sway and Christchurch.

From 1945 to 1968 we bred 500-2000 each year. In 1950 the Brook colony began to weaken due to the near disappearance of the foodplant. After the extermination of the rabbits in 1954 by myxamatosis the coarse grass took control and *cinxia* became extinct. This meant releases being made further along the coast, care having to be taken to ensure that no area became overpopulated beyond the capacity of the foodplant to support a reasonable number.

It now seems that we have arrived at a balance. One notable year was 1966. We decided to take the car and make a day of it touring the island. On arrival we parked the car and walked to the cliff edge when it started to rain. There was only one course, to collect the larvae as soon as possible. We picked them up in spoonfulls and in twenty

minutes had 1695. We were back at Boldre by 1 p.m. Of these, 1294 were subsequently returned and many fine underside forms were retained. These resembled those bred in 1945 but the black markings were much heavier.

These were duly exhibited at the South London Exhibition.

What of the status of *cinxia* generally in the island? Collectors visiting many of the old localities will find it greatly reduced in numbers, or absent altogether. The foodplant no longer flourishes, being choked with the coarse grass and brambles which were previously kept in check by the rabbits.

However, if one is prepared for a walk of several miles, *cinxia* can still be observed in thousands. The island coast is subject to constant erosion, and cliff falls are numerous. I have often seen masses of larvae in positions inaccessable except for a climber with suitable ropes.

In my opinion there is no danger to this species in the foreseeable future but larvae should not be taken in numbers unless the imagines can be returned.

"Porcorum," Sandy Down, Boldre, Lymington.

Discovery of the Larva of *Sorhagenia rhamniella* Zeller

By Lieut.-Col. A. M. EMMET, M.B.E., T.D.

Writing in 1966 (*Ent. Rec.*, **78**: 9) Mr. S. Wakely summed up the information then existing about the three species of *Sorhagenia,* and his article should be read as an introduction to these notes. He described the larval habits of *S. lophyrella* Douglas and *S. janiszewskae* Reidl but stated that the early stages of *S. rhamniella* Zeller were still unknown In 1966 Wakely and I twice visited Wicken Fen to search for larvae of this species, our visits being on the 19th of May and the 8th of June. On the first occasion we found the larvae of *lophyrella* plentiful on common buckthorn (*Rhamnus catharticus* L.) but *rhamniella* eluded us. I was convinced that the trouble was that we were too early, and resolved to search again later in the season when opportunity offered. The chance came this year, when I was able to visit the Fen on the 18th of June. I concentrated my attention on the alder buckthorn (*Frangula alnus* Mill.) and in due course found an area where there was a number of spinnings on the tender terminal leaves. I collected over a dozen, but my breeding efforts were handicapped by illness which prevented me from renewing the foodplant. Nevertheless, from this material I had two *rhamniella* on the 7th and 9th of July, and three *Ancylis apiciella* Schiff. between the 4th and 14th of July. Probably only the most advanced larvae survived.

The life-histories of the three *Sorhagenia* species may be summarised as follows:—

S. lophyrella Dougl. As far as is known, it is confined to *Rhamnus catharticus*. The larva feeds in mid-May in the terminal shoots, spinning leaves together. The moths emerge in mid-June. This appears to be the commonest of the three and probably has the widest distribution. Most *Sorhagenias* in collections are likely to belong to this species.

S. janiszewskae Reidl. The larva feeds on the pith of the terminal

shoots of *Frangula alnus*, causing them to droop; it leaves the mine to pupate. Early June is the time to look for the larvae, and the moths emerge in early July. The species has been recorded from Kent (Blean Woods), Sussex (Ashdown Forest) and Hampshire (New Forest).

S. rhamniella Zell. The larva feeds in middle to late June in spun terminal leaves of *Frangula alnus*. The moths begin to emerge in mid-July and continue on the wing until late August (they were still plentiful and in fair condition on the 20th August 1968). So far the species has only been recorded from Wicken Fen.

The moths are very similar in appearance and difficult to differentiate without examination of the genitalia. I only possess a single specimen of *janiszewskae* bred from a pupa given me by Wakely, so I cannot pronounce on that species; but when viewed in series the other two show a measure of difference. There is, however, some overlapping, so it would be difficult to be certain about an individual moth.

Lophyrella is the larger moth (average wing-spread 11 mm.) and the wings are more variegated and colourful. In particular, the basal half of the dorsum forms an ochreous background to the scale-tuft on the fold. In most specimens there is an angulated pale fascia "at three quarters", and black raised scales beyond.

By contrast, *rhamniella* is smaller (average span 10 mm.) and the wings are more uniform in coloration. The dorsal area is paler but seldom ochreous, and then only faintly so, while the angulated fascia is rarely discernable. In general, the moth has a greyer appearance. In my material the white banding of the apical quarter of the antennae is less pronounced than in *lophyrella*, though this may be due to wear and tear.

The distinctions I have cited are based solely on Wicken specimens of the two species, and take no account of possible local variation. My *lophyrella* are all bred, but the majority of my *rhamniella* were caught wild, though my two bred specimens confirm the points of difference I have noted. It is probably safe to say that June moths are *lopyrella*, August moths *rhamniella*, but July moths might be any of the three species.

Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 16.xi.1968.

Discovery of the Larva of *Ancylis paludana* Barrett

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

Ancylis paludana Barr. is a moth which is confined to the fens of Cambridgeshire and Norfolk; according to Meyrick it is also doubtfully recorded from Germany but otherwise unknown on the continent. Although the moth is not uncommon in its restricted haunts, the larva has long remained undiscovered, though Meyrick hazards that it feeds on *Lathyrus*.

For the last two or three autumns I have collected larvae, which I suspected to belong to this species, at Wicken Fen. I have been successful in bringing them through the winter, but they have refused to pupate. This year I still had living larvae at the end of May—a date by which the first generation of the wild imagines should be flying. This reluctance to pupate in captivity seems to be characteristic of the genus, and probably explains why this species has not previously been bred.

I therefore decided to try my hand at breeding the summer generation, and was successful in rearing four moths. I collected the larvae at Wicken Fen on the 18th June and the moths emerged from the 4th to the 7th July.

The foodplant is the marsh pea (*Lathyrus palustris* L.). At first the larva mines a leaflet, but later makes a spinning in the manner characteristic of the genus. In the marsh pea the leaflets are opposite and project from the stem at an angle of some 60 to 90 degrees to each other. The paludana larva draws a pair of leaves together and spins them into an extremely neat pod—so neat that at first sight the spinning appears to consist of a single leaflet. It is a considerable architectural feat to unite leaves which are relatively so widely separated. The larva feeds inside the pod, depositing its frass at the end nearer the stalk, and blanching the further portion of the leaves. Each larva constructs several pods, often only making a short journey to the adjacent pair of leaflets. The larvae of the summer generation of moths feed in June, and those of the spring generation in September, over-wintering, as has been indicated, as larvae in their cocoons. They leave their pods for this purpose, in captivity spinning up in folds of the tissue paper lining their container. The larva is putty-brown with a slight greenish tinge in some cases, and lacks conspicuous markings.

A different kind of larva, collected on *Lathyrus palustris* on the same day, produced a specimen of *Pandemis dumetana* Treits. This species is known to have a fairly wide range of foodplants, but does not appear to have been previously recorded as feeding on the marsh pea.

Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 16.xi.1968.

John Lawson (d. 1711) and the origin of the common name "Buck-Moth" for *Hemileuca maia* (Saturniidae)

Ronald Sterne Wilkinson, F.L.S., F.R.E.S.
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The usual explanation of the Buck-moth's curious name is that given by Holland (1903): "The name . . . is said to have been given to them because they fly at the time when deer-stalking is in order", that is, in the autumn (p. 92). While collecting material for a history of American entomology before Say, I have come upon a more detailed explanation, the history of which forms an interesting, if minor, chapter in the folklore of entomology.

Much had been forgotten about the original meaning of the name by Holland's time. The English collector John Abbot, for many years a resident of Virginia and Georgia, explained over a century earlier (Abbot and Smith, 1797) that the "Moth is called in America the Buck fly, from an erroneous vulgar notion that Bucks breed its caterpillars in their heads, and blow them out of their nostrils. This opinion originated from the fly coming out in the rutting season, while the Bucks are pursuing the Does. The hunters therefore take notice of the insect, in order to know the proper season for their sport, which is later in

Georgia than in Virginia, as is the appearance of these flies" (Vol. I, p. 99).

Abbot's actual notes for the *Natural history of the rarer lepidopterous insects of Georgia*, sent to Sir James Edward Smith and edited by him, give basically the same information in less polished language, and add nothing to the printed account. However, when preparing the volume, editor Smith added that "As the *larvae* of many insects do occasionally breed in the bony cavities of the nose in animals, and sometimes even in the human subject, causing dreadful diseases there, the vulgar notion mentioned by Mr. Abbot may not *always* be erroneous; at least some particular accidental facts of this kind may have led to the general opinion" (Vol. I, p. 99).

It is surprising that such a shrewd and experienced entomological observer as Abbot did not solve the mystery behind the settlers' accounts. Smith, of course, was 'on the right trail.' A fly, the nose-bot *Cephenemyia phobifer* (Clark) deposits its eggs in the nostrils of the white-tailed deer. The larvae grow to over an inch in length, and fall from the nose in the spring to pupate in the ground (Kellogg, 1956; Bennett and Sabrosky, 1962; Stone *et al.*, 1965). Deer are quite commonly infected with nose-bots, and it would have been quite natural for the deer-stalker to link larvae 'blown' from the animal's nostrils in the spring to moths associated with the deer (at least seasonally) in the fall. This explanation of *maia's* origin was, in fact, a rather clever one for the casual eighteenth-century observer.

The observation was first made much earlier than the 1790s, and it is possible to trace the *phobifer-maia* confusion through almost the entire eighteenth century. Several purely entomological writers mentioned *maia* specifically before Abbot and Smith. These were Drury (1773), who described the species, as well as Cramer (1779) and Fabricius (1793). All are silent on the point in question, but earlier authors are not.

In his discussion of the Virginia deer, Brickell (1737) noted a disorder prevalent among coastal Carolina specimens. "Their Nostrils and Throats are frequently found full of *Bots* or *Maggots* in the *Spring*, which make them very poor at that time; but as the *Summer* approaches these *Bots* become the most beautiful *Butter-flies* imaginable, being large, having black, white, red, and yellow stripes in their Wings" (p. 109).

John Brickell was a physician in Edenton, North Carolina for some years before removing to Ireland and publishing his work at Dublin. He was obviously interested in natural history, and part of the volume is based on original observation. Yet much of Brickell's book is paraphrased from a much earlier treatise, John Lawson's *A new voyage to Carolina* (1709). The exact extent of Brickell's 'borrowing' has been the subject of some debate. His severest critic (Adams, 1952) admitted that "Whereas Lawson had dismissed them in a few words, Brickell went into detail on such creatures as bees, butterflies, and mosquitoes." Evidently Professor Adams was not aware that different species of bees, butterflies and mosquitoes are found in North Carolina and Europe, for he pointed out in debunking Brickell's account that all of these, "it must be noted, could be found in Europe as well as America" (p. 153).

But regardless of Brickell's claim to originality, the passage quoted above is traceable to Lawson, as is a related one on the rabbits of the region, which "breed Maggots in their Testicles and other parts of the Body, which become most beautiful Butter-flies" (p. 127). It is true that Mark Catesby's *The natural history of Carolina, Florida and the Bahama Islands* (1743) had appeared between the two works, and in his discussion of the 'fallow-deer' Catesby had noted that "near the Sea they are always lean, and ill tasted, and are subject to Botts breeding in their Heads and Throats, which they frequently discharge at their Noses" (Vol. II, p. xxviii). Similarly, when discussing the rabbit, he had observed that these were "subject to large Maggots, which are bred between the Skin and Flesh" (Vol. II, p. xxviii). But no mention was made of butterflies or moths being bred from the "Botts", although Catesby discussed and figured a number of Lepidoptera in his splendid work.

If Lawson (1709) is examined, Brickell's source becomes clear: Lawson explains that some deer killed near the coast of Carolina in January "have had abundance of Bots in their Throat, which keep them very poor. As the Summer approaches, these Bots come out, and turn into the finest Butterfly imaginable, being very large, and having black, white and yellow stripes" (ed. 1966, p. 129). On the rabbit, he says that at "one time of the Year, great Bots or Maggots breed betwixt the Skin and Flesh of these Creatures" (ed. 1966, p. 127). Catesby's debt to Lawson is less clear, as he does not include the "butterfly" in his account. Perhaps he did not believe that portion of the story.

Although earlier works mention the deer of the region, such as Lederer (1672), I have found no confusion of *phobifer* and lepidopterous larvae before Lawson. None of the other investigators working the eastern seaboard in the late seventeenth and early eighteenth centuries seem to have noticed *phobifer* larvae at all, despite the busy entomological collecting activity engendered largely by the apothecary-scientist James Petiver, author of the first book on the English Lepidoptera, *Papilionum Britanniae* (1717).

Petiver contacted a miscellany of potential collectors, ranging from ship surgeons to settlers, who sent him plants and animals (including many Lepidoptera) from seaboard localities as far apart as Massachusetts and South Carolina. Much of the resulting correspondence is still preserved in the Sloane Manuscripts, British Museum. I have examined these interesting letters (Wilkinson, 1966a, b, c), as has Raymond Stearns (1952). Petiver supplied his correspondents with printed collecting instructions and equipment, including an early form of bag-net that may have been the first in England and was certainly the first in America (Wilkinson, 1966b, d).

Among Petiver's collectors was our John Lawson, who first went to the American colonies in 1700. Lawson did not meet Petiver before leaving England. He did, however, fall in with several of the apothecary's correspondents when reaching America, and in 1701 he wrote for Petiver's printed instructions. A later letter informed Petiver that "butterflies, & other Insects you may depend on w[ha]tever our new Settlement affords" (Sloane MS. 4063, f. 79).

There is no further Lawson-Petiver correspondence until 1709. In 1708 Lawson returned from Carolina to England to complete his book and secure its publication. During his visit he procured an appoint-

ment as surveyor-general of North Carolina, and met Petiver in person for the first time. The apothecary furnished further directions, books, and "a few pinns that your Insects may not fly away after you have once caught them" (Sloane 3337, f. 63). Petiver's comment alludes to the early practice of direct pinning (Wilkinson, 1966b;) he informed travellers in 1690 that "Insects as Spiders flyes Butterflies and Beetles" should be killed and preserved "by thrusting a pin thr[ough] their Body and s[t]ick[ing] them in your ha[tt] until you get a board [i.e. aboard the ship] then pin them to ye wall of your cabin or ye inside lidd of any Deal Box so yt they may not [be] crushed" (Sloane 3332, f. 2).

In January 1709/10 Lawson left for North Carolina with his new commission, but Petiver did not hear from him for some time. Finally, in a long letter dated 30th December 1710, Lawson reported that he had sent a box of specimens including bird and snake skins, fossils, plants and "4 vials of Insects." He promised to collect further biological specimens, and forward them with the extensive data required by Petiver. Insects would be accompanied by "the months they appear to us in the place of their resort, how they breed & w[ha]t changes they undergo, their food, makes [*i.e.* form, morphology], & parts [;] this may be very well done by hav[ing] a many small Phyals or boxes w[i]th descriptions of every Insect contained in each bottle & when you receive them You may rank them on wyer pins in little drawers as you think fitt having y[ou]r notes constantly by you." The interesting letter (Sloane 4064, ff. 249-50) shows that Lawson envisioned extensive collecting enterprises that were terminated when he was killed by Indians while searching for plants in September, 1711.

Further details about Lawson's life are given by Lefler in his introduction to *A new voyage to Carolina* (1966), but nowhere except in the cited passages from the *Voyage* have I found reference by Lawson to the nose-bot phenomenon. Was the "very large" butterfly with "black, white and yellow Stripes" the moth *Hemileuca maia* imperfectly or fleetingly observed, or had the end product of nose-bot metamorphosis been changed in the minds of colonial observers between Lawson and Abbot?

Some moths were, of course, thought to be butterflies in the eighteenth century. But only several large North Carolina Lepidoptera fit Lawson's description even generally, and none do so specifically. *Graphium marcellus* (Cramer) at least has black and white "stripes", and it is large. But *Hemileuca maia* fits *these* criteria as well. Moreover, the abdomen of *maia* does contain the colour orange, if not yellow. Considering Abbot's statement, this is probably the insect meant by Lawson. Perhaps he did not see the moth at all, and was only repeating a settler's exaggerated description.

I attempted to solve the problem while examining what remains of Petiver's collection of insects, now at the British Museum (Natural History). Most of the specimens in the two leather-bound volumes are Lepidoptera. Each is placed in a mica sandwich which has been sealed with tape and fixed to the page, for Petiver gave up pinning insects due to the ravages of pests. Among the Lepidoptera are the oldest North American specimens extant, some collected as early as the end of the seventeenth century.

The insects almost always have reference numbers, some referring to the lists in Petiver's many publications, and some to his data notebook, now lost. Numerous American species are recognizable, and many are still in excellent condition, even after more than 250 years of storage. Some have the collector's name as well as locality data written directly on their bindings. But there is no *Hemileuca maia* at all. One may have existed, sent by Lawson, for the naked tabs on almost every page show that many specimens were removed as curiosities before the Petiver volumes came under the care of the Entomological Librarian.

Thus although much of interest to the student of early American entomology can be found in Petiver's correspondence and collection, these give no further information about the origin of the story of Lepidoptera engendered from the nose-bots of deer. With Lawson's statement the matter must rest at present, although extensive research in late seventeenth-century sources may tell us more

Acknowledgments

I am indebted to the staff of the Entomology Library, British Museum (Natural History), who very kindly afforded me special facilities for studying the Petiver Collection. Miss Sandra Raphael, Librarian of the Linnean Society of London, was especially helpful with the papers of Sir James Edward Smith. Dr. Rollin Baker, Dept. of Zoology, Michigan State University, advised from his experience with the white-tailed deer.

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A New Aberration of *Axylia putris* L. (Lep. Noctuidae)

By B. Goater, B.Sc.

Axylia putris Linnaeus ab. *brunnea* ab. nov.

The ground colour of the forewings is warm reddish brown, and the hindwings are smoky. Collar warm reddish brown, remainder of thorax and abdomen dark grey-brown.

Holotype: male, Mill Hill, Middlesex, 7.vii.1958, B. Goater. Rothschild-Cockayne-Kettlewell coll., British Museum (Nat. Hist.)

Paratype: male, Bushey, Herts, 1.vii.1968, B. Goater. B. Goater coll.

Current Notes

The attention of readers is drawn to the fact that while it has been decided that it is essential for the Special Index to be maintained, commencing with this volume, in future the General Index will be replaced by a fuller list of contents printed in the cover matter of each number, usually on a fly-sheet. This should be borne in mind when giving instructions for binding.

We welcome Mr. P. N. CROW, 12 Harvey House, Westcote Road, Reading, Berks, RG3 2DW, who has volunteered to take over the office of Hon. Treasurer as from 1st January 1969. Subscriptions for 1969 and the future should be sent to him at the above address. It is hoped that readers will assist him and the magazine by paying promptly, thus saving unnecessary work and postal expenditure.—Ed.

Notes and Observations

Hydrophilus piceus L. (Coleoptera: Hydrophilidae) Devouring Froglet.—While looking for Marsh Frogs, *Rana ridibunda* L., on 24th April 1968, Mr. Alfred Leutscher captured a female Great Silver Water Beetle, *Hydrophilus piceus* L., in a dyke very near Appledore, in Romney Marsh. He very kindly allowed me to keep it and I kept it under observation in an aquarium tank at my home in Clevedon, Somerset, until it died on 12th October. It lived very well in the tank and consumed large quantities of aquatic vegetation of various kinds, including broken and rotting stems. Other inhabitants of the aquarium included various small pond and ramshorn snails, lesser water-boatmen, *Corixa* spp.; small water-beetles; a few nymphs of the Common Ischnura Damselfly, *Ischnura elegans*, and four well grown tadpoles of the Common Frog, *Rana temporaria* L. When I returned on 21st June from a few days in London, two of the latter had developed all four legs and their tails were half-way towards being fully reabsorbed. On the morning of 23rd June, I was surprised to discover that the *H. piceus* had seized one of these froglets, which was dead, and had already devoured one hind-leg and was busily engaged in eating the abdomen. It fed head-downwards

among the water-weeds. By mid-morning it had completely eaten the froglet.

A few days later another tadpole which had reached the froglet stage disappeared mysteriously and I suspect that it too fell victim to this large water-beetle.

Balfour-Browne (*British Water Beetles*, London, 1958, Vol. III, pp. 3-10) states that "the imagines are omnivorous in that they eat both animal and vegetable food," but does not mention froglets among the animal food that he has seen them accept I would be interested to hear of any instances that readers of *The Record* have encountered.—J. F. Burton, F.Z.S., F.R.E.S., B.B.C. Natural History Unit, Broadcasting House, Bristol, 8. 31.x.68.

Heliothis armigera Hübn. and Heliothis peltigera Schiff. in Suffolk. —On 3rd October, 1968, I found a specimen of *H. armigera* in my moth trap at Walberswick. During September larvae of *H. peltigera* were quite common on *Senecio viscosus* growing on the sandhills here. The sea had breached a large gap in the sandhills earlier in the year, and after the sand had been bulldozed back the Sticky Groundsel sprang up much more commonly than before.—H. E. Chipperfield, The Sheiling, Walberswick, Suffolk. 25.xi.68.

Nymphalis antiopa Linn. in Suffolk.—Two specimens of the Camberwell Beauty were seen in Suffolk on 31st August, 1968. The first was reported by Mr. G. B. G. Benson at Benacre, whilst Mr. L. W. Howard saw one on Woodbridge Golf Course. Whether these insects came over under their own power or not must remain a matter for conjecture, but it may be worth noting that each locality is within ten miles of a port into which timber is imported from Scandinavia.—H. E. Chipperfield, The Sheiling, Walberswick, Suffolk. 25.xi.68.

Two Late Butterflies.—On 21st November, a reasonably warm sunny day for this time of year, my wife and I visited Blackmoor Copse, the S.P.N.R. reserve near Salisbury managed by the Wiltshire Trust for Nature Conservation. The purpose of our visit was primarily to plant out a hundred or so broad-leaved sallow cuttings for the benefit of future generations of purple emperors. While walking round the copse we were astonished to see a male brimstone at rest in full sun on a withered leaf still attached to a sallow bush; as we approached closely it flew off down the ride and eventually disappeared over the tree tops.

But this was not the only surprise because, an hour later, as we were having lunch on the outskirts of the copse, a female comma suddenly appeared and settling on a nearby bank sunned itself for some time. Neither of us paid particular attention to its ultimate movements, but when my wife was clearing up the lunch things, she found it sitting happily at the bottom of a plastic mug feeding hard on the residue of the cider it had contained.—Major-General C. G. Lipscomb, C B., D.S.O. 22.xi.1968.

Some Late Dates for 1968.—As usual, there have been several species of moths which have appeared exceptionally late in the season at my mercury vapour trap run in the garden here for the eighteenth year in

succession. Some of these dates probably reflect a second or even a third brood of the species. The following list is in chronological order from September onwards—September 12th: *Plusia moneta* Fab.; September 17th; *Pheosia gnoma* Fab.; September 18th: *Plusia chrysitis* L.; October 8th; *Agrotis exclamationis* L.; October 22nd; *Epione repandaria* Hufn.; October 27th: *Triphaena pronuba* L.; October 29th: *Ochroneura plecta* L.; October 30th: *Thera obeliscata* Hübn.; December 1st: *Plusia gamma* L. and *Phlogophora meticulosa* L.—C. G. M. de Worms, Three Oaks, Woking. 2.xii.1968.

Bupalus piniaria L. f. funebris Cockayne at Woking.—I had one of each sex of this melanic form of the bordered white in my trap here during July 1968 out of nine examples recorded in it, which indicates quite a high percentage. There seems to be an increasing incidence of melanic forms generally in this area.—C. G. M. de Worms, Three Oaks, Woking. 2.xii.1968.

Mompha conturbatella Hübn. and M. raschkiella Zell. (Lep.: Tineina) in Scotland.—Whilst collecting micros in the grounds of Hopetoun House, West Lothian, on July 22, 1968, I netted a single fresh specimen of *M. conturbatella* as it was flying amongst *Chamaenerion angustifolium*. I am not aware of any previously published record of the occurrence of this species in Scotland.

In 1966, *M. raschkiella* was found to occur in Lanarkshire and Perthshire (cf. Chalmers-Hunt, *Ent. Rec.*, **78**: 237; Brown, *Ent. Rec.*, **79**: 23). This year, I observed it over a very wide area in Scotland, having found mines with larvae in *C. angustifolium* at Jedburgh, Roxburghshire, July 21; at South Queensferry, West Lothian, July 22; at Muir of Ord, Ross-shire, July 27; at Tain, Ross-shire, on the north-east coast, July 28; and at Dunvegan, on the north-west coast of Skye, August 1.—J. M. Chalmers-Hunt, St. Teresa, Hardcourts Close, West Wickham, Kent. 4.xii.1968.

Meliana flammea Curtis in Suffolk.—The Rev. Guy Ford records this species (*Entomologist's Record* **80**: p. 294) (19.x.68) from near Bury St. Edmunds and is inclined to think it has not been recorded before from Suffolk because it did not appear in the first list of Suffolk Lepidoptera published by the Suffolk Naturalists (1937). He has overlooked the following:—"*Meliana flammea* Curtis near the East Coast—Since the first vague record of this marsh Noctuid Moth from 'Suffolk' (Meyrick, 66) it has been creeping eastward: a good number at light, Brandon, 29 and 30 May 1939 (*Entom.* **74**: p. 172); at light in Thelnetham Fen, 22 June 1946 (*Trans. S.N.S.*, **6**: p. 56). Now I am glad to be able to record it from within a mile of the Suffolk Coast in the marshes of Blythburgh, near the heronry, where I cut the pupa that is now in Mr. Morley's collection from a reed, whence the imago emerged at Lowestoft on 31 May 1948. Dearth of reed-examiners hitherto will account for its previous omission from East Suffolk."—P. J. Burton, *Trans. Suffolk. Nat. Soc.*, **6**: 244. To this I would add that H. E. Chipperfield recorded it, *id.* **14**: 1, from Walberswick on May 25th 1967 and from Lopham Fen on July 5th 1967. Moreover I took it myself at Fritton, N.E. Suffolk, to light on

1.vi.1968.—E. P. WILTSHIRE, 140 Marsham Court, Marsham Street, London, S.W.1. 22.xi.1968.

SUCCESSFUL PAIRING OF ACHERONTIA ATROPOS L. IN CAPTIVITY.—Pairings of this species in captivity are apparently very rare, and only one such event is recorded in L. Hugh Newman's recent book "Hawk Moths of Great Britain and Europe," p. 54: the mating position described does not quite correspond with my own observations.

I had been trying for several years to obtain pairings in captivity, since the species is quite common in this area, but without success until last February. Two bred specimens had been placed in a cage outdoors for a night. Then a third moth (caught in the mercury vapour light trap) was added during the day, and about half an hour after sunset I went outside to inspect. Normally the moths give just an occasional squeak as they collide with each other whilst traversing the sides of the cage, but this time, as I got near I heard a most furious and prolonged squeaking. Shining a torch through the celluloid top of the cage I saw that a pairing was taking place and that the "odd man out" was trying to knock the other two apart by repeatedly flying against them, squeaking loudly all the while. I was so amazed by this performance that I watched quite motionless for a time, then, realising that the desired pairing might be broken up by the buffeting they were receiving, I inserted my arm through the trapdoor at the base of the cage and, by the light of the torch shining through the top, managed to grab the rejected suitor by the wing and got him out of the cage.

The pairing was still intact with the male on top of the female, grasping her with his legs but, as I watched (using the absolute minimum of light), he moved very slowly clockwise through 180°, until he hung head downwards in the normal mating position.

I then brought the cage indoors, and by photographing through the celluloid top, obtained excellent colour transparencies. The moths separated after an hour, probably due to their being so much disturbed.

A few weeks later I obtained another pairing. This took place some time during the night, and the pair remained in the normal mating position all day, only separating after I had photographed them at 6 p.m.—HILTON L. O'HEFFERNAN, 63 Keurboom Road, Newlands, C.P. South Africa. 25.xi.1968.

THE WOOD-WASP SIREX GIGAS LINN. ATTACKING A BEE-HIVE. — Doubtless most field workers in entomology have come across the large wood-wasp *Sirex gigas* Linn. at some time or other, but generally single specimens or a few only in the course of a day's work. Recently, browsing upon some back numbers of *The Zoologist*, I came across an acount of a swarm of "hundreds", which attacked a bee-hive and drove out all the bees. It is contained in the issue for January 1863 at pages 8343-4, and the recorder was John A. Power, B.A., who was elected a Member of the Entomological Society in 1834 and (apparently) resigned in 1843. Through our Editor's kindness I reproduce it herewith *in extenso*. It will be interesting if other readers of the *Record* have had similar experiences:— P.B.M.A.

Sirex Gigas an Enemy of the Hive Bee.—The following account of a curious fact connected with the habits of *Sirax Gigas*, communicated to me by my friend Miss Flora Jeston, of Henley-on-Thames, may not be uninteresting to your readers. She writes thus:—"One day about the last day in July we noticed an unusual commotion round the largest of the bee-hives of my friend Mr Pennington. It had been for some time observed that very few bees were to be seen coming out, and he had wondered as to the cause, inasmuch as it was the strongest of the hives, and a supply of thirty pounds of honey had been left in November for the consumption of the bees during the winter. On the morning in question the hive was beset by hundreds of the *Sirex Gigas*, which were passing in and out, and the bees apparently engaged in trying to turn them out of the hive, from which they were issuing in great numbers. There was a battle of some hours, during which the bees killed many of their enemies. The *sirex*, however, retained possession of the hive, and towards evening the last of the bees took their departure. The next morning every one of the Sirices had also disappeared. On examining the hive it was found nearly empty. No honey remained. The old comb was there, but there was no appearance of any new comb having been built during the summer. In fact nothing remained except some dead bees and Sirices, and a portion of old comb containing a little bee-bread".

Miss Jeston gave me some of the insects in question. I presume that this was a foray of a Sirex army in search of honey or other food, and they decamped when they had secured it. I never, however, before heard of the insect congregating in such numbers, but have generally seen only solitary individuals. I believe, too, that it is usually attached to the region of fir trees, and there is, if I am not mistaken, no fir plantation of any kind within a considerable distance of Henley. It is rather singular that a weak state of the hive should have been noticed where it was expected to be strong, but of course it is not to be supposed that the Sirices bred in the hive, after the fashion of Sitaris or Ripiphorus; for I believe their habit is to bore into fir trees to deposit their ova; and, moreover, remains of their pupae, etc., could not have failed to be found and noticed.—John A. Power, 52 Burton Crescent. 17.x.1862.

Current Literature

From Professor **Alexander B. Klots,** I have received separates from the Journal of the New York Entomological Society. Vol. LXXIV June 1966: 95-100 deals with melanism in the Noctuid moth *Panthea furcilla* (Packhard): Professor Klots has analysed his wild catch to show 1 melanic to 3 melanistic to 1 normal, and he also gives an account of broods raised from wild females. LXXIV September 1966: 140-142 gives an account of the larva of the Megalopygid moth *Lagoa laceyi* (Barnes and McDunnough) from egg to the full-fed larva, and points out the similarity between the early instar larvae and popular cotton which is omnipresent during their existence in that stage. He also points out their similarity to larvae of "metal mark" butterflies (Riodinidae) and suggests that these larvae gain some protection from the similarity. LXXIV December 1966: 185-188 illustrates the full-fed larva of the skipper butterfly *Amblyscirtes samoset* (Scudder) and compares this with the

larva of *A. vialis* (W. H. Edwards) found in the same area. Beside halftone figures of the full-fed larvae are line drawings of the head structure.

LXXV May 1967: 43-44 gives an account of an interesting feeding habit of the larva of the pine-feeding Noctuid *Panthea furcilla* (Packhard). Having regard to the necessity for the larva to be able to devour the long needles of the white pine from extremity to base it sits on the twig and with prolegs and first pair of claspers, it pulls the needle down until the point is brought to the jaws, when feeding takes place from point to base. The process is illustrated by an excellent line drawing. LXXV June 1967: 62-67 deals with larval dimorphism and other characters of the Notodontid moth *Heterocampa pulverea* (Grote and Robinson), the larva having both a green and a brown form. The author tabulates the sexes raised from the green and from the brown larvae. LXXV October 1967: 154-158 describes two new species of Crambid moths, *Crambus bigelovi* from Wyoming and *C. harrisi* from the Guadalupe Mountains of New Mexico. Male and female genitalia are illustrated. LXXVI March 1968 covers the North American *Microcrambus* moths. These include eight species so far, three of which, *M. copelandi, M. kimballi* and *M. matheri* are described as new from California, Florida and North Carolina respectively. Male genitalia of all eight species are shown and these are keyed both by genitalia and by colour and pattern. LXXVI March 1968: 58-59 is entitled "Melanism in Connecticut *Charada deridens* (Guenne) (Lepidoptera: Noctuidae)", in which the author has second thoughts about his conclusions in a paper in the same journal (LXXII: 142-144) published in 1964, and now considers many specimens described as normal, to have been melanistic. Results are tabulated.—S.N.A.J.

Obituary

W. Parkinson Curtis died on June 26, 1968, in his 90th year. Born in Poole, he was a lawyer by profession, and practised is Bournemouth. He seldom attended the meetings of Societies, or took part in their activities. The reasons for this being that he was extremely deaf from an early age, and in later years, he was much crippled by arthritis. In his youth he came into contact with a number of Dorset naturalists, the most prominent being the Rev. O. Pickard Cambridge and E. A. Bankes. He joined the Dorset Natural History and Archaeological Society in 1897 and was a Vice President at the time of his death. He was a Founder Member of the Bournemouth Natural Science Society, which was formed in 1903. In 1908 he was elected a member of the Royal Entomological Society of London. In 1932 he joined the Entomological Society of the South of England, which later was to become the Society for British Entomology. Mainly interested in the Lepidoptera, he had at one time a very extensive collection, and a fine library. For very many years he had been working on a List of the Lepidoptera of Dorset. This was in fact, a very comprehensive study of the species found in the County, and included the lists made by J. C. Dale, C. W. Dale and E. R. Bankes, dating from 1816. An accomplished artist, he was also interested in ornithology, photography and horticulture. Thus closed a full and active life.—S. C. S. Brown.

EXCHANGES AND WANTS

For Sale.—Butterflies and Moths—Many species especially Africa and Madagascar, also species from Europe and U.S.S.R., pupae of *Thais polyxena* from Hungary and Czechoslovakia, expected pupae *Bunaea alcinoë* and *Pseudantheraea discrepans* from Central Africa. Lists on request.—*Robert Keiser*, Frederik Van Eeden Plein 3, Antwerp 1, Belgium.

Wanted.—Volume 4 of "The Entomologist" to enable me to complete set. Can anybody help?.—D. O'Keeffe, 29 Arcadian Avenue, Bexley, Kent.

For Sale.—Papered Foreign Butterflies. List available.—*D. Brown*, 25 Charlcote. Near Warwick, Warwickshire.

Wanted.—Specimens of *Pararge aegeria*, and *Pieris napi* from Scotland and Northern England.—*George Thomson*, 98 George Street, Dunblane, Perthshire.

Required.—Would any entomologist or botanist expecting to visit Lebanon, Syria, or Turkey in Asia, consider trying to obtain living stock of the local subspecies (*pseudorapae*) of *Pieris napi*, preferable by collecting the eggs from wild cruciferae where the butterfly is flying? If so please contact *S. R. Bowden*, 53 Crouch Hall Lane, Redbourn, St Albans, Hertfordshire.

For Sale.—"Ent. Rec.", Vols. 66-68 inc. 72 and 73 (no supplement), 10/6 each. 74 and 75, 12/6 each. "Entomologist", Vols. 84-91 inc., 10/6 each. "Proc. S. London E.N.H.S.", 1952-3 to 1963 inc. (except 1955), 7/6 each.—*A. J. Showler*, 12 Wedgwood Drive, Hughenden Valley, High Wycombe, Bucks.

Urgently Wanted for field work, pupae of *Biston betularia*. Female pupae 1/- each or exchange.—*Dr. H. B. D. Kettlewell*, Department of Zoology, Parks Road, Oxford.

For Sale or Exchange.—Proceedings and Transactions of the South London Entomological Society 1944-45, 1947-48 to 1949-50 incl., 1952-53 to 1960 incl. What offers? *Wanted.*—Entomologist's Gazette Volume 6, Vol. 9, Pt. 1; Vol. 12, Pt. 2. Can anyone help me to complete my series? Literature on European lepidoptera also required. Any offers?—*Dr. N. L. Birkett*, Kendal Wood, New Hutton, Kendal, Westmorland.

For Sale.—"Ent. Rec." Vols. 64-68 inc., 72 and 73 (no supplement), 10/6 each; 74 and 76, 12/6 each. "Entomologist", Vols. 84-91 inc., 10/6 each. Proc. S. London E.N.H.S., 1952-3 to 1963 inc. (except 1955), 7/6 each.—*A. J. Showler*, 12 Wedgwood Drive, Hughenden Valley, High Wycombe, Bucks.

For Sale.—Watson "Service" microscope, mechanical stage, complete set of eyepieces and objectives. Cooke stereoscopic microscope, triple nosepiece, several objectives and eyepieces. Erecting Watson Eyepiece and stand. All in first class condition with cases.—Offers to *Mrs. Broome*, 47 Keswick Road, Bournemouth.

CHANGES OF ADDRESS:

T. N. D. Peet, now of Beaconwood, Rednal, nr. Birmingham.

M. Hull, now of "Windcliffe", Alvanley Road, Helsby, via Warrington, Lancs.

Dr. F. M. G. Stammers, now of 11 Barry Close, Chiswell Green, St. Albans, Herts.

Brian Coles, now of Rose Cottage, Weston-on-the-Green, near Bicester, Oxon.

C. A. Cole, now of Higher Ley, Wood Lane, Slapton, near Kingsbridge, S. Devon.

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

with the assistance of

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Barbados, Grenada, Trinidad, Tobago (April-May, 1968)

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

Any part of the West Indies must of necessity be an attraction to anyone interested in the Lepidoptera of that very delectable part of the world which harbours some of the world's choicest species and especially the island of Trinidad which can boast of no less than just over 600 kinds of butterflies. My enthusiasm to visit this region was fired by a most illuminating and entertaining article by Mr. T. H. Homer (*Ent. Record,* 1967: **79**, 163). in which he describes in detail his experiences during a stay of some two months on Trinidad in the autumn of 1966 and from which he returned with a rich harvest of captures. Though this fine and large island was the main objective of my journey, I thought it worth while to visit another one in the main chain of the Caribbean group so as to sample its lepidopterous fauna as well. The one that seemed the most attractive and congenial was Grenada which I was told was the least unspoilt. Very successful and rewarding my choice proved to be. Not long before setting out I had happened to meet Dr Norman Hickin who had just visited this area. He at once said he would contact the various representatives of his firm, Rentokil, on the respective islands. The kindness of these people helped to make my time among the most enjoyable periods I have ever spent, and I would like to express at this stage my extreme indebtedness to them.

Accordingly I set out from London Airport, at mid-day on 19th April, in a VC10. After an eight-hour flight we had a brief halt at Bermuda and then a further three-hour leg to Barbados where I was met by Mr Brian Parsons of Rentokil who conducted me to very sumptuous quarters in the Paradise Beach Club by the shore near Bridgetown. That evening I was able to sample the real tropical atmosphere and temperature of the New World. The following morning Mr Parsons and his wife picked me up and kindly took me for a tour of this most delightful island with its quiet Caribbean shore to the west and its wild Atlantic coast to the east side, but most of its landscape is made up of vast sugar plantations with hardly any of the original vegetation still extant except for a small area of forest in the north which we visited. Only a sprinkling of yellow Pierid butterflies were on the wing in the heat of the day which we spent at Mr Parson's very beautiful residence on the outskirts of Bridegtown. In the afternoon we motored to the airport where I embarked for Grenada which was reached in under an hour. We landed at the airstrip on the east of the island and I had a delightful drive in heavy rain over the mountainous centre for fifteen miles to the capiital at St George's. The winding road through the forest and plantations of cocoa and nutmeg bordering the roads ascended to nearly 2000 ft. at the summit near the Grand Etang which is an old crater. We were able to see still the ravages of the great hurricane of 1955. I went on three miles south of St George's to what was to be my headquarters for the next ten days, the very comfortable Silver Sands Hotel on the lovely Grand Anse Beach. The main holiday season was over with few visitors. On an open landing leading to my room I was greeted by quite an assortment of moths of all descriptions at rest below a light which was kept on all night. Of these there was the spectacular

Agrius cingulata, a Sphingid looking very similar to our Convolvulus Hawk. The walls were plastered with the geometer *Semaeopus caecaria*, very like *Cosymbia puppillaria*. Another very attractive little moth was the local *Racheospila isolata*, a tiny Emerald.

The following day, 21st April, I had my first sample of the island's butterflies which were disporting themselves in fair quantity on a rough patch of ground adjoining the hotel and bordering the beach. The thermometer was standing at nearly 90°F. and after about 1½ hours in this very delectable site I adjourned to the refreshing waters of the Caribbean, but not before I had been able to see and take several interesting species. The large yellow Pierid with a cream female, *Phoebus eubule*, was flying everywhere, while the large common White, *Ascia monuste* was much in evidence with the little fluttering yellow *Eurema venusta* and the diminutive Blue, *Hemiargus hanno*, flitting about among the low herbage. The large speckled Nymphaline, *Anartia jatrophae*, sailed fast round the flowering bushes in the garden with the silver Skipper, *Hesperia syrichtus*, in plenty in the grassy patches where it was advisable to watch your step, as the ground was pitted with the large holes of the land crabs. That afternoon I took a walk southwards along the road bordering the Grand Anse Bay. Here I saw *Danaus plexippus* settling on flowering bushes. The next day, the 22nd, after a morning visit to the very picturesque town of St Georges with its hilly and narrow streets, I made a further survey of the derelict patch near the hotel. A host of *Utetheisa bella*, the counterpart to our *U. pulchella*, were often getting up at every footstep and settling on the low herbage. Two other species of Skippers appeared the orange *Polites vibex* and the deep brown *Lerodes euphala*, about the size of our larger Hesperids. Later that day I visited Dr and Mrs Groome at their very delightful large residence near Pointe Saline on the coast to the south of the island. Before I set out from England I had been asked to find out what I could about the status of Well's Ground Dove (*Leptotila wellsi*), a bird peculiar to Grenada, which was thought to have been almost exterminated by the 1955 hurricane. Dr Groome was able to assure that he had heard the bird calling and was fairly sure it was nesting in that vicinity. I did not see for certain this rare species, though several other kinds of Ground Doves were about everywhere in the scrub bush.

The only new butterflies observed and caught on the 23rd were the Fritillary-like *Agriades vanillae* and the local Peacock *Junonia lavinia*, but at rest the following morning outside my room was the grand Hawk-moth, *Pholus vitis fuscatus* together with quite a spate of the fine noctuid *Gerespa famelica*, looking rather like the Alchemyst. Also among this assemblage were a big yellow Thorn-like geometer *Nepheloleuca polita* and a browner insect of the same group *Pero curvistrigaria*. *S. caecaria* was again in plenty and there was one Cossid, *Xyleutes punctifer*.

On 24th April in glorious weather I set out in a taxi driven by a former native policeman for a tour of the whole island which is about the size of the Isle of Wight. We proceeded along the west coast northward and I stopped to collect en route. *A. vanillae* was flitting among the bushes and I was pleased to get a Hairstreak which turned out to be *Thecla angerona*. We continued towards the north visiting a nutmeg centre en route and saw the preparation of this spice. After a picnic lunch on the most northerly point looking out on the chain of Grenadines which separate Grenada from St Vincent, we returned down the Atlantic

coast to the very attractive Westinhall Estate set on the edge of a sort of sea loch and finally through the sugar fields in the south of the island covering about 60 miles in all. The afternoon of the 25th I explored the high ground by the golf course, seeing several *D. plexippus* and the large tailed Skipper, *Eudamus dorantes*. On the 26th Mr Winsborrow drove me over the summit of the island to Grenville. On the way we stopped to see the Grand Etang at close quarters. This small crater lake supplies the whole island with its water. During the last two days of my stay in Grenada I concentrated on the ground in the immediate vicinity of the Silver Sands Hotel, but I did not add any further species of butterflies and the final nights also yielded very few more moths. One of the delights of my time on this lovely island was watching the many Humming birds hovering over every sort of fairly high-flowering plant and bush.

Early on the morning of 29th April I set out once more by car over the mountain pass to the airstrip near Grenville whence I flew the 100 miles to Trinidad where I was met at the airport by Mr Malcolm Barcant whose knowledge of the local butterflies is unsurpassed. He drove me into the capital, Port of Spain, by way of the mountain drive where it is possible to get a fine panorama of the big city of over 100,000 inhabitants. I put up at the extremely comfortable and well-appointed Queen's Park Hotel, where I remained for the whole of my stay on this grand island. That evening I had the opportunity of seeing Mr Barcant's wonderful collection comprising most of the 615 species of butterflies so far known on Trinidad. The next morning he called for me early and kindly motored me some 70 miles southwards down the west coast via San Fernando to the Forest Reserve not far from the famous Pitch Lake. Here we visited Mr. Henry Covia who was employed by the Oil Company. Their rigs are dotted about among the virgin forest with pipe lines along the rough roads and rides traversing this most enchanting region. We drove on into one of the best and thickest parts of the forest soon after 10 a.m. to a spot where Mr. Covia had plastered some trunks in a secluded path with a special concoction made from guavas growing in his garden. No sooner had we got there than I heard our host shout "Here comes a Zebra, there goes a Postman", a species of *Heliconia*. In fact the area seemed alive with lepidopterous life in the great morning heat. One of the earliest arrivals on the bait was a huge *Caligo* (Owl butterfly) and shortly afterwards with a deft stroke of his long-handled net Mr Barcant swept off a grand *Prepona meander*, looking rather like an outsize Purple Emperor. In a small glade we saw several more Zebras, a nymphaline *Gynesia dirce* which takes it name from its very striped underside and also another very striking member of this Family, *Chlosyne saundersii*. Another capture in this spot was one of the Click Butterflies, *Ageronia amphinome* which makes a crack as it flies. We drove on to a part of the forest devoid of oil rigs where we collected along a wide ride bordered with thick undergrowth. It was here that I caught sight of my first *Morpho peleides* as it swept across, though I had already seen several emerging in Mr. Barcant's large conservatory. It was an unfortgettable sight. Further along in the thicker forest I took a huge female *Papilio thoas*. It was especially interesting to note how many of the Lycaenids settled on leaves in the shafts of sunlight that penetrated the thick forest. One of these that found its way into our net was the beautiful tailed Blue, *Thecla hemon* with a superb metallic purple upperside, also another paler tailed species *Thecla*

meton. There seemed to be innumerable Skippers and good many Heliconias, to keep us busy, but Mr Barcant assured me it was rather the off season for most of the butterflies. We made our way back to Mr Covia's home for welcome refreshment and got back in the evening to Port of Spain much pleased with out day's trip and harvest.

The next morning, 1st May, Malcolm Barcant again called for me, this time accompanied by Geoffrey Chandler. They took me to a small forest area near the airfield at Las Lomas which was alive with butterflies, in particular the Riodinids which are so numerous in the American tropics. We saw several Preponas flying high and Adelphas skimming about like White Admirals, of which at least ten species are known in Trinidad. I took up a position just inside the forest where several Morphos sailed past me just out of reach and it was amazing to see how they wove their way through the closely-growing trees. About mid-day we went on to another forest area where my host advised me not to penetrate too far into it, as I might meet a bushmaster, one of the most dangerous snakes. We finished up along a most picturesque winding road leading into the mountain chain that crosses the northern area of the island and is for the most part still thickly afforested. In both of these latter localities we saw and took a good many further Lycaenids and black and white Riodinids.

The morning of the 2nd I took a taxi up to the top of Lady Chancellor Road where there is a wonderful view of the city. Along a wide path leading to the hills there was a large number of species on the wing, including besides Morphos, several kinds of Riodinids and Adelphas together with the ubiquitous Heliconias and Ithomiines which the former mimic. It was remarkable to observe how similar each of these types of butterflies appeared when flying together. The Hesperids were again much in evidence. The following day was indeed a red-letter one for me, but in the sphere of bird-life. Mr. J. N. MacGregor of Rentokil, to whom I was very indebted for much kindness and hospitality, arranged for me to visit the famous Caroni swamp, just south of the city, the home of the superb Scarlet Ibis. I embarked on a flat-bottomed boat and was paddled through the huge mangrove forest till we eventually came out of the waterways into an open sheet of water where I got my first view of these ibises sitting in trees from which a large flock rose looking like a red cloud. In another lagoon we saw numbers of various kinds of egrets and herons nesting with ospreys sailing overhead. It was indeed a most wonderful sight and experience.

I had always heard that the island of Tobago, the proverbial home of Robinson Crusoe, was a small paradise. On the afternoon of 4th May I flew the short distance to the north-east of Trinidad, landing at the western tip of Tobago and thence by car to the very pleasant Bacolet Inn just outside the chief town of Scarborough. Here I spent a most delightful week-end. Several Swallow-tails were flying round the garden of the hotel as well as the usual number of Riodinids. On the 5th I got a view of the centre of the island when I visited friends on the north side. But it was on the following morning that I hired a taxi to take me to the eastern end along a winding coastal road that went through Speyside to an eminence where there was a grand view of the little township of Charlotteville. It was opposite the former small town that I got a glimpse of Little Tobago, the island which is colonised by Birds of Paradise imported

at the beginning of the century. That afternoon I flew back to Trinidad.

Malcolm Barcant once more kindly called for me at my hotel on the morning of 7th May and drove me into the northern mountains to a most enchanting locality, near Lalaha, where there was a fine assortment on the wing. With his high net he swept off three males of the superb Nymphaline, *Catanephele numilia*, known as the King Shoemaker, with its huge orange patches on a background of purple, while the female is a more sober blue-grey and white. Many Adelphas were sailing around with an occasional Prepona. There were many kinds of Heliconias and Ithomiines including some of the transparent species. Suddenly I was aware of a big butterfly near me and with a sweep of the net I found I had a fine Morpho, which are apparently quite a feat to take in full flight. This was the climax of a glorious day. Just after this spectacular capture my companion made an even more remarkable one. Wielding his long net high up, he found he had in it a transparent Ithomiine which he did not recognise. This eventually turned out to be *Pteronymia artena*, a species new to the Trinidad list and the thirteenth addition he had made to the butterflies of the Island.

The following morning, again at an early hour, we set out again for a valley running up into the mountains just at the back of the City. This very attractive area was bordered on one side by a deep-set stream and we wended our way up a winding path. Adelphas were once more to the fore and I netted one of the rarer species, *A. naxia*. We also took two small black tailless *Papilios* feeding on a flowering bush, *Parides cymochles* and *Parides parianus*. With them were also some of the Dynamine, small spotted Nymphalines together with black and whites Riodinids and many kinds of Heliconias as well as some small brown Satyrids. In the afternoon we motored some 15 miles eastwards to another locality bordering the mountains, but we were much dismayed to find that the forest area had been largely cut down and was now very devoid of butterflies. So we returned to the vicinity of the Capital where in a small shaded bed of a stream right in the suburban area at the foot of Lady Chancellor Road we found a wealth of insects fluttering under the trees. These were mainly Heliconias and Ithomiines, but my final catch was the black and white *Phyciodes leucodesma*, a small Nymphaline looking very like a Riodinid. This was my last sample of collecting on Trinidad.

The next morning, 9th May, I took a taxi early and went for a most enchanting drive over a high mountain pass to the beautiful Maracas Bay on the north coast which harbours a grand bathing beach. In the afternoon, with a heavy heart, I took the plane for Barbados and, after a brief halt there and on Antigua and Bermuda, I reached London at dawn on the 10th and was breakfasting in my own home at Woking. So ended what had been a most enjoyable and successful tour which gave me my first taste of the American Tropics. I cannot emphasise too much how deeply grateful I was to the many people who so kindly entertained me and made this trip one that will remain among the best I have ever undertaken.

I have thought it of interest to enumerate the Lepidoptera observed on this tour. The following species were noted on Grenada between 20th and 29th April.

Butterflies:—

PIERIDS
Phoebus eubule L.
Ascia monuste L.
Eurema venusta L.
DANAIDS
Danaus plexippus L.
NYMPHALINES
Agriades vanillae L.
Junonia lavinia L.
Anartia jatrophae L.
Cystaneura cana Erichs.
LYCAENIDS
Thecla angerona Gdmn. & Slvn.
Hemiargus hanno Stoll.
HESPERIDS
Hesperia syrichtus F.
Polites vibex Geyer
Lerodes euphala Edw.
Eudamus dorantes Stoll.
Polygonus catillus Cr.

Moths taken on Grenada:—

SPHINGIDAE
Agrius cingulata F.
Pholus vitis fuscatus L.
ARCTIIDAE
Utetheisa bella L.
NOCTUIDAE
Leucania solita Willgrn.
Concana mundissima Wkr.
Bleptina caradrinalis Guen.
Zale lunata Drury
Gerespa famelica Guen.
Eutelia ablatrix Guen.
Oblima spec. near *pyraloides* Wkr.
GEOMETRIDAE
Racheospila isolata Warren
Semiothisa everiata Guen.
Semaeopus caecaria Hübn.
Disclisioprocta stellata Guen.
Nepheloleuca polita Cr.
Pero curvistrigaria H.-S.
COSSIDAE
Xyleutes punctifer Gdrt.
PYRALIDAE
Mesocondyla gastralis Guen.
Agathodes designalis Guen.

Butterflies seen and caught on Trinidad between 30th April and 9th May:—

PIERIDS
Eurema albula Cr.
MORPHOS
Morpho peleides L.
PAPILIOS
Papilio thoas L.
Parides cymochles Dbl.
Parides parianus R. & J.
HELICONIAS
Heliconius erato L.
Heliconius hydara Hew.
Heliconius ricini L.
Heliconius melpomene L.
Heliconius wallacei Reak.
Heliconius ethilla Btlr.
Eueides aliphera Gdrt.
ITHOMIINES
Tithorea megara Gdrt.
Ithomia pellucida Weym.
Hymenitis andromica Hew.
Pteronymia artena Hew.
Hypoleria ocalea Hew.
Melinaea lilis sola Kaye
Hypothyris euclea Gdrt.
Mechanitis isthmia kayei Btlr.
Lycorea cleobaea ceres Gdrt.
Aeria agna Gdmn. & Slvn.
NYMPHALINES
Gynesia dirce L.
Didonis biblis L.
Ageronia amphinome L.
Catanephele numilia Cr.
Chlosyne saundersii Dbl. & Hew.
Prepona meander Cr.
Adelpha iphicla L.
Adelpha naxia Fdr.
Cystaneura cana Erichs.
Dynamine theseus Fdr.
Dynamine mylitta F.
Dynamine artemisia F.
Phyciodes leucodesma F.

SATYRIDS
Euptychia hesione Sulz.
Euptychia hermes F.
LYCAENIDS
Thecla hemon Cr.
Thecla meton Cr.
Thecla linus F.
Thecla basilides Geyer
Thecla orcidia Hew.
Thecla philinna Hew.
Thecla nubes Druce
Leptotes cassius Cr.
RIODINIDS
Calephelis nilus laverna Gdmn. & Salvn.
Nymphidium onaeum Hew.
Nymphidium calyce F.
HESPERIDS
Staphylus vulgata Kaye
Hesperia syrichtus F.
Eudamus proteus L.
Polites otho Smith
Arotis sirene Mab.
Milanion hermes Cr.

I would like to express how indebted I am to Mr. Barcant and also to Mr. G. Tite, of Tring Museum, for naming the majority of the butterflies I took on Trinidad, as well as to Mr. D. S. Fletcher, Mr. A. Hayes and Mr. T. G. Howarth of the Entomological Department of the British Museum (Natural History), for their help in the identification of a number of species emunerated above.

Breconshire and Monmouthshire Entomology

By J. M. Chalmers-Hunt

INTRODUCTION

As much of Breconshire is *terra incognita* to the Lepidopterist, I decided to investigate this year a few of its unexplored areas, and on May 25 arrived by car at Crickhowell, prepared for a fortnight's entomologising. The weather was particularly favourable during my stay, and daytime excursions into remote parts of this picturesque corner of the Principality afforded me much interest and enjoyment, as did a number of visits to localities in the ancient forest terrain of east Monmouthshire, so renowned for its entomological richness.

I undertook no night expeditions, but my friend Mr. J. P. Sankey-Barker of Llangattock, most kindly invited me to run an m.v. trap on the lawn of his beautiful garden. The nights were propitious, and among the more notable species to occur in the trap were *Harpyia bicuspis* (Borkh.), *Acronycta alni* (L.) (a melanic form), *A. menyanthidis* (Esp.), and *Laconobia biren* (Goeze)=*glauca* (Hübn.)—the last two occurring here apparently at about the most southerly edge of their range.

There is no published account of the butterflies and moths of Breconshire, but I have a MS. list of its Lepidoptera containing so far as I am aware every known record. I have therefore indicated with an asterisk as probably new to the county, any species noted by me during my travels which was not included in that list. I should add that besides Lepidoptera, it is my custom when working relatively neglected areas to take *en passant* representatives of other insect orders, and a list of some of these is appended.

The following is a note of the localities visited from which insects were recorded. *Breconshire*: Beulah, boggy marshland, 1.6; Brecon, flowery waysides, 27.5; Builth Wells, wood, 6.6; Craig-y-Cilau Nature

Reserve, bog on carboniferous limestone outcrop, 4.6; Crickhowell, 25.5-6.6; Ffrwdgrech, mixed woodland, 27.5; Glangrwyney, waysides, 5.6; Valley of the Irfon, near Abergwesyn, 1.6; Llanbedr, 26.5; Llangattock, 26.5-5.6; Llangorse, lakeside marsh and carr, 30.5; Llangynidr, woods, canalside vegetation, 29.5; Llyswen, wood, 6.6; Mynydd Illtyd near Penpont, marshy fields and moorland, 4.6; Mynydd Llangattock, carboniferous limestone crags and rocky hillsides, 26, 29.5; Hermitage, Black Mountains, 3.6; Pontneathvaughan, 28.5; Senny Bridge, 4.6; Talybont, mixed woodland, adjacent rough grasslands, 3.6; Ty-mawr near Ystradfellte, boggy moorland, 28.5; Upper Chapel, marshy field, 1.6; Ystradfellte, cliffs and rocky places by the river Mellt, 28.5. *Monmouthshire*: Coed-y-Bwynydd near Bettws Newydd, National Trust wood, 5.6; Deri-fach near Abergavenny, hillside oak standards with bilberry undergrowth, carr, 2.6; Redding's Inclosure near Monmouth, mixed deciduous forest, 31.5; Tintern, woodland and adjoining marshy fields, 31.5; Usk, woodland, hedgerows and alder carr, 5.6.

The nomenclature and classification adopted is that of the Lepidoptera portion of the New Edition of Kloet and Hincks, "Check-List of British Insects", to be published shortly. My best thanks are due to Messrs J. D. Bradley, D. S. Fletcher and P. E. S. Whalley, of the Department of Entomology, British Museum, for their kindness in making available to me the typescript of this excellent list, and for permission to follow their work here prior to its publication.

Finally, I must thank the following specialists for kindly undertaking a number of determinations:—Mr. A. A. Allen, Mr. J. D. Bradley, Mr. B. H. Cogan, Mr. A. M. Hutson, Mr. D. E. Kimmins, Mr. G. E. J. Nixon, Dr. J. F. Perkins, Mr. A. C. Pont, Mr. T. Quinlan, Dr. F. Rose, Mr. M. Shaffer, Mr. K. G. V. Smith, Mr. R. W. Uffen, and Dr. I. H. H. Yarrow.

LEPIDOPTERA

MICROPTERIGOIDEA

**Micropterix thunbergella* (F.), Llangynidr. *M. aruncella* (Scop.), Tintern. *M. calthella* (L.), Ffrwdgrech, on *Stellaria holostea* blossoms; Llyswen, on *Ranunculus* blossoms.

ERIOCRANIOIDEA

Dyseriocrania subpurpurella (Haw.), Ffrwdgrech.

HEPIALOIDEA

Hepialus (*Korscheltellus*) *lupulina* (L.), Llangattock.

NEPTICULIDOIDEA

Nepticula aurella (F.), larval mines on *Rubus*, Redding's Inclosure and Derifach. **Tischeria marginea* (Haw.), Llangattock.

INCURVARIOIDEA

**Nematopogon panzerella* (F.)=*schwarziellus* (Z.), Llangynidr; Talybont; Coed-y-Bwynydd; Deri-fach. *Nemophora degeerella* (L.), Coed-y-Bwynydd. *Adela reaumurella* (L.)=*viridella* (Scop), Talybont, swarming over oak; Tintern; Redding's Inclosure; Deri-fach. **A. rufimitrella* (Scop.), Upper Chapel, plentiful, flying about in the sunshine and settling on *Cardamine amara;* Mynydd Illtyd, one.

ZYGAENOIDEA

Zygaena (*Zygaena*) *trifolii* (Esp.) ssp. *palustrella* Verity, Tintern.

TINEOIDEA

**Psychoides verhuella* Bruand=*verhuellella* Staint., Ystradfellte, larvae

on fructification of *Scolopendrium vulgare*. *Nemapogon cloacella* (Haw.) (det. J. D. Bradley), Tintern; Hermitage. *Tinea* (*Acedes*) *trinotella* Thunb.=*lappella* sens. auct., Tintern. **Leucoptera spartifoliella* (Hübn.), Crickhowell, larva mining *Cytisus scoparius*. **Caloptilia* (*Caloptilia*) *betulicola* (Hering), Talybont. *C.* (*Graeillaria*) *syringella* (F.), Tintern. **Phyllonorycter messaniella* (Z.), Llangynidr, reared from *Quercus ilex*.

YPONOMEUTOIDEA

Anthophila fabriciana (L.) Ystradfellte; Pontneathvaughan; Talybont; Senny Bridge; Builth Wells; Tintern; Deri-fach. **Glyphipterix cramerella* (F.)=*fischeriella* (Z.), Ffrwdgrech; Llyswen; Redding's Inclosure; Tintern; Coed-y-Bwynydd. *G. fuscoviridella* (Haw.), Llangynidr; Talybont; Redding's Inclosure; Tintern. **Argyresthia* (*Argyresthia*) *pygmaeella* (Hübn.), Pontneathvaughan, larva on sallow, reared. **A.* (*A.*) *conjugella* Z., Talybont, several imagines beaten from *Pyrus aucuparia*. *Yponomeuta evonymella* (L.), Ffrwdgrech, larval nest on *Prunus padus*. *Y. plumbella* (D. & S.), Usk, numerous larval webs on spindle, reared. **Swammerdamia pyrella* (Vill.) (det. J. D. Bradley), Beulah. *Plutella* (*Plutella*) *xylostella* (L.) =*maculipennis* (Curt.), Llangattock. **Schreckensteinia festaliella* (Hübn.), Talybont, three beaten from low cover.

GELECHIOIDEA

**Metriotes lutarea* (Haw.)=*modestella* (Dup.), Ffrwdgrech, imago on *Stellaria holostea* bloom. **Coleophora nigricella* (Steph.), Llanbedr, case on alder. **C. laricella* Hübn., Talybont, case on larch. **C. murinipennella* Dup. (gen. det. R. W. Uffen), Talybont; Hermitage. *C. sylvaticella* Wood, Tintern, imagines disturbed from *Luzula sylvatica*. **C. alticolella* Z. (gen. det. R. W. Uffen), Beulah, several. *Elachista argentella* (Clerck), Tintern. **E. subalbidella* Schläger Beulah, one. *E. rufocinerea* (Haw.), Talybont. *Endrosis sarcitrella* (L.), Llangattock. *Esperia sulphurella* (F.), Llangynidr; Coed-y-Bwynydd; Tintern. *Alabonia geoffrella* (L.), Tintern. **Agonopterix propinquella* (Treits.), Llangattock, one, in m.v. trap, 28.5. *A. arenella* (D. & S.), Llangattock, one in m.v. trap, 2.6. **A. hyperiella* Bradley =*hypericella* sens. auct., Builth Wells, larvae on *Hypericum perforatum*, reared. **Bryotropha* (*Bryotropha*) *terella* (D. & S.), Llangattock. *Neofaculta ericetella* (Hübn.), Craig-y-Cilau; Hermitage. *Mompha epilobiella* (Roemer), Ffrwdgrech, one.

TORTRICOIDEA

**Cydia* (*Cydia*) *succedana* (D. & S.), Upper Chapel. **C.* (*Grapholita*) *jungiella* (Clerck)=*perlepidana* (Haw.), Ffrwdgrech; Tintern. **Pammene splendidulana* (Guen.) (det. J. D. Bradley), Pontneathvaughan, one flying in afternoon sun. **P. populana* (F.), Crickhowell, larva on *Salix caprea*, reared. **Lathronympha strigana* (F.)=*hypericana* (Hübn.), Builth Wells, larva on *Hypericum perforatum*, reared. *Epiblema* (*Epiblema*) *scutulana* (D. & S.) (det. J. D. Bradley), Llangattock; Talybont. **E.* (*Notocelia*) *uddmanniana* (L.), Crickhowell and Redding's Inclosure, larvae on *Rubus*. **Epinotia* (*Epinotia*) *sordidana* (Hübn.), Llanbedr and Usk, larvae on alder. **E.* (*Hamuligera*) *trimaculana* (Don.), Senny Bridge, larva on wych elm, reared. **E.* (*Evetria*) *immundana* (F. v. R.) (det. J. D. Bradley), Llangynidr. **E.* (*E.*) *tedella* (Clerck), Talybont, imagines beaten from spruce in

swarms; Llangattock. **E. (E.) signatana* (Dougl.), Ffrwdgrech, larva on *Prunus padus*, reared. **Ancylis (Ancylis) unguicella* (L.), Pontneathvaughan. *A. (Anchylopera) badiana* (D. & S.)=*lundana* (F.), Tintern. *A. (A.) myrtillana* (Treits.), Deri-fach, larvae on bilberry, reared. *Bactra lancealana* (Hübn.), Ponneathvaughan; Llangorse; Upper Chapel; Mynydd Illtyd; Tintern. *Endothenia marginana* (Haw.) (det. J. D. Bradley), Tintern. *Hedya pruniana* (Hübn.), Llanbedr, larva on sloe, reared. **H. nubiferana* (Haw)=*variegana* (Hübn.), Llanbedr, larvae on hawthorn, reared. *Olethreutes (Argyroploce) lacunana* (D. & S.), Crickhowell, larva on *Chamaenerion angustifolium*. *Pandemis cerasana* (Hübn.), Deri-fach, larva on oak, reared. *Archips (Archippus) podana* Scop., Deri-fach, larva on oak, reared. **A. (Archips) xylosteana* (L.) det. J. D. Bradley), Crickhowell, larva on *Salix caprea*, reared. **Syndemis musculana* (Hübn.) Irfon Valley; Talybont; Mynydd Illtyd; Deri-fach, flying in numbers over alders; Pontneathvaughan; Coed-y-Bwynydd. **Clepsis (Clepsis) senecionana* (Hübn.) (det. J. D. Bradley), Irfon Valley, ♂; Talybont, ♀. *Ptycholoma lecheana* (L.), Llanbedr, larva on rose, reared. **Capua favillaceana* (Hübn.), Talybont; Tintern; Redding's Inclosure; Deri-fach. **Ditula angustiorana* (Haw.), Llanbedr, larva on rose, reared. *Eulia ministrana* (L.) Llangynidr; Coed-y-Bwynydd. *Cnephasia interjectana* (Haw.), Glangrwyney, larva on *Aconitum*, reared; Builth Wells. larva on dock, reared. **Croesia bergmanniana* (L.), Senny Bridge and Llanbedr, larvae on rose, reared. **Acleris rhombana* (D. & S.)= *contaminana* (Hübn.), Ffrwdgrech, larvae on *Prunus padus*, reared; Llanbedr, larvae on hawthorn, reared; Crickhowell district, larva on *Sorbus minima*, reared. *Hysterophora maculosana* (Haw.), Redding's Inclosure. **Falseuncaria ruficiliana* (Haw.), Pontneathvaughan.

PYRALOIDEA

**Crambus nemorella* (Hübn.)=*pratellus* sens. auct., Irfon Valley; Talybont; Craig-y-Cilau; Tintern. *Scoparia ambigualis* (Treits.) (det. M. Shaffer), Pontneathvaughan. **Eudoria angustea* Curt. (det. M. Shaffer), Llangattock, 3.6. *Evergestis forficalis* (L.), Llangattock. **Eurrhypara hortulata* (L.)=*urticata* (L.), Crickhowell; Llangattock. *Pleuroptya ruralis* (Scop.), Crickhowell and Redding's Inclosure, larvae on *Urtica dioica*.

HESPEROIDEA

Errynis tages L., Tintern.

PAPILIONOIDEA

Gonepteryx rhamni L., Tintern. *Pieris brassicae* L., Talybont; Redding's Inclosure. *P. rapi* L., Ffrwdgrech. *P. napi* L. ssp. *britannica* Verity, Ffrwdgrech; Upper Chapel; Talybont; Brecon; Mynydd Illtyd; Redding's Inclosure. *Anthocharis cardamines* L. ssp. *britannica* Verity, Llangattock; Brecon; Upper Chapel; Ffrwdgrech; Llangorse; Builth Wells; Redding's Inclosure. *Lycaena phlaeas* L. ssp. *eleus* F., Talybont. *Polyommatus icarus* Rott., Tintern. *Celastrina argiolus* L. ssp. *britanna* Verity, Llangynidr. *Nymphalis io* L., Redding's Inclosure. *Boloria (Clossiana) euphrosyne* L., Tintern. *Euphydryas aurinea* Rott., Tintern, extremely abundant in one marshy field, at one point it being possible to count a score on the wing or at rest without moving one's position. *Pararge aegeria* L. ssp. *egerides* Staud., Ffrwdgrech; Talybont; Redding's Inclosure. *Dira megera* L.,

Talybont. *Coenonympha pamphilus* L., Talybont.

GEOMETROIDEA

Cilix glaucata Scop., Llangattock. *Ochropacha duplaris* (L.), Llandynidr *Cyclophora linearia* Hübn., Redding's Inclosure. **Scopula floslactata* Haw., Talybont; Deri-fach. *Xanthorhoe designata* Hufn., Upper Chapel; Mynydd Llangattock; Llangorse; Llangattock; Talybont. *X. spadicearia* D. & S.=*ferrugata sensu* Haw., Llangattock; Talybont; Tintern; Redding's Inclosure. *X. ferrugata* Clerck=*unidentaria* Haw., Llangattock. *X. montanata* D. & S., Llangattock; Talybont; Llanbedr; Coed-y-Bwynydd. *X. fluctuata* L., Crickhowell; Llangattock. *Scotopteryx mucronata* Scop. ssp. *umbrifera* Heydemann, Redding's Inclosure. *Epirrhoe tristata* L., Talybont, flying plentifully in afternoon sun in the rough open ground adjoining a conifer plantation at an altitude of about 900 ft. *E. alternata* Müll., Talybont. *Lampropteryx suffumata* D. & S., Mynydd Llangattock, two, 29.5. *Ecliptopera silaceata* D. & S., Llangattock; Llangynidr; Hermitage; Tintern. **Chloroclysta truncata* Hufn., Llangattock. **Thera obeliscata* Hübn., Llangattock; Talybont; Redding's Inclosure. *T. variata* D. & S., Redding's Inclosure. *Electrophaes corylata* Thunb., Llangynidr; Llangattock. *Colostygia pectinataria* Knoch, Craig-y-Cilau. **Hydriomena impluviata* D. & S., Llangattock, two, both melanic form. *Operophtera brumata* L., Senny Bridge, larvae on hazel, sloe, rose; Tintern, larvae on apple. *Perizoma flavofasciata* Thunb., Llangattock. **Eupithecia pulchellata* Steph., Llangattock. *E. vulgata* Haw., Llangattock; Deri-fach. *E. tripunctaria* H.-S.= *albipunctata* Haw. non Hufn., Llangattock. *E. subfuscata* Haw.= *castigata* Hübn., Talybont. *E. abbreviata* Steph., Llangattock, both type and a melanic form. *E. lariciata* Freyer, Llangynidr; Llangattock. **E. tantillaria* Boisd., Talybont; Llangattock; Llangynidr; Redding's Inclosure. *Aplocera plagiata* L., Talybont. *Asthena albulata* Hufn.=*candidata* D. & S., Talybont, three disturbed from hazel. *Hydrelia flammeolaria* Hufn., Llangattock, one, 30.5. *Minoa murinata* Scop., Redding's Inclosure; Tintern. *Cepphis advenaria* Hübn., Tintern. **Lobophora halterata* Hufn., Llangattock, 30.5. *Petrophora chlorosata* Scop., Pontneathvaughan; Upper Chapel; Llangattock; Tintern; Deri-fach. *Plagodis pulveraria* (L.), Llangynidr; Llangattock. **P. dolabraria* (L.), Llangattock, 30.5. *Opisthograptis luteolata* L., Ffrwdgrech; Llangattock. *Pseudopanthera macularia* L., Tintern. *Apeira syringaria* (L.), Llangorse, larva on *Lonicera periclymenum*. *Odontopera bidentata* (Clerck), Llangattock. *Biston betularia* L., ♂, type, Llangattock. *Erannis defoliaria* Clerck, Deri-fach, larvae abundant on oak, also on hawthorn; Crickhowell district, larva on *Sorbus minima;* Tintern, larva on apple; Pontneathvaughan, larva on sallow. *Menophra abruptaria* Thunb., Llangattock. **Aethalura punctulata* D. & S., Llangattock. *Ematurga atomaria* L., Ty-mawr; Talybont. **Bupalus piniaria* L., Talybont. *Cabera pusaria* L., Talybont; Craig-y-Cilau. *C. exanthemata* Scop., Llangynidr; Llangattock.

BOMBYCOIDEA

Saturnia pavonia (L.), Ty-mawr. *Laothoe populi* L., Llangattock. *Deilephila elpenor* L., Llangattock.

NOTODONTOIDEA

Harpyia bicuspis (Borkh.), Llangattock, two, 2.6. *Eligmodonta ziczac* (L.), Llangattock. *Pheosia gnoma* (Fabr.)=*dictaeoides* (Esp.) Llangattock, 28.5. *P. tremula* (Clerck)=*dictaea* (L.), Llangattock, 2.6. *Pterostoma palpina* (Clerck), Llangattock, 6.6.

NOCTUOIDEA

Dasychira pudibunda L., Llangattock. *Euproctis similis* Fuessly, Glangrwyney, larva. *Spilosoma lubricipeda* L.=*menthastri* D. & S., Llangattock. *Diaphora mendica* Clerck, Llangattock, ♂, 30.5. *Nola confusalis* H.-S., Llangattock, three. *Agrotis exclamationis* (L.), Llangattock. *A. ipsilon* (Hufn.), Llangattock, 29.5, one only. **A. puta* Hübn., Llangattock, 28.5. *Axylea putris* L., Llangattock. *Ochropleura plecta* (L.), Llangattock; Tintern. *Diarsia rubi* (View.), Llangattock, 29.5. *Amathes* (*Amathes*) *c-nigrum* (L.), Llangattock. *Cerastis rubricosa* (D. & S.), Llangattock, one, 30.5, a very dark form. *Hada nana* (Hufn.)=*dentina* (D. & S.), Llangattock, one, 4.6, a yellowish-grey form. *Lacanobia thalassina* Hufn., Llangattock, 2.6. *L. genistae* Borkh., Llangattock, 30.5, 4.6. *L. oleracea* L., Llangattock. **L. biren* (Goeze)=*glauca* (Hübn.) Llangattock, 30.5, 2.6. *Ceramica pisi* (L.), Llangattock. *Orthosia gothica* (L.), Llangattock. *Mythimnia* (*Leucania*) *comma* (L.), Llangattock. *Agrochola lota* Clerck, Crickhowell, larvae on sallow, bred. *Acronicta* (*Triaena*) *alni* (L.), one, 30.5, one, 2.6, both approximating to ab. *carola* Philipps, but not quite so extremely melanic as some that I have from Sheffield. *A.* (*T.*) *psi* (L.), Llangattock. **A.* (*Pharetra*) *menyanthidis* (Esp.), Llangattock, 6.6. *A.* (*P.*) *rumicis* (L.), Llangattock. *Euplexia lucipara* (L.), Llangattock. *Apamea crenata* (Hufn.), Llangattock. **A. sordens* (Hufn.) =*basilinea* (D. & S.), Llangattock, 29.5. **Oligia latruncula* (D. & S.), Llangattock. *Charanyca trigrammica* (Hufn.), Llangattock. *Panemeria tenebrata* (Scop.), Tintern. *Colocasia coryli* (L.), Llangattock, 30.5. *Autographa gamma* Hübn., Llangattock; Talybont; Tintern. *A. pulchrina* Haw., Llangattock. *Abrostola triplasia* (L.)= *tripartita* (Hufn.)=*urticae* (Hübn.) ("Light Spectacle"), Llangattock. *Callistege mi* (Clerck), Talybont. *Euclidia glyphica* (L.), Tintern. *Phytometra viridaria* (Clerck), Talybont; Tintern.

COLEOPTERA

Llangynidr: *Sinodendron cylindricum* L.; *Denticollis linearis* L. Talybont: *Geotrupes stercorarius* L.; *Cytilus sericeus* Forst.; *Lathrobium fulvipenne* Grav.; *Cantharis decipiens* Baudi (=*Metacantharis clypeata* auct. part.). Brecon: *Philonthus fuscipennis* Mann. Ystradfellte: *Cantharis decipiens* Baudi; *Chrysolina polita* L., *Lochmaea capreae* L.; *Dorytomus taeniatus* F. Llangorse: *Rhagium bifasciatum* L.; *Agonum thoreyi* Dej.; *Chrysolina polita* L. Ffrwdgrech: *Agriotes pallidulus* Ill.; *Helodes minuta* L.; *Pyrochroa serraticornis* Scop.; *Lema lichenis* Voet. Upper Chapel: *Athons haemorrhoidalis* F.; *Rhagium bifasciatum* L. Irfon Valley: *Dalopius marginatus* L. Glangrwyney: *Pyrochroa serraticornis* Scop. Llangattock: *Necrodes littoralis* L., two in m.v. trap. Redding's Inclosure: *Cantharis pellucida* F. Tintern: *Melandrya caraboides* L. Deri-fach: *Anisotoma humeralis* F., about 30 examples under a white fungus attached

to a growing alder trunk. Coed-y-Bwynydd: *Anaspis frontalis* L. All det. A. A. Allen.

HEMIPTERA-HETEROPTERA

Stenodema calcaratum Fall. (det. A. A. Allen), Ffrwdgrech. *Dryophilocoris flavoquadrimaculatus* Deg. (det. A. A. Allen), Usk.

TRICHOPTERA

Rhadicoleptus alpestris (Kol.), 1 ♀, Pontneathvaughan. *Limnephilus extricatus* (McL.), 1 ♀, Pontneathvaughan. *Agapetus ochripes* (Curt.), 1 ♂, Llangattock. *Polycentropus* sp., ♀, Pontneathvaughan. *Rhyacophila dorsalis* (Curt.) 1 ♂, Tintern. All det. D. E. Kimmins.

PLECOPTERA

Protonemura meyeri (Pict.) (det. D. E. Kimmins), 1 ♀, Pontneathvaughan. *Isoperla grammatica* (Scop.) (det. D. E. Kimmins), 1 ♀, Ffrwdgrech. *Leuctra* sp., 1 ♀, Ffrwdgrech.

NEUROPTERA

Micromus paganus (L.) (det. D. E. Kimmins), 1 ♀, Llangynidr. *Osmylus fulvicephalus* (Scop.) (det. D. E. Kimmins), 1, Tintern.

MECOPTERA

Panorpa germanica (L.) det. D. E. Kimmins), 1 ♂, Senny Bridge.

EPHEMOPTERA

Ephemera danica (Mull.), 1 ♀ sub., Mynydd Illtyd; 1 ♂, 1 ♀ sub., Tintern. *Ecdyonurus torrentis* Kim., 2 ♂♂, Mynydd Illtyd. *Rhithrogena semicolorata* (Curt.) 1 ♂, Ffrwdgrech. All det. D. E. Kimmins.

ODONATA

Calopteryx virgo (L.), 1 ♂, Builth Wells. *Pyrrhosoma nymphula* (Sulzer), 1 ♂, Upper Chapel. *Coenagrion pulchellum* (V. d. L.), Llangorse, extremely abundant, 1 ♂, 2 ♀♀ taken; Mynydd Illtyd, 1 ♀. All det. D. E. Kimmins.

DIPTERA

Syrphidae

Ringia campestris Mg., Upper Chapel; Llangorse; Ffrwdrech. *Helophilus lunulatus* Mg. Llangorse. *Bacha obscuripennis* Mg. Senny Bridge. *Melanostoma scalare* F., Ffrwdgrech. *Cheilosia variabilis* Pzer. (det. K. G. V. Smith), Builth Wells. *C. albitarsus* Mg., Upper Chapel. *Pyrophaena granditarsa* Forst., Builth Wells. *Volucella bombylans* L. Llangynidr. *Eristalis horticola* Deg., Llangynidra. *Leucozona lucorum* L., Coed-y-Bwynydd. All det. K. G. V. Smith.

Empididae

Empis tessellata F., Ffrwdgrech; Builth Wells. *Rhamphomyia stigmosa* Mcqut., Irfon Valley. *R.* (*Lundstroemiella*) *hybotina* Zett., Ffrwdgrech. All det. K. G. V. Smith.

Tipulidae

Limnophila (*Limnophila*) *punctata* Schrank, Beulah; Llangorse. *Lipsothrix remota* Walker, Ystradfellte. Both det. A. M. Hutson.

Psychodidae

?*Psychoda* sp. (det. A. M. Hutson), Llangorse.

SCIOMYZIDAE

Knutsonia albiseta Scop., ♂, Llangorse. *Sepedon spinipes spinipes* Scop., ♀, Llangorse. Both det. B. H. Cogan.

CHIRONOMIDAE

Chironomus (*Chironomus*) *plumosus* L. (det. A. M. Hutson), Llangorse.

STRATIOMYIIDAE

Microchrysa polita L. (det. K. G. V. Smith), Senny Bridge.

SCATOPHAGIDAE

Scatophaga merdaria F. (det. A. C. Pont), ♂, Redding's Inclosure.

RHAGIONIDAE

Atherix ibis F. (det. K. G. V. Smith), Builth Wells.

SEPSIDAE

Nemopoda nitidula Fall. (det. A. C. Pont), Ystradfellte.

BIBIONIDAE

Bibio pomonae F. (det. A. M. Hutson), Ffrwdgrech.

PTYPHOPTERIDAE

Ptyphoptera contaminata L. (det. A. M. Hutson), Llangorse.

MUSCIDAE

Phaonia signata Mg. (det. A. C. Pont), ♀, Coed-y-Bwynydd.

ANTHOMYIIDAE

Hylemya strenua Desv. (det. A. C. Pont), ♂, Coed-y-Bwynydd, ♂, Ffrwdgrech.

HYMENOPTERA

Bombys lapidarius L., Talybont. *B. agrorum* F., Ffrwdgrech. *B. lucorum* L., Mynydd Llangattock, 26.5. *Psithyrus sylvestris* Lep., Ffrwdgrech. *P. bohemicus* Seidl., Talybont. *Formica fusca* L., Senny Bridge. *F. rufa* L., Deri-fach. *Lasius niger* L., Crickhowell. All det. I. H. H. Yarrow.

Selandria serva (F.) (det. J. Quinlan), ♂, Llangorse. *Dolerus aeneus* Htg. (det. J. Quinlan), ♂, Ystradfellte. *Dolerus* sp. (det. J. Quinlan), ♂, Llangynidr. *Eubadizon extensor* L. (det. G. E. J. Nixon), Llanbedr, bred ex larva of *Acleris rhombana* (D. & S.) (Lep. Torticoidea). *Mesoleius* sp. (det. J. F. Perkins), ♂, Ffrwdgrech.

St. Teresa, Hardcourts Close, West Wickham, Kent.
November 17th, 1968.

LATE APPEARANCE OF PHEOSIA GNOMA FABR. AND BLASTOBASIS DECOLORELLA WOLL.—Whilst inspecting my M.V. trap on the evening of 27th November 1968, I was surprised to see a perfect specimen of *P. gnoma* sitting on the wall nearby. Specimens of the first and second broods were quite frequent in the trap, so there was presumably a partial third brood.

A few days later, I found a fresh specimen of *B. decolorella* in the trap. This species is quite frequent along this stretch of the East coast. In 1967 a fresh specimen appeared towards the end of December. I mentioned this to Mr. S. Wakely, who suggested that this might have been a third brood. Could it be that this species has a regular partial third brood?—H. E. CHIPPERFIELD, The Shieling, Walberswick, Suffolk. 29.xii.1968.

Lithocolletis glaserorum spec. nov. (Lepidoptera, Lithocolletidae)

By Gerfried Deschka

Brief Diagnosis: Thorax with one white central band. Forewings pale orange, markings white. Front margin with three or four costal strigulae, the fourth either insignificant or missing; inner margin with three strigulae. The first costal mark in the centre of the wing is extended as far as the base of the wing. No basal stripe. Front margin has an indentation before the wing-tip. The tip has a dark border, with a black spot.

Holotype ♂: Frons, frontal hair and basal segments of the antennae pure white. Antennae white, segments with very delicate darker rings. Eyes black. Thorax brilliant orange with a broad white central band. Abdomen whitish. Front legs white with very dark rings; mid and hind pairs of legs white, with faint darker variegations. Ground colour of the fore wings brilliant pale orange, markings white. Fore wings without basal stripe. Pure white from the first fore wing costal mark to the base, so that a white wedge radiates outwards from the base to the top of the first costal mark (first costal mark extended to the base). The first dorsal strigula appears as a small white patch near the base, which is joined to the wing base by a very narrow bridge on the inner edge. This is followed by two strigulae edged on the inside with very faint dark marks. On the costa a further two strigulae with delicate, dark markings on the inside, follow the first costal strigula. The fourth costal mark, near to the wing tip, is scarcely discernible. Wing tips delicate lustrous violet, with black borders and a distinct black spot just short of the tip. On the front margin, close to the tip, a slight indentation. The fringes on this indentation have black tips. Fringes of the fore wing and the hind wing white. Wing span 4·2 mm.

Male genitalia symmetrical, slightly sclerotized and remarkably small for the genus. Valves broad, curved outwards and thinly edged on the inner side with many incurved bristles. In the last third a large, approximately triangular protrusion with a more strongly chitinised tip protrudes from the surface of the valves; on this protrusion two irregular rows of a few short setae. Tegumen broad, round, with a narrow uncus which ends in a blunt point; the uncus has two lateral rows of bristles near the tip; the uncus tip extends somewhat beyond the valves. Aedeagus longer than valves, in ventral view shaped like a thin pear, in lateral view like an elongated S, broader at the base than in the middle or at the tips. The aedeagus has a forked end, with one shorter and narrower tip and one longer and wider. Ventral scale shorter than the valves, tongue-shaped, with a saddle-shaped indentation at the end; distal edge thinly fringed with very fine hairs. Tegumen sharply bent, no process. Genital Preparation No. 331 (Deschka).

Holotype 1 ♂ labelled: "Hispania, Cataluna, Port Bou 0-300m, 9-24.vi.64, leg. M. u. W. Glaser, *Lithocolletis glaserorum* DESCHKA, G. Deschka det. Gen.-Prep. Nr. 331. Holotypus". At present time in coll. Deschka.

Paratypes: 4 ♂♂, 2 ♀♀ labelled: "Hispania, Cataluna, Port Bou 0-300 m, 9-24.vi.64, leg. M. u. W. Glaser. *Lithocolletis glaserorum* DESCHKA.

G. Deschka det. Paratypus". At present time in coll. Glaser and Deschka.

Female genitalia symmetrical. Postapophyses and antapophyses approximately the same length. Both apophyses have the same width; only the postapophysis has a minute extension in the centre. Sterigma remarkably strongly sclerotized, broadly conical and projecting some distance from the 7th segment. Signum bursae clearly sclerotized, with two tips in the shape of a swallow-tail. The form of the sterigma could well be another good distinguishing feature.

I dedicate the new species to Margit and Wolfgang Glaser of Vienna, who collected it in Port Bou and who placed their collection of Lithocolletis at my disposal for identification. I owe them my particular thanks.

Remarks

The species of the genus *Lithocolletis* are a very uniform group, whose representatives are closely related to each other. In order to be fair to the present state of research it is absolutely necessary to employ modern methods of morphological and anatomical investigation. Only in this way can an insight into the points of relationship between the individual representatives be guaranteed. Unfortunately, no such investigations by any of the writers of the last century and the beginning of this century are available to us and consequently there are no opportunities for comparisons. Only in the future will attempts be made to investigate and evaluate the morphology of the genitalia of early type material. Above all, the author regrets that, for all the species of Lithocelletis which are important to this work, no (or only few) results of investigations are available. It is very much regretted, that almost no investigations of south and west European material have been published; similarly, pertinent investigations of the American representatives are lacking. The author was therefore compelled either to check the present material by using traditional methods without taking into consideration the result of modern microscopic investigations or himself to investigate the genitalia of a number of species from western and southern Europe. Both possibilities were utilized to the full. Furthermore, descriptions of the holotype and copies of the drawings published here were sent to the most important authorities in this field, for comparison with their collections and literature. Over and above this, some original descriptions had to be procured.

The lack of knowledge of the biology, and especially of the food-plants, of the new species caused great difficulties. Since almost the whole genus is made up of monophagous or oligophagous representatives, a knowledge of the host-plant would have enabled one to exclude many otherwise similar species. By investigation of the wing colour and marking and particularly of the male genitalia, it become more and more obvious to the author that *Lith. glaserorum* can only be a *Fagaceae* miner. To-day it can be assumed with great probability that the species lives on a hard-leafed oak.

In order to exhaust all possibilities in the investigation which may serve to clarify the question of the host-plant, the author asked the two collectors of the type-sample of *Lith. glaserorum,* Frau Margit and Herrn. Ing. Wolfgang Glaser, to characterise the plant association on which the new species was found. Since no notes were made while the two collectors were in Port Bou, the attached details are based only on a reconstruction from memory.

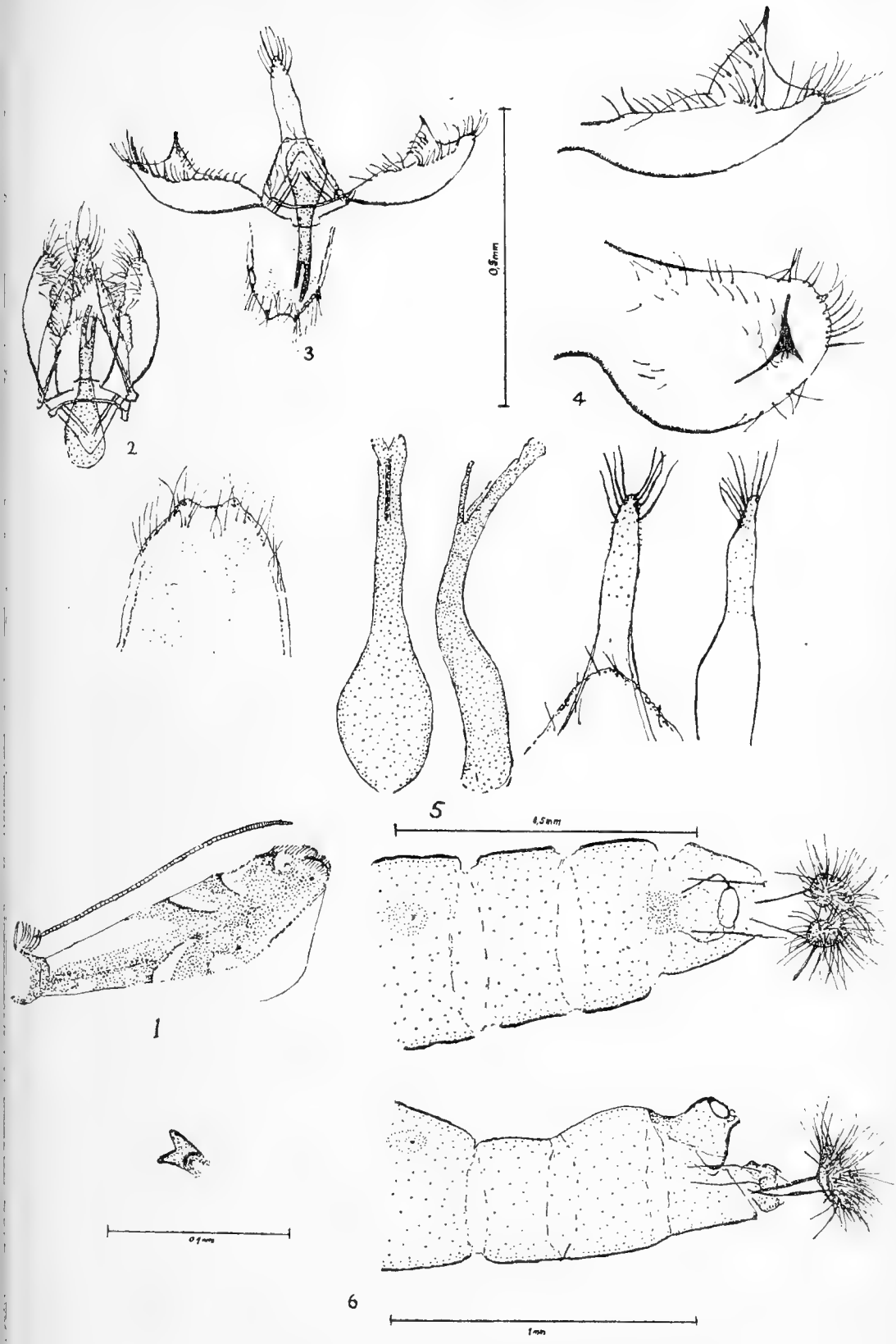


Fig. 1 *Lithocolletis glaserorum* sp. nov. Holotype forewing pattern; Fig. 2. Male genitalia closed. Fig. 3. Male genitalia opened (Preparation No. 331 Deschka). Fig. 4. Various views of the valves. Fig. 5. Ventral plate seen from below. Aedeagus, ventral and lateral views. Uncus, dorsal and lateral views. Fig. 6. Paratype female genitalia, ventral and lateral views (Prep. No. 350). Signum bursae greatly enlarged.

The place where they were found lies directly on the edge of an incline, in a river-bed which is dry in summer and autumn. Nearby are open as well as cultivated vineyards. The open vineyards cover one side of the valley and have scarcely any overgrowth worthy of mention. The river-bed in which the species was captured in daylight, harbours above all *Lavandula stoechas* L., *Rubus ulmifolius* Schott (?), Potentilla spec., *Euphorbia* spec., *Malva moschata* L., *Tamarix gallica* L., *Typha* spec. is found in damp places and *Mentha* spec. in pools. *Cistus salvifolius* L., *Foeniculum vulgare* Miller, *Genista anglica* L. and *Ononis* spec. grow on the slopes. Particularly important for the present work are: *Quercus ilex* L., perhaps also *Qu. ilex* var *suber* (L.) Pereng and *Castanea sativa* Mill. As already explained, only the last named *Fagaceae* can be seriously considered as the host-plant of *Lith glaserorum*.

With regard to the systematic position of the new species a few main points should be explained. *Lith. glaserorum* does not stand close to any palaearctic species. The characteristic wing markings with the extended first costal strigula, the missing basal stripe and the small indentation near to the tip have no similarity with any representative of palaearctic fauna known to the author. The same applies also for the South African (Vari). Two species were found among the American fauna which may have a direct relationship with the new species without, however, being identical to it: *Lithocolletis fitchella* Clemens 1860 and *Lithocolletis leucothorax* Walsingham 1907. The first species differs from *Lith. glaserorum* in its completely silver-white thorax, the pale saffron-yellow antennae, the different ground-colour, the five (instead of four) costal strigulae and their more definite basal margin and the completely different position and form of the inner margin strigulae; *Lith. leucothorax* differs from *L. glaserorum* in its pale saffron-yellow antennae, the much thinner first costal strigula, the lack of a black spot near the wing tip, the basal stripe (shown in the drawing) and the completely different type of costal marking. In spite of these marked differences, the three species have common features: the seemingly very similar wing-pigment, the remarkable first costal strigula which extends as far as the wing base, and the lack of the basal stripe (not mentioned in the original diagnosis of *Lith. leucothorax*— a white basal stripe is faintly indicated in fig. 2, plate XXI of the Trans. Am. Ent. Soc. XXXIV). *Lith. fitchella* is an oak miner. Without doubt, *Lith. glaserorum* is to be classified in Group I of the grouping according to Annette F. Braun (cylindrical caterpillar, white marking features, more darkly-edged at the base) and this assumption can also be justified if the larva is still unknown, since the marking features given by Braun are valid for the whole group without exception.

I have consulted Herrn Karl Burmann in Innsbruck, Dr. J. Klimesch in Linz, Dr. F. Gregor in Brünn and Herrn and Frau Glaser in Vienna on various problems which came up during the description of the species. They have compared my diagnosis and my drawings with their literature and their collections of specimens and given me the benefit of their wide experience. I thank them for their help.

I would also like to thank Mr. F. H. Firth for his handling of the English translation of this paper.

Maniola (Epinephile) jurtina (L.) (Lep. Satyridae) and its Forms

By George Thomson

(continued from P. 14)

RACES

Geographical Variation

The extent of fulvous in the male is not a strongly developed character in the north but becomes so in the western form of the Atlantic Group and in one or two parts of Switzerland and North Italy. In the far south it takes on a different character being rather 'glossy-golden' in the Canary Islands and again in the East. Females of the race *phormia* in general exhibit poor development of the fulvous, while it becomes more of a feature in Sweden and, in a different way in the Western British races. It reaches its greatest height in *fortunata* and *hispulla*.

The apical eyespot of the male shows variation being poorly developed in Sweden and the south and highly developed in the West and some of the Mediterranean islands (*iernes* and *corfiothispulla*). The female eyespot shows a north-south cline from the rather small single pupilled form in the north to a bipupilled form in the south where it tends to 'spread'. Similar marking occurs in the isles of Scilly and Corfu.

The underside hindwings of the females are more yellow in Scandinavia and Central Europe than in the Iberian Peninsula and the Canaries (*cassiteridum* and *splendida* being exceptions).

A. The Typical Sub-species

Jurtina L. 1758, Syst. Nat., X, p. 475, No. 104 (female) [Plate One, figs, 5, 9]. Upperside ground colour brownish-fuscous or fuscous, sometimes blackish in the male, with a darkening of this colour towards the base. The male has a blackish brand which contains the androconial scales. The basal area (sometimes on all the wings) and the costa have, in fresh specimens, an iridescence—sometimes strongly marked. The fulvous markings, on both sexes are very variable both in extent and in tone. The usual male colouring is rather darker than that of the female, though the fulvous colouring usually forms a band or series of blotches below the apical eyespot, and, in the female, often invades the central area and to a lesser extent the hind wings. The apical eyespot of the male is often suffuse but does not often lose its pupil which is more often very small and off-white. In the female bipupilled forms are not as common as single pupilled forms.

The underside forewing in more than half the Swedish males examined were unicolourous, having little or no difference between the light subapical band and the basal half. Only 6·73% had the dark medial transverse line so frequent in the Atlantic races. The situation in The Netherlands is even more striking with 80% of the males having a unicolourous underside forewing and only 3·36% with the dark medial line. The hindwings have a very variable light band with usually two or three black spots on each wing. These wings are only lightly marked with dark striae.

Average size: ♂♂ 46·2 mm.; ♀♀ 50·6 mm.

Locality: Sweden, Finland, Denmark, Netherlands, Belgium, North Germany and as far as existing papers suggest Hungary and Moravia. Specimens from the west coast of Sweden might be found to differ from the typical form, but my three males and four females from Marstrand, although they differ constantly, are insufficient to even suggest to which race they might belong. Information received from the Zoological Museum, Oslo, confirms that Norwegian *jurtina* are identical with those from Sweden in all respects.

B. The Atlantic Group

In a species which shows such variation, both individual and geographical, it is often impossible to find a single character to distinguish with reasonable certainty one sub-species from another. In the case of *jurtina* it has been possible to separate one or two races as being distinctly sub-specific. In this category I would place all of the Eastern Group, *fortunata, hispulla, corfiothispulla* and *cassiteridum.* It has been said that *fortunata*-like specimens have been found in the south of Portugal, and specimens approaching *cassiteridum* in the west of Cornwall. Though I have no experience of the Portuguese '*fortunata*' I suspect that these two forms of 'intermediates' are of a similar nature. I have collected extensively in Cornwall and for a few weeks in the Isles of Scilly, but I am certain that anyone who has seen freshly emerged *cassiteridum* would not place the Cornish race as belonging to that sub-species. About *iernes* I am not so sure, as so many west-central Scottish specimens and some from Hampshire I find difficult to separate from my less bright Irish specimens—even although they come from the type locality. But Graves' statistical comparison is convincing and I accept his conclusions.

In north-west Scotland we find *splendida* flying with the 'typical' southern type and intermediates, but there are localities where the strain is pure. From these there is a long cline in which *splendida*, intermediates are found.

Graves (1930, Entomologist 63, p. 76-81) could find nothing which could with reasonable certainty separate the southern British form from the typical Swedish examples, though both he and Lempke felt that the British form was 'different'. In the first place the number of females with the apical eyespot bipupilled is greater on these islands than in Sweden, and the average size of both sexes is smaller in the typical *jurtina.* But it is on the underside that the real difference lies, British specimens being more contrasty. Indeed the females from England and Southern Scotland reach a degree of contrast on the forewings (between the subapical band and the basal half) never found in Scandinavia. This is a striking characteristic of both *cassiteridum* and *iernes.* Oddly, *splendida* females tend in the opposite direction, if we are to go by Graves' illustration, which could throw doubt on his theory that the three British Atlantic races result from the same early cross with a *hispulla* ancestor. However, I have examined *splendida* from Gairloch and all have the transverse line in the female well marked — quite different from Graves' illustration

Graves used for his comparisons the extent of fulvous on the upperside and its form, the bipupillation of the apical eyespot of the female

and the form of the light medial band of the underside hindwings in both sexes. As distinguishing characters these are useful, but the great variation which occurs within each race makes them rather suspect.

As I have said, the greatest difference between the type *jurtina* and our form is the contrasting underside of the latter, the difficulty in measuring this being the stumbling block. On examining several hundred females I found that, although the British examples reached a degree of contrast not found in Sweden and the Swedish examples reached a degree of uniformity not found in the British races, there were a fair number of insects which were similar in this respect. Turning to the males I found the situation quite different. In 93·27% of the British males (excluding *splendida, iernes* and *cassiteridum*) the darker basal half of the underside forewing was separated from the lighter sub-apical band by a transverse line of a distinctly darker colour than the basal half. In Swedish examples this line appeared in only 6·73% of the specimens. Only 1·04% of the British males had the unicolourous underside forewing (i.e. with the usually darker basal half of the same colour as the usually lighter sub-apical band), while 63·42% of the Swedish examples were of this form. In the Netherlands this difference is even greater. My analysis of the specimens examined is shown in Table 1. When these percentages are compared with statistics of other distinguishing features used for the *jurtina* races, we find that this is one of the most constant characters in the species and probably one of the most useful to separate the races of *jurtina*, not only *jurtina* and the British races but for all other sub-species of the butterfly. Unfortunately, my specimens from southern Europe are not sufficiently numerous to make any conclusions, but initial investigations show that this line is almost always lacking in *phormia* (although it appears in some specimens from north Italy), *emi-, praehispulla* and *miscens*, while it is found occasionally in a modified form in *hispulla*. However, much work is necessary on this, and it might be found that the use of this character as a distinguishing feature in the male throws new light on the species, just as the bryo-streak helped the study of the *Pieris napi/bryoniae* complex.

The development of the transverse line in the South British, Scillonian and Irish specimens suggests a relationship much closer to each other and much further from the typical sub-species than was thought by Graves. Because of the differences found in *cassiteridum* and *splendida* as explained by Graves, I had no hesitation in separating them from the mainland race. The case with the Irish specimens was not so simple, as 'low' *iernes* specimens were very close to the frequently found *ierneformis* of central and south-west Scotland. After a much closer examination I found that the Irish male with its female characteristics and the larger size of both sexes differed constantly—if not by much—from the mainland form. It would be useful from the point of view of their relationship to extend the description of *iernes* to cover the south British form, but statistical comparisons show that the Irish race is sufficiently distinct. It is necessary, therefore to describe the south British form and for this I suggest the name *insularis* s.sp.nov.

S.sp. *insularis* nov. [Plate One, figs. 1-4, 6-8, 10-12]

Male: *Upperside*, mummy brown to sepia sometimes reaching an

Erebia-like colouring when freshly emerged. In such cases the androconial brand is wholly or partly obscured. Over all of the wings is an iridescence (sometimes bluish, sometimes greenish) which is more pronounced than in Scandinavia or Central European forms, but somewhat less than in *splendida*. This iridescence is most strongly developed on the costal margin, on the androconial brand and on the basal area of the hindwings. The apical eyespot is well developed, usually with a very white pupil, larger than in typical *jurtina*—not often bipupilled, and hardly ever not pupilled—set in a well marked ring of bright fulvous. The sub-marginal band is usually quite well formed, but less so than in *iernes*.

Underside. Forewing basal half almost always of a darker colour than the sub-apical band (in 98·96% of specimens examined), often taking on a dark rust or raw sienna tone, and in 93·27% of specimens the two shades were further divided by a well-marked line of darker colouring than either of the two parts. Only 6·73% of Swedish males had this line. The hindwings are very variable but the light medial band is less well marked than in *iernes*. However, this is frequently well defined and the darker areas sometimes take on a reddish shade. Spots on the band vary from 0-6, usually two.

Female: *Upperside*. Ground colour mummy brown to sepia—hardly ever blackish. The fulvous below the apical eyespot (which is not infrequently bipupilled) is very variable in size but is usually fairly extensive, sometimes broken by the nervures, and often appearing on the hindwings. In this respect *insularia* is less bright than the other British races. The fulvous on the forewing often invades the central area, usually separated by scales of the ground colour as in *iernes*, but sometimes without such separation, as in *slendida*. The fulvous is of a darker (more red) colour than Swedish *jurtina* or French *phormia* occasionally reaching a colour similar to that of typical *splendida*.

Underside. Discal area of a darker colour than the sub-marginal band—often strikingly so, and with a dividing transverse line of a much darker colour than either, approximately similar to that of the upperside ground colour. The hindwings have a well marked band, somewhat yellowish usually but can tend towards greyish as in *hispulla*. The general appearance of the underside is of contrast to a degree rarely found in Swedish *jurtina*. A long series looks quite different from the typical sub-species.

Insularis thus belongs to the same group of sub-species as *cassiteridum*, *iernes* and (perhaps) *splendida* which are characterised by the high degree of contrast reached on the underside of the forewings and, to a lesser extent, on the hindwings, also by the strongly developed transverse line on both sexes. It differs from *cassiteridum* in the lack of strong *hispulla*-form characters in the apical eyespot and the underside hindwing of the female, from *iernes* in its smaller size, less gynaikoptropic form of the male and more variable nature of the fulvous markings and from *splendida* in the less dark underside forewing of the male and the more yellow hindwing of the female. A feature of *insularis* is its heterogeneous nature, which ranges from close to (but distinct from) *jurtina* in Hertfordshire and some of the Midland counties, to an approach to *cassiteridum* in west Cornwall, *splendida* in central and north-west

Scotland and *iernes* in any but mainly maritime localities throughout its range. It is one of the most variable races of *jurtina* (similar in this respect to *phormia*, to which it might be closely related) with the forms *addenda* Mousley, *erymanthoides* Strand, *fracta* Zweigelt and *antiparvipuncta* Leeds being not uncommon. Among the rarer forms which I have taken is *anommata* Vrty.

Size: Average expanse—♂♂ 48·00 mm. ♀♀ 53·00 mm., not as variable as typical *jurtina* or *phormia*.

Locality: Described from 230 ♂♂ and 280 ♀♀ from England, Wales, South Scotland and Central Scotland (mainly from Hampshire, Hertfordshire, Surrey, Cornwall, Dorset, North Wales, Berwickshire and Stirlignshire). Individual specimens from Hertfordshire and the south Midlands are hard to distinguish from Swedish *jurtina* except by its larger size, but these are not common.

Types: ♂ Isle of Wight, ♀ allotype Isle of Wight together with paratypes in my own collection.

S.sp. *iernes* Graves, 1930, loc. cit. pp. 52-54.

Male: *Upperside*. Ground colour as in *insularis*. The ocelli are frequently doubled or bipupilled and are set in well marked fulvous rings, below which is usually a well marked and regular orange or ochraceous-orange band broken by the nervures and frequently reaching interspace 2, sometimes 1b. About half of the specimens have the orange partially veiled by dark scaling as in *hispulla*.

Underside: Discal area of forewings ochraceous buff to ochraaceous orange contrasting fairly strongly with the lighter sub-apical band and separated by a well marked transverse line of a darker colour than either of these two areas. Hind wings with a very well marked light medial band, more so than in any of the other British races, and well powdered with dark striae. Sub-marginal ocelli minute or absent. Average expanse 51·9 mm.

Female: *Upperside*. Ground colour as in *insularis*, with a broad fulvous band very well marked and usually broken by the dark venation. Discoidal area sometimes with fulvonus but this forms a patch and does not break through the transverse line bordering the sub-apical fulvous band inwardly. Hind wing very variable but usually with at least an orange 'point'.

Underside. Discal area of a darker colour than the sub-apical band separated by a very well marked transverse line as in *insularis*—sometimes more so. The hindwings very bright and variable usually washed with yellowish or orange and evenly powdered with dark striae. Average expanse 55·6 mm.

Locality: Described from Kerry but the whole Irish population belongs to this race.

Amongst the forms found in *iernes*, *grisea* Tutt is very rare and *erymanthia* Esp. is not uncommon.

S.sp. *cassiteridum* Graves, 1930, loc. cit. pp. 75-76.

Male: *Upperside*. Similar to *iernes*.

Underside. Forewings with the basal half and the sub-apical band of a similar colour (much more so than in *insularis*) but these two areas are divided quite distinctly by a transverse line. The hindwings of

various shades of olive with a medial band more marked than in *insularis* but less than in *iernes*. The whole wing is very strongly marked with dark striae. The sub-marginal ocelli are usually well developed particularly in interspaces 2 and 5 where they are often ringed with orange and pupilled with white. Average expanse 49·22 mm.

Female: *Upperside*. Similar to *iernes*, but the fulvous on the hind wings is usually more free of ground colour scaling.

Underside. Forewing of a generally lighter colouring than Irish specimens with very well marked transverse line showing in strong contrast. The hindwings are more variegated than in other British *jurtina* usually with a buff rather than a yellowish or orange wash. The medial band is often very light in colour and irregular on its outer edge. The whole wing is very heavily marked with course dark striae to an extent not found in any other British race. Average expanse 53·15 mm.

Locality: The Isles of Scilly. Individuals from the west coast of Cornwall have been reported but I have yet to see one which could be called pure *cassiteridum*. *F. feminea* Graves has been recorded in this race and *addenda* Mousley is frequently found.

S.sp. *splendida* Buchanan White 1871, Scott. Natur 1, 200, redescribed by Graves 1930 (loc. cit. pp. 49-52)

Male: *Upperside*. Ground colour as in *insularis* with a slightly more marked iridescence than in other British races. The apical eyespot is sometimes bipupilled or double and is ringed with orange, usually of a more red colour than in the south. The orange scaling below this is very variable in form and colour but is usually mixed with dark scaling and broken by the nervures.

Underside. The forewings much darker than is usual in *insularis* but the dark transverse line remains. The hindwings are abundantly sprinkled with dark striae to an extent that the usually light medial band is almost or completely obscured. The general appearance is one of dark uniformity. Ocelli on the hind wings vary from 0-4, but are small and indistinct. Average expanse 50·3 mm.

Female: *Upperside*. Ground colour sepia with a well developed sub-apical fulvous band which is rather darker than other British races due to an admixture of ground colour scaling. The band usually invades the discal area, breaking through the ground colour at the inner border of the sub-apical band. Hind wing fulvous band nearly always present but suffused by the ground colour scaling.

Underside. Forewings less contrasting than in other British *jurtina* but with a poorly marked transverse line. The hindwings are *hispulla*-form, having a light greyish medial band edged inwardly with a 'dirty mustard yellow' line (Hübner's sign). This often has a violet tinge. The whole wing is well marked with dark striae. Average expanse 54·2 mm.

Locality: Longa Island and the shores of Gairloch, Ross-shire (Scotland), Coll, Inchnadamph and Lochinver, from which it forms a long cline in which *splendida, insularis* and intermediates are found flying together. I am not at all happy with Graves' redescription of this sub-species. I have examined about one hundred specimens from the north west of Scotland (including Gairloch, but *not* Longa Island) and not one specimen had *all* the characters described by Graves. The

most common failing was that many did not have the very dark unicolourous forewing and hindwing of the male or the greyish medial band on the underside hindwing of the female. Most, if not all, had very extensive fulvous markings in the female but not to any greater extent than in many maritime localities elsewhere in Britain. The extent of fulvous on its own, as I have said, is not a reliable character for separating *jurtina* forms, however, I do not doubt Graves' figures or that his description was based on a series of 'pure' *splendida*, but I suspect that the range of the true *splendida* sub-species is more restricted than one would suppose from the many reports of it from the North West. Both Graves and Ford state that they do not know how far south *splendida* came. I think it might be the case that the Longa Island form is pure and only approaches to it are found throughout the north west of Scotland. Where one draws the line between *splendida* and the southern sub-species I do not know, but I have prepared a map to show the extent of *splendida*-like specimens and the area of cline between them and *insularis*. I have, for the purpose of the map, called specimens *splendida* if they agreed with Graves' description in *most* respects, but I would point out that I have seen one female from Dover which was closer to what I would call *splendida* than some of the Gairloch specimens in the same collection! This, of course, is an exceptional case.

To what extent climate has influenced the development of the British races I would not like to guess but it is interesting to note that both *cassiteridum* and *splendida* are found in areas which have a climate in some ways quite different from the rest of the country and that the Irish sub-species is that most like the mainland form. Also the brighter populations (those with extensive fulvous markings) are found in areas which enjoy a more mild winter.

Map One

Britain showing the distribution of *Maniola jurtina splendida* B White and its cline with *M. jurtina insularis* s.sp.nov.

Map Two

Britain showing January (4°C) and July (16°C) isotherms, and rainfall over 60″ per annum.

Table One

The development of the transverse line on the underside forewing of the male *Maniola jurtina*.

A—with a unicolourous underside forewing and no transverse line.

B—with the basal half of the underside forewing of a darker colour than the light sub-apical patch but with no transverse line.

C—with a unicolourous or contrasting underside forewing and, in addition, a transverse line of a darker colour than the basal half.

	%A	%B	%A B	%C	No. examined
Sweden (including Oland and Gotland)	63·42	28·85	93·27	6·73	145
Netherland	80·00	16·64	96·64	3·36	149
Scotland (S), England and Wales	1·04	5·69	6·73	93·27	223

EXPLANATION OF PLATE

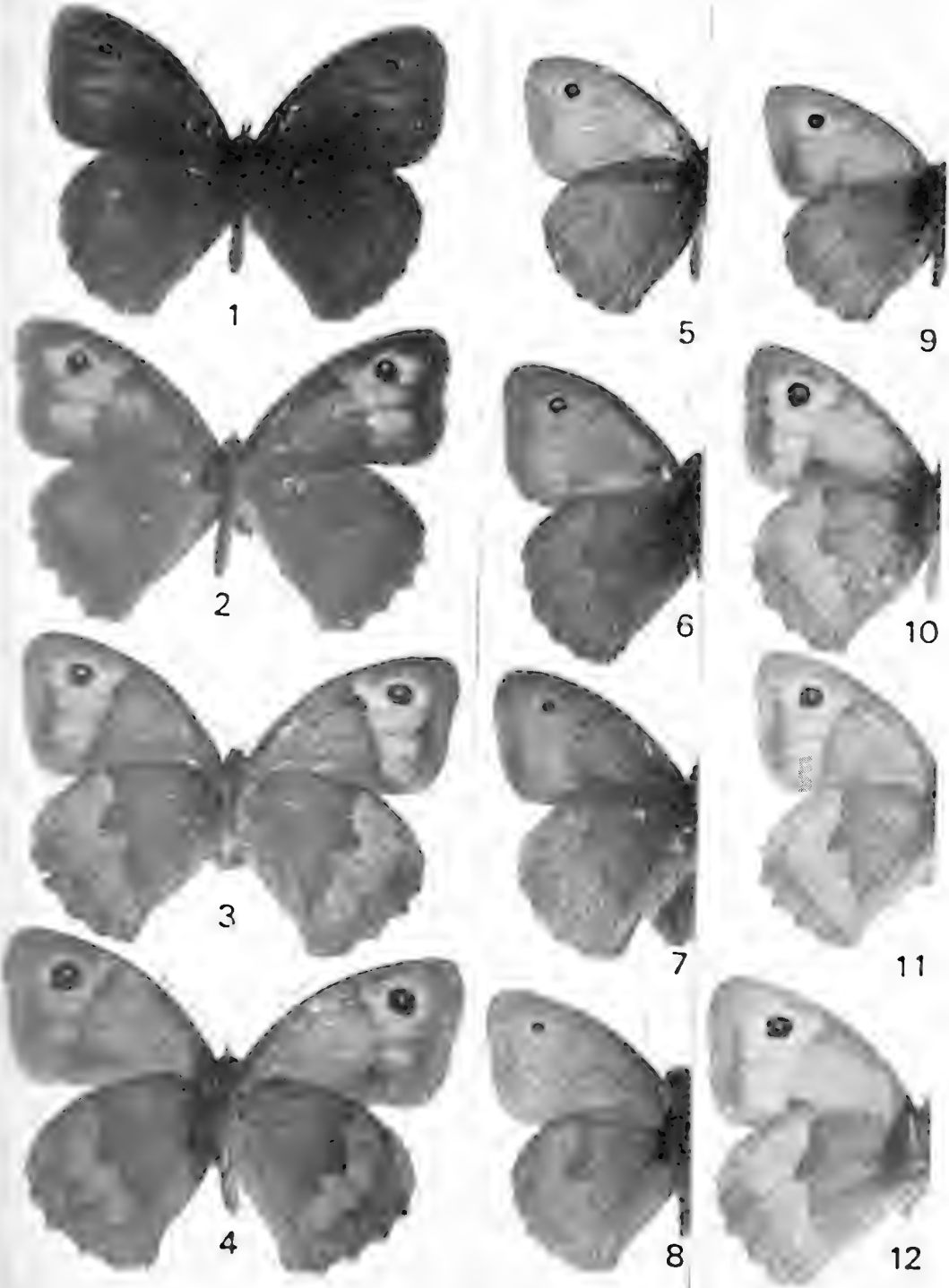
Fig. 1 *Maniola jurtina insularis* s.sp. nov. ♂ upperside type, Isle of Wight, 29.vi.1966.
2 *M. jurtina insularis*, ♀ upperside allotype, Isle of Wight, 29.vi.1966.
3 *M. jurtina insularis* f. *concolorata* nov. ♀ underside, Dunblane, Perthshire.
4 *M. jurtina insularis* f. *rectoformis* nov. ♀ underside, Dunblane, Perthshire.
5 *M. jurtina jurtina* (L.), ♂ underside, Hällevik, Blekinge, Sweden.
6 *M. jurtina insularis*, ♂ underside paratype, Lulworth, Dorset.
7 *M. jurtina insularis*, ♂ underside paratype, Dunblane, Perthshire.
8 *M. urtina insularis*, ♂ underside paratype, Whippendell, Hertfordshire.
9 *M. jurtina jurtina*, ♀ underside, Ismarstar, Oland, Sweden.
10 *M. jurtina insularis*, ♀ underside, paratype, St Abbs, Berwickshire.
11 *M. jurtina insularis*, ♀ underside paratype, Dunblane, Perthshire.
12 *M. jurtina insularis*, ♀ underside paratype, Isle of Wight.

Bug Watching in a Bournemouth Garden

By H. Symes, *M.A.*

During the past summer, for various reasons not the least being the indifferent weather, most of my entomology has been confined to the limits of my small garden. Until well past midsummer, the only butterflies that appeared were the large and small whites (*Pieris brassicae* L. and *P. rapae* L.). They are not very interesting to watch, and the chance of taking a gynandrous *rapae*, as was done by G. B. Coney in his garden at Batcombe, Somerset, is infinitesimal. The buddleias were in full bloom when they were visited by a comma (*Polygonia c-album* L.) on 19th July. I never saw it again, nor did the later brood appear. On 13th August I saw the first peacock (*Nymphalis io* L.). On the 16th I found a male tiger moth (*Arctia caja* L.) on the footpath outside, and next day the fine dipteron (*Volucella zonaria* Poda) appeared on hemp agrimony (*Eupatorium cannabium* L.). The real season for Vanessids opened on 20th August. From then until 14th October one or more species appeared on every suitable — and sometimes unsuitable — day. The small tortoiseshell (*Aglais urticae* L.) was first on the scene on 20th August, the red admiral (*Vanessa atalanta* L.) on 21st, but the painted lady (*V. cardui* L.) did not appear until 13th September. Of the 56 days from 20th August to 14th October (inclusive), at least one Vanessid appeared on 35. On many of them it was *urticae* and/or *atalanta*. *Atalanta* was seen on 22 days, *urticae* on 21, *io* and *cardui* each on six. *Io* was last seen on 25th August, *cardui* on 2nd October.

Some days were of outstanding interest. One of these was 12th September, when, in addition to 3 *urticae* (the maximum number on a single day) and 1 *atalanta*, 2 specimens of that large dragonfly *Aeshna cyanea* Mueller were seen: one spent about two hours resting on a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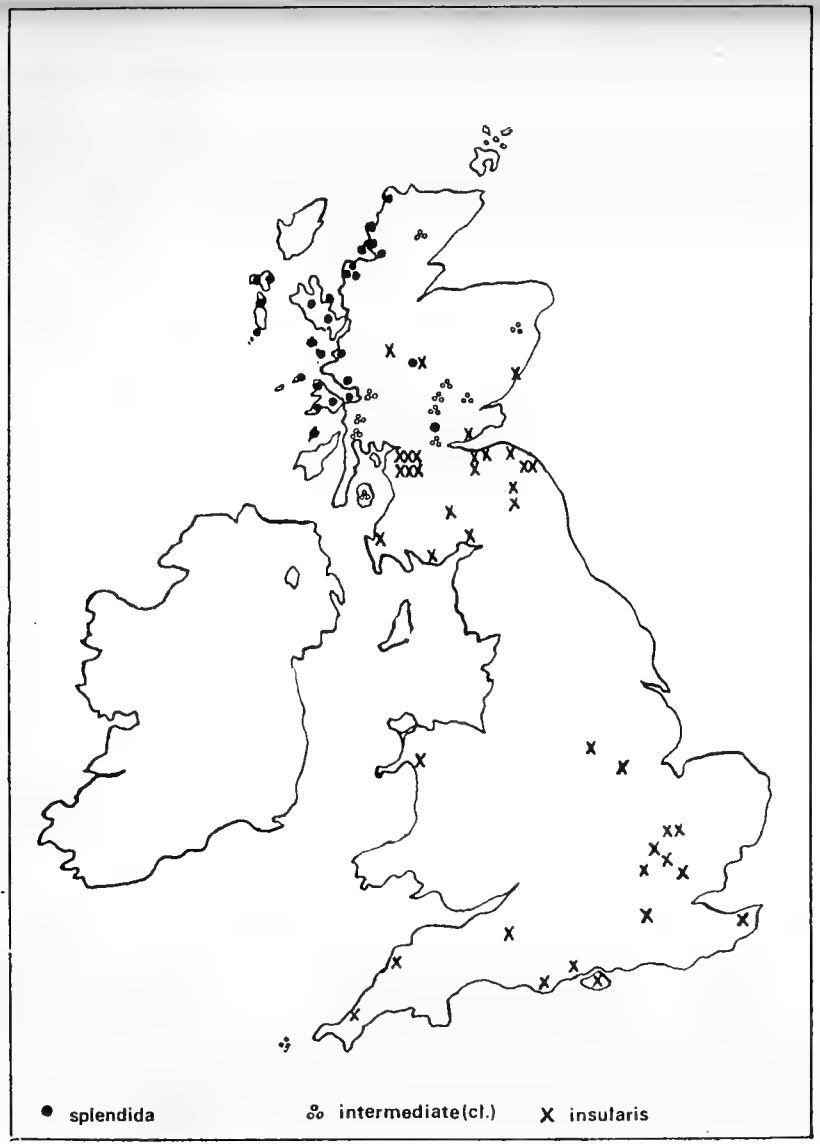
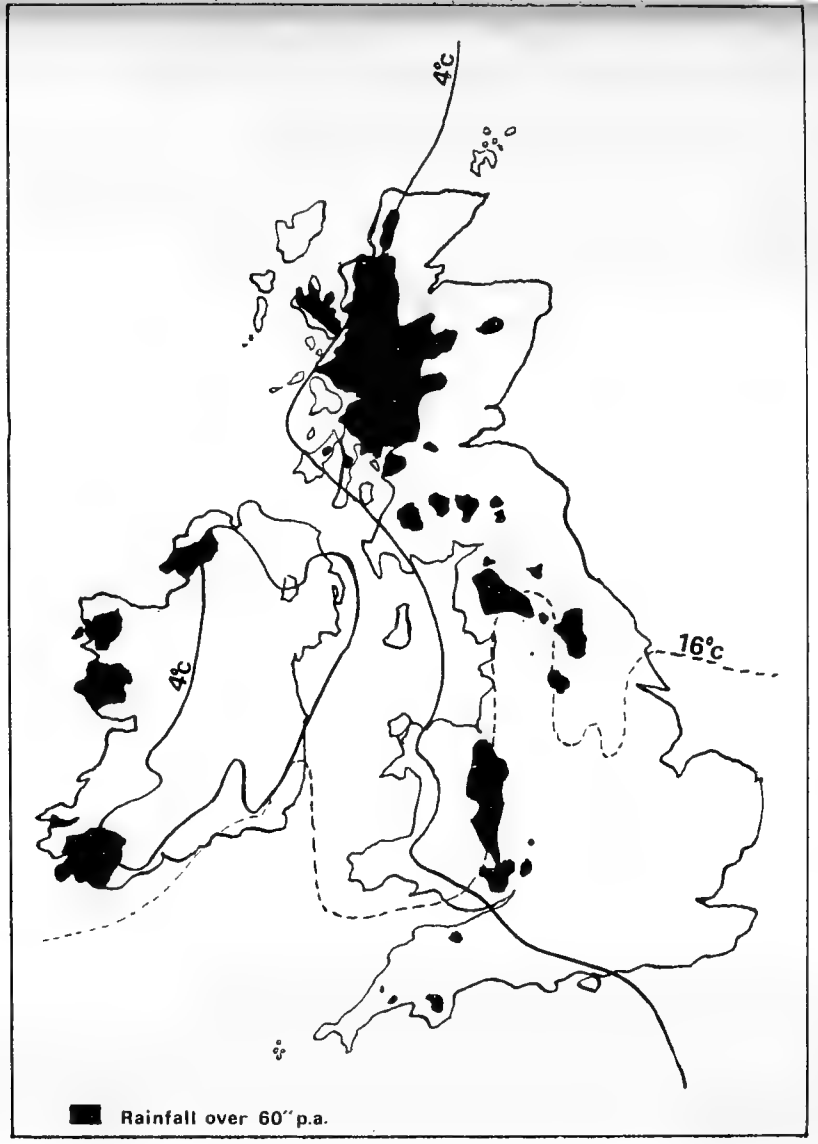

splendida
intermediate(cl.)
insularis


4°c
4°c
16°c
Rainfall over 60" p.a.

lavender bush, while the other was hawking for flies; and after breakfast my wife found a strange beast on the back door. It turned out to be a female nymph of the great green grasshopper (*Tettigonia viridissima* L.). How this wingless creature came to be in the middle of Bournemouth I do not know. Perhaps it had a lift in a motor car or lorry from the country, for it is not uncommon in such Dorset localities as Hod Hill and Portland. I placed it on a valerian plant and it stayed there quietly all day. Towards evening I decided to put it in a larva cage for observation, and I hoped especially to have a chance to see it moulting. I have offered it various pabula and it has eaten valerian leaves, arbutus flowers, and rowan berries, but very sparingly and only enough to keep it alive, for it does not seem to have grown at all. I have never seen this insect in the New Forest, nor apparently had W. H. Hudson. It was a great favourite of his, and he tells us in "Hampshire Days" (chap. vii) how delighted he was to have found a colony in Harwood Forest. He spent several days watching the courtship of the males and listening enraptured to their music. Finally, he took a female home with him and put her on a well-berried branch of wild guelder (*Viburnum opulus* L.), which he kept on a table close to an open window. She made no attempt to fly away and he kept her for more than a fortnight. At first she ate guelder berries, but later developed a taste for sweets, and there was nothing she liked better than bread-and-butter pudding! Eventually Hudson took her back to her home.

Other good days were 13th September, when I saw my first *V. cardui*, as well as two *urticae*, one *atalanta* and a speckled wood (*Pararge egeria* L.), and an *A. cyanea;* 2nd October (two *atalanta*, one *cardui* and two *urticae*), and 6th October (three *atalanta* and three *urticae*).

I did not see any butterfly attacked by a bird, but of two *atalanta* seen on 14th October, one was in perfect condition and the other had lost two bits out of its wings, which suggested a narrow escape. Mr. J. Turner tells me that one day in his garden at Boscombe he saw a spotted fly-catcher take a peacock, a red admiral and two tortoiseshells in the air and bite off their wings, which came fluttering down to the ground. Apart from those I have mentioned, the only butterfly I have seen in my garden was the meadow brown (*Maniola jurtina* L.) on 20th July and 20th August.

I noticed that the red admiral was by far the most bibulous of the butterflies. Time after time one would arrive soon after 9 a.m. at a particular michaelmas daisy and stay there until about 5 p.m., flying off occasionally for a short turn round the garden, and even paying a quick visit to another michaelmas daisy, but always returning soon to the plant of his original choice. He was also remarkably tame and one could walk right up to him without in the least disturbing him. Sometimes he was joined by two friends and an odd tortoiseshell. There must have been something in the nectar of the flowers on that particular plant.

Turning to moths, I saw the first silver y (*Plusia gamma* L. (on 28th July, and an odd one or two appeared on most days in September. A vapourer (*Orgyia antiqua* L.) was seen at rest on a window (11th September) and an angle shades (*Phlogophora meticulosa* L.), which had been so plentiful in 1967, was seen on 14th September.

Larvae were very scarce. I found a grey dagger (*Apatele psi* L.) on sallow and a dot (*Melanchra persicariae* L.) on phlox. In the road outside

I found a nearly full-fed peppered (*Biston betularia* L.) feeding on sycamore, a food plant on which I have never previously found this polyphagous larva.

As regards other insects, bumble bees of several species were remarkably plentiful and so were drone flies (*Eristalis tenax* L.) in the early autumn, but honey bees and wasps were extremely scarce.

Records of Empididae (Diptera)

By R. M. Payne, F.R.E.S.

The following notes on Empid flies which I have taken in recent years may be of interest to Dipterists as supplementing Collin's remarks on distribution etc. in his great work *British Flies, Vol. 6. Empididae*, 1961. The species are listed in the sequence in which they occur in that work.

Bicellaria intermedia Lundbeck. A pair on stones on the shore of Loch Garten, East Inverness-shire, 16 Aug. 1966, and a single female in damp woodland near Daltulich Bridge on the river Findhorn, 13 Aug. 1966.

B. vana Collin. Collin refers to this as a common southern species, but the following seem to be new county records: Salcey Forest, Northants, a female on Dogwood leaf, 16 May 1965; Dinas Powis, Glamorgan, a female by evening sweeping in long grass, 3 June 1967.

Ocydromia glabricula Fln. I took a specimen of this glossy black little Empid on the very late date of 30 Oct. 1967, on a Hazel leaf in my garden at Dinas Powis. Collin gives his latest date as 18 September.

Oedalea apicalis Loew. This is clearly a rare insect, which Collin records only from the New Forest. I took a single female in Epping Forest, South Essex, on 21 May 1966. It is an unmistakeable species, with wing-tips infuscated and stout antennal style. Oddly enough, Collin also records only females.

Rhamphomyia (*Megacyttarus*) *maculipennis* Zett. A coastal species, but Collin gives no Welsh records. A pair was swept from long grass above the small salt-marsh at East Aberthaw, Glamorgan, on 5 May 1968. Incidentally, this appears to be rather an early date, though I also took it on 3 May 1965 at Maldon, South Essex.

R. (*Pararhamphomyia*) *tarsata* Mg. A single female on the wing near the summit of Pen-y-Fan, Brecon (alt. 2900 ft.), on 18 June 1967.

R. (*P.*) *atra* Mg. Collin's records indicate this to be a south-eastern species, but he does not record it from Essex. I took a male on nettles by the Stort canal at Harlow, North Essex, on 25 May 1963.

R. (*R.*) *sulcata* Mg. A common insect, but the following records are from counties little visited by Dipterists: Salcey Forest, Northants, in a clearing, 16 May 1965; Trellech Bog, Monmouth, on Birch leaves, 13 May 1967, and Tintern, Mon., by sweeping, 1 June 1968.

R. (*R.*) *subcinerascens* Collin. Loughton, South Essex, on Blackthorn flowers, 18 April 1965 and 10 April 1966.

R. (*R.*) *stigmosa* Macq. Cwm Bychan, Merioneth, among Ling and Bracken, 3 June 1966; Llyn Fach, Glamorgan (alt. 1500 ft.), among *Juncus*, 26 May 1968.

R. (*Holoclera*) *flava* Fln. This delicate yellow Empid was swarming on

the flower-heads of Hogweed (*Heracleum sphondylium* L.) at the edge of a wood at Wellesbourne, Warwickshire, on 21 June 1968.

Empis (*Lissempis*) *nigritaris* Mg. A distinctive species, glossy black with yellow legs. It was common on Wood Spurge at Black Cliff, Tintern, Mon., on 13 May 1967.

E. (*Xanthempis*) *punctata* Mg. Beaten from Sallow at Dylife, Montgomeryshire (alt. 1100 ft.), on 2 June 1966.

E. (*X.*) *lutea* Mg. A very yellow Empid, of which I took a male on flowers of *Clematis vitalba* L. in a roadside hedge at Felsted, North Essex, on 31 July 1963.

E. (*Kritempis*) *livida* L. Perhaps the commonest of the large Empids, but the following captures in little-worked counties may be worth recording: Rayne, North Essex, 10 June 1959; Epping Forest, South Essex, on Bramble, Creeping Thistle, Marsh Thistle, Hogweed and *Phragmites*, 1960-1965; Wellesbourne, Warwicks., plentiful on Ox-eye Daisy flowers, 21 June 1968.

E. (*Anacrostichus*) *verralli* Collin. I recorded this from Brecon in 1964 (*Ent. Record*, **77**: 110), and on 15 June 1968 I took a pair by sweeping grass, Bilberry and *Scirpus* at an altitude of 2600 ft. on Corn Du, in the Brecon Beacons.

E. (*E.*) *nuntia* Mg. Common on nettles by the Stort canal at Harlow, North Essex, on 7 May 1966.

E. (*E.*) *praevia* Collin. A female taken indoors at Loughton, South Essex, on 25 May 1964.

Hilaria pilosa Zett. Flying over a puddle in a ride in Salcey Forest, Northants, on 16 May 1965. Presumably a typical habitat, since Collin says "appears to be confined to well-wooded areas".

H. thoracia Macq. With its shining yellow thorax, this is one of the few distinctive species in this difficult genus. I took a male by the river Wye at Marteg Bridge, Radnor, on 16 June 1965.

Westwood, Highwalls Avenue, Dinas Powis, Glam.

New Forest Mercury Vapour Light Records

By L. W. Siggs

In 1968, the trap at Minstead was not run from 23rd June to 5th August and from 5th September to 10th November owing to my absence in hospital and subsequence convalescence. This affects the value of the comparisons which are the main purpose of the annual reports. However, sufficient remains to provide some interest to those who like to know how things are going in the New Forest.

The numbers of specimens recorded are as follows:—

	Nights	Total	Average
March	24	1772	74
April	27	2680	99
May	25	1253	50
June	19	3393	179
July	nil		
August	25	5799	232
September	14	1822	130
October	nil		
November	16	246	15

One's impression of 1968 has been a year of wet and cool weather inimical to moth trapping, but these figures compare well with those shown in the 1966 report.

The following have occurred in this trap for the first time:—

Anagoga pulveraria L.

Eupithecia valerianata Hubn.

In May 1968, Fletcher published an article showing the difference between *Amphipyra pyramidea* L. and *A. berbera* Rungs. Between 8th August and 9th September, 13 *pyramidea* were recorded and between 20th August and 14th September, 30 *berbera*. This brings the total number of species of macrolepidoptera recorded to 450.

Visitors which only occasionally appear and which turned up in 1968 were *Saturnia pavonia* L., *Chloroclystis debiliata* Hubn., *Apatele megacephala* Fab., *Hydrelia flammeolaria* Hufn. (2), *Dysstroma citrata* L., *Bapta bimaculata* Fab., *Moma alpium* Osbeck, *Selidosema brunnearia* Vill., *Pyrrhia umbra* Hufn. (7), *Apamea ypsillon* Borkh., *Zenobia retusa* L., *Trichiura crataegi* L., *Scopula promutata* Guen. (*marginepunctata* Goeze).

There was a record catch of a number of species and the records might have been more remarkable had the use of the trap been uninterrupted. They include *Lophopteryx capucina* L. (55), *Drepana falcataria* L. (42), *Cosymbia punctaria* L. (35), *Colostygia pectinataria* Knoch. (52), *Rivula sericealis* Scop. (361), *Epirrhoe alternata* Mull. (149), *Amathes glareosa* Esp. (16), *Lithina chlorosata* Scop. (269), *Ceramica pisi* L. (329), *Xanthorhoë ferrugata* (163).

MIGRANTS.—*Agrotis ipsilon* Hufn. (34), *Peridroma porphyrea* Schiff. (3), *Laphygma exigua* Hubn. (1), *Plusia gamma* L. (142), *Nycterosea obstipata* Fab. (1), *Nomophila noctuella* Schiff. (47), *Udea ferrugalis* Hubn. (5), *Plutella maculipennis* Curt. (7).

POLYMORPHISM

Biston betularia L
typical 97 (91%)
carbonaria 1 (1%)
insularia 9 (8%)

Sterrha aversata L.
remutata 20.
aversata 1.

Apamea crenata Hufn. Typical 10, *alopecurus* 1.
Ectropis biundularia Borkh. Typical 4, melanic 1.
Eilema griseola Hubn. Typical 9, *flava* 2.

The variation in the orbicular stigma of *Ochropleura plecta* L. was:—typical 936 (75%), club shaped 267 (21%), others 50 (4%).

On 13th September, *Pararge aegeria* L. was taken in the trap.

For 1968, I acted as recorder of specimens taken in a Rothamsted trap run by the Forestry Commission keeper at Linford, at the western end of the Forest. I am glad to record the following species which have not been taken at Minstead, *Sterrha emarginata* L., *Apoda avellana* L. (2), and *Larentia clavaria* Haw. (2).

Sungate, Football Green, Minstead, Lyndhurst, Hants.

REFERENCES

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

Fletcher, D. S. (1968). *Ent. Gaz.*, **19**: 91.

Notes and Observations

TEICHOBIA FILICIVORA MEYRICK FEEDING IN HARTSTONGUE FERN.—In the past, I have bred this moth from male fern, the foodplant given by L. T Ford in his "Guide to the Smaller British Lepidoptera", and in June 1965, I caught some of the imagines flying round these plants in a rather dark part of a Cornish wood.

In April 1968, I collected a few fronds of hartstongue near Looe in Cornwall hoping to breed the related species *T. verhuellella* Stainton. Late in May, five of these emerged, followed in June by seven *filicivora*. Possibly someone has had this experience before, but I cannot recall its being recorded.—R. FAIRCLOUGH, Deanoak Lane, Leigh, Reigate. 14.xii.68.

NYMPHALIS POLYCHLOROS L. IN 1967 AND 1968.—I personally did not for certain see the large tortoiseshell in 1967, but there were again reports of the species in the Swanage area in the spring; and Dr. R. H. Clarke saw a specimen in his garden near Oxford on 26th August of that year.

Last year, 1968, I observed one in the grounds of this school on 26th March. I first saw it from my classroom, flying about and settling on the terrace. From there it flew against the window from which I was watching, paused, and then doubled about two or three times before disappearing On 15th July, I took one out of two specimens seen in a churchyard set in our local woods. This is only the second specimen I have taken all my life, the previous one being in 1935.

Finally, one of the boys here, a quite knowledgeable naturalist, informed me that he saw a large tortoiseshell in the outskirts of Southampton on 6th October. It was at first inclined to discount this report, on the grounds of the date: but later learned quite by chance of an almost certain sighting of this species, by a most experienced observer, in Surrey, on that very day (a particularly pleasant one). I am given to understand that, although the large tortoiseshell usually appears to go early into hibernation, it sometimes flies again about the end of September or beginning of October, if the weather is good, for a week or so.—I. R. P. HESLOP, Stroud School, Romsey, Hants. 24.xii.1968.

THE FOODPLANT OF EREBIA AETHIOPS.—The text and illustrattion in "The Complete British Butterflies" (1968) by Mansell and Newman, follow Stokoe (1944) in giving the Blue Moor Grass (*Sesleria caerulea*) as the principal foodplant of *Erebia aethiops*. However, the known distribution of both *Sesleria* and *E. aethiops* only partially correspond. In Scotland, *Sesleria* is a very local plant and almost entirely confined to the calcareous schists of the Grampian Highlands, whereas Ford (1945) shows that *E. aethiops* is widely distributed on the mainland and occurs on some of the Isles. It is possible the misconcepttion originally stems from Frohawk's "Natural History of British Butterflies" (1924), where the Purple Moor Grass (*Molinia caerulea*) is incorrectly described as the "Blue Moor Grass". This misleading common name was adopted in the 3rd edition of South's "The Butterflies of the British Isles" (1941) and apparently interpreted as *Sesleria* by Stokoe in "The Caterpillars of the British Butterflies".—J. MITCHELL, Dubhaniel, Gartocharn, nr. Alexandria, Dunbartonshire. 2.i.1969.

DANAUS PLEXIPPUS L. (MONARCH BUTTERFLY): A REQUEST FOR INFORMATION.—With reference to the Editor's note in the November issue of the *Record* (**80**: 297-298), an unusually large influx of Monarch butterflies certainly occurred in the British Isles during October, As soon as I heard of the first reports, I broadcast radio and television appeals to the general public in the West of England, to send me details of any large butterflies which they thought might be referable to this species. As a result, I received a large number of letters, and others found their way to Mr L. Hugh Newman. He was then invited to discuss the records received up to that time in "The Living World" programme broadcast on 17th November, and repeated on 20th November. This broadcast produced several more reports.

I now have all this correspondence in my possession, and am currently engaged in sorting and checking all these records. I have written individually to every correspondent to ascertain the accuracy of their observations, and as soon as the outstanding replies have been received, I shall be preparing a paper giving all the records known to me, and discussing the circumstances of what was undoubtedly a genuine immigration. The arrival at the same time, of an unprecedented number of North American birds, such as the first Blackpool Warbler to be seen in Europe, the second Myrtle Warbler, and so on, provides sufficient supporting evidence.

The first one was seen near Swanage, Dorset, on 24th September. This was apparently followed by an influx on 3rd Octobeer, on a broad front extending from the Isles of Scilly to the Isle of Wight. Most seem to have stayed near the coast and were seen on various dates throughout October; others, however, moved inland and I have received satisfactory records from Gloucestershire, Sussex, Essex and even Yorkshire. Outside England, one was caught by a schoolboy near Swansea, Wales, and sent to me, while, in Ireland, two were seen at Cape Clear, Co. Cork, and another at Ballycotton, Co. Cork.

I am not yet in a position to state accurately the total number of genuine records in 1968, but it seems to be in the region of about 50 This surpasses the previous highest total ever recorded—40—in 1933. I would be most grateful for any records that readers of the *Record* can supply, in order to complete the picture of this most interesting event.—J. F. BURTON, B.B.C. Natural History Unit, Broadcasting House, Bristol 8. 21.xii.1968.

MR P. N. CROW, the new Hon. Treasurer, would like to inform those subscribers who are kind enough to help him by paying their subscriptions by Banker's Order that "The Record's" banking account is being maintained at Lloyds Bank Ltd., Ferndown, Dorset, where it has been for some years. This will obviate any necessity for them to alter their present arrangements.

EXCHANGES AND WANTS

For Sale.—Butterflies and Moths—Many species especially Africa and Madagascar, also species from Europe and U.S.S.R., pupae of *Thais polyxena* from Hungary and Czechoslovakia, expected pupae *Bunaea alcinoë* and *Pseudantheraea discrepans* from Central Africa. Lists on request.—*Robert Keiser*, Frederik Van Eeden Plein 3, Antwerp 1, Belgium.

Wanted.—Volume 4 of "The Entomologist" to enable me to complete set. Can anybody help?.—D. O'Keeffe, 29 Arcadian Avenue, Bexley, Kent.

For Sale.—Papered Foreign Butterflies. List available.—*D. Brown*, 25 Charlcote. Near Warwick, Warwickshire.

Wanted.—Specimens of *Pararge aegeria*, and *Pieris napi* from Scotland and Northern England.—*George Thomson*, 98 George Street, Dunblane, Perthshire.

Required.—Would any entomologist or botanist expecting to visit Lebanon, Syria, or Turkey in Asia, consider trying to obtain living stock of the local subspecies (*pseudorapae*) of *Pieris napi*, preferable by collecting the eggs from wild cruciferae where the butterfly is flying? If so please contact *S. R. Bowden*, 53 Crouch Hall Lane, Redbourn, St Albans, Hertfordshire.

Urgently Wanted for field work, pupae of *Biston betularia*. Female pupae 1/- each or exchange.—*Dr. H. B. D. Kettlewell*, Department of Zoology, Parks Road, Oxford.

For Sale or Exchange.—Proceedings and Transactions of the South London Entomological Society 1944-45, 1947-48 to 1949-50 incl., 1952-53 to 1960 incl. What offers? *Wanted.*—Entomologist's Gazette Volume 6, Vol. 9, Pt. 1; Vol. 12, Pt. 2. Can anyone help me to complete my series? Literature on European lepidoptera also required. Any offers?—*Dr. N. L. Birkett*, Kendal Wood, New Hutton, Kendal, Westmorland.

For Sale.—Watson "Service" microscope, mechanical stage, complete set of eyepieces and objectives. Cooke stereoscopic microscope, triple nosepiece, several objectives and eyepieces. Erecting Watson Eyepiece and stand. All in first class condition with cases.—Offers to *Mrs. Broome*, 47 Keswick Road, Bournemouth.

Wanted Urgently.—20, 30, or 40 drawer solid Mahogany Cabinet in good condition. —Full details please to *T. W. Harman*, 26 Highfield Road, Chesterfield, Derbyshire.

CHANGE OF ADDRESSES

J. Muggleton, now of Department of Botany, Science Laboratories, South Road, Durham.

Ian McLean, now of Ganavan, Guise Lane, North End, Bassingbourn, nr. Royston, Herts.

R. de Jong, now of Drs. R. de Jong, Pluvierhof 85, Hellevoetsluis, Holland.

G. A. Cole, now of Higher Ley, Wood Lane Slapton, near Kingsbridge, S. Devon.

J. S. Taylor, now of 27 Howick Centre, Howick, Natal, South Africa.

E. S. A. Baynes, now of 'Sandford', Adelaide Road, Glenageary, Co. Dublin, Eire

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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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THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

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Some Butterflies in France, 1968

By Major-General Sir George Johnson, K.C.V.O., C.B., C.B.E., D.S.O.

I was fortunate in being able to spend five weeks in France from 23rd June to 27th July 1968, and carried out quite an extensive tour. I collected in the Vosges around Contrexeville, near Grenoble, in the Massif Centrale, and finally in the Hautes Alpes centred on Briancon.

My wife and I flew with our car from Lydd to Le Touquet on 23rd June and motored south east to Contrexeville which we made our centre until 1st July. This little town, once a prosperous Edwardian watering place seemed now rather deserted and depressed. There are many beautiful deciduous forests within easy reach. We explored many of them by car and on foot in search of *Limenitis populi* E., *Euphydryas maturna* L. and *Pararge achine* Scop., our main objectives in this area, but results were rather disappointing.

Of *L. populi* we saw and took only two, a male and a female, both rather tattered, flying about the road in a clearing of the Fôret de Morimond, 26 Km. south west of Contrexeville. Of *E. maturna* we also caught only two, not in the best condition, in a ride in the forest on the western outskirts of Contrexeville on 29th and 30th June. *P. achine* we did not see at all, it was probably over.

A rather marshy valley in the Fôret de Darney, 23 Km. to the south east, produced many *Brenthis ino* Rott. including a fine albino on 25th June, and on 28th June we saw and missed a fine *Apatura iris* L. sucking at a putrid grass snake which had been run over by some passing car.

On 1st July we left Contrexeville for St Martin d'U'riage on the outskirts of Grenoble. Shortly after passing through the small town of Gray (Hte. Saône) we turned down a side road for lunch and found ourselves in a wood containing much poplar and aspen. It was a very hot day and no sooner had we got out of the car than several apaturids came to investigate. Both *A. iris* and *A. ilia* Schiff. were present. My wife had a large floppy hat which seemed to interest them and she got a fresh *A. ilia* form *clyte*. I missed several but got one *iris*. We went on to Dole, where we had booked a room for the night, but returned next morning, which was again very hot. The apaturids were again much in evidence. My wife took another *ilia* and I secured two male iris in the car, which acted as quite a good trap. All were very fresh.

We went on about mid-day to St Martin where we arrived in a thunder storm. Next day, 3rd July, it was still overcast. We went to inspect a marshy area on the banks of the Isère near by, where we hoped to find *Coenonympha oedippus* Fabr., but nothing was on the wing. Next day in sunshine we returned but only succeeded in finding one of this rare butterfly. This locality is traversed by reedy ditches, dry at this time, but is much overgrown by bushes and scrub. Yellow flag, the food plant of *C. oedippus*, was not very common, on the edges of the bushy areas. It may be that the colony has been much reduced by a shortage of food plant due to encroachment by the scrub. We caught and examined numbers of *Aphantopus hyperantus* L. which much resemble *oedippus*, but with no further success.

On Friday, 5th July, we set off across the Rhone for the Massif Centrale —destination Le Rozier in the spectacular gorge of the River Tarn. Here we stayed at a very pleasant hotel until 10th July. Our main collecting

ground was on the slopes of the gorge immediately east of the close-by and rather mediaeval village of Peyreleau. Here there was plenty flying, *Agapetes galathea* L. in swarms, including many females of the form with white undersides; many *Pyronia bathsheba* Fabr. (rather worn), *Brenthis daphne* Schiff. and very dark *Maculinea arion* L. One of my objectives was the very brilliant large blue form of the female of *Meleagris daphnis* Shiff. This was scarce, probably just emerging, and we only got one female and several males. There were many flowers, the most peculiar being the lizard orchis which I have never seen so numerous before, occurring repeatedly on the slopes in groups of up to eight or nine plants.

On 10th June we moved to Langogne (Lozère), and the next day we spent on the Col de Meyrand where the very local *Erebia ottomana* H.-S. was abundant by the roadside on the north side of the pass. A nice series was soon procured. On 12th June we worked a marshy valley by the roadside just above the rather squalid little hamlet of Les Salesses, 21 Km. south west of Langogne. Here *Clossiana titania* Hübn. was common and fresh, *Mellitaea diamina* Lang. was also common and very fresh, and we took a few of *Boloria sifanica* Gr.-Gr. on the bog. *B. ino* was common, and to my surprise we noted a few specimens of *E. ottomana* which had no doubt drifted down from the slopes above.

Next day we moved westwards to the mountains of Cantal. On the way to Aurillac where we had booked rooms, we stopped at the Lioran road tunnel to investigate a meadow at the foot of a telesiege on the south-eastern side of the tunnel. Here we immediately found *Erebia sudetica* Stdgr. flying in some numbers and very fresh. It is to be hoped that this limited locality will not be interfered with further, but there were some rather ominous earth-moving machines parked nearby, which might indicate an intention to enlarge the already extensive tarmac car park. The hills here are covered with an extensive conifer forest, and we passed a road sign depicting a large stag and a warning against "Le gros gibier du Lioran". I believe that as well as deer and no doubt pig, there are a number of Corsican moufflon naturalised in the woods. Needless to say we saw none. Next day was overcast and rainy. We drove round the rather spectacular Puy Mary but nothing was on the wing.

On 15th July we started back for Grenoble but struck a patch of bad weather with fresh snow on the high tops of the Alps on 17th July. Another visit to the Isere marshes was unsuccessful.

On 18th July we moved eastwards into the Hautes Alpes, basing ourselves at Briançon where we were in search of various passes of 6000 feet or more, as well as the hot comparatively low level valley of the Durance running south from Briançon.

On the way over from Grenoble we stopped on the Col du Lautaret. Here at about 5000 feet we saw *Erebia alberganus* de Pr., *E. euryale* Esp., *E. pharte* Hübn., *Coenonympha satyrion* Esp., *Boloria pales* Schiff., *Aricia allous* H.-S., *Agriades glandon* de Pr. and *Polyommatus eros* Ochs.

At Briancon we profited from Baron de Worms's experiences in the Durance Valley in 1964.

On 19th July we motored down the valley to St. Crepin, crossed the river, and drove back over a minor road via the hamlet of Pallon on the right bank of the Durance. Insects were numerous and just on the southern outskirts of Pallon we found a roadside ditch with water, with many blues at the water and damp earth. The most interesting were

many *Agrodiaetus damon* Schiff. and a few *Meleagris daphnis*. In a meadow just above we got one female *damon* and many more males.

Twentieth and 21st July we devoted to a search for *Erebia aethiopellus* Hffmog. The first day we went to the Col d'Izoard about 18 Km. south east of Briançon, and on the second to the Col d'Allos 104 Km. to the south. Above the tree line on both passes there were a few of a small *Erebia* on grass at the edge of screes which appeared to me to be *Erebia gorge* Hübn. Fortunately I took a small series and on returning to England all but one were identified as *E. aethiopellus* which I thought I had failed to find. Other insects at this altitude (5000-6000 feet) included *Colias phiconome* Esp., *Oeneis aello* Hübn. (one only on Col. d'Izoard), a few *E. pluto* de Pr. on the screes, *E. cassioides* Hohenwarth, *E. euryale, E. alberganua, E. epiphron* Knoch., *E. gorge, Albulina orbitulus* de Pr. (one only on Col. d'Allos), worn *Eumedonia chiron* Rott. and some *Mellicta varia* Meyer Dür. both on the Col d'Allos.

On 22nd July we made an expedition to the Col de Mont Cenis to try for *E. montanus* de Pr. at a spot where I had seen a few in 1966. We failed to find it, I suppose it was too early. *P. eros* was not uncommon, and we took a female *E. pluto* some way from any scree.

On 23rd July, our last day at Briançon, we went up the Argentière valley and worked some of the juniper-covered slopes above Ailefroide. Here our most interesting captures were a few *Aricia nicias* Meig., a new insect to me.

On 24th July we started back for the Channel in rather dull weather, reaching Lydd on 27th July.

We had, on the whole, a very successful trip, and considering the generally poor summer experienced this year, we lost very few days from lack of sun. The student riots and strikes in May seemed to have frightened most foreign tourists and we had the country very much to ourselves (apart from the French!). This was nice for us but most unprofitable to all the hoteliers.

I am much indebted to Mr. R. F. Bretherton for his help in advising on localities in the Massif Centrale for *E. ottomana, E. sudetica* and *C. titania*.

Castlesteads, Brampton, Cumberland. 30.x.1968.

Isle of Canna Report for 1968

By J. L. Campbell

The season opened with a severe blizzard on April 2, producing snow three or four inches deep, with much drifting. The moth trap could not go into action until April 9; between then and April 17, when I had to leave the island for five weeks, it produced the usual spring species, *Dasypolia templi* Thunbg., *Cerastis rubricosa* Schiff, *Orthosia gothica* L., *O. stabilis* Schiff., *O. incerta* Hufn., *Xylena vetusta* Hb.. *Xylocampa areola* Esp., *Earophila badiata* Schiff. and *Nyssia zonaria* Schiff.

From the 20th of May the summer was the most glorious anyone in the Hebrides could remember for sustained hot calm sunny weather—a fact which the B.B.C. weather reporters appeared to be most reluctant to admit until a state of actual drought had been reached in mid-August. I returned to Canna on May 22. There were brief spells of rain at the

beginning and end of June, which itself was a very fine month. From July 5 to August 17 there was the longest spell of sustained fine hot weather in my Hebridean experience, which goes back to 1933. There was then a spell of rain and wind, but fine weather was re-established on August 23 and lasted into the first week of September. The weather did not really break until September 27. There was again a fine spell in October, and November was unusually dry, but I was away again for part of these months.

One consequence of this glorious summer was record crops of apples, pears, raspberries, black currants, brambles and rowan berries. Another was record catches in the moth trap, and a most welcome revival in the number of the island's butterflies, which had been in decline for the last seven or eight years.

All the species of local butterflies benefited by this weather, and some of them became markedly more numerous. This applies to *Aglais urticae* L., seen in numbers again at the east end of the island after having become very rare indeed; *Argynnis aglaia* L., seen flying over low ground for the first time for many years; *Satyrus semele* L., *Maniola jurtina* L. and *Polyommatus icarus* Rott. *Pieris brassicae* L. and *P. napi* L. the former reinforced by immigrants, became abundant, especially over oats and rye fields where charlock was growing; this was later stripped by *brassicae* larvae. All these seven species, and *Coenonympha pamphilus* L., were seen flying together in the Haligary ravine, now permanently fenced and with willows and alders planted along its stream, on July 13; it is not often that one can see eight kinds of butterflies flying together in the Hebrides. I was absent during the emergence period of *Callophrys rubi* L., but was able to check the presence of *Argynnis selene* Schiff. in its very restricted colony here, first discovered by Dr. Michael Harper, on June 15.

The re-appearance of *Pararge aegeria* L. on Canna for the first time for 17 years has already been described (*Ent. Record*, **80**: 295).

In spite of these favourable conditions, there was no sign of any re-appearance of *Nymphalis io* L., which has not been seen here since the autumn of 1961, after having been observed on the island more or less continuously from 1939.

Migrants.—Neither *Vanessa cardui* L. nor *V. atalanta* L. was observed during the early part of the season, but on August 5 full grown larvae of the former were found at the east end of the island on thistles in a rye field now protected by a shelter belt of willows, alders, spruces and Austrian pines that was planted in 1950, and it was evident that a good many larvae had fed there. The first adults appeared on August 16, and the butterfly was to be seen around this spot on fine days until September 18. *Cardui* was commoner this year than any time since 1952.

Atalanta on the other hand was not seen here until August 31 between which day and September 28 it was noticed 10 times.

Herse convolvuli L., one on September 12 in the m.v. trap (see *Record*, **80**: 294).

Peridroma saucia Hb, one in the m.v. trap on September 4, and one on December 11!

Plusia gamma L., first seen on July 25; continuously September 4-27. Sixty-seven taken in the trap in all.

Nomophila noctuella Schiff., one only, in the trap on July 27.

Moths.—11,173 moths were taken in the trap, comprising approximately 160 species. This beats the previous highest figures, those for 1966, when the total was 10,625 moths of approximately 158 species. As is usually the case, a substantial proportion of these moths consisted of Large Yellow Underwings *Triphaena pronuba* L.

On August 27 there was a record catch of 828 moths, of which 441 were *pronuba* and 201 *Hydraecia micacea* Esp. This year *pronuba* numbered 3,246, or 29 per cent. of the total catch. Indeed nearly four-fifths of the catch was made up of 20 common species: *pronuba* 3,246, *Apamea monoglypha* Hufn. 1,063, *micacea* 852, *Diatarxia oleracea* L. (alleged by 'South' not to be found in the Hebrides)—continuously from May 26 to August 11—598, *Triphaena ianthina* Schiff. 551, *Apamea secalis* L. 411, *Amathes glareosa* Esp. 221, *Spilosoma menthastri* Schiff.= *S. lubricipeda* Auct. Nich. L. 182, *Cerapteryx graminis* L. 181, *Plusia chrysitis* L. 174, *P. pulchrina* Haw. 173, *Omphalosceles lunosa* Haw., 149, *Amaphes xanthographa* Schiff. 141, *Alcis repandata* L. 135, *Hada dentina* Esp. 116, *Dysstroma citrata* L. 106, *Hadena consperso* Schiff. 105, *Abrostola tripartita* Hufn.=*triplasia* L. 97, *Smerinthus populi* L. 94, *Dysstroma truncata* Hufn. 94, a total of 8,689 or 77·76 per cent.

The poplar hawk moth has become much commoner here in recent years, presumably as a consequence of the widespread planting of willows and black Italian poplar that has been done here since 1949. For the last three years the numbers taken in the trap have been 93, 77, and 94; the highest previous figure was 15 in 1964.

New species added to the Canna collection this year were:—*Ecliptoptera silaceata* Schiff., June 2; *Graphiphora augur* Fab., single specimens on July 16 and 18; and *Griposia aprilina* L., a very great surprise, on September 24. I believe that *silaceata* was taken elsewhere in the Highlands and Islands for the first time this summer.

Other species of local interest:—*Lampra fimbria* L. was taken in the trap for the first time since 1955, three specimens, one on August 11 and two on September 14; *Colocasia coryli* L. for the first time since 1961 and only the second time in all; *Bombycia viminalis* Fab. for only the third time (previously 1958 and 1966). Comparatively good numbers were caught of *Hadena caesia* Schiff. (16), *Folia nebulosa* Hufn. (9) and *Anaplectoides prasina* Schiff. (6). *Lophopteryx camelina* L. with its highest number (21) also reflected the growth of poplars planted here. Six specimens of *Celama confusalis* H.-S., were taken, and five of *Ellipia prosapiaria* L. This species seems to have established itself in consequence of the establishment of new plantations; it was taken for the first time in 1966, and again in 1967.

In spite of the favourable conditions, some moths which might have been expected to occur during such a good summer were either very scarce or absent. These include *Arctia caja* L. (only 4), *Euxoa tritici* L. (2), *E. obelisca* Schiff. (4) and *Amphipyra tragopoginis* L. (1); while *Euxoa cursoria* Hufn., *Agrotis vestigialis* Hufn., *Actebia praecox* L., *Phalaema typica* L., *Leucania pallens* L., *C. trapezina* L., and *Agrochola lota* L. were certainly absent.

As the hot dry summer wore on, the grassy basaltic terraces of Canna dried up and from the sea the island began to appear like an island in the Aegean. This may have affected adversely the Burnets and other lepidoptera inhabiting the southern cliff faces. Moths tended

to appear in the trap early and specimens to be smaller than usual. The drought might have become serious if the coming of rain in August had been postponed for another week or two. It will certainly be a long time before the summer of 1968 is forgotten in the Hebrides.

Georgian Bay, Lake Huron, Canada July-August 1967: August-September 1968

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

Most of our entomological excursions are, of necessity, to places in the Sterling area—Jamaica twice, Malaysia twice, India once, Hong Kong once and, previously, on the occasion of business visits, South Africa twice. However, since our son lives in Canada and we have grandchildren there we do visit that dollar country each year. For many years these visits have been at Christmas time, but, since retirement, we have felt that the summer months permit of rather more activity so, for the last two years we have made our visits in July and August. The exact periods of these two visits were from the 16th July until 23rd August 1967 and from 8th August until 12th September 1968.

Our son lives in Willowdale, a suburb of Toronto, some 15 miles to the north of the city. Cities are not usually satisfactory collecting grounds but in this suburb there exist what our Canadian friends call 'ravines'. These are the watercourses of small streams. Often the land around them is so uneven, of low level and so irregular that they are not distrubed but are allowed to grow wild. Except for the local children who delight in them and the use of an occasional footpath, few people visit them. They tend to abound with rough grasses and golden rod (a weed in Canada and universally abhorred) other wild plants, including milkweed, small shrubs and, sometimes, trees. The insect population of these ravines must be considerable although, as yet, we ourselves have not been very successful in collecting there.

Our son has a cottage at, or rather near, Honey Harbour in Georgian Bay a little more than 100 miles north of Toronto. Georgian Bay comprises the south-eastern part of Lake Huron. The Bay was until recently said to have some 30,000 islands many of which are small and uninhabited. This number has recently been increased to 50,000 by the inclusion, as islands, of all the pieces of rock which, from time to time, project above the water. The cottage is situated on the shore line about 5 miles north of Honey Harbour—a well known centre for boating in the summer and ice yachting in the winter. There are no roads or shops nearer than 5 miles to the cottage. Access is only by water. Power is, however, supplied by the "Hydro". The country is rocky, none of it can be called flat and north of Honey Harbour cultivation is quite impossible on the lake shores which are, for the most part, clad only by conifers, scrub oaks and juniper with an occasional maple. There is a little grass among the vast rocks but there are many small plants among the prevailing conifers. Small patches of milkweed are sometimes to be seen.

The altitude is that of the Great Lakes generally, just under 600 feet above sea level. The Lakes have to be seen for it to be realised how vast they are. They give the appearance as of the sea and the wind generally produces waves although there are no tides. Huron is 200 miles in length

and 101 miles in width with over 23,000 square miles of water. (The whole of England and Wales comprises 58,000 square miles). Georgian Bay is a relatively small area practically undeveloped for the most part except for one or two ports not in our immediate area. Apart from the many summer homes to be found on the coasts and islands there is no industry to be seen to the north of Honey Harbour.

While it is very cold in winter—the Bay itself freezes over completely, although the whole of the Lake does not,—summer temperatures can be high—well into the 80's or even 90's. Windstorms and thunderstorms are by no means unusual in the course of which the water level of the lake can, in a few hours, rise by as much as 5 feet.

From this description it may be concluded that this should be an admirable collecting area and the Royal Ontario Museum confirmed that this was so. Nevertheless, on the two occasions during which we spent a total seven weeks at the cottage we have been surprised at the very small numbers of butterflies we have seen in the months of July, August and early September. Curiously, too, we saw hardly any even in the lush country on the approaches to Georgian Bay, an area little affected by insecticides. It is no exaggeration to say that the number of butterflies seen in the Honey Harbour area on both visits did not average more than one per day—and most of the days were sunny and usually without wind.

In 1967 we saw only two Monarchs (*Danaus plexippus* Linnaeus) one Viceroy (*Limentis archippus* Cramer) the mimic of *plexippus*; half a dozen Mourning Cloaks (*Nymphalis antiopa* Linnaeus)—one of the commonest of the eastern Canadian butterflies—and five Great Spangled Fritillaries (*Speyeria cybele* Fabricius). We saw none of the Blues nor did we see more than one or two of the Hesperiids and these we could not reach because of the rocky terrain. This year we certainly saw in Georgian Bay a dozen or so examples of *D. plexippus* but none at all of *N. antiopa* yet we were at Georgian Bay for a comparable calendar 9 days.

Moths were much more rewarding. We took with us in 1967 a 125 watt 240 volt m.v. lamp together with a transformer to increase the voltage from the local 110 to 240 plus the usual choke used at home. We found some difficulty in persuading the apparatus to work but an engineering friend in Toronto went to much trouble to help us and we were able to use the light. We had no moth trap as such so we made use of a dustbin (garbage-can to Canadians) on which we placed a cardboard carton with a hole in the centre to receive a four flanged baffle which we also made of cardboard. The lamp itself was suspended from a gallows made from two upright pieces of wood passing through the handles of the bin and secured the one to the other about two feet above it. The lamp so suspended just touched the baffle and even the worst storms did not derange it. This apparatus worked very well and it was left on each night. There were often so many visitors that we were unable to count them and certainly with our then lack of knowledge of the Canadian species it was impossible to record what came. When, early in the evening, the light was running it was surrounded by a cloud of hundreds if not thousands of small insects. Many of those entered the trap together with the moths. We had our problems with birds in the morning and it was necessary to be on the spot early to minimise losses. Birds were not the only such problem since the chipmunks came and disposed of many desirable items in the vegetation around the trap. So friendly were the chipmunks and

so encouraged were they by the free meals so unexpectedly provided for them that they had to be driven away.

This trap we ran in a rising, rocky hollow behind the cottage. There was no long view although the dispersing light could be seen for some distance.

Simultaneously we ran a Heath Portable Trap from a 12 volt accumulator which we purchased in Canada for the purpose, together with a trickle charger. We ran this trap in a number of different situations—in a clearing in a wooded area and also on the lakeshore itself. The results were poor. It is a strange thing that whereas this same trap, with a sheet, produced so much in Jamaica (*Ent. Rec.*, **80**, No. 1, January 1968) it attracted no more than a few isolated insects when used in Hong Kong, Kuala Lumpur, Cameron Highlands and in the National Park in Malaysia during two or three hours running in what seemed to us to be ideal situations and conditions. In running this trap we met another enterprising enemy—a frog—which jumped right into the trap itself—a jump of over 12 inches in height.

On our first visit the m.v. light proved most exciting. We took nine species of Sphingids including examples of *Lapara bombycoides* Walk. This sphingid was of particular interest to our friends at the British Museum who had, for some time, been trying to obtain specimens from North America. We were very happy to present them with four. *Bombycoides* is a small Pine Hawk very similar in appearance to our own *Hyloicus pinastri* Linnaeus, though with barely half its wing span.

We also took *Smerinthus jamaicensis* Drury a smaller version of our Eyed Hawk *Smerinthus ocellata* Linnaeus and two other closely related insects. The first, *Calasymbolus exaecata* Abbott and Smith superficially, at any rate, resembles *ocellata* and is about the same size. It has, however, an easily recogniseable spot in the centre and towards the leading edge of the forewing. The second was *C. myops mc creary* Clark of which we took five specimens, mostly rather worn, which has the eyes of the hindwings as in *exaecata* (and, of course, *ocellata*) but with no reddish background. We also took three *Ceratomia undulosa borealis* Clark and three splendid examples of *Sphinx kalmiae* Abbott and Smith; one *Daropsa pholus brodiei* Clark; one *Sphinx chersis* Hübn. and four really wonderful *Pachysphinx modesta borealis* Clark. These last mentioned are fully of 5 inches wing span and the reddish and dark brown patches on their hind wings render them particularly beautiful.

In this country the Underwings (Catocalas) are not numerous but in America, North of Mexico, there are said to be about 100 species. These North American insects range from some which are perhaps rather larger than our own Red Underwing (*Catocala nupta* Linnaeus) and with a range of underwing colourings from red, through pink to yellow and white, to others which, with mainly yellow and black markings, are no more than $1\frac{1}{2}$ inches across. The larger Catocalas are truly magnificient as, indeed, is *nupta* but some of the White Underwings are even more striking and especially *C. relicta* Walker of which we took a number.

In all we brought back twelve of the Catocalas (not many out of one hundred) including *C. concumbens* Walker (with pink rather than red underwings); *C. unijuga* Walker; *C. briseis Edwards and C. ilea* Cramer. The foregoing all have reddish underwings. In *ilea* the black markings on the red predominate. There were also the two small red underwings

Ephesia ultrona Hübner and *E. coccinata* Grote, the first distinguishable from the second by the dark patches on the forewings.

Among those with yellow underwings we took *C. cerogama*, as large as the largest of its red underwinged compatriots and the less spectacular but much more common *C. sordida* Grote and *E. similis* Edwards. Lastly we took *Catabapta antinympha* Hübner with almost black forewings.

In Canada, curiously enough, the "Underwings" are so commonly encountered that we could find no one really interested in them. Nevertheless, with so many such closely related species there must surely be at least a considerable possibility of interesting aberrations.

We have already referred to the similarities of a number of the insects we have mentioned to those known to us in this country. There were other examples. We found a solitary Herald (*Scoliopteryx libatrix* Linnaeus) in the trap and examination in London showed that it was indeed the moth we see so often at home. We also found what we took to be the Swallow Prominent (*Pheosia tremula* Clerck) but on closer examination it was clear that the white wedge shaped streak between veins 1 and 2 was missing and it proved instead to be *P. dimidiata* Herr Schultz. This was not the only member of the Prominents we took. We found *Lophodonta ferruginea* Packard as well, but there are still nearly 100 of this family we have not yet taken.

Another insect which reminded us of our moth trap at Woking was a Plusia. It so happened that three weeks before leaving home we had taken a Golden Plusia (*Polychrisia moneta* Fabricius ab. *maculata* Lempke) so we were especially interested in Plusias. We took a superb enlarged edition of our own Burnished Brass (*Plusia chrysitis* Linnaeus). It was *Plusia balluca* Gever and nearly twice as large. Another comparable moth (comparing country and country) was the Canadian Copper Underwing (*Amphipyra pyramidoides* Quen) so like our own, *A. pyramidea* Linnaeus. We also took *Apatele dactylina* Grote which interested us very much since we live at Woking, one of the not very many places where the Miller (*Apatele leporina* Linnaeus) is taken and we had taken examples this summer. Our *leporina* is much smaller than *dactylina*.

We took other moths, of course, some of them quite impressive. This was especially true of the Imperial Moth (*Citheronia imperalis* Drury). About 4½ inches wing span and with its bipectinate antennae it is certainly regal but by no means difficult to capture. Tiger moths, not unlike our own, exist in Canada. We did take one of the Haploas—*Haploa confusa* Lyman and also the larger Virgo Tiger, *Apantesis virgo* Linnaeus. We only saw one of these but took a number of its relative *A. williamsi* Dodge. These were found in considerable numbers in the trap daily.

Of the other moths we took we should mention *Gonophora rectangulata* Otto, *Nadata gibbusa* Abbott and Smith and *Panthea furcilla* Packard among the many others which, thus far, it has been difficult exactly to identify.

We have already indicated that our 1968 visit to Georgian Bay commenced some 19 days later than our visit in 1967. In this country the 10th August, the commencing date of our visit to Canada in 1968, would not seem unduly late in the season but in Canada we found a great falling off in the numbers of moths which appeared. This had nothing to do with moon conditions, since we timed our trip to coincide with a waning moon. No doubt the severity of the winters, and long winters they are

too, with ice on the Bay well into April, means that most of these insects have had so to arrange their lives that their progeny are able to cope with the extreme conditions to be expected.

However, we felt that 1963 in Georgian Bay had compared, date for date, very poorly with 1967. So we visited the Royal Ontario Museum in Toronto to discuss the matter with someone there likely to know the position. One of us met Mr. M. J. Riotte who is in charge of the Entomological Section and talked to him about it. He agreed that for some unexplained reason Georgian Bay had had a disappointing year entomologically. Will it be better next year? No one knows but we propose to go there again—in June rather than later—to see what changes there may be and to be able to add to our records just that much earlier in the year.

Incidentally, Mr. Riotte showed us some of the Museum's collection, especially the Sphingids and the Catocalas. This was most interesting and we now have a much better idea of what to expect. In viewing the collection we were intrigued to find that the Museum's current idea of maintaining specimens is to allow them substantially to set in their resting position rather than to set them with wings as is usually the case. In so far as this maintains a record of what the insects may look like when found at rest this may have something to commend it but it did not seem to us to be quite so easy to identify those insects where the principal obvious differences are in their appearance as, for example, in the hindwings which cannot be seen at all. However, no doubt experience is a good teacher and this method does have the merit of saving storage space.

We must return to the ravines of Willowdale, in the suburbs of Toronto for a moment. On several occasions, mid August and early September, we visited one of them and took numbers of the Orange Sulphur or Alfalfa Butterfly (*Colias eurytheme* Boisduval) and the Common or Clouded Sulphur (*Colias philodice* Latreille) as well as the ubiquitous *Pieris rapae* Linnaeus. We met two schoolboys who offered to show us where we could almost certainly take some Mourning Cloaks (Camberwell Beauties in England) *Nymphalis antiopa* Linnaeus. They were right and did so and we must have seen a dozen or so in an afternoon. They were swift on the wing and flew at height but they were greatly attracted by a dead trunk in an almost impossible situation for capture. Nevertheless, we did capture them one at a time on the same spot to which the remainder returned after disturbance. We could find no reason for this since the horizontal tree trunk was quite smooth—having been worn so by climbing children. The same boys guided us to another part of the ravine where they said we could find the Black Swallowtail (*Papilio polyxenes asturias* Stoll). And again they were right. We saw a number but only captured one. Regrettably much of this area has now been bulldozed and is now in the course of development.

In conclusion we wish to refer once again to the Monarch (*Danaus plexippus* Linnaeus). Just before we left Canada in September 1968, we went to see a niece who, with her husband and children, lives near the shore line of Lake Ontario to the south and west of Toronto. On this Sunday morning we saw literally dozens of these magnificent creatures floating over gardens and roads alike. In the days which followed before our departure we saw them wherever we went—even from the public

buses on the main approach roads to Toronto. This was curious since we had seen none at all in this area in 1967 from which we returned to England on 26th August. Had the southward migration started before the 10th September? We could not find out. However, in a year when *plexippus* is found on the south coast of this country in not inconsiderable numbers—and in October—perhaps almost anything can happen.

Lepidoptera in Lapland

By G. Howard

The purpose of these notes is to record some of the Lepidoptera which I have seen in Lapland this year and in so doing perhaps encourage others to visit this vast expanse of moorland, mountain and marsh. In spite of its northerly situation Lapland is fairly easily accessible by road and rail. Unfortunately by virtue of its geographical location, Lapland often seems to get the worst aspects of both maritime and continental types of climate. I have also mentioned a few points of biological interest which are particularly related to Lepidoptera in this area—a tract of country which lies mainly above the Arctic Circle.

In no part of Europe is one so dependent on sunny weather as when collecting Lepidoptera in Lapland. Nearly all who have reported their experiences there have stressed this. The vast majority of day-flying Lepidoptera are only in flight when the sun is shining. Many of them rest when even a thin veil of cloud obscures the sun. One of the exceptions is *Sympistis melaleuca* Thnbg. which I have seen flying in numbers when the sky has been temporarily overcast. The body-temperature of Lepidoptera must reach a certain critical level before flight is possible. It is perhaps surprising that even the relatively slight drop in temperature resulting from thin cloud over the sun, can prevent flight. Both day- and night-flying moths tend to have larger bodies than do butterflies of similar size. They therefore tend to lose heat more slowly than butterflies and this may be one reason why *S. melaleuca* is able to fly during a cloudy spell. Also worth noting in this connection is the fact that *Zygaena exulans vanadis* Dalm. has a lot of hair on its body and this probably results in a decreased rate of heat-loss.

Melanism is some northern species is generally supposed to be an adaptation of low temperatures. *Argynnis improba improbula* Bryk. flies only at a height of about 750-950 metres. The wings, which have a span considerably less than that of other fritillaries occurring in this area, are dark and the wing-pattern appears somewhat blurred. The presence of so much black pigment must result in a relatively rapid uptake of heat. I have seen this butterfly resting on sunny rocks at 900 metres on Nuolja, near Abisko. Before taking flight the wings quiver. This muscular activity causes an increase in body-temperature. One can speculate that similar marked degrees of melanism are not more prevalent in other Lapland fritillaries because interspecific colour differences and patterns must be maintained. At these high latitudes where the density of certain of these species is low, and where the number of sunny hours when flight is possible is limited, it is essential that the males of any species find the females as soon as possible. A further point is that nothing is known of the possible physiological disadvantages which may be associated with

increased melanism in these species. Genes controlling melanism invariably affect other processes as well as the formation of black pigment. I do not believe that any exact estimates of heat-absorption and heat-loss associated with melanism in subarctic Lepidoptera have been carried out. Until this is done only surmise as to the advantages (in terms of heat absorption) that result from different degrees of black pigmentation. This is especially important in view of the tendency for many species of Scandinavian Lepidoptera to show increasing degrees of melanism the higher the altitude.

It is an impression of many who have collected in Lapland that the sunny weather has become progressivly more unstable in recent years. Long periods of sunny days are uncommon and weather forecasts are even less helpful than is the case elsewhere. This year—1968—the winter was very cold and pro'onged. On June 24th there was still a lot of ice on Torneträsk at Abisko. The first butterflies I saw were at Jokkmokk on June 12th. *Callophrys rubi* L. were common together with a few *Argynnis freija* Thnbg. and single specimens of *Pyrgus centaureae* Rbr. and *Isturgia carbonaria* Cl. Five days later at the same locality all these insects were out with *Erebia embla* Thnbg. and *Ematurga atomaria* L. I also took one *Argynnis euphrosyne lapponica* Est. *A. freija* is one of the earliest butterflies to emerge and this date is in contrast to 1966 when, at a higher altitude at Kvikkjokk they were occurring in numbers and in a worn state. The white spots on *P. centaureae* turn yellow in the cyanide jar but later regain their original colour. On June 20th in spite of sunny periods no Lepidoptera were out at Saltaluokta. During the next week the weather was overcast and on a visit to Abisko at the end of the month I saw only one *Gnophos sordaria* Thnbg.—a common insect usually to be seen in numbers in the evening.

On July 1st I returned southwards to Luleå where I took fresh *Argynnis selene* Schiff and *Argynnis eunomia ossianus* Hbst. The following day at Overkalix, *A. euphrosyne lapponica* were flying in a grassy clearing together with *Colias palaeno* L. On July 3rd I stopped by the Pajala-Karesuando road, near Pajala, where *A. euphrosyne lapponica* were common. There was great variation in the quantity of black wing pigment. All gradations occurred and this was clearly not an example of polymorphism. The darkest specimens were strikingly melanic and could be distinguished from the others even in flight. Examples of *A. euphrosyne* from Central and Southern Sweden closely resemble the English form. Ssp. *lapponica* has darker wings and this represents the northern section of a cline extending up through Scandinavia to Northern Lapland. (In the far N.W. of Lapland a lighter, smaller form occurs.) On the same day near Karesuando I took several *Erebia disa* Thnbg. flying over marshy ground.

The next day, July 4th, was the last sunny day I had in Northern Lapland and I am told that it was overcast until about the 17th. I visited Saana which is a limestone mountain situated near the road at Kilpisjärvi. The neighbouring two mountains are also limestone as are others extending in a N.E. direction. *Pieris napi bicolorata* Pet. were common. The females of this northern ssp. have yellow wings with veins heavily dusted with grey. Small numbers of *Colias nastes werandi* Zett. were out and are almost impossible to net when on the wing. *Pyrgus andromedae* Wallengr.

were flying in the same area as *Titanio schrankiana* Hochenw, which is a "micro" and can easily be confused with *Sympistis zetterstedti* Stgr. Neither *S. zetterstedti* nor *Agriades glandon aquilinus* Stgr. had yet emerged but were common at this locality on the same day in 1966. This latter insect is remarkable for its reduced degree of sexual dimorphism. The wings of both sexes are very similar in colour—a somewhat washed-out mixture of brown and blue. These last four insects are mainly confined to one part on Saana where the limestone is mixed with dolomite. All the insects I took this year on Saana were in immaculate condition.

The next days were cloudy and virtually no Lepidoptera were in flight when I continued up to the North coast and back to Karesuando by the road from Alta. On July 8th, near Vitangi, I stopped at a marsh and during a sunny interval caught some *Argynnis freija* in perfect condition, as well as one *Argynnis frigga* Thnbg., *Erebia disa* and *E. pandrose* Esp.

This year I did not see any *Anarta* spp. This group is of particular interest as in Lapland thirteen species are known to occur. Of these perhaps seven can be said to have a mainly subarctic distribution. Any visitor to Lapland will become aware of the similarity of the vegetation, and much of the terrain, with that of the Scottish Highlands. It would seem a strong possibility that one or more *Anarta* spp. remain to be discovered in Scotland. On June 29th 1966 I was fortunate in netting one *Schöyenia* (*Anarta*) *quieta* Hb. near Abisko. (See Entomologist, 1967, 100: 1). This insect had previously been taken only once before in Sweden (also near Abisko) although it has been found on different occasions in North Finland. Abisko is one of the areas in Lapland which has been most often visited by entomologists. The moth is inconspicuous and cannot easily be identified in the field when in flight.

In conclusion a brief mention must be made of *Hyphoraia alpina* Quens. It has been taken in Northern Siberia, Alaska and near Irkutsk. In 1799 one example was taken in Northern Lapland. In July 1962 Prof. Sotavalta caught a male flying on Saana. The following year he found an empty cocoon at the same locality. (For an acount in English see: Ann. Ent. Fenn. 28.4.1962, p. 182-185 and 29.4.1963, p. 254-257.) The next year another empty cocoon was found on a mountain a little east of Saana. Saana has been visited regularly by Finnish entomologists over the last few decades and yet this large tiger-moth had not been seen. At rest it is certainly inconspicuous as the white mottling on the fore-wings must blend well with stone and lichen as a background. The reddish hind-wings are unlikely to be exposed when the insect is at rest. The moth probably flies on the summit plateaus of some mountains in this region. It is probably a day-flier and if its flight-time is short and late in the day it could be easily overlooked. Perhaps the most rewarding approach will prove to be a search for the hibernated larvae in June when the snow is melting.

Although many Finnish collectors visit Finnish Lapland, and a few Swedes go to the Abisko district, the less accessible parts are soldom visited by collectors. One can only hope that the summer weather becomes more settled so that more entomologists feel encouraged to explore this exciting area.

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Lepidoptera 1968

By T. W. Harman

To make a change in my annual collecting notes, I have decided to pick out more noteworthy events and field trips of the season. Because of this, I shall begin these notes on 16th April, when Mr. T. J. G. Homer and myself made the long trip from Henley-on-Thames to North Wales in search of *Nyssia zonaria* Schiff. and larvae of *Amathes ashworthii* Doubl. On arrival we called at Conway Golf Course to see whether there was any sign of *N. zonaria*. We found nothing during the first half hour, but then turned up one female. This was followed by two more females and one male. We returned at dusk with a mercury vapour light to try for males, but without luck. By searching with a light I found one male sitting low down on a grass tussock. We then gave in and left for Sychnant Pass, still wondering how to find Zonaria in any numbers. The Pass was even more disappointing. There had been a long dry spell and plants were parched. The heather looked as if it were incapable of supporting anything. After about an hour and little to show for the effort, we retired to the Fairy Glen Hotel, small, but comfortable and handy for operations. The next afternoon, 17th April, we were again back on Conway Golf Course, where I was nearly hit by a ball which had been sliced off the fairway by an incompetent golfer! We had more success on this occasion, but still found males hard to find; only three in the whole afternoon. The females seemed to occur in colonies, living in areas about ten yards in diameter. One of these was where the short, bare stems of dwarf rose pushed up through the grass. The moths crawled up these and could easily be seen moving about on the tips. The other area was in an old sand dune in which grew marram and a variety of other grasses. Here the females were low down on the marram grass stems, and we got one in the act of laying in an old grass stem sheath. Most were put into plastic containers with marram grass stems, where they laid freely, most of the ova being completely hidden under the sheaths. The next morning we were in some doubt about what to do. Homer decided to visit Beaumaris Castle as it was such a lovely day, and I opted for a walk up the Fairy Glen to return via Sychnant. In the Pass I stopped again to try to find the answer to *ashworthii*. There were no signs of larvae sunning themselves even though the sun was quite hot. The only foliage which seemed a possible foodplant was foxglove. The young plants grew among the loose rubble and had obviously been chewed in many instances. I therefore spent the rest of the morning looking underneath the leaf clusters, and after an hour and a half found the first characteristic larva of *ashworthii*. Very common were larvae of *Eumichtis lichenea* Hübn., of which I now have a lovely series. After lunch we returned and set about the foxgloves in earnest, and in three hours found three more larvae, all large. We may have been a little late, or using the wrong collecting method. From the four larvae we obtained three moths.

Back in Derbyshire I decided to try for larvae of *Parasemia plantaginis* L. in Lathkill Dale. The whole family went there late in the afternoon, a sunny one, of the 24th April. The picnic basket was left at the bottom of the slope, and everyone put to work looking for hairy caterpillars! My six-year-old son found the first of 13. They were not so common as might

have been expected, but quite conspicuous as they crawled rapidly over the flat, matted grass tussocks. One was spotted walking up the side of the picnic basket by my four-year-old son while we sat eating in the warm sun. After eight years of visiting various British localities, I still think this dale contains some of the finest inland scenery to be seen anywhere.

May was enlivened by the emergence of a series of *Euphyia luctuata* Schiff., the result of ova laid by a female in Orlestone Woods, Kent, on 22nd July 1967. They came through well and again emphasised the necessity for breeding species to obtain good specimens, particularly the Geometers. The family spent the first week in June at my father's small farm at Turville Heath, Bucks. Two mercury vapour lights were used, one inside the beechwood, and one just outside. Most interesting was the number of *Selenia lunaria* Schiff. seen over the week, nearly a dozen being recorded, mostly inside the beechwood. The males appear to be restless in pillboxes, and I would advise immediate transference to the killing jar. Several I caught damaged themselves too much to be worth keeping. A female laid a number of ova, but these turned out to be largely infertile, only about eight hatching. I have two pupae at present and I am wondering if this is a typical result with this species, as I heard of another similar case. Other species of note during this week were large numbers of *Discoloxia blomeri* Curt. and a few *Ectropis consonaria* Hübn. On the 5th June Homer and myself tried beating for larvae of *Strymonidia w-album* Knoch on local wych-elms. I soon knocked three from one tree, but these were all we saw. We were obviously too late for these larvae. It gave me great pleasure later in the year to see the butterfly quite commonly in a piece of rough woodland where I used to find it commonly fifteen years ago. We also tried beating for larvae of *Thecla betulae* L. in various likely Chiltern localities but drew a blank. On the local moors with Mr. B. Elliott on 11th June, we had quite a surprise when a fresh male *Harpyia bicuspis* Borkh. arrived on his sheet. Our elevation was 1050 feet and the only trees in the area were a few stunted birches. The 15th June saw the arrival of Messrs. Skinner and Chatelain for a hectic week-end's collecting, the highlight of which was seeing the larvae of *Orgyia recens* Hübn. abundantly, but very locally, in an unlikely-looking Yorkshire locality. In a quest for the larvae of *Gortyna petasitis* Doubl., Elliott and I went to a local spot near a river in which the foodplant was plentiful. Digging proved much too hard and we then tried Elliott's brilliant idea of cutting the stems at ground level, holding them to the sky, and looking up the hollow centres. If a larva was, or had been, present, its workings could easily be seen. These sometimes went right up into the ribs of the leaf. Another key sign we found was that if a stem, on being cut, gushed water, there was almost certainly a larva present. These methods probably only work when collecting larvae which are not full-grown as they burrow down into the roots later. The larvae seem to be able to stand severe conditions of high moisture, and we each got nearly a dozen moths through, later in the season.

The 25th June found us in north Nottinghamshire, where we found the larvae of *Hemaris fuciformis* L. They were in a very confined area, a clearing among trees, and only on honeysuckle which was growing low among grasses. It seemed a most unlikely place and it was Elliott's

wife who found the original feed hole in a leaf after he had given up as a result of two hours of fruitless beating and searching. On the last day of June, we decided to make the long day-trip to the Lake District in search of *Erebia epiphron* Knoch. This was a particularly ambitious trip and we also wished to see *Coenonympha tullia* Mull. and *Phothedes captiuncula* Treits. on top of a journey of 180 miles each way! However, it was a lovely day and we got to a good locality for *epiphron* without incident. We had almost given up the butterfly, but were not high enough for some time. After reaching the 1800 foot contour we then found them quite commonly. They seemed to prefer flat areas between outcrops, and their condition was very mixed; the best plan appeared to be to net those which looked blackest, these were the fresh ones. We only just got off the mountain in time to quench our thirsts at a local public house, beating the clock by 30 seconds! We did include *tullia* in the day's programme, but had to let *captiuncula* remain undisturbed, time being the limiting factor.

Another ambitious trip was made to North Devon on 5th July for the week-end. Mr. R. G. Chatelain met us down there and, armed with various information, we set about collecting larvae of *Lygephila craccae* Schiff. as the main aim. On the Friday night, Elliott and Chatelain went to search a locality which had been surveyed by day, while I guarded four mercury vapour lamps on the rocky coast. The catch here included several *Agrotis trux* Hübn. which I wanted badly, but a breeze rather spoiled results at the cliff top. The others returned at about midnight with only 11 larvae and not very glowing reports. The next day we carried out a terrific programme which included a trip to Cornwall for *Atolmis rubricollis* L. We had the good fortune to find the moth sitting about on herbage by day and saw three dozen, mostly fresh, in an hour, after which we got rained off. A search for larvae of *Hemaris tityus* L. proved hopeless. It would appear to be a major task demanding more time than we had available. That evening Elliott ran two lights at the coastal station while Chatelain and I went back to the *craccae* spot. Chatelain dropped me at the coast and then went back inland to try mercury vapour in a wooded locality. Here he took *Mythimna turca* L. and some lovely light forms of *Polia nebulosa* Hufn.

The problem with the *craccae* larvae was the steepness of the cliffs on which the foodplant grew. To overcome this I travelled as light as possible, one hand torch, a white tin tray, and a few boxes in my specially made large front anorak pocket. Instead of a stick for beating, I used my hand. On my feet I wore wellington boots. These helped in keeping a foothold on the loose soil and rock and protected ankles and legs from rocks and brambles. In places it was necessary to kick foot-holds in the slope to get to clumps of foodplant. This was easily the hardest operation I have carried out in the field of collecting, and being dark made things even worse. By experimenting, I found searching just as effective as beating, as I only found two larvae by beating which I had not already seen. If disturbed they drop, wriggle violently and will most probably be lost among the shale. In about two hours I found a further 19 larvae, which allowed us ten each. Their range in size was great, and we had fears for the smaller ones, especially with such a local foodplant. We need not have worried, they preferred tufted vetch to their natural food, and we got one hundred per cent. emergence.

While searching the cliffs I found another larva on wood vetch, which turned out to be *Antitype xanthomista* Hübn. and a fine specimen of *Ammogrotis lucernea* L. If other collectors wish to obtain *craccae* larvae, my advice is to survey the area by day, travel light, attend an Outward Bound course previously, and have a stiff shot of whisky before ascending! The sound of small rocks clattering on the beach 50 feet below can be a little unnerving! It is a very fine species when bred, which is a first-class consolation. There may be places where wood vetch grows on more gentle slopes; ours was not one of them. Elliott did quite well with the other mercury vapour lights and his catch included four *Laphygma exigua* Hübn., one *Heliothis peltigera* Schiff., one *A. lucernea*, and some more *A. trux*. The journey back on Sunday was made in pouring rain, and this heralded the West Country floods, so, in all, we had been very fortunate.

The 20th July was another red-letter day when I found my first ever pair of *Sphecia bembeciformis* Hübn. *in cop* and about three feet high on a sallow trunk in south Yorkshire. It was 10.30 a.m. on a dull, but warm day. Elliott accompanied me to the same spot the next day and we found another pair, the female just emerged, and the male buzzing around nearby. This started a daily visit to the locality, where there are plenty of old sallows. However, no sign of others was seen even when conditions for emergence were apparently ideal. Homer and myself paid a fleeting visit to the spot on the 30th July and found another freshly emerged female, quite a flash in the pan! It would seem that this species has a long emergence period and hatches in small numbers at a time. Possibly it is affected by only small changes in temperature and humidity and we wondered whether pouring warm water around the bases of trunks would induce emergence? This locality is threatened with development in the very near future and we may never have the chance to try this experiment.

Homer came up to Derbyshire for a few days on the 29th July and on the local moors obtained three full-grown larvae of *Apatele menyanthidis* View. as well as a number of other northern species he wanted. One of these was *lucernea*, and we discovered that it was partial to the flowers of cross-leaved heath, but was not attracted to mercury vapour light, even when feeding within its glare. On the 30th, we took two specimens of *Venusia cambrica* Curt. ab. *bradeyi* within five miles of Chesterfield, which proved that the Goyt Valley is not its only home. On the 31st we had a most extraordinary night with mercury vapour light on the moors. Moths swarmed on the sheet and it was rather like being in a southern lowland locality on a good night. Homer wanted *Plusia interrogationis* L. and we must have seen over 100 specimens, all in lovely condition.

The first week in August saw us back at my father's farm and some interesting species were seen here including one female *Xanthorhoe quadrifasciata* Clerck, one worn male *Amathes stigmatica* Esp., *Nycteola revayana* Scop., *Cosmia affinis* L. and a single *Rhyacia simulans* Hufn., obviously a female, but I only risked keeping her for two days, in which time she did not lay. We moved down to Kent on the 11th August, and I ran one mercury vapour light in my mother-in-law's garden. Upon arrival I was handed a female *Mormo maura* L., and although fed and kept well for three weeks, she failed to lay. That night I visited Sand-

wich Bay, which is not far away, and searched marram grass heads and buddleia blossom. One patch of marram was covered in moths, comprising about ten species, of which *Eremobia ochroleuca* Schiff. was the best. The buddleia close by yielded a rather different variety of species with *Eüxoa tritici* L. the commonest species and *E. nigricans* L. a close second. The next day at Sandwich Bay, butterflies were numerous, especially on buddleia. *Vanessa cardui* L. was quite common and one *Polygonia c-album* L. was seen. We moved to Walmer to look round the beach. Valerian and buddleia grow here on the shingle and the buddleia bushes, though small, were covered with *cardui.* Back in the garden I saw *Celastrina argiolus* L. flying around buddleia and that night, the best of the mercury vapour light catch were two *Leucania straminea* Treits., one *Nonagria dissoluta* Treits. and two worn *Lygris prunata* L. Two more *argiolus* were seen in the garden on the 13th. On the 17th I travelled to Dungeness with my brother-in-law. We wanted to try some beach fishing, and I wanted to see if any larvae of *H. peltigera* could be found. They were abundant, and in a square yard at one place we found 14. Our fishing part of the trip was not successful—cold wind and no fish driving us home at midnight instead of dawn. The family visited St. Margaret's Bay on the 18th, where I again saw *argiolus* and took a fresh *Stenodes alternata* Steph. at rest. We came back to my parents on the 19th, and I took a female *Amathes stigmatica* Hübn. at light. Although I obtained fertile ova, the resulting larvae died when I tried to force them. While helping my father in a large, private garden locally, we noted dozens of *Nymphalis io* L. on Buddleia. My father said he had never seen so many, so they must have had an exceptional year. We also saw *argiolus* in the same garden.

Back in Derbyshire at the end of the month we were joined by Homer who stayed at the Peacock Inn at Rowsley. He had the good fortune to take a specimen of *Eurois occulta* L. in his trap there on the 27th August. He also took *G. petasitis, Atethemia xerampelina* Esp. and *Antitype chi* L. On the moors that night we saw *P. interrogationis* and a single *Lithomoia solidaginis* Hübn. Determined to do better with the last species, Elliott and I went up to the moors by day on the 31st August. We searched stone walls, but it was hard work. A few were found, and these nearly all on one piece of wall, about a hundred yards in length. *Orgyia antiqua* L. occurred in one area, in thousands. All stages of the moth occurred together, males were flying in the sunshine while larvae stripped the bilberry growing along the base of the wall. The vast majority of larvae had a virus disease, which was probably fortunate, or the whole of Derbyshire might have been eaten bare! The next day I went back again for *solidaginis* and managed to get a female which laid two small batches of ova. Returning on the 3rd September yielded three more *solidaginis* and three *Oporinia filigrammaria* H.-S.

On the 12th September Elliott and I made another long trip, this time to Dorset where we stayed at our usual hotel at Durleston. We had high hopes of migrants, but none of note were seen, either at Durleston or at Portland. We saw *Lysandra bellargus* Rott. in two fairly widely separated localities and, in south Wiltshire, we saw vast hordes of insects flying over flowers of devil's bit scabious on the Downs. One could look up the hillside and see at least 50 *Plusia gamma* flying at one time with quantities of *Aglais urticae* L. and even a few *Lysandra coridon* Poda

which included a pair *in cop.* No *bellargus* were seen in this locality which, I believe, was once famous for the species. We made the trip to Portland on the 14th, and tried sugar as well as two mercury vapour lights. Sugar was rather disappointing; the first round showed moths to be coming on well, but about two hours later most posts were blank. Our main quarry was *Leucochlaena hispida* Gey. and while searching open cliff faces on which short grass was growing, I found the moth very commonly; it was easier to get by this method than at mercury vapour light.

The final outing of the year was to Clumber Park, Nottinghamshire, on the 5th October. Conditions were good to start with, but the moon rose in a clearing sky and forced a halt by 9.30 p.m. However, we did see three *Anchoscelis helvola* L. and two very large female *Enargia paleacea* Esp., neither of which laid.

The final noteworthy event of 1968 was the birth of our fourth specimen of *Homo sapiens* on 2nd December. This will probably be sufficient to complete the series of this species as they take up such a lot of space!

26 Highfield Road, Chesterfield, Derbys. 28.i.1969.

Maniola (Epinephile) *jurtina* (L.) (Lep. Satyridae) and its Forms

By George Thomson

(continued from page 58)

C. The Central European Group

The distinctive characteristics of *jurtina* from the area now under discussion (i.e., all of the Continent of Europe excluding Spain and the areas in which the typical sub-species is found) are not easy to determine in a species so variable. Generally speaking, however, these could be listed as

(a) larger size than typical *jurtina* but smaller than *hispulla* Esp.
(b) greater development of fulvous in the female but less so than in the Southern Group
(c) its closer relationship to the typical sub-species than *hispulla* in its smaller size and less robust appearance.

The situation is complicated mostly by the fact that *jurtina* does not form sub-species which are conveniently separated from each other by simple clines and by the fact that environmental influences cause very different populations to spring up fairly close to each other while, in some cases, over a stretch of a thousand miles the species could be virtually homogeneous. In many areas, too, altitude produces forms different from those close to sea level.

There are several ways of looking at the situation throughout Central Europe, depending upon the form of the species with which one is most familiar. From our point of view it is best to consider *phormia* as the widespread form throughout central and parts of southern Europe from which other races differ—to the north in the form of a rather gradual cline towards the typical sub-species, to the south towards *hispulla* and its related races and to the east towards *telmessiaeformis* Vrty.

As one goes north from Normandy into Belgium the cline to the

typical *jurtina* is a relatively straightforward one, with the butterflies becoming smaller and, in the female, a little less marked with fulvous. To the south of France the cline is composed of *phormia*, transitional specimens and individuals portraying *hispulla*-like characteristics. In Italy, Austria, the Balkans and Asia Minor the position is very much more complicated for it is here that the usual sub-specific concept breaks down. Although *phormia* tends towards *hispulla* to the south west of this area, towards *jurtina* to the north and to *telmessiae* in the east, individuals of any of these variants crop up almost anywhere in the region—often forming a considerable proportion of the populations. For example, *hispulla*-like specimens appear in a few spots on the Aegean Coast, while in one or two north Italian localities some populations consist of a large proportion of typical *jurtina*. Clearly this situation is not adequately catered for in our present system of nomenclature and it is with this reservation in mind that I proceed to discuss the ways by which the other Central European races vary from *phormia*.

As one comes lower down the mountains of northern and central Italy, Jugoslavia and Greece *phormia* becomes larger and takes on some of the *hispulla* characters—particularly the extent of fulvous on the upperside. This has been named *praehispulla* by Verity who also described *emihispulla* as a further development towards *hispulla* as is found in Western Asia Minor, the low lying areas of the Balkans and the Island of Elba. *Emihispulla* differs from *praehispulla* only in the larger area of fulvous on the upperside hindwings of the female of the former race. In the east of Europe the cline from the typical sub-species through Estonia and Latvia is a long one and becomes *strandiana* Obratzov, a rather larger form in the Kiev, Transylvanian and Crimean areas.

S.sp. *phormia* Fruh. 1909, Int. Ent. Zeitschr. 3 p. 121. Like many of the earlier original descriptions, that of this race is hardly adequate as it refers to a population of a limited area but has since been extended to cover the butterflies in a very extensive area. It was originally described from the South Tyrol as being a form showing some *hispulla* characters. Its size is larger than *jurtina* from Sweden but smaller and with a more acute apex than *praehispulla* while the male has a more reddish apical patch. The fulvous of the female, however, is paler and more extensive than that of the typical sub-species.

Phormia occupies a position in Central Europe with typical *jurtina* to the north, *hispulla* to the south and *telmessiaeformis* to the east with its range also bordering on those of *strandiana*, *praehispulla*, *emihispulla* and *miscens*, tending to take on characters of these races where its range comes close to theirs. This race is so variable throughout its range that it undoubtedly is in fact several races, but much work is necessary here —particularly on the French races.

Locality: France to Normandy in the north, and the Pyrenees in the south, the uplands of north and central Italy, and the hills of the Balkans, Greece and Asia Minor, also the Tyrol from which the race was described.

[*meridionalis* Pionneau was described as a form (1924, *Bull. Soc. Sc. Nat. Ouest.* IV, p. 58) having a colour much darker than the specimens from central France. However, as Verity points out (1953, Le Farfalle diurne d'Italia, vol. 5, pp. 268-9) that the name is only doubtfully sub-specific, and is probably synonymous with *phormia*.]

S.sp. *strandiana* Obratzov, 1936, Festschr. E. Strand, 1, p. 638, is a race of large size (in comparison with the typical sub-species from Sweden). Obratzov gives the dimensions of the typical sub-species as 40-42 mm. in the male and 42-46 mm. in the female. This is much smaller than my Swedish *jurtina* and less than the figures given in textbooks on the butterflies of Scandinavia. Moreover, jurtina from the Netherlands and North Germany is larger than the Swedish insects. The description of the male—including the size—is of a typical specimen. In the female, however, the difference is more apparent. Firstly the apical eyspot is larger in this race while the fulvous areas of the forewings stand out far less sharply than in the typical subspecies. This, combined with the larger size, should distinguish most *strandiana* from the typical race.

Locality: Eastern Russia, Crimea, Bessarabia and Podolia. Actual localities mentioned include Kiev, Kherson and Transvania. Intermediates are found in Estonia (Reval) and Latvia and represent a cline towards the typical sub-species which is found on the other side of the Gulf of Finland.

S.sp. *praehispulla* Vrty. 1921. *Ent. Rec.*, **33**, p. 210.

The shape of the forewings is more round apically than in *phormia* and the outer margin is somewhat curved. It is larger than *phormia* but also very variable. The male nearly always has a patch of fulvous below the apical eyespot while the female has little or no yellow on the hindwings.

Locality: The lower slopes of the mountains in Greece to a transition with *emihispulla* in the north (Olympia), probably most of lowland Jugoslavia and all of Italy except the mountains and the far north. Actual localities mentioned are Calabria, Emelia, Ligura, Querci, Piano di Carmelia, South Lazio, Aspromonte and Tuscany.

S.sp. *emihispulla* Vrty. 1919. *Ent. Rec.*, **31**, p. 123.

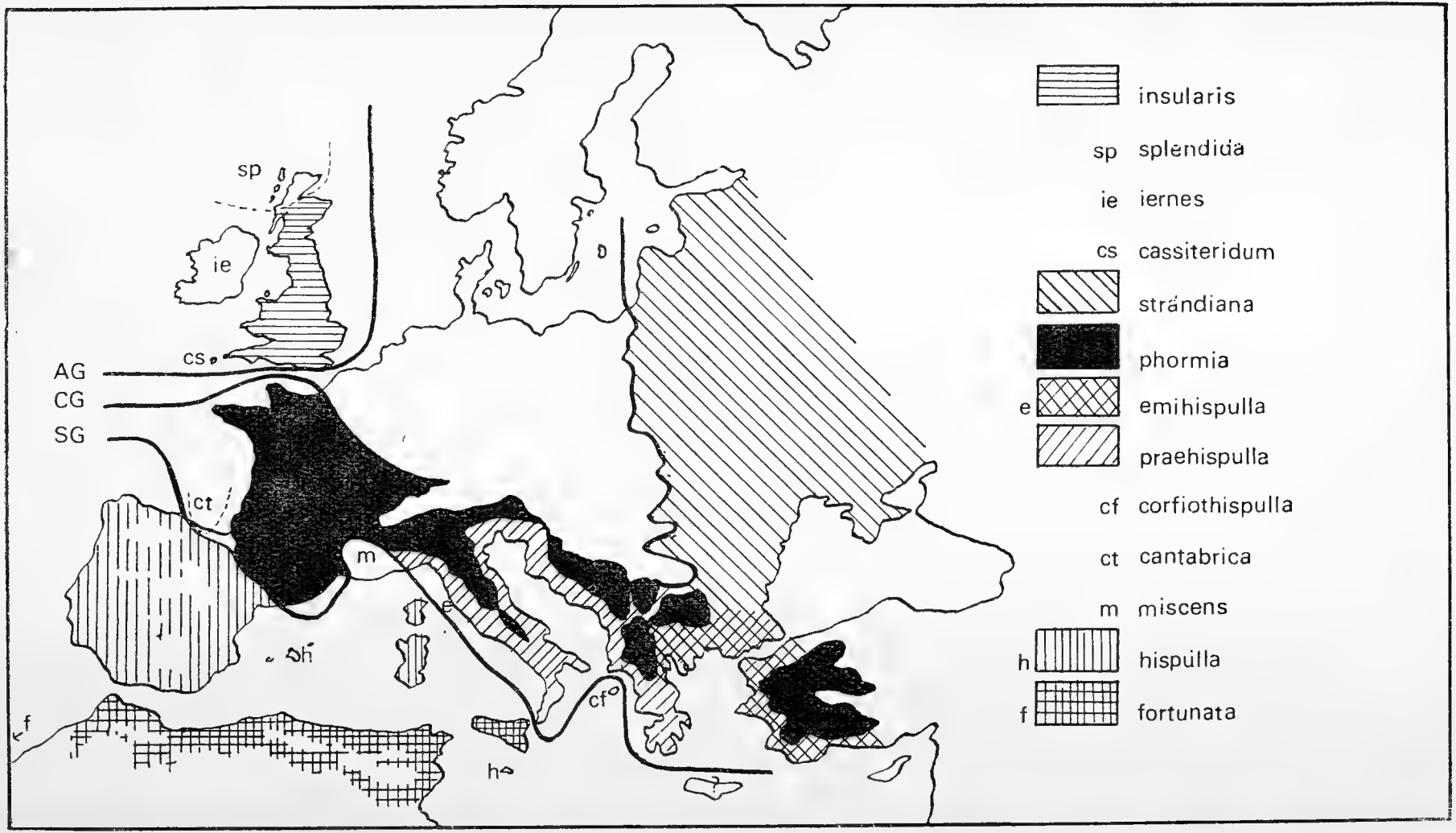
This race is similar to *praehispulla* in size, in the apical eyespot and in general colouring. The main difference is in the greater development of the fulvous on the upperside hindwings of the female, or in the discal area of the forewings. However, individuals are found which are inseparable from *phormia* and others which are very close to *hispulla*.

Locality: Elba and the lowlands of Asia Minor (west) and the Balkan States south to Thessalonika and Olympia.

D. The Southern Group

The situation in the Southern group of sub-species is only a little less complicated than the Central group. However, the distinction between these two groups is in itself a comparatively clear-cut one. Indeed, it has even been suggested that the genitalia of *hispulla* varies from that of the typical sub-species, but I have been unable to confirm this. Superficially the southern races have a more robust appearance which is more difficult to describe than to recognise. The strong development of the fulvous areas is characteristic but in this respect *cantabrica* is an exception.

The races *miscens, hispulla* and *fortunata* represent three gradations each one characterised by the degree of fulvous displayed on the upperside of the female, reaching a magnificence in the Canary Island form.



Map Three

Europe, showing the distribution and range of the Atlantic (AG), Central European (CG), and Southern races of

Both *cantabrica* and *corfiothispulla* represent two races which could best be described as untypical of the group, but obviously belonging to it. In the male of all the southern races the androconial brand is strongly defined standing out strongly on a somewhat differently coloured ground. The shape, too, is rather more pointed showing a relationship in this respect to the eastern *telmessiaeformis* Vrty. but in this latter race these characters are even more pronounced. The females have rather dentate hindwings while the forewing outer margins tend to be concave. The underside forewing of the male is more often unicolorous than even slightly contrasty, though a very weak transverse line between the sub-apical and discal areas is often present. The female has a very well developed transverse line—much more so than in the Central European Group but only slightly more than in the Atlantic races. The reason why the sub-species *cantabrica* and *corfiothispulla* have developed along rather individual lines is in some ways not hard to understand as both have evolved in areas which are to a certain extent isolated from the populations of the surrounding areas. In the case of the Corfiote form this isolation is complete, but not so with *cantabrica* which is separated from the Spanish *hispulla* only to the south of its range by the Cantabrian Mountains. What is more difficult to understand is why *jurtina* has evolved in these localities but has not in many others where conditions are as much suited to evolution of this nature.

S.sp. *corfiothispulla* Graves. 1933. *Entomologist*, **66**, p. 180.

In the markedly scalloped margin of the hindwings and well-developed androconial brand this race resembles *hispulla* and *fortunata* but the extent of fulvous is more often than not confined to a ring around the apical eyespot. The underside colouring is overall more uniform in colour than other Southern races with a very inconspicuous transverse line on the forewings. Even this is sometimes lacking. The female resembles *hispulla* in the extent of the fulvous though on the hindwings is rather more suffused with dark scaling. The underside also is *hispulla*-form. The most striking feature of this race is its size which is in the male about the same as *fortunata* (c. 56·0 mm.) but in the female the largest of the group averaging 61·7 mm. with some specimens as large as the giant race *megela* Obthr. from Akbes and (?) Marmarice. The largest of Graves' series was 66 mm.

Locality: The Island of Corfu.

S.sp. *cantabrica* Agenjo. 1934. *Eos*, **9**, p. 313, fig. —.

The principal characteristics of this sub-species are found in the female. In comparison with *hispulla* it is much darker with the upperside forewing discal fulvous area almost totally obliterated by the ground colour. The apical eyespot is variable as in the other races of the area. The fulvous below the apical ocelli appears to be incomplete and in some cases disappears altogether. This greater diffusion of the ground colour at the expense of the fulvous markings is similar to that in *praehispulla*, but examples of this race when compared with *cantabrica* never display a reddish tone. Specimens from Austria and France are as close to the Italian races as this sub-species is to the Spanish *hispulla*. The underside of the forewings, however, is of a much hotter colour than those of *hispulla* in both sexes. Agenjo states that this is a characteristic of all the *Epinephile* of the Cantabrian region. The male is identical to *hispulla* in all respects except those which I have already mentioned.

Specimens close to *hispulla* are found flying with *cantabrica* but the proportion is small.

Locality: Described from Camargo (Santander) but comprises a fair proportion of the *jurtina* to the north of the Cantabrian Mountains.

S.sp. *miscens* Verity, 1953, loc. cit., p. 268.

This is a heterogenous race in which the main characters of the Southern Group are found (i.e. extensive fulvous markings particularly that on the hindwings) but in which specimens more close to *praehispulla* are found as a somewhat smaller proportion of the population. The fulvous is generally a little less extensive than in the Spanish race, while the apical eyespot has a tendency to be of a size more akin to *praehispulla*.

Locality: Described from near Nice. The population of the Maritime Alps and much of south east France belongs to this race. Its northern extent is not given by Verity but my specimens from St. Etienne, Valence and Gap agree in every respect with his description and with those from Vaucluse.

S.sp. *hispulla* Esper, 1805, Schmett., II, p. 11, pl. 119, f, 1, 2. Hübner, 1805, Sammung Eur. Schm., p. 27, f. 593-6. (see Verity 1953, loc. cit. p. 261.)

Wings dark brown with a large apical eyespot which is often diffuse in the female. The fulvous marking of this sex is extensive in both fore and hindwings. The discal area is mostly taken up by this colouring, and the underside hindwings have a greyish band tinted with violet and edged inwardly with a line of 'brick-brown' ('Hübner's line'). This light band is sometimes with a row of small 'points' circled with yellowish. The underside forewings display a very well marked dark transverse line which strikingly divides the discal and sub-apical areas. The male is similar to the other southern races with rather pointed forewings and well defined androconial brand.

Locality: The population of Spain to Catalonia and the Cantabrian Mountains, Portugal (type locality), Majorca and the Balearic Islands, Sardinia and probably also Corsica. The form from Malta, though applicable to this race, approaches *fortunata* in some respects more than *hispulla* from other localities.

S.sp. *fortunata* Alpheraky, 1889. *Mem. Roman*, **5**, p. 222, pl. 11, f. 4.

Fortunata is larger than *hispulla*, a fact which in itself should distinquish most specimens. However, the male has a magnificent golden gloss in the apical area on a deep blackish brown ground which is not present in most *hispulla*. The hindwings are dentate as in the Spanish race. In the female the extensive fulvous markings in the sub-apical areas are usually broken by the ground colour along the nervures. The apical eyespot itself is large and usually bipupilled. The basal area of the underside hindwings is dark vividly contrasting with the sometimes bluish tinted light medial band. The size of the male is about 1 mm. larger in the male and 2·5 mm. larger in the female the average *hispulla*—♂♂ 56·00 mm. and ♀♀ 59·96 mm.

Locality: The Canary Islands, Palaearctic Africa and Sicily. Specimens approaching *fortunata* are said to occur in the south of Portugal.

E. The Eastern Group.

With the Eastern races we come up against tremendous difficulties both

as far as material in the form of specimens is concerned and in the complications which have arisen around published descriptions of the races. In the first place *telmessia* Zell., which was described from Cyprus, adjacent Asia Minor and the 'East', was found to be a true species. It was then found that the form from Cyprus was distinct (*cypricola* Graves). Specimens resembling *telmessia* but with the genitalia of *jurtina* were named *telmessiaeformis* Vrty. but the range of this race was not made clear. From the information I have gathered it appears that the large specimens of *megela* Obthr. turn up almost anywhere in the region often flying with specimens of another race. The area in which these Eastern races fly includes Asia Minor, the Turco-Syrian borderland and North Persia to the Caspian sea. However, with the exception of a few actual localities in these areas the actual range of the species is not very well documented.

There is not one character which distinguishes the Eastern races from the other groups. The general characteristics are similar to *hispulla*—in size and the extent of the fulvous—but there are exceptions to this. However, the spotting on the underside hindwings of both sexes, but particularly in the male, is very well developed.

Clearly all that can be attempted here is to gather together the facts which are available. As I said when I began this paper there is much work to be done on this insect—particularly in the East, and I hope that the following information, though limited, will provide a basis for what could be a very interesting and worthwhile study.

S,sp. *megela* Obthr. 1909. *Lep. Comp.*, III, p. 387.

This is the largest geographical race of *jurtina* for which Graves (1933, *Entomologist*, **66**, pl. 181) quotes figures of 63·80 mm. for the male and 65·22 mm. for the female. The hindwings are very dentate and on the underside of the male are grey or yellow-grey with up to five small ocelli which are sometimes white pupilled. In the female, according to the original description, there is very little fulvous scaling, but this must be a comparative statement as a majority of Graves' specimens have these markings in two interspaces on the hindwings. Therefore, when compared with specimens from Portugal or the Canaries, and probably also specimens from surrounding areas, they are much more poorly marked in this respect. The apical eyespot is very well developed and there often additional spots below this (f. *addenda* Mousley).

Locality: Described from Akbes. Graves gives Shar Deresy on the Turco-Syrian borderland as a locality from this race and also suggests that specimens from Marmarice in south west Asia Minor belong to this race. It is found flying with the next race forming a large proportion of the population in the 'Amanus meridional'.

S.sp. *maraschi* Pfeiffer, 1932. *Mitt. Münch.* E. G., **22**, p. 24.

This is another large race, but it does not attain the dimensions of *megela*. The male is said to resemble slightly those from the Riviera (presumably only in the pattern of the upperside) though the apical eyespot is always white pupilled. The underside of the forewings is yellow-brown with the marginal areas very narrow. The underside hindwings are 'earth-brown' with the light medial band scarcely visible. Four or five

orange circled spots are always present on the band. In the female the fulvous markings are well developed (about the same as in *hispulla*) and appear lighter around the apical eyespot. The underside of the forewings of this sex is said to be similar to that of the upperside with an addition ocellus sometimes appearing below the apical one. The ground colour of the hindwings on the underside is chocolate brown, tinted with violet, with a well defined light medial band. The black points, when present, are small.

Locality: Described from Marasch—other localities are not given than that mentioned under s.sp. *megela*.

S.sp. *telmessiaeformis* Vrty. 1919. *Ent. Rec.*, **31**, p. 124.

The scent patch in the male of this race (and *telmessia*) reaches vein 3 standing out strongly because of the extension of the fulvous markings below the apical eyespot and towards the discal area. The forewings are rather less acutely pointed than in the Southern races. The discal patch on the forewings of the female is bright 'foxy brown'. The genitalia differs from that of *telmessia*.

Locality: Very difficult to ascertain, but it is certainly found in the part of Asia Minor lying opposite Cyprus. However, it is not clear whether or not *telmessiaeformis* is to be found in the areas where the races of *telmessia* fly. If this is so this sub-species should also be taken in North Persia and Kurdistan.

S.sp. *persica* Le Cerf 1912. *Bull. Soc. Ent. France*, p. 227.

The male resembles *hispulla* on the upperside but the ground colour is brighter with fairly well developed fulvous markings. The apical eyespot is small and the androconial brand very well developed reaching vein 3. The underside forewings are unicolorous with wide and regular margins. The apical ocelli are larger on the underside than on the upperside and are ringed with yellow. The hindwings are uniformly grey with a diffuse medial band on which are two rather large spots circled with yellow. The female is similar to the typical sub-species but larger and the fulvous markings are broken up by the nervures. Rarely this colour invades the discal area.

Locality: Iran Plateau and the western mountains of Persia.

S.sp. *ghilanica* Le Cerf 1913. *Ann. Hist. Nat.*, **II**, p. 43, pl. V, f. 18, 19.

This race is similar to *persica* but differs in the genitalia. The wings are more rounded and of a colder ground colour, particularly in the male. In both sexes the apical eyespot is larger, especially in the female.

Locality: The moist wooded regions on the shores of the Caspian Sea —Seilan-Kelahe, Seng-e-Serck and Sia-Khani.

In concluding this paper, which I hope has helped to clear up some of the confusion which surrounds this species, I would like to repeat the plea which I have made throughout not to neglect this interesting species. Reports from the east of Europe, the Mediterranean Islands and the East would be particularly valuable, and specimens sent to me from anywhere throughout *jurtina's* range would be most welcome. However, if this paper has not stirred at least some small interest in this butterfly it will not have been entirely my fault.

98 George Street, Dunblane, Perthshire. 13-x-1968.

A Disappointing Day at Porthgwarra

By R. M. Payne

Ever since becoming interested in the Orthoptera, many years ago, I have been fascinated by W. J. Lucas's remarks about *Phaneroptera falcata* (Poda) in West Cornwall. On page 199 of his *Monograph of the British Orthoptera* (1920) he cites two circumstantial records of this European bush-cricket, one for Porthgwarra in 1881 and one for Sennen Cove in 1884. His concluding comment has always appealed to me as a challenge: "There is, therefore, a chance of this insect being given a recognised postion in our list, if some enterprising entomologist will search the Land's End district at the end of summer".

But Land's End is a very long way from home, and it was not until 1967 that a family holiday found me in Cornwall at the right time of year. As soon as this holiday was arranged I made a mental vow that it must include a day at Porthgwarra. Porthgwarra was chosen rather than Sennan Cove on two grounds: it seemed likely to be the less populous place of the two, and the locality given by Lucas was more specific—"at rest on grass near a footpath".

So on 29th August 1967, a warm sunny day, we drove down to Land's End from our lodgings at St. Austell, and after the obligatory visit to Land's End itself I manoeuvred the family along the few miles of lanes to the southernmost tip of the Land's End peninsula at Porthgwarra, where the younger members were soon deposited safely in a sandy cove.

Some years previously I had come into possession of a continental specimen of the *Phaneroptera*, so I knew what to look for; and indeed this long-winged, slim green insect is quite different from any other Bush-cricket.

As soon as the very minimum time had been wasted over the consumption of food, I began what were perhaps the most engrossing few hours of that whole summer. Along all the available footpaths I meandered, over the cliff tops, down cliff faces where they were accessible, inland through the gorse and even up the one metalled road (which may well have been only a footpath in 1881). The coast here is strikingly beautiful, tall Tree Mallows on the rocks, the cliffs festooned with flowering mats of "Mesembryanthemum" (*Carpobrotus edulis*), and the stones below the blue waters streaked with bold colours. But of course I had no time for aesthetic idling: the hunt was up!

The day was ideal for the detection of Orthoptera, and I was glad to find that the passing of years had not deadened my ears to the sounds of stridulation. The Common Field Grasshopper *Chorthippus brunneus* (Thunberg) and the Meadow Grasshopper *C. parallelus* (Zett.) occurred commonly over the whole area, and in the dry heathland on the cliff tops the little Mottled Grasshopper *Myrmeleotettix maculatus* (Thunberg) was plentiful. Several specimens of the plump green Speckled Bush-Cricket *Leptophyes punctatissima* (Bosc) were noticed sitting on Stinging Nettle leaves by the side of a path.

My heart-beats quickened when I heard an unfamiliar stridulation amongst a tangle of Bracken, Wild Carrot and long grass on the cliff top just east of the village, but alas! this was soon traced to a colony of the

Grey Bush-Cricket *Platycleis denticulata* (Panzer), which I had not come across since a holiday in Dorset several years previously. Later in the afternoon I found another colony of this species in Purple Moor-grass (*Molinia coerulea*) on a dried-up *Sphagnum* bog half-way down the cliff to the west of Porthgwarra.

A few hundred yards inland was a steep piece of waste land where some ruined cottages had become overgrown with scrubby vegetation (of which Large Bindweed was the most conspicuous element). Here was a vociferous colony of our finest Orthopteron, the Great Green Bush-Cricket *Tettigonia viridissima* L.

But the day drew to its inexorable close, and there was no sign of *Phaneroptera falcata*. Nevertheless, all experienced Orthopterists will know how very local our Bush-Crickets can be, even within an area in which they are plentiful, so perhaps I am entitled to a faint hope that a colony many still persist near some remoteovergrown footpath I failed to reach. Or must we accept, as a recent authority would have, that "the two old records - - - are inadequate - - - for the acceptance of this insect as British"?

Westwood, Highwalls Avenue, Dinas Powis, Glamorgan.

Aggregations of *Agonum dorsale* Pontoppidan (Col. *Agonini*) on Lindisfarne (Holy Island)

By B. R. Benham

Although the gregarious behaviour of *Agonum dorsale* has been reported several times in the past, notably by Southwood, 1963, and Muggleton, 1966, I feel that the large aggregations of this species which were observed on Holy Island are worthy of mention.

While on a bird watching visit to Holy Island on the 1st February 1969, I was walking (South to North) along a path on the extreme Eastern side of the Island within fifty yards of the sea, and could not help but notice the numbers of large stones which had fallen from the dry-stone wall bordering the path. Realizing that the undersides of these would form a suitable habitat for insect life, I proceeded to lift some of these stones, and although several had sunk up to two inches into the soil, on lifting them I was, in many cases, greeted by the rapid dispersal of seemingly countless numbers of the beetle *Agonum dorsale*. The maximum number that I was able to count was fifty plus individuals under one stone which was embedded about one inch into the soil, and about one hundred square inches in area, while numbers from five to forty were recorded under several similar sized stones in the near vicinity. In a few cases single specimens of *Nebria brevicollis* Fabricius (which Linssen refers to as an inland species), were found in the centres of *Agonum* aggregations.

The large size of these aggregations may be due to the fact that there are few suitable overwintering shelters on this exposed Island, and that not only do these stones from the wall form a suitable hide-away (the soil beneath these stones was unfrozen, while that at ground level was quite hard), but the wall itself (the stones being within a yard or two of the

wall) forms an excellent shelter from the extremely violent and cold winds. And I have little doubt that further investigation would have revealed even larger aggregations than those which I have recorded.

REFERENCES

Southwood, T. R. E. 1963. Life of the Wayside and Woodland. Warne, London.
Muggleton, J. 1966. Gregarious behaviour of *Agonum dorsale*. *Bull. amat. Ent. Soc.*, **25** : 53.
Linssen, E. F. 1959. Beetles of the British Isles. Warne, London.

9 Victoria Terrace, Durham City.

Dasychira fidjiensis M. & V. (Lep., Lymantriidae) biology and wing pattern formation

By Gaden S. Robinson, F.R.E.S.
(Department of Zoology, University of Durham)

Dasychira fidjiensis Mabille and Vuillot (1890): Novitates Lepidopterologicae, **1**, *p. 5, pl. 1: 2.*

D. fidjiensis is a polymorphic Lymantriid endemic to Fiji. It has been collected on the islands of Viti Levu, Vanua Levu (T. H. C. Taylor) and Taveuni (H. S. Evans). On Viti Levu it is a common species, frequently taken at light but preferring to alight on an illuminated wall rather than enter an M.V. trap. The larva has been found on *Psidium littorale* Raddi and *Rhizophora mangle* L. (mangrove). In jungle its foodplant is probably *Crossostylis* spp. It is apparently continuous-brooded. H. S. Robinson and I bred *D. fidjiensis* on *Rhizophora*. The life-history is as follows:

Ovum: 8 days. Spherical, creamy brown, with a black-brown cap, two wide brown bands below the cap, the lower band equatorial.
1st Instar: 5 days.
2nd Instar: 4 days.
3rd Instar: 10 days.
4th Instar: 15 days. At the end of the fourth instar the larva is about 50 mm. long, clothed with fine white hairs with longer black hairs intermingled. There are six orange-brown "shaving brushes" on the back, one per segment. On the penultimate segment there is a black hair-pencil with a white tip.
5th Instar: (females only) 15 days. Larva similar to fourth instar.
Pupa: 14 days. Emergence is usually at about 7.30 p.m.

Because of the staggered emergence of males and females it is difficult to obtain an F2 generation and *fidjiensis* is extremely reluctant to mate in captivity. These factors have hampered investigation of the genetics of the species.

D. fidjiensis is polymorphic; females are larger than the males and fairly consistent in wing patterning but the males exhibit a startling variety of forms. Major variation of the males can be accounted for by the postulated existence of four pairs of alleles or groups of linked alleles. Breeding experiments have so far confirmed this hypothesis and the frequencies of the different patterns of a long series of wild specimens also support it. The major genes affecting wing patterning are as

follows. A capital letter denotes a dominant gene, a small letter a recessive.

D: produces grey speckling over the whole of the forewing and outlines the reniform.

d: is only a partial recessive. A dd homozygote has white forewings and a Dd heterozygote has faint speckling.

B: gvies rise to black submarginal, postmedial, submedial and basal lines. A DDBB (or DDBb) specimen does not show the lines clearly—they tend to be masked by the grey dots.

b: A bb specimen lacks these lines except for faint traces at the costa.

S: has no effect on wing pattern.

s: lays down black or deep brown bands on the distal edge of the postmedial, the colour concentrated at the inner angle, and between the submedial and basal lines. In a bb specimen the dark enclosing lines are absent but the band is unaffected.

G: produces a "ghosting" of the lines controlled by B. A finer line is laid down about 1 mm. to either side of the B-lines. This effect tends to be smothered by the grey speckling of a DD specimen. In the case of a bb specimen the "ghost" lines are still present, flanking a faint "B-line."

g: A gg homozygote lacks the ghost lines.

The number of discernible forms made available by this system is nineteen. So far, all specimens caught or bred fit into a definite category. All these genes are probably about equally common but varieties produced by a number of recessive characters appear to be rare for recessives in heterozygous form are masked. In addition a DD combination masks a number of varieties giving a single phenotype with several possible genotypes. The wild specimens so far captured run from an albino (ddbbSSgg) to a grey-speckled form with black-edged brown "shoulder-bands" and postmedial bands, the edge of the bands very faintly "ghosted" (DDBBssGG). The typical form is a combination of all the dominants (DDBBSSGG), a grey-speckled moth with indistinct transverse lines.

There appear to be several genes of very minor effect controlling the density of colouration on the hindwing and the density of overall pigmentation on the forewing. These have not been investigated owing to the difficulty of detection of their effects. However, mention should be made of one aberration, a unique specimen with a ddbbSSGG forewing. its hindwing clouded all over with black. All other specimens have a grey or brown termen to the hindwing, the rest of the hindwing field being white. In some bred families, females have been totally absent indicating a sex-linked lethal gene or genes. Mortality occurred in the egg stage. In another family 34 ova of a total of 51 failed to hatch (in another batch obtained at the same time all ova hatched) and the adults of this family consisted of seven males and four females.

The reason for polymorphism is *D. fidjiensis* is not at all clear to me. There appears to be nothing for *fidjiensis* to mimic in any of its forms and I cannot conceive of a situation in which this variety of patterns could be at all beneficial as camouflage. There are no common insectivorous birds which might be predators (except for the recently introduced mynah) and it may be this very lack of natural selection that permits *Dasychira fidjiensis* to retain its bewildering multiplicity of forms.

Notes and Observations

A Notable Variety of Biston betularia (*Ent. Record*, **80**: 329).—On August 24th 1952, I took at light here a similar variety of *Biston betularia* L. with forewings as ab. *carbonaria* and normal hindwings. This was shown at the Annual Exhibition of the British (then South London) Ent. and Nat. Hist. Society later that year, but it aroused little interest at the time. I therefore supposed it to be a not uncommon form and took no further action. *B. betularia* is a very common moth here, and this is the only example of this form that I have taken in 22 years, so no doubt it is very rare.—Air Marshal Sir Robert Saundby, Oxleas, Burghclere, nr. Newbury, Berks. 13.i.1969.

Occurrence of Adoxophyes orana F. v. R. at Camberwell, London.—A male of this tortricid moth occurred in the light trap in my garden on the night of 7th September 1968. This moth was first recorded in England by Miss J. R. Groves at the East Malling Research Station, Kent, in the year 1950 and an account of her discovery was published in *Ent. Mon. Mag.*, **87**: 259. J. D. Bradley wrote a full account of the species, including a plate and drawings in the *Entomologist* **85**: 1-4. S. N. A. Jacobs next recorded the moth in his garden at Bromley, Kent (*Ent. Record*, **64**: 86-87). This was followed by a note in 1953 by H. C. Huggins (*Ent. Record*, **65**: 360-1) stating that he had taken a number of the second brood at light at Westcliff on Sea. A. A. Allen recorded having taken three specimens at Blackheath, Kent, in 1956 (*Ent. Record*, **71**: 153). Other specimens have probably been taken since, but I have seen no records of the species in the 1960's, which has prompted me to write this note. No females have yet been recorded at light. Larvae are apparently fairly easy find on apple trees where the moth occurs. It seems to me that this moth might easily be overlooked and mistaken for a more common species; possibly this note will result in a few more records coming to hand. Luckily it does not appear likely to become a serious pest as it did in some places on the continent.—S. Wakely, 26 Finsen Road, London, S.E.5. 4.ii.1969.

Orgyia antiqua L. at Light. — I was most interested to read Dr. C. G. M. de Worms's note in the December *Record* (**80**: 327) since, at *ca.* 2300 hrs. on September 29th 1967, I was quite as surprised as he was a year later to find that a vapourer had been attracted to the light of the blended bulb in my garden.—G. A. Pyman, "Treyarnon," The Ridge, Little Baddow, Essex.

Thera variata Schiff. in Essex.—In the first week of September 1968, F. B. and Miss C. M. Murray caught a *Thera* at light in their Little Baddow garden. I provisionally identified it for them as a grey spruce carpet and am pleased to say that Mr H. C. Huggins subsequently confirmed the identification, adding that the insect belonged to the nominate continental race. There are several spruce nurseries in the immediate vicinity, but so far as I can ascertain this is the first Essex record of this very local species.—G. A. Pyman, "Treyarnon," The Ridge, Little Baddow, Essex. 14.i.1969.

CHORISTONEURA DIVERSANA HÜBN. IN SOMERSET. — Recently I noticed that a specimen which I took at Shapwick in Somerset on the 13th July 1964, and had identified as *Archips rosana* L., had a slightly differently shaped apex to the forewings from my other examples of that species. I submitted the moth (a female) to Mr J. D. Bradley who kindly examined the genitalia and found that it was *Choristoneura diversana* Hübn. There are old records, cited by the Victoria County History, for this species from Bath, Castle Cary and Abbots Leigh, but Mr. A. H. Turner, in his "Lepidoptera of Somerset" (Somerset Archaeological and Natural History Society, 1955) considers it is "very rare, if not, indeed, extinct" in the county. My record establishes its survival.—Lieut.-Col. A. M. EMMET, Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 18.i.1969.

ORGYIA ANTIQUA L. AT LIGHT.—Like Messrs de Worms, Bretherton and Messenger (*Ent. Record*, **80**: 327) I have also seen male vapourers at light. I have four males in my collection all taken at mercury vapour light in my garden on the following dates: 1.ix.1966, 22.viii.1967, 4.vii.1968 and 6.ix.1968. During the same period I have seen as many worn specimens at light, so that nocturnal flight does not appear to be of rare occurrence in this species.—D. O'KEEFFE, 29 Arcadian Avenue, Bexley, Kent. 22.i.1969.

EARLY APPEARANCE OF NOMOPHILA NOCTUELLA SCHIFF.—I had two fresh specimens of this species in my mercury vapour light trap here this morning, 22nd January 1969. I had January captures in 1966 and 1967. If this migrant can make the crossing in January, why can it not manage to overwinter here?—L. W. SIGGS, "Sungate", Football Green, Minstead, Lyndhurst, Hants. 22.i.1969.

CORRECTION

Antea page 2, line 4: For *Cacoecimorpha pronbmana* read *Cacoecimorpha pronubana*.

Current Notes

Readers who are hoping to plan this summer's holiday with an entomological interest may like to consider a stay at Bardsey Bird and Field Observatory; situated five miles off the tip of the Cheyn Peninsula in Caernarvonshire, North Wales, it offers an inexpensive and peaceful holiday with much to interest the naturalist.

The considerable range of flowering plants has a varied associated insect fauna which would well repay investigation. The accommodation, while only able to take a limited number of visitors, in hostel-type style, usually has space in late April, May and July.

Fuller details may be obtained from Mrs. R. A. L. Bond, "Wensheda", Clapper Green, Hunton, nr. Maidstone, Kent.

EXCHANGES AND WANTS

For Sale or Exchange.—Butterflies and moths. Many species from Africa, Madagascar, Formosa, and other countries. Expected pupae *Pseudanteraea discrepens* and possibly other species from Central Africa. List on request by sending 1/- stamps.—*Robert Keiser*, Frederik Van Eeden Plein 3, Antwerp 1, Belgium.

For Sale.—Papered Foreign Butterflies. List available.—*D. Brown*, 25 Charlcote. Near Warwick, Warwickshire.

Wanted.—Specimens of *Pararge aegeria*, and *Pieris napi* from Scotland and Northern England.—*George Thomson*, 98 George Street, Dunblane, Perthshire.

Required.—Would any entomologist or botanist expecting to visit Lebanon, Syria, or Turkey in Asia, consider trying to obtain living stock of the local subspecies (*pseudorapae*) of *Pieris napi*, preferably by collecting the eggs from wild cruciferae where the butterfly is flying? If so please contact *S. R. Bowden*, 53 Crouch Hall Lane, Redbourn, St Albans, Hertfordshire.

Urgently Wanted for field work, pupae of *Biston betularia*. Female pupae 1/- each or exchange.—*Dr. H. B. D. Kettlewell*, Department of Zoology, Parks Road, Oxford.

Two Mid XIXC Victorian 12 Drawer Mahogany Butterfly Cabinets. Ring Ashford (Middx) 55785 for Full Details.—*F. W. Westwood.*

Urgently Wanted.—20, 30, or 40 drawer Solid Mahogany Cabinet in good condition.—Full details to *T. W. Harman*, 26 Highfield Road, Chesterfield, Derbyshire.

Wanted.—Information *and* data on the distribution and habitats of *Coccinella 11-punctata* (Eleven-spot Ladybird) for an investigation into this species. *All* records welcome.—*J. Muggleton*, Dept. of Botany, Science Laboratories, South Road Durham.

For Sale.—Private collection Ornithopthera, and 500 species from Russia, Japan, Australia, New Guinea, Malaya, Africa, and Solomon Islands. Many Charaxes and Papilios. To be sold as one lot.—Please reply to *R. H. Morgan*, 108 Titirangi Road, New Lynn, Auckland 7, New Zealand.

Urgently Required—A good clean copy of "The Butterflies of Southern Africa" (Part 1, Papililionidae and Pieridae) by G. van Sen, published by Transvaal Museum in Pretoria.—Reply with details to "The Entomologist's Record", 59 Gurney Court Road, St Albans, Hertfordshire.

Wanted.—"Entomologist's Gazette" Vol. 12, part 2 to complete series. Reasonable price paid.—*Dr. Neville Birkett*, Kendal Wood, New Hutton, Kendal, Westmorland.

CHANGE OF ADDRESS (Correction)

B. R. BAKER, No. 5 Dovedale Close, Caversham, Reading, Berks.

CONTENTS (March, 1969)

THE AMATEUR ENTOMOLOGISTS' SOCIETY

The Society was founded in 1935 to cater especially for the younger or less experienced Entomologist.

For full details of publications and activities, please write (enclosing 6d. stamp to cover postage) to:—**R. D. HILLIARD, Hon. Advertising Secretary, A.E.S., 18 Golf Close, Stanmore, Middlesex.**

EXCHANGES AND WANTS

For Sale or Exchange.—Butterflies and moths. Many species from Africa, Madagascar, Formosa, and other countries, also from Europe and U.S.S.R. Pupae of *Thais polyxena* from Hungary and Czechoslovakia. Expected pupae *Pseudanteraea discrepens* and possibly other species from Central Africa. List on request by sending 1/- stamps.—*Robert Keiser*, Frederik Van Eeden Plein 3, Antwerp 1, Belgium.

Wanted.—Volume 4 of "The Entomologist" to enable me to complete set. Can anybody help?.—D. O'Keeffe, 29 Arcadian Avenue, Bexley, Kent.

For Sale.—Papered Foreign Butterflies. List available.—*D. Brown*, 25 Charlcote. Near Warwick, Warwickshire.

Wanted.—Specimens of *Pararge aegeria*, and *Pieris napi* from Scotland and Northern England.—*George Thomson*, 98 George Street, Dunblane, Perthshire.

For Sale.—Dried Formosan butterflies, beetles, moths, dragonflies, grasshoppers, praying mantis, cicadas, living cocoons and ova of moths. Coloured natural ferns, seashells, specimens for collection, decorations and gift use.—*Taiwan Novelty Co. Ltd.*, P.O. Box 860, Taipei, Taiwan (Formosa).

Urgently Wanted for field work, pupae of *Biston betularia*. Female pupae 1/- each or exchange.—*Dr. H. B. D. Kettlewell*, Department of Zoology, Parks Road, Oxford.

Wanted.—Entomologist's Gazette, Volume 12, Part 2, to complete series. Reasonable price paid.—*N. L. Birkett*, Kendal Wood, New Hutton, Kendal, Westmorland.

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LEPIDOPTERA OF KENT, VOL. II

This comprehensive work was completed with the instalment in our May issue and a limited number of separates, unbound, with stiff paper cover, is available for sale at 45/- per copy from The Editor, 54 Hayes Lane, Bromley BR2 9EE, Kent. (Postage extra)

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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.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION
(Founded by J. W. TUTT on 15th April 1890)

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THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

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

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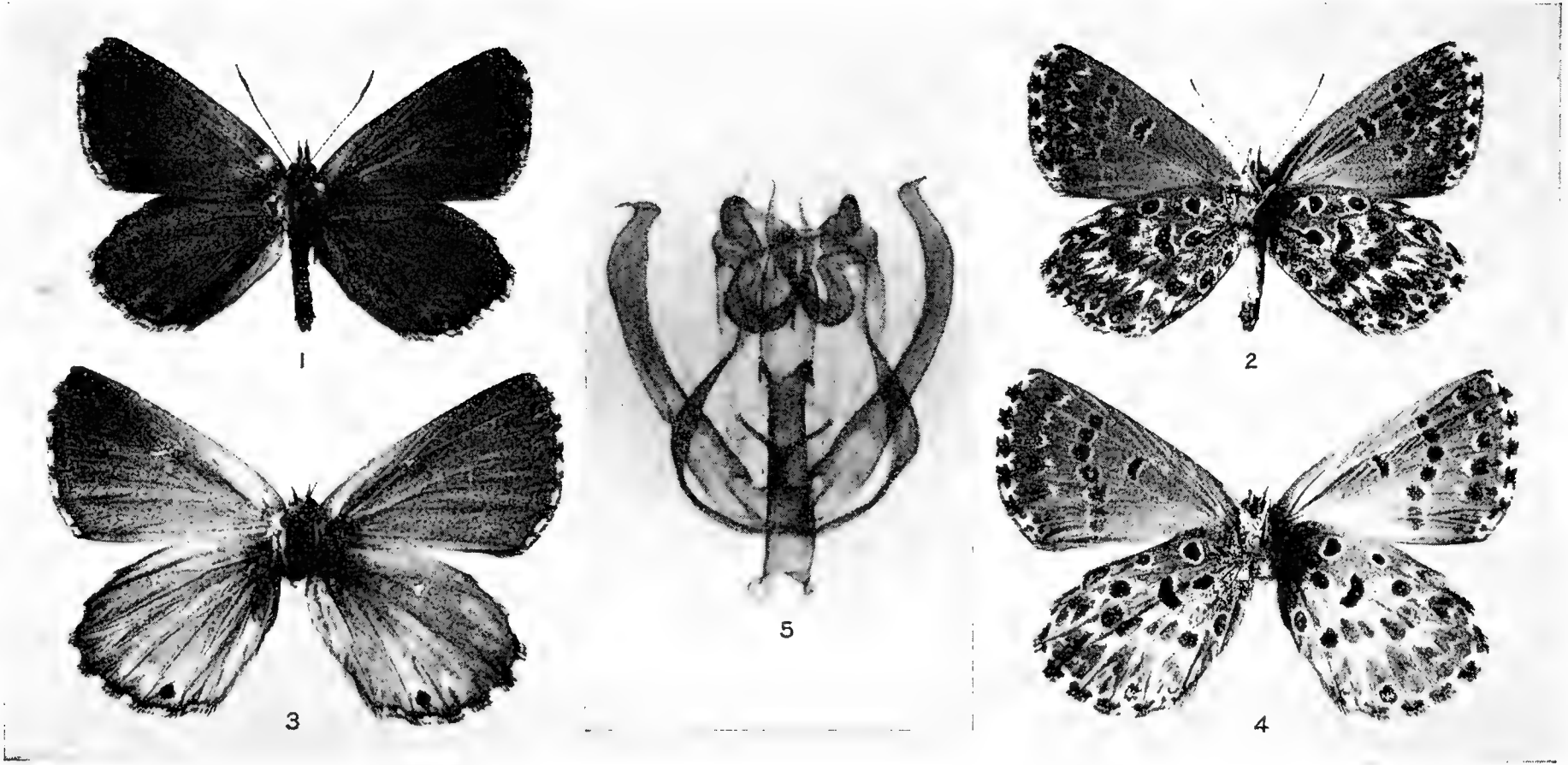

Photo: H. N. Wykeham

Fig. 1. ♂ Holotype (upperside). Fig. 3. ♀ Holotype (upperside).
Fig. 2. ♂ Holotype (Underside). Fig. 4 ♀ Holotype (underside).
Fig. 5. Genitalia of a ♂ paratype.
Figures of imagines approximately 1·8 times natural size.

A new species of *Lepidochrysops* Hedicke (Lepidoptera: Lycaenidae) from the North Western Cape

By C. G. C. Dickson

This Lycaenid belongs to the *L. methymna* (Trimen) group and it bears some general resemblance to *L. bacchus* Riley. The forewings are not acute at the apex and the hindwings are rather elongated, the upperside has a decidedly bronzy tone and the greyish underside is distinctively marked in certain respects.

Lepidochrysops penningtoni spec. nov.

Male. Upperside.

Both fore- and hind-wings, bronzy-brown, with some dark coloration at the bases and (especially in the forewing) darkening a little towards the distal margins, which are edged with black. Cilia greyish to blackish-brown with white spaces.

Forewing. A small dark-brown marking, not sharply defined and in some specimens barely visible, at end of cell. Outer portion of cilia continuously greyish or dark-brown except near apex, with most of the white spaces enclosed by the dark colouring.

Hindwing. A more or less elongated (round in one paratype) black spot in area 2 near wing-margin, with some slight white scaling inferiorly and surrounded by slightly lighter colouring than that of the general background; a very faint trace of other, smaller, markings in some of the remaining areas in some specimens, including the holotype. Inner-marginal area greyish (distally somewhat brown), with a rather shiny surface. Cilia practically as in forewing but, to some extent, tipped with white.

Underside.

Forewing. Ground-colour brownish-grey. A white-edged, blackish-brown lunulate marking at end of cell and a postmedian series of nearly round markings, very dark brown and also edged with white scaling. (In two of the paratypes these markings are less distinct or only partially developed.) Postmedian spots six in number (but the lowest one, in area 1b. occasionally doubled). Lowest spot a little nearer distal margin than the one above it in area 2—but those in 2-6 forming a fairly even curve approximately equi-distant from distal margin. A submarginal series of markings a little darker than the ground-colour, in areas 1b-6, with irregular whitish edgings which, on the inner side, are roughly chevron-shaped. In at least one of the paratypes, these markings are barely apparent. A marginal series of prominent, detached white chevrons in areas 1b-6 with their apices touching the white spaces in the cilia: two in area 1b, the lower one much reduced and hardly in the form of a chevron. Cilia almost as on the upperside.

Hindwing. Ground-colour much as in forewing, but with scattered white scaling in places, within the basal half of the wing. The dark or darker markings edged to a variable degree with white. A black or nearly black streak edging vein 8 near its base (indistinct in some specimens); a black spot, variable in size (and very small in one of the paratypes) close to innermargin, sub-basally; a small and often very ill-defined dark spot in area 1c (in two of the paratypes enlarged and prominent), sub-basally;

a prominent black spot (in the holotype, with an abnormal inward projection) in cell above the foregoing spot; and a prominent spot immediately below vein 8, sub-basally. Black or nearly black lunule at the end of cell, large. Lowest marking of median series black or nearly so, more or less oval and well basad of the following, 2nd marking; 2nd-7th markings brown to dark-brown, varying in size and shape but as a whole more uniform in size and forming a more even curve than in most of the allied species; 8th marking in the form of a well detached black spot in area 7, close to costa and considerably more basad than the preceding marking. The median series strongly but sinuately curved, the evenness of the curve being broken by the relatively more inward placing of the markings in areas 2 and 3. (In one of the paratypes the discal markings are largely malformed.) White chevrons distad of the median markings prominent and the contour of the series as a whole similar, but the chevrons losing their form at the lower end of the series. The space adjoining and on the distal side of these chevrons darker than the general ground-colour of the wing. Submarginal rings variable in outline and the rings losing their shape at each end of the series. A black spot in area 2 partly covered by pale metallic-blue scaling, with dull orange replacing the white of the encircling ring, above it. Outer portion of submarginal rings corresponding to the chevrons in the forewing and also in contact with the white spaces in the cilia. Cilia as in forewing but tipped slightly with white in places.

Length of forewing (including cilia): 14-16·25 mm. (15·75 mm., in holotype).

Head black with some greyish to white hairs and scales between antennae and, between black ones, frontally. Eyes black, edged with white scales. Palpi black above with white scales (including hair-like scales) on sides and beneath (the white not extending as far down on the whole on outer side); the palpi mainly, and broadly, black-fringed along their outer lower length; terminal joint mainly black (partly white beneath). Antennae black, ringed with white at the joints; the club largely black but orange-brown along lower inner portion up to extremity, and the lower outer portion white, with white scales curving up on the outer side just short of the extremity. Thorax and abdomen black above, the former, especially, with light-brown to greyish hairs and with brownish scales as well as some similarly coloured hairs also present on part of the abdomen; beneath with silvery-white scales and hairs (largely grey on thorax), and the legs extensively scaled with white.

Female. Upperside.

Similar to that of male, allowing for marked lightening of colouring owing to the age of the female-allotype. Cilia of both wings with the white spaces more conspicuous than in the male.

Underside.

Again, presumably due to the age of the specimen, the general ground-colour of a faded tone—i.e., light-brown without any grey tint.

Forewing. The darker markings for the most part clear against their background, but with less contrast towards the innermargin. Cilia as in the male.

Hindwing. Very much as in the male. A considerable amount of white scaling over much of the basal half of the wing. The dark sub-basal spot in area 1a hardly discernible in one wing and, apparently due to loss of

scaling, indistinct (though presumably originally large) in the other wing; that in area 1c very small in one wing and even smaller, and barely visible. in the other wing. Cilia like those of male.

Length of forewing (allotype): 17·25 mm. (exp.—as set: 33 mm.).

The allotype has lost its antennae and abdomen and the underside of the thorax seems to have been affected by rubbing or pressure.

♂ Holotype, WESTERN CAPE PROVINCE (Little Namaqualand): Steinkopf, 15.ix.1968 (Mrs. R. J. Southey); specimen to be presented by Mrs. Southey to the Transvaal Museum.

♀ Allotype, "CAPE. Namaqualand. Between Spectakel & Steenbok's Fontein. Aug., 1873. R. Trimen"; British Museum Reg. No. Rh. 17104.

Paratype presented by Mrs. Southey to British Museum (N.H.), data as holotype, 1 ♂ (R.J.S.).

Paratypes in Coll. K. M. Pennington, as holotype, 16.ix.1968, 2 ♂♂ (K.M.P.); 25.ix.1967, 2 ♂♂ (Mrs. K. M. Pennington).

Paratype in Coll. R. J. Southey, as holotype, 1 ♂.

The final part of Trimen's statement at the top of p. 29 of Vol. II of "South African Butterflies" (1887) concerning what were regarded as variations of *L. methymna* refers presumably to the present Namaqualand female specimen, while the actual locality is given on the same page as "Spectakel, Namaqualand". A label below the locality label on this specimen is inscribed: "Ex Trimen Coll. p. 171 [or 178?] No. 29". The specimen is also referred to in some detail by Dr. C. B. Cottrell in "Mem. ent. Soc. S. Afr.", No. 9, pp. 77-78 (June, 1965). The difference in size between Trimen's female and the largest male specimen of *L. penningtoni* of the present series is greater than would have been expected in a *Lepidochrysops* of this group, but the very close resemblance in other respects (apart from fading in the early specimen) seems to indicate that this female is conspecific with the male specimens.

The species can be distinguished from *L. bacchus* by its larger average size and the somewhat richer bronzy tone of the upperside and, on the underside (amongst other features in both fore- and hind-wings), by the more regular size of the discal markings of the hindwings (and more even conformation of the series as a whole), while the black spot near the tornus is surmounted by dull orange as against the white scaling in *bacchus*.

L. penningtoni is perhaps still closer to another, Western Cape, species which is being described by Mr. Pennington, which, however, has a brighter-coloured upperside in combination with a distinct difference in some of the underside markings. The present insect also has certain features in common with the larger and, on the upperside, darker *L. badhami* van Son, including the form of the discal series of markings on the underside of the wings.

The genitalia of one of the male paratypes are figured in the accompanying plate. It should be noted that the right valve (left side of figure) had its distal end turned downward somewhat in the slide. Most of the details of the genitalia are apparent from the figure. Falces very broad up to the main bend. Valves relatively slender (one broader than the other), the small inner projection of the bifurcate basal portion fairly close to the actual basal extremity; varying in breadth but without an abrupt widening near distal end, before final constriction and hooked extremity. Aedeagus with the tubular portion about three-fifths of the total length.

There are detail differences in the genitalia in comparison with those of *L. bacchus* and other allied species which have been examined.

The genitalia of most of the species of the *L. methymna* group have been studied exhaustively by Dr. C. B. Cottrell (*op. cit.*). A number of the species have also been dealt with from this aspect by the late Rev. D. P. Murray in "Anns. S. Afr. Museum", Vol. XLIII, Pt. 2 (Dec., 1956).

This butterfly is named with pleasure after my friend Mr. K. M. Pennington, who has made so many notable discoveries in the course of his life-long study of the butterflies of Southern Africa. Mr. Pennington has written as follows concerning this insect:—

"On 25th September 1967, we stopped at a large patch of mauve *Mesembrianthium* on west side of road five miles from Steinkopf on the tarred highway to Viool's Drift on the Orange River. My brother and I covered the whole area of twenty acres, while my wife worked the roadside. We collected for an hour. *P. chrysantas* (Trim.) was fresh on the flowers, a small *Aloeides* was rare and shy, and *S. nanus* (Trim.) was not uncommon. But the prize fell to my wife, who caught two rather worn specimens of a new *Lepidochrysops*, which she saw flying slowly among the scrub. We all pressed on to the Drift, where our target was *Colotis doubledayi* (Hopff.), and found it commonly in a steep dry valley three miles south of the bridge into S.W. Africa. Rushing back in the early afternoon for more of the *Lepidochrysops*, we found a wind had driven them to shelter, and an hour of concentrated hunting produced no more specimens. On our way back from Port Nolloth four days later, there was a cold south wind blowing clouds up, and no further collecting was possible.

"I returned to the spot on September 15th and 16th, 1968. The veld was not as advanced as the previous year, but about midday I spotted a fresh *Lepidochrysops*, which disappeared in the breeze. My wife and Mrs. Ruth Southey joined me from the car, and by 2 p.m. the latter had the good fortune to catch three fine males, while I missed another. Next day I caught two more good males, and missed a third.

"The country is flat, stony, and well covered with a variety of low plants. But the seemingly inevitable wind freshens towards midday, and all species stop flying. There was nothing distinctive about the vegetation, and all seven males were taken within an area of four or five acres. I searched six or seven square miles of the surrounding flat country without results. But I feel sure there must be many other spots in that part of Namaqualand where this dull brown insconspicuous Lycaenid exists. The altitude is just over 2,000 feet".

The manuscript of this paper has been read by Mr. Pennington before its publication. Mr. J. P. Doncaster, Keeper of Entomology, British Museum (Natural History), most obligingly consented to Trimen's early specimen being sent on loan to the writer, and thanks are due to Mr. G. E. Tite of the same institution for his kind help in this connection.

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

READERS will hear with regret that our late Treasurer, Mr. Leonard Parmenter, died on 4th March. A suitable obituary notice will be published as soon as possible.

Autographa festucae Linnaeus and *Autographa gracilis* Lempke

By B. J. Lempke

Several notes have already been published in the *Ent. Rec.* about localities where *Autographa gracilis* was met with, but I presume that many British and Irish lepidopterists who have not seen my original article on the subject wonder how they can distinguish *gracilis* with certainty from *festucae*. It is true that both species were by chance figured already by South in his original edition of the Moths of the British Isles, but copies of the 1908 issue in which the plates had still their good colours will no doubt be rather rare at present.

I therefore think I cannot do better than to reproduce again the excellent photos made by my compatriot Mr J. Huisenga and which accompanied my original article. The external differences between the two species are the following: *A. gracilis* is as a rule smaller than *A. festucae*, the ground colour of its fore wings is redder, the lowest silver spot near the apex is shorter (because the postmedian is less bent inward) and broader and the two discal silver spots are also shorter and therefore proportionately higher. If those who possess a good copy of the old edition of South compare his figures after having read the above, they will see that all these differences are clearly shown by them with the exception of the shape of the postmedian, because the print of the plate is not sharp enough to give such details.

Wing markings of *Autographa festucae* Linnaeus (left) and *A. gracilis* Lempke (right).

After the publication of my article it appeared that several lepidopterists in the Scandinavian countries and in Russia had already suspected that two species were hidden in the series of *A. festucae* from their countries, but none had ever made slides to check this or had published a note on it. That we have to do with two different species is not only proved by the constant differences in their appearance, but also by their genitalia (both of male and female) and their biology. As it is not difficult to separate the two by their external characters I refrain from giving figures again of the genitalia. They can be found in my original article.

Although we know still very little about the biology of *A. gracilis*, two important differences with *A. festucae* could be established, at least in the Netherlands. First the number of generations. Whereas *A. festucae* is clearly double brooded with a second generation that outnumbers the first, *A. gracilis* has as a rule only one generation. In favourable seasons a very small second one may occur in the second half of September and the first week of October, but neither in 1967 nor in 1968 it was observed. The optimal flying time of the first generation of *A. festucae* is June, that of *A. gracilis* the second half of June, but especially July, so that they overlap. Cf. the histograms I gave in supplement 13 of the Catalogue of Netherlands Macrolepidoptera, p. 909 and p. 912 (1966).

A second difference is the biotope. Whereas *A. festucae* may be found everywhere where the food plants of the caterpillar grow, *A. gracilis* is confined to moist places. Especially in marshes it may be common, more numerous indeed than true *festucae*.

No differences are yet known between egg, caterpillar and chrysalis of the two species. I met with a few bred specimens in Netherlands collections, but the captors had found the caterpillars in a time when we had not yet the slightest suspicion of the existence of two different species. One of the breeders, however, had kept the cocoon, so that I could compare it with three cocoons of *festucae* in the collection of the Amsterdam Zoological Museum. The latter were all made in the bend of a leaf as is usual with this species. The result is that the *festucae* cocoon is rather short and broad. The *gracilis* cocoon on the contrary is long and slender (spindle shaped, length 4 cm., greatest breadth 7 mm.) and lays stretched out on (or under?) a narrow leaf. It is of course not certain that the *gracilis* caterpillar always spins its cocoon in this way. If so the difference between the two is very striking. The colour is, in both species, the same, greyish white, the cocoon of *gracilis* perhaps a trifle yellower. As is the case in *festucae* the dark pupa shines more or less through the tissue. It is possible that the two chrysalids show differences in the anal hooks, but as I was not allowed to open the so far unique cocoon this problem must be postponed till more material is available.

The distribution of *A. gracilis* is still insufficiently known. As far as we know at present it occurs in England, Scotland, the Netherlands, West and East Germany, Denmark, Norway, Sweden, Finland, the Estonian SSR and I also saw a specimen from Austria. It would be interesting to know if it really fails in Ireland. The species is almost certainly to be expected in Belgium and the marshes of northern France. Mr. J. Viidalepp from Tartu in the Estonian SSR informed me that *gracilis* is very common there. Further Russian localities are not yet known.

Finally a few remarks on the specific nomenclature. In 1968 the Finnish lepidopterist T. H. Clayhills published a short note on this subject. He writes that he sent a few specimens to Leningrad, where Dr. V. I. Kuznetshov compared a photo of a slide of a Finnish male with the (holo) type of *A. festata* Graeser, which is in the collection of the Zoological Institute of the Academy of Sciences in that town. Kuznetshov answered that the photo of the slide agreed with the genitalia of the ♂ holotype, so that Clayhills concludes that *gracilis* is a synonym of *festata*. I must say that I am not in the least convinced that this conclusion is correct. First there are the external differences. *A. festata* is smaller, head, collar and patagiae are paler and the two silver discal spots are (as far as we know)

always united. In *gracilis* these spots are (just as in *festucae*) nearly always separated. The male genitalia resemble each other much and I can imagine that a lepidopterist who only judges by these organs declares the two identical. But the female genitalia differ so strongly that in my opinion the two cannot be considered conspecific. *A. gracilis* ♀ has an enormous bursa (still larger than *festucae*!), whereas the ♀ of *A. festata* has a much smaller bursa with a differently shaped sclerotized patch. Neither is the shape of the ostium identical.

Excellent figures of the genitalia are also given by Urbahn. They too show the enormous size of the *gracilis* bursa compared with that of *festucae*.

Clayhills further writes that "*P. barbara* Warr. described from Morocco (Warren 1906), has been suggested to be identical with *P. gracilis*". This species is only known from one ♀ which is in the collection of the British Museum (Nat. History). Its forewing markings are not identical with those of A. gracilis (which might point to a subspecific difference). But here again the genitalia differ considerably. Those of *barbara* are smaller. the shape is different and the sclerotized patch is not identical. For the present I can only maintain my opinion that we have to do with three different species, not with three subspecies of one specific unit.

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Note.—It is a pity that the Norwegian lepidopterists named their new periodical "Atalanta", for in 1964 a German one with exactly the same name was erected for the publication of data on migrating insects, especially Lepidoptera.

Amsterdam 1010, Oude Yselstraat 12III.

EARLY APPEARANCE OF PACHYCNEMIA HIPPOCASTANARIA HÜBN.—I was astonished on clearing my mercury vapour light trap on 26th January to find a specimen of this species, which I kept as of great interest. On 28th January there was another specimen in the trap! South (Moths of the British Isles, 1961) says "The first flight of the moth occurs in April and May; the second in August . . ." My own records show that the earliest I have previously taken it here was on 19th April (1964), and the latest 26th November (of the same year).—L. W. SIGGS, Sungate, Football Green, Minstead, Lyndhurst, Hants.

Notes on the Microlepidoptera

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

Eucosma mercuriana Hübn. On July 29th 1968 I was collecting in the Brandon range near Dingle at about 2500 feet above sea level in the place where on the previous day I had seen the remarkable flight of *Pieris brassicae* L. (*Ent. Record,* **80**: 316). My object was to get a couple more of the mountain race of *Calostygia didymata* L., but although it was a hot sunny day there was a cold breeze on the crest, so I descended about 50 feet into a hollow. When I had taken one *didymata* I came to a little cliff over the top of which was hanging a large plant of *Vaccinium.* Over this several small moths were flying; I netted one and it proved to be a newly emerged *mercuriana,* new to me in Ireland. I netted another, and then went for a walk round the hollow for the last *didymata* I wanted to complete my set.

I then decided to go back for some more *mercuriana,* but before I reached the place the sun clouded over and all insects stopped moving, so after a quarter of an hour's wait I set off home. I fully intended to come back the next day, but I must have got a chill watching *brassicae* on the 28th as I developed a nasty cold and it was a week before I could return, and then the mountain tops were wreathed in mist and I saw no insects whatever.

This record for *mercuriana* seems to give it quite a new Irish range. Beirne (Microlepidoptera of Ireland: 90) gives only one southern one, Comeragh lakes, Waterford, and only four others, the most southerly of which is Dublin, though he states it is apparently frequent on the high hills, probably a conjecture.

I have never before seen it in West Cork or Kerry; I should have expected it particularly on Caha plateau near Glengariff.

One point particularly interests me: the insect's food. Barret (**11**: 197) states that the larva lives in a web on *Dryas octopetala,* although Dr. Wood reared it on heather, and conjectures that it is not very particular as to its food. L. T. Ford (Guide to the smaller British Lepidoptera: 66) gives the food as *Culluna, Vaccinium,* and *Dryas,* but as he does not give his usual details of its method of feeding I gather he had no personal acquaintance with it.

The interesting part of this is that in Barrett's account of the moth he mentions *Dryas* several times. I have never seen *Dryas* on the Dingle peninsula or indeed anywhere off limestone in Ireland. There are acres of it, of course, in the Burren.

In my little place, the moths were only round this big trailing plant of *Vaccinium* as I kept my eyes on the heather when tramping about for the last *didymata.* As I remember exactly where the plant was, I hope to visit it and look for the larva in mid June this year.

My two Kerry *mercuriana* are slightly larger and brighter than my North Lancashire ones.

65 Eastwood Boulevard, Westcliff on Sea. 11.i.1969.

Correction.—In the account of "Breconshire and Monmouthshire Entomology" (antea. p. 40) fifth line up, for *Cardamine amara,* please read *Cardamine pratensis.*

Inverness-shire in 1968

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

At long last the depressing ebb tide in the Lepidopterous population of the Scottish Highlands which has been so evident during the last few years seems to be on the turn. The evidence for this lies convincingly in my 1968 m.v. light-trap figures, which for the comparable six-month period from April to September yielded a respectable total of 5385 moths, more than twice the 2500 total for 1967. How far the improvement is due to the very fine dry summer we had here in the North remains to be seen, but at least we can hope that a real start of a flood tide will be seen in the next few years.

The 1967-8 winter was about average with a few severe frosts down to Zero F., but no thick snow cover. A quick thaw on 14th January brought a beautiful sight in my spinney in the form of a small passing flock of nine Waxwings vainly searching for berries, and on 18th the first male *Phigalia pedaria* Fab. of the new season emerged and rested on my neighbouring electricity post as usual. This species continued emerging in all mild spells until early March.

February weather followed the normal pattern of fairly continuous frost and light snow, but also long periods of cloudless sunshine; beautiful but not entomologically productive!

Early in March saw a slow thaw begin, which produced the first immigrant Plovers and Oystercatchers passing through on a northerly course on 8th, when bees were beginning to forage at the Snowdrops, and a tentative dawn chorus began. I then started my m.v. trap, but this only produced an occasional *P. pedaria* until 23rd, when the first *Achlyia flavicornis* L. and *Orthosia gothica* L. together with *Conistra vaccinii* L. appeared. The month ended with the return of severe frosts and snow blizzards.

Springlike weather returned on 9th April, and on 10th a big emergence of my local colony of *Poecilopsis lapponaria* Bdv. took place, followed quickly by all the common early Spring species.

The Sallows were well out by the middle of April, emergence continued and I was delighted to welcome back a lamented absentee of recent years, *Panolis flammea* Schf. (*piniperda* Panz), but only a single specimen. Mr. E. C. Pelham-Clinton also found it and two *Endromis versicolora* L. near Aviemore, another species which has caused anxiety in recent years but seems to be just surviving. The month ended with the conclusion of the fine spell of weather and the season about average, and about a fortnight earlier than last year.

May began with snow on the high tops and a fine male *Odontosia carmelita* Esp. in the m.v. trap. The cold spell continued with snow, frost and bitter East winds until the last week, so that the emergence of the moorland species was badly delayed, fresh *Anarta cordigera* Thun. and *Isturgia carbonaria* Cl. not being seen until 22nd May. Light trap catches were very small, though a few common late Spring species did appear. *Pieris napi* L. and *Anthocaris cardamines* L. began emerging on the last day of the month.

June opened with chilly stormy weather, but the early summer species began emerging in fair numbers, and the weather warmed up culminating in a glorious hot sunny spell from the 9th to the 19th of the

month, an almost exact copy of the 1967 June spell and of the same duration. My son Dr. M. W. Harper and I were lucky in that we had booked a long week-end for a Burnet hunt in the Island of Mull from the 13th to the 17th of June. Our quest was greatly helped by the pioneer work of others including Mr. W. G. Tremewan, and we were successful in finding several small isolated colonies of *Zygaena loti* Denis & Schiff. (*achilleae* Esp.) on the West coast of the island. The species was well out and in good condition, many pairs being found *in cop.*, but *Z. purpuralis* was only beginning its emergence. We found no Burnets elsewhere, and no *Z. filipendulae* L., but we did discover a fine colony of *Procris statices* L. near Grass point on the East coast, and it was very interesting to watch the adults on the wing, and also feeding, not on the larval foodplant, *Rumex acetosa*, but on the equally abundant Bluebells flowering amongst the young Bracken. One curious fact we noted was that the insects appeared always to extend their probosces and draw their liquid sustenance from the outside of the perianth, and did not insert it into the "bell". M. W. Harper also found another species which may be a new record for the island, *Jodis lactearia* L. flying among Hazel in woodland. We found *Euphydryas aurinia* Rott. widespread over the island but uncommon and not in colonies. Also on 15th we found *Argynnis aglaia* L. already emerging, a very early date. Back in Badenoch, on the 18th M. W. Harper found no less than eight specimens of *Hyppa rectilinea* Esp. resting on fence posts on high ground above 1500 feet altitude on the open hillside, and a small number of *Psodos coracina* Esp. flying amongst the detritus of the high tops even though the "even" numbered year was not favourable for it. Cool showery weather now supervened; m.v. trap catches of usual species remained small for the rest of the month, but I had the pleasure of recording a new addition to my local list in a fresh specimen of *Ecliptopera silaceata* Schf. The foodplants, *Epilobium* species have become increasingly common in recent years and I hope the moth will soon become established, as it is already locally on the West coast as far as the Isle of Skye. The month ended with a large immigration of single-brooded *Pieris brassicae* L. which I noted flying in a genaral westerly direction into Inverness from the Moray Firth; within the next few days some had penetrated as far as Upper Speyside. But here we had no trace of the great Saharan dust storm which brought so many interesting immigrants and deposited them in England with the dust!

July was a rather disappointing month; the first half was cold and showery with predominantly North and East winds; later quiet and pleasant but cloudy conditions did not conduce to seeing many butterflies, and all species seemed to be in small numbers when on the wing, the Lycaenids being particularly scarce; m.v. trap catches however continued to be fair, but no interesting species occurred. The month ended with a short series of the heaviest rain storms I can ever remember since my tropical travels!

August was a much better month, dry, fine and warm with good sunny periods except for a very wet spell in the middle of the month. The m.v. light trap catches improved greatly, the year's record of 170 individuals occurring on the 13th with 32 species, high for this part of the Kingdom. On 15th August I was pleased to detect a number of slightly worn *Alcis jubata* Thun. resting on Oak trees in an old wood near Inverness. On 22nd

after many years I paid a visit to what used to be called the Culbin sands on the Moray Firth coast near Forres. My worst fears were confirmed and the whole large area has been utterly ruined entomologically by almost complete afforestation with conifers. I was only able to find one minute area of sandhill left wherein to work my portable m.v. light. It was a warm night, but very few coastal species were seen among the fair number of others; the most interesting and totally unexpected insect was a male *Mormo maura* L. in mint condition, an astonishing sight! It is thought possible that this record may prove to be a most northerly one. The month ended with fine sunny weather continuing, and all the early Autumn species emerging freely.

September continued the pleasant quiet weather but punctuated with a few wet days and a sharp frost on 19th, and the first and only *Plusia gamma* L. on 22nd! *Noctua pronuba* L. was also mercifully in short supply this year!

The first week of October was notable for the first big movements of migrating birds, a huge gaggle of about two hundred geese flying South at a great height on 2nd, and several large flocks of fieldfares passed through my spinney during next few days, completely consuming all Rowan berries in the process. A storm force (10) wind on 13th then removed almost all leaves and killed off most of the moths, so that the season virtually petered out quietly by the end of the month, when snow and frost ushered in November. Thus ended a much better year than recently, but with no events of outstanding entomological interest.

Neadaich, Newtonmore, Inverness-shire. 13.i.69.

Collecting Notes for 1968

R. G. Chatelain, D. O'Keeffe, B. F. Skinner

The season in the south-east has been pretty dismal and it is only by burning a prodigious amount of petrol that sufficient results have been achieved to enable this note to be written. Even so, on some occasions the best capture proved to be a fine series of green shield stamps. The following account includes trips undertaken by one or more of us and we apologise if the result is disjointed.

Operations did not really start until early March when a few visits were made to Petts Wood with paraffin lamps to collect *Erannis marginaria* Fab. and *E. leucophaeria* Schiff. The first trip with the generators was on 9th March when the three of us descended on Hamstreet to welcome the common spring species, including a few *Apochima hispidaria* Schiff., *E. leucophaearia* and many *Achlys flavicornis L.* A further visit to the same locality by O'K. and S. on 24th produced the same species plus a multitude of *Biston strataria* Hufn. and the common Orthosias which were just beginning to appear. Friday Street, Surrey, on 27th March produced little of note except for a somewhat early *Panolis flammea* Schiff, at sallow. On 31st, S. and C. accompanied Messrs Rogers and Sadler to a spot near Winchester where about a dozen *Trichopteryx polycommata* Schiff., mostly worn, were sitting around on the privet. A visit to Alice Holt Forest later that night resulted in two mint *Gypsitea leucographa* Schiff. S. ran his lights at Ranmore on 29th when a dozen male *A. hispidaria* turned up and two *G. leucographa* were taken at sallow.

April opened with cold weather and snow which had only just started to clear when O'K. and S. shot up to Conway on 4th, accompanied by Cyril Bruce of Lee, to search for *Nyssia zonaria* Schiff. Back-breaking work yielded one male and six females from which a large number of eggs was obtained. On 15th, the temperature rose and the lamps produced a fair sprinkling of moths at Friday Street, with *Polyploca ridens* Fab., *Selenia tetraunaria* Hufn. and *Drepana lecertinaria* L. heralding the second wave of spring insects. Conditions were back to normal on 17th when C. and O'K. visited Ham Street, where heavy rain until shortly before dusk inhibited flight and the best moths of a poor bunch were *P. flammea*, *S. tetralunaria* and a couple of *Orthosia populeti* Fab.

S. spent the period 10th to 17th April at Aviemore and returned home well satisfied with 13 male and one female *Brachionycha nubeculosa* Esp., one *Dasypolia templi* Thunb., and a fine series of *Poecilopsis lapponaria* Boisd. from Struan. He also noted *O. populeti* and *Xylena vetusta* Hübn. commonly as well as a few *Chloroclysta miata* L.

On 20th April, S. and C. drove down to Brockenhurst where they had the first good night of the season with the temperature not dropping below 50 deg. F. The main quarry was *Bapta distinctata* H-S of which five were taken, two of them at m.v. Of the 34 other species noted, the best were five *Euphithecia irriguata* Hübn., two *Lithophane ornitopus* Hufn. and one *X. vetusta*. Conditions were again poor three days later at Friday Street where five *Odontosia carmelita* Esp., a few *Notodonta trepida* Esp., half a dozen *Pachynemia hippocastanaria* Hübn., and one *Chesias rufata* Fab. were noted. Three pounds of sugar produced only a few common Noctuids. On 29th, O'K. and S. made a trip to the New Forest and in three hours searching tree trunks found 29 specimens of *Cleora cinctaria* Schiff., many of which were worn. A stop at Ockham Common produced a dozen half-grown larvae of *Parascotia fuliginaria* L. under pine logs.

May opened with exciting news that Sadler and Rogers had found larvae of *Cocnophila subrosea* Steph. and on 3rd the three of us loaded up the car with the generators and headed towards Wales. The night was cold and apart from one worn *X. vetusta*, no worthwhile moths were seen. Nevertheless, searching bog myrtle after dusk produced 84 small larvae and others were still coming up to feed when we packed up some two hours later. We were in some doubt as to the wisdom of keeping all we had found, but in view of the evident commonness of the species in the area and the fact that it had been recorded as the most plentiful Noctuid the previous year, we felt justified, especially as no one knew the extent of parasitism or the willingness of the larva to take to alternative foodplants. In the event, it proved an easy species to rear on willow, provided that the pupae were kept damp.

On 12th May, S. led a British Entomological Society meeting at Mickleham but only O'K. and one other collector turned up and most of the day was spent beating for larvae of *Cleora ribeata* Clerck and *Strymonia w-album* Knock., both of which were very scarce. An hour spent at Abinger proved a pleasant change from beating and *Xanthorhoe biriviata* Borkh. was flushed from the orange balsam. That evening, only about eight moths came to m.v. at Ranmore Common but *Lampropteryx suffumata* Schiff., *Ligdia adustata* Schiff. and the usual spring Geometers were fairly numerous at dusk. S. and O'K. spent the morning of 15th

May beating at Salcey Forest and moved to a locality near Oxford in the afternoon. Again, larvae were scarce and *Strymonia pruni* L. was not seen, whilst three *Thecla betulae* L. were still the size of pinheads. That evening, dusking at Ranmore produced the same species as on 12th but in better numbers and m.v. at Friday Street attracted over 40 *Notodonta trepida* Esp. and about 20 other species, including the first *Drymonia dodonaea* Schiff. of the season and an aged male *Jodia croceago* Schiff.

S. visited Wimbledon Common on 23rd May with R. F. Haynes where they found forty fully fed larvae of *Tiliacea citrago* L. On 26th, S. went to Eynsford to beat larvae of *Philereme vetulata* Schiff. and *P. transversata* Hufn. and flushed up a female *Cycnia mendica* Clerck. On 27th O'K. and S. again collected in Kent, leaving two lights running near Wye whilst they visited Ham Street. It was a disappointing night with little of note at the latter locality and only a few *Agrotis cinerea* Hübn. among a host of commoners at Wye. The remainder of the month was enlivened when S. found numerous egg batches of *Orthosia advena* Schiff. on dead grass stems near his home.

"Flaming" could only be applied to June as an epithet in the sense that Alf Garnett would have used it and of the thirty species which came to C.'s light at Eynsford on 5th, there was only one good bug—a female *Lithophane semibrunnea* Haw. which steadfastly refused to lay. Similarly, a visit to Fawke Common near Sevenoaks produced one *Tethea fluctuosa* Hübn. and 39 species of junk.

S. visited Ham Street on 3rd June, when Mrs. Skinner captured a specimen of *Hemaris fuciformis* L. Only one *Euphyia luctuata* Schiff. was seen, together with three *Rheumaptera hastata* L. M.V. that night attracted one *Cucullia gnaphalii* Hübn., three *Selenia lunaria* Schiff., and a few *Anagoga pulveraria* L., *Herminia barbalis* Clerck and *Clostera curtula* L. A visit by C. and S. to Woodwalton in early June almost produced frostbite and conditions were little better at Holme Fen where two lights had been left burning. S. paid further visits a few days later when things were far better and noted *Arenostola extrema* Hübn., *Apatele alni* L., *S. lunaria*, *Zanclognatha cribrumalis* Hübn., *Apamea unanimis* Hübn. and *Mesoleuca albicillata* L. As usual, *Hydrillula palustris* Hübn. was conspicuous by its absence and we are beginning to place this insect in the same category as the unicorn and other mythical beasts.

During this period, O'K. was on a family holiday near Stockland in Devon but had little to report on his return save that he had taken a series of *Lampropteryx otregiata* Metcalfe in a nearby wood. Conditions on 10th June were quite good when O'K. and C. ran four lights on the North Downs near Trottiscliffe and noted nearly 60 species, including eight *Hadena contigua* Schiff., an uncommon bug in Kent, *H. conspersa* Schiff., *Bapta temerata* Schiff., a few *B. bimaculata* Fab. and many other common chalk insects. A few days later, plenty of larvae of *Earophila badiata* Schiff. were beaten from dogrose near Farnborough, Kent, and on 13th June *Idaea lineata* Scop. was flying in its restricted locality off the chalk near Ashford. On the same day, larvae of *Clostera pigra* Hufn. were found in numbers on scrub aspen at Ham Street.

Mr. and Mrs. Brian Elliot had kindly invited S., his wife and C. to spend a weekend at Chesterfield, where they arrived at noon on 15th June and were soon afterwards sampling Mrs. Elliot's excellent cooking. After lunch, Tony Harman joined the party and a somewhat somnolent

journey to Doncaster ensued to visit a local collector who kindly acted as guide to one of his localities for *Orgyia recens* Hübn. It was amazing to find larvae of this species in abundance on a restricted stretch of hawthorn hedge, surrounded by miles of apparently suitable terrain from which it was absent. Larvae were so common that it was almost possible to collect a series without moving one's feet. On the return journey, one of the dales near Bakewell was visited where *Parasenia plantaginis* L. and *Procris geryon* Hübn. were common, although no females of the former were to be found. That night, the lamps were set up on a local moor but the weather was chill and windy. Nevertheless, it was pleasant as southern collectors to see *Hadena bombycina* Hufn. and *Entephria caesiata* Schiff., as well as one *Epirrhoe tristata* L. and to search for larvae of the lovely red form of *Amathes castanea* Esp., *Lygris populata* L. and *Calostygia didymata* L. The most noteworthy event the next day was a dish of scampi à la Elliott.

No further collecting was undertaken until 18th June when S. and C. visited Mr. Symes at Bournemouth and spent the rest of the day abortively touring Dorset in search of webs of *Eriogaster lanestris* L. Although several trips were made during the remainder of the month, nothing useful took place until 30th June when a mini-heatwave occurred. The temperature was 68 deg. F. at dawn at Ham Street when C. and S. packed up after noting twenty *Moma alpium* Esp., one *C. gnaphalii, Angerona prunaria* L., *E. luctuata, Paracolax derivalis* Hübn., *Herminia barbalis* Clerck, *Atolmis rubricollis* L., *Rheumaptera undulata* L. and many *Apoda avellana* L. In all about 100 species were logged. A visit to the same spot by O'K. the following night produced a similar list of species including a further six *M. alpium*, one *C. gnaphalii* and one *Colobochyla salicalis* Schiff. The temperature on this occasion was 86 deg. F. at 10 p.m. and still 74 deg. F. at dawn!

July opened with some promise and, for the first few days, we went our separate ways. S. departed for the Lake District on 5th and the next day at Butlermere noted about 20 *Erebia ephiphron* Esp. mostly worn, one *Colostygia salicata* Hübn., half a dozen *Xanthorhoe munitata* Hübn. and one example of *E. caesiata.* At Meathop Moss a few *Sterrha muricata* Hufn. were flushed and *Coenonympha tullia* Müller and *Scopula ternata* Schrank. were common. At Eskdale on 7th July several *P. plantaginis* were taken, including one *hospita*, and a second brood was bred out in the autnmn of which the *hospita* form represented one-fifth of the males. Light that night at Witherslack produced *Plusia bractea* Schiff. in numbers, two *P. festucae* L., six *P. gracilis* Lempke as well as *Nudaria mundana* L., *Venusia cambrica* Curts, *Apatele menyanthidis* View and *L. populata.* Migrants were pleasantly represented by a male *Plusia ni* Hübn, a female *Eublemma parva* Hübn, and five male and one female *Lamphygma exigua* Hübn.

On 5th July, C. met Brian Elliot and Tony Harman in North Devon where the main object was *Lygephila craccae* Schiff. of which 30 larvae were taken. As these notes will be of some length, we will leave it to Harman to cover the visit in his usual excellent article on the year's collecting. On the return journey, on 7th, C. stopped at Swanage but the torrential rain did not ease up until dusk and apart from hordes of *Agrotis trux* Hübn., little was seen.

The 12th July saw the three of us together again, this time at Bury

St. Edmunds where larvae of *Rheumaptera cervinalis* Scop. were abundant although *Pareulype berberata* Schiff. were going down. The night in the Breck was disappointing, but *Heliophobus calcatrippe* View. was common and *Hyloicus pinastri* L., *Mesotype virgata* Hufn., *Euphyia cuculata* Hufn. and *Epirrhoe rivata* Hübn. were noted. That night, a *Heliothis peltigera* Schiff. entered C.'s trap at Orpington. Because of the weather, it was not until 15th July that we were able to visit the marshes near Faversham, where *Leucania favicolor* Barrett and *Scopula emutaria* Hübn. were getting worn, although *Ortholitha chenopodiata* L. was in beautifully fresh condition.

On 20th July, S. visited Dungeness where he noted about 20 *Thalera fimbrialis* Scop. flying over the shingle. In the meanwhile, C. and O'K. were working Camber for *Leucania litoralis* Curt., *Agrotis ripae* Hübn. and one each of *Heliophobus albicolon* Hübn., and *Apamea oblonga* Haw. Visits to Dungeness by O'K. and C. on 20th and 22nd were uneventful, although a female *T. fimbrialis* was taken on the latter visit. Pupae of *Nonagria algae* Esp. were common in the reed mace near Cuckfield, mainly in the dead stems. On 28th July, S. left for a holiday in Devon when no exhaustive collecting was undertaken. However, the trap which Mr Frank Lees kindly allowed him to run at Maidencombe attracted one *Discoloxia blomeri* Curt. (the second record for Devon), *Cryphia muralis* Forst., *E. quadripunctaria* Poda., *Leucania putrescens* Hübn. and *Lygris prunata* L. Local trips produced *V. cambrica*, *Schrankia taenialis* Hübn., *Lithosia deplana* Esp., *Alcis jubata* Thunb., *Apamea scolopacina* Esp., *Colostygia olivata* Schiff. and one female *Panaxia dominula* L.

As things were fairly dull in the south-east, O'K. and C. decided to see how *C. subrosea* was faring and drove over to Wales for the night of 3rd August. They were pleased to find the moth extremely common and must have seen some 200 specimens. Other interesting captures were *P. bractea*, *P. festucae*, *Perizoma bifaciata* Haw. and *Plemyria rubiginata* Schiff. The following day O'K. departed for Southwold for a week's collecting. Apart from the first night which produced 65 species at m.v. at Walberswick and 58 at Southwold, the week was not very productive due to cool dull weather and a continuous northerly wind. However, he was pleased to obtain a number of new species including *Nonagria neurica* Hübn., *Arenostola brevilinea Fenn*, *A. oblonga*, *Euxoa cursoria* Hufn. and *Cucullia asteris* Schiff., all fairly commonly on the first night.

The first half of the month also saw several trips to the New Forest, when a total of eight *Catacola promissa* Schiff. were taken, about half of them at light, with many *Amphipyra berbera* Rungs. at sugar and *Lymantria monacha* L., *H. pinastri* and, on a particularly wet night, a male *Thecla quercus* L. which had swum down from an overhanging oak. *L. otregiata* was plentiful at dusk and several visited the lights.

The month continued uneventfully with day trips to Higham Marshes for pupae of *Nonagria sparganii* Esp. Ranmore on 14th yielded one each of *Amathes stigmatica* Hübn. and *Triphosa dubitata* L. and a few *Scopula ornata* Scop. The same locality on 22nd produced a fresh *Acasis viretata* Hübn., *Xanthorhoe designata* Hufn., a few female *Aspitates gilvaria* Schiff. and two late *Ortholitha bipunctaria* Schiff. On 19th at Westwell, O'K. took a female *A. stigmatica* which laid a large number of eggs, on which he has hopes of a nice series next year. On 24th August, C. was surprised to find that half a dozen *Nyssia zonaria* Schiff. from larvae col-

lected in Conway the previous year had emerged and were still alive.

A visit to Friday Street was made on 30th August, when *Diarsia dahlii* Hübn., was taken, together with a few *Amathes castanea* Esp. and one *Thera firmata* Hübn. O'K. stayed at Dawlish with his family from 24th and took five *E. quadripunctaria*, one *Eilema caniola* Hübn., one *L. exigua* and one *Eupithecia phoeniciata* Ramb., all at his m.v. trap. A larvae he found on sea rocket on 27th August produced a fine female *Plusia ni* Hübn. on 19th September.

S. was again in Devon at the end of the month and on 31st August noted a few *Vanessa cardui* L. and one *Colias croceus* Four. at Slapton and took two *P. festucae* and a few *Nonagria geminipuncta* Haw and *N. dissoluta* Treit. at m.v. On 3rd September at Prawle, three male *Lasiocampa trifolii* Schiff. and one female *E. caniola* were captured. Back in London on 8th September, he found fifteen larvae of *C. curtula* on black poplar on Mitcham Common.

On 4th September, O'K. and C. ran the lights in Ashdown Forest where *Amathes agathina* Dup. was common and in good condition and many larvae of *Anarta myrtilli* L. were swept from the heather. These nearly all died miserably within a week and any advice on treating this larva in captivity would be welcomed. Other visitors to the sheet were *Paradiarsia glareosa* Esp., *Tholera cespites* Schiff., *Asphalia diluta* Schiff., *X. designata* and a female *Cosymbia porata* L.

On September 8th, O'K. and C. departed on a flying visit to the West Country, arriving in North Devon during the late afternoon. Little time was available for fieldwork but one fully fed larva of *Hadena barrettii* Doubl. was found in the roots of sea campion. The met. pundits had forecast a warm, muggy night but had omitted to mention that a minor gale would be blowing down the *comes* chosen for the night's operations. Two lights were carted to the bottom of the cliff, where they were fairly well sheltered until nightfall, when the wind veered a few points to the west and straight on to the sheets. Only seven *Antitype xanthomista* Hübn. were seen, slightly past their prime, together with one mint *A. agathina*, a female *Calostygia pectinataria* Knock and hordes of *Plusia gamma* L. The lamps at the top of the cliff produced a surprisingly fresh female *Ammogrotis lucernea* L., which obliged with eggs two nights later, half of which were infertile.

The next day was still very windy and it was decided to cut anchor and move south. That afternoon was spent largely thrashing hedges in the forlorn hope of a late *E. quadripunctaria*. Night operations were carried out at Maidencombe but as the winds remained strong, a curtain may be drawn over the results; the only moths worth mention were *Ennomos quercinaria* Hufn., and *Amphipyra pyramidea* L. The trap in the village produced a female *Nonagria typhae* Thunb. and *Atethmia xerempelina* Esp.

Conditions on 10th September seemed better on Portland where several *Lysandra bellargus* Rott., *Vanessa atalanta* L. and one *V. cardui* L. were seen in Church Ope Cove. Later on, the lamps produced about about sixty *Leucochlaena odites* (*hispida*) Hübn., the females of which came early, followed by the males about an hour later. Two more female *A. lucernea* were taken, one somewhat early *Aporophyla australis* Boisd., a few *Aspitates ochrearia* Rossi and a nice male *Laphygma exigua* Hübn. Although *P. gamma* was everywhere in the afternoon and at dusk, few

were on the wing after dark and the flowerheads were almost destitute of moths, although a worn *Gnophos obscurata* Schiff. was seen and *L. odites* were sitting about on the grasses. The return journey was broken in the New Forest at 1.30 a.m. when a few larvae of *Bomolocha crassalis* Fab. were swept from the bilberry. That night, S. took two male *Nycterosea obstipata* Fab. in his trap in West Norwood and on 12th September, King's College Hospital took him for an enforced stay, much to the relief of the moth population.

The latter part of September was accompanied by a number of warm, overcast nights but in spite of the apparently good conditions, there was a dearth of moths and three pounds of C's. sugar in Petts Wood on 21st produced five bugs, with similar results on other occasions near Farnborough. On 26th September, O'K. and C., in a fit of desperation, shot down to Dawlish for the night, where O'K. had found his larvae of *P. ni* and only a few miles from Teignmouth where Terry Dillon had also found a larvae. The night was warm, cloudy, moonless and with a south-west wind but results were abysmally disappointing with thirteen species noted, including four *Leucania l-album* L., two *Aporophyla nigra* Haw. and one *Antitype flavicincta* Schiff.

On 1st October, O'K. and S. visited Ham Street under favourable weather conditions to wake up the autumn species. However, the only desirable moths were two *Chlorocysta miata* L. with a fair number of *Gortyna flavago* Schiff. Sugar was deserted. Still optimistic, O'K. ran down to Dungeness on 4th but despite seemingly ideal conditions with a temperature not below 61 deg. F. the only interesting visitors to his lights were a few *A. australis,* some fresh *Agrochola lota* Clerk and *Citria lutea* Ström. with a fresh female *Leucania straminea* Treits. heavily dusted with black scales. On 5th October, a few *Calophasia lunula* Hufn. were still feeding at Dungeness and that night at Ham Street it was warm enough for C. to work in shirt-sleeves. But he need not have bothered. On 12th, C. and S. ran the lamps at Ranmore, where the best of a bad bunch were three female *Tiliacea aurago* Schiff. Fortunately, however, some November moths were taken and on examination of the genitalia proved to include several *Oporinia christyi* Prout. The ivy near Boxhill station was damp from the day's rain and bore only one *T. aurago.*

Conditions on 18th October were not promising, with persistent rain. Nevertheless, O'K. and C. felt that results could not be less miserable on a poor night than they had been on recent occasions and in a fit of nil desperandum decided to visit Swanage for the night. In fact, the rain had practically ceased at dusk and the moderate westerly wind was not troublesome. Messrs. Rogers and Sadler turned up as soon as the best pitches had been bagged at Durlestone Head and there were eight lights working to the confusion of the local moths, most of which decided to stay away. Things livened up somewhat towards midnight when one each of *Lithophane ornitopus* Hufn. and *H. leautieri* Boisd. landed on the sheet, accompanied by a run of *Allophyes oxyacanthae* L. and a few *Leucania l-album* L. and *Eumichtis lichenea* Hufn. Most of the ivy had gone over and was in any case very wet but there were hordes of moths feeding and resting in the foliage. Most of these were plebs. but welcome visitors were two *L. socia* Haw., one *Dasypolia templi* Thunb., with a few *Conistra ligula* Esp., *L. l-album, A. nigra* and one *E. lichenea* for good

measure and all mostly in fair condition. There were a few more moths at the lamps at dawn but apart from a male *D. templi* and a few more *L. l-album*, there was little of note, although the ivy produced a third *L. socia*. It was interesting to observe the build up of species towards midnight followed by a gradual decline, contrary to the pattern usually seen in the summer. In all, 25 species of macros were observed.

S. stopped at Swanage on his way down to Devon on 22nd September and took four *D. templi*, two *L. l-album*, and a few *H. leautieri* at light, whilst the ivy produced four *L. socia*, one *L. semibrunnea* and some common species. On 26th at Churston he took two more *L. socia* at ivy and on 30th found small larvae of *Ortholitha mucronata* Scop. fairly common at night on gorse.

As the weather looked right for *Ptilophora plumigera* Esp. on 11th November, S. and O'K. visited Ranmore where they took two specimens. It was not until 22nd that C. and O'K. visited Wye to try for the species but although conditions were promising very little came to the lights but searching the woods with paraffin lamps revealed a number of *Erannis aurantiaria* Esp. and *Operophtera fagata* Schiff., all in good condition. O'K. returned on the next night and secured eight male *P. plumigera*.

The final task of the season was to obtain wingless females of some of the winter species. S. had a successful outing to Mitcham Common on 25th when he found females of *E. defoliaria* and *E. aurantiaria* after five hours hard work and on 30th the three of us descended on Petts Wood where, in very damp conditions, pairs of *O. brumata* were numerous and *O. fagata* was abundant in both sexes. Birch trunks yielded eight female *E. aurantiaria*.

Psilocephala melaleuca Loew. (Dip. Therevidae) in Berkshire

By Peter Crow

I recorded my capture (*Ent. mon. Mag.*, **103**: 176) (1967) of two specimens, both females, in Windsor Forest of *Psilocephala ardea* Fabr., and I am writing this note to say that these two insects have now been re-identified by the appropriate Therevid authority as specimens of the very rare British species *P. melaleuca* Loew.

I had always been unhappy about the original determinatiin of my two insects and my doubts were based on my knowledge, as a collector, of the locality environment, which was so far away from the previous recorded ones for *P. ardea*: these were all from West Midland counties in a different kind of situation.

Thus the five known records of *P. melaleuca* in Great Britain, all from the Windsor area, are: May 1930, a male specimen bred by the late H. St. J. Donnisthorpe from a larva found in oak in May 1929; June 1940, a female specimen bred by A. A. Allen from a larva found in beech; 2nd July 1962, a female specimen captured by Prof. T. R. E. Southwood in his house at Ascot, Berks; 19th June 1967, two female specimens taken by myself in Windsor Forest.

In conclusion I would like to state for the benefit of future hunters of this species, that there is great sexual dimorphism.

12 Harvey House, Westcote Road, Reading, Berks. 18.ii.1969.

Hypothyris vallina colophonia D'almeida (Lep. Ithomiidae) Rediscovered in Venezuela

By John H. Masters

Ferreira d'Almeida (1945) described *Hypothyris colophonia*—now considered to be a subspecies of *Hypothyris vallina* (Haensch)—from three specimens from Rio Branco, "Amazonas," Brazil. For twenty years, until I and others took additional examples of *H. v. colophonia* at El Pao, Bolivar, Venezuela, the type series had been the only known specimens.

I visited El Pao during March of 1965 and again during February of 1966 along with Harold W. Skinner, presently of La Victoria, Venezuela. Our hosts at El Pao were Albert and Mary Lou Gadou, experienced tropical collectors then living at El Pao, who first introduced me to the interesting and useful technique of collecting ithomids with heliotrope (Masters, 1968). Heliotrope (*Heliotropum indicus* Linnaeus)), a small purple flowered plant growing in sandy areas, was collected, dried and then hung out along trails where it serves as a very strong attractant for all Ithomiidae, certain Danaidae and moths of the family Ctenuchidae. Even though we collected at the height of the dry season when the poorest numbers of butterflies are to be expected, I was able to collect, with the help of heliotrope, 204 ithomids which represented 21 species and 14 genera. The most interesting of these ithomids were 11 males and 2 females of *Hypothyris vallina colophonia* which were determined by the late Dr. Richard M. Fox, formerly of the Carnegie Museum, an acknowledged expert in the Ithomiidae.

All of the *H. v. colophonia* were collected in a small, dark, damp area along a jungle trail near El Pao. They were collected quite late in the afternoon from dusk to sunset, however, it was noted that all of the ithomines were somewhat crepuscular in habit and had a tendency to fly early in the morning and towards evening, being relatively inactive at mid-day. While several other stations were collected near El Pao and south of El Pao to El Dorado and beyond, without collecting any additional examples of *H. v. colophonia,* I am making the assumption that the species is very local in occurrence.

Flying sympatrically with *H. v. colophonia* was a very similar appearing species, *Hypothyris euclea forbesi* Fox; however, *forbesi* seemed to be more abundant, more widespread and less restricted in habitat and it was collected at four collecting stations. Further south of El Pao, at El Dorado and beyond, a third *Hypothyris*, *H. vallonia* (Hewitson), was encountered.

D'Almeida's type locality for *H. colophonia* (Rio Branco, Amazonas, Brazil) apparently refers to the Rio Branco watershed in the present Brazilian state of Rio Branco and not to the town of Rio Branco in Acre, nor to any place in the present state of Amazonas. In this case my specimens are from a locality 300 to 400 miles north of the type locality and from the opposite side of the Sierra Pacaraima, which divides the Rio Branco watershed and Brazil from the Caroni watershed and Venezuela. This makes me wonder if perhaps the d'Almeida type series could actually be from a locality further north, and in the Caroni basin—perhaps the locality data on them was taken from a base camp and the collecting actually covered a much larger area.

Species of the genus *Hypothyris* Hubner are perhaps better known under *Ceratinia* Hubner as there has been a good deal of misusage (following Haensch in Seitz 1909) in which the species *Hypothyris* are placed under *Ceratinia* with the name *Calloleria* Godman & Saivin usually applied to the species of the true genus *Ceratinia*.

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Maniola (Epinephile) jurtina (L.) (Lep. Satyridae) and its Forms

By G. THOMSON

(Concluded from p. 90)

Notes and Additions

Since publication of the three parts of this paper some further information has come to hand. The following, therefore, should be taken into account when making use of this work.

p. 10 B. *Albinism*

The albinistic character in *jurtina* is an inherited one (see the Entomologist **83**: 25-26). However, a cross where one or both parents are abnormal produces offspring whose chance of survival in captivity is small and in nature remote. Such specimens often show, in addition, abnormal wing veination and their flight is weak.

Examination by a number of entomologists has shown that the scales responsible for all albinistic forms of this species are abnormal in one characteristic only—failure of the pigmentation. This occurs in varying degrees from light brown through shades of yellowish-brown to white and in extreme cases, transparency. 'Malformation' of the scales is almost invariably due to external interference *after* emergence (e.g. rainwater) on the light or transparent scales. The idea that these light patches are caused by moisture affecting the pupae has no foundation. The various manifestations of albinism in *jurtina* are due to variation in the distribution of these scales types and there are two groups into which all *jurtina* albinos fall. The first are these forms which I place with *brigitta* Ljunch together with *testacea* Schille, *radiata* Frohawk and a further synonym *pallidus* Frohawk (1938. Var. Brit. Butterfl. pl. 10, fig. 2). Specimens of this sort vary from those with light patches to those which are totally affected. The majority of scales in this form are of the transparent type but occur together with more or less of the pale ones. In this and the next form all colours of the wings can be affected including the fulvous areas and the apical eyespots.

In the second group—*cinerea* Cosm.—I place all forms listed under *cinerea, glabrata* Leeds and another synonym *cervinus* Frohawk (1938, loc. cit.). They differ from *brigitta* only in the distribution of the light scales which are, in incomplete forms, scattered more or less evenly over the wings. When males are affected in this way they are 'ashy', 'metallic' or 'greasy' in appearance depending on the mixture ol light and

transparent scales.

There is no justification for the use of any more than the two names —*brigitta* and *cinerea*—for this form of albinism in *jurtina*. However, if one wishes to be more specific about the superficial appearance of specimens of this kind, the synonym describing it most closely could be placed in parenthesis between the name of the form to which it belongs and its author—e.g. *brigitta* (*radiata*) Ljunch. It is quite possible that specimens showing both *brigitta* and *cinerea* tendencies will or have already been taken. These could be referred to as *brigitta-cinerea*.

p. 13 D. *Variation in the Apical Eyespot.*

The form *antirufa* Leeds (see *subhispulla* Strand) is a synonym for *nigro-rubra Lmbll.*

f. *ocellata* Tutt 1908, Ent. Rec., **20**: 247.

=*infra-pupillata* Lempke.

f. *postexcessa* Leeds 1950, has one or more eyespots on the upperside hindwings.

Rise and Decline of *Vanessa Io* in the Small Isles (Inner Hebrides)

By J. L. Campbell

The interesting article by Mr. P. B. M. Allan on the decline of the Large Tortoiseshell (*V. polychloros*) in the December 1968 number of the *Record* set me thinking of another Vanessid which came to, and apparently has gone from, the district where I live in the Hebrides. I refer to the Peacock, *Vanessa Io.*

The first time I ever saw a Peacock in the Highlands, in a district where I had collected in the summer holidays as a boy between 1918 and 1924, was at Crinan in North Knapdale on the 26th of August 1935. It was a considerable surprise. Living on Canna since 1938, my first record of seeing this butterfly here was in early June 1939 (Scottish Naturalsit 1939: 133). My records of the butterfly can be summarised as follows:

Year	*Spring*	*Autumn*
1939	1	—
1945	None (absent till April 26th)	5
1946	Not at home	—
1947	None, bad weather	Common
1948	Common	No record found
1949	None, cold wet spring	1
1950	—	None, very bad autumn
1951	—	1
1952	1	—
1953	1	—
1954	1	Absent after August 19th
1955	—	—
1956	—	1
1957	—	—
1958	—	—
		Absent July 23 to September 13
1959	2	One seen at Morar, September 13
1960	4	1
1961	—	3

The butterfly was certainly about in the autumn of 1948, as that was the year I found a large batch of larvae feeding on nettles near my house, and reared some of them, but I do not seem to have kept records

of the butterfly that summer, as it seemed to be well established.

September 20th, 1961, was the last time I saw a Peacock butterfly here. Since then no one who could recognise the species has seen one here, although 1966 and 1968 were eminently favourable seasons. The summers of 1961, 62 and 63 were very bad, and until 1968 the Small Tortoiseshell (*V. urticae*) itself had become very rare here. *V. io* has also gone from the neighbouring islands of Rum and Eigg. In Vol. 67, No. 5, of the *Record* Professor Heslop Harrison wrote that *io* had first been seen on the island of Rum in 1943 and was now (1955) firmly established there. Mr. Peter Wormell, the Warden of Rum, informs me that he has not seen a specimen there since September 1963. In Eigg, where I certainly remember seeing *io* in 1946 or 1947, Dr. H. McLean tells me that the last specimen he saw there was in the autumn of 1966.

Is the Peacock in a state of regression elsewhere in Scotland or the British Isles generally? It would be interesting to have the impressions of others amongst your readers.

Insects and Motor Cars

By R. Launcelot Hard

Whilst the exhaust gases of motor cars certainly form an unwelcome addition to industrial and other forms of pollution, I cannot believe that they act directly on insect populations in the way suggested by the author of "Death from the roads".

I see no reason why carbon monoxide (CO) should be of any harm to insects, even in concentrations quite a lot higher than those in question. In mammals, CO acts by forming a compound with the haemoglobin molecules of the blood in preference to oxygen. This leads to severe oxygen deficiency and death, as individual cells rely almost entirely on the blood stream for their oxygen requirements. The blood has no role in respiration in the majority of insects, indeed, it contains no haemoglobin or haemocyanin. The tracheal system ramifies so finely that a tracheal tube reaches most cells in the body. The oxygen can thus reach them by diffusion, and there is no need for a 'carrier' which is affected by carbon monoxide. It seems unlikely that any of the other components of exhaust gas could ever reach a high enough level in the atmosphere to kill or sterilise insects. They are simply not produced rapidly enough to accumulate before being diluted in vast quantities of air, as a result of air currents and diffusion. It is illogical to equate the extreme sensitivity many of the Lepidoptera have in the perception of scents with their sensitivity to the *effects* of the substances causing them. The former is centred in the antennae, the latter throughout the body, and they are totally unconnected anyway.

It is an undeniable fact that the verges of many roads are heavily polluted, and it does seem likely that lepidoptera may avoid laying eggs on polluted foodplants. Yet lepidopterous larvae can often be found on plants near heavily used roads: surely spraying and suburban-style cropping of the verges are more at fault.

What gases in exhaust are harmful to insects, and how could they affect areas where the decline in butterflies is as pronounced, but cars are few? Not by wind, as the concentrations would be too low. Influx of insects from affected areas would not harm a stable resident population, unless the immigrants had undergone some genetical change, which is unlikely to say

the least. All the circumstantial evidence is against the wastes of petrol engines having a directly harmful effect. If one insect is killed or sterilised by them, why should another of its kind not be? The result would not be a decline, it would be a virtual extinction, but I have found all three *Pieris* spp. breeding 50 yards from the M4.

Motor cars produce dirty air and dirty vegetation—that much is undeniable. Inexpensive filters that remove the guilty components from the exhaust are at present available, and I would be happy to see legislation making their use compulsory, for without it nobody will take the trouble to have one fitted. But meanwhile let us not tilt at windmills and blame the unfortunate motorists for everything, when pesticides and 'development' are far greater dangers. It's no use, anyhow, as one can always confidently expect convenience and financial considerations to take precedence over aesthetic ones.

Notes and Observations

ORGYIA ANTIQUA L. AT LIGHT.—C. G. M. de Worms asks whether anyone else has noted the vapourer moth (*Orgyia antiqua* L.) at light. I have a record of one coming to my trap in Croydon on the night of October 10th 1966, when only seven other moths were noted. I see this is about the same time of year as the de Worms record and considerably later than the usual flight period of this species.

The following year I obtained several larvae on Mitcham Common in September, and moths resulted from these in October. The single male among them did not fly at all during the day and, though I did not actually observe it, I strongly suspect from its disposition the following morning, that it flew at night. It may be worth noting that none of the females had yet emerged.

In its normal flying period during August, the flying time when the males seek out the wingless females is normally confined to the morning hours of warm sunny days. It is not unreasonable to suppose, therefore, that the lack of these same conditions in the autumn may well be the cause of incidents where these late specimens (they are almost certainly not examples of second brood) are observed at light.

The problem surrounding species found at light which formerly were considered exclusively day flying insects needs further research. It has been stated in the case of many butterflies that light disturbs them in their treetop resting places and that they then fly unwillingly towards the source. However, the number of species attracted in this way is strictly limited and not confined to, or determined by, those which rest in trees. It may be assumed that there is some other factor involved. I have never, for instance, heard of any of the burnet moths (Zygaenidae) at light—whereas the moth *O. antiqua* and the butterflies *Pararge aegeria* L. and *Thecla quercus* L. appear to be quite regular visitors.

More observations on this subject are needed—especially in connection with the species which most frequently appear and those which are conspicuously absent. — L. K. EVANS, 31 Havelock Road, Croydon, CR0 6QQ, Surrey. 12.i.1969.

MELIANA FLAMMEA CURTIS IN SUFFOLK.—I was most interested to read Mr. E. P. Wiltshire's note (*antea* 29). It may be of further interest to readers to know that whilst collecting with Mr. Michael Tweedie, a specimen of *Meliana flammea* Curt. turned up on the sheet when we were working

mercury vapour light in a ride in Dunwich Forest on the night of 18th June 1964. It was one of those very gusty nights when working light by the extensive reed beds or sandhills immediately to the north was quite impracticable. Hence the trip to Dunwich Forest instead of to Walberswick from Southwold. Actually we had been down to the reed beds at the foot of the slope by the forest looking for settled insects and *flammea* had not entered into our calculations. Doubtless the moth had been carried into the wooden shelter by the wind.—T. J. G. Homer, St. Timothee, Pinkneys Green, Maidenhead, Berks. 22.ii.1969.

Coenonympha corinna ssp. elbana Staudinger.—As the only records of which we know, of *Coenonympha corinna* ssp. *elbana* Staudinger, being taken on the mainland of Italy refer to specimens found on Monte Argentario (Grosseto), I think the following may be of interest.

During the last week of May 1967 my wife and I found this subspecies in the neighbourhood of Talamone (Grosseto) some 25 miles north of the above mentioned locality. Although it was sparingly distributed on the shrub-covered hillsides, it was abundant in shady woodland paths.

We were unsuccessful in finding this race on Monte Argentario during the two days we were there, but this may have been owing to the inclement weather. Much of this area has now been developed.—Lt. Col. W. B. L. Manley, Greenways, Shoreham Road, Otford, Sevenoaks, Kent. 9.iii.1969.

Hydraecia lucens Freyer at Dingle.—On 20th August 1968 there was a rather strange looking *Hydraecia* in my mercury vapour light trap at Dingle. The ground colour was a pinkish grey and the ear mark white. Had it been in this area, I should at once have classed the moth as *H. paludis* Tutt, but as this species has not yet been found in Ireland, I waited until I could get Mr. Fletcher to have a look at it. He has now kindly done so and has determined it as *lucens*. This is rather interesting to me as although I have been taking Hydraecias on the coasts of West Cork and Kerry for the past twenty years, I have never before found *lucens* there. I have brought home over 100 specimens from Glengarriff, Adrigole, Inch, and Dingle, and they have every one been determined as *H. crinanensis* Burrows, mostly by Dr. Cockayne or Mr. Fletcher.

Donovan (p. 37) gives the moth as common, though less so than *crinanensis*, and in the same localities. Mr. Baynes (p. 49) quotes Donovan and gives a few localities, but not one of these is in Kerry or West Cork.

The only places on the west coast where I have found *lucens* are in the Burren, where it is usually the commonest of the group.

I have still to find *H. oculea* L., and think it must be mainly an inland insect in Ireland.—H. C. Huggins, F.R.E.S., 65 Eastwood Boulevard, Westcliff on Sea, Essex. 25.ii.1969.

Forms of Acleris lorquiniana Dup. (Lep. Tortricoidea) at Wicken Fen.—From larvae that I collected in August 1968, feeding on flower heads of *Lythrum salicaria*, some 20-30 moths were reared in September. The series contains three main forms: (a) with more or less unmarked forewing; (b) forewing with dark diagonal stripe and (c) forewing with intense black spot in centre. It is interesting to note that according to Huggins (*Ent. Rec.*, **80**: 233) the latter form is only supposed to occur in the first generation (summer brood).—J. M. Chalmers-Hunt, St. Teresa, Hardcourts Close, West Wickham, Kent. 12.ii.1969.

Current Literature

Plant and Animal Geography by **Marion I. Newbigin,** xv+298, Univerversity Paperbacks No. 221, Methuen & Co., Ltd. 18/- in U.K. only. The fact that since this book was first published in 1936 it has been reprinted seven times really makes a review unnecessary. However, the present edition, which was being compiled at the time of the author's death, has been completed by Florence M. Newbigin with the help of others.

The chapters are subdivided, and these subtitles give a good idea of their scope: chapter I is divided into "The Terrestial Plant Cover and its Significance", "Animals associated with the great Plant Communities", "Taxonomic distribution of Plants and Animals and its geographical Aspects", "Ocean Life", and "Economic Bearing of Biogeography" all of which speak for themselves, and the Summary educes three main topics for discussion; The influence of natural conditions on the distribution and outstanding features of the great terrestial plant communities and the animals associated with them; the outstanding facts of the taxonomic distribution of organisms over the land surfaces, in so far as this distribution throws light on the present features of these and their probable past history; and the response made by marine organisms to the ocean habitat in relation to the conditions existing there, and the similar response in the case of the fresh water habitat.

Chapter II gives a general explanation of the elements of taxonomy, an important piece of information to enable the reader to cope with what follows. Three chapters on soils and climate are contributed by Miss Margaret Dunlop. Following chapters deal with the major plant communities and their animal associates, Taxonomic distribution of plants and animals, and Factors of Plant Geography.

The chapters are filled with interesting material which defies individual notice, but one sees how the whole matter is skilfully strung together in the pursuance of this very important subject. The index is followed by a few blank pages for notes.

The paperback edition is well printed and strongly bound to stand up to the handling necessitated by study, but the book is also supplied with a board cover for the library. The student will fully appreciate its value, but the immense interest of this book is recommended in smaller doses to the ordinary intelligent reader, and the result will be a great increasing of his understanding of the Natural History situation. —S.N.A.J.

Pleasure from Insects by **Michael Tweedie.** 172 pp. including one coloured and 16 half-tone plates. David & Charles, Newton Abbot, 30/-. Mr Tweedie is in an ideal position for writing this book, being an experienced biologist with museum experience, which gives him an insight into the attitude of ordinary members of the public, and an ability to show how interesting the science can be. He explains in his introduction that the book is mainly for those who have neither the urge to collect, nor "the time or inclination for more austere entomological studies". His hope is to bring people and insects closer together for the benefit of both.

The text is divided into four sections, namely "Looking at them", "Keeping them" and "Photographing them", and the author leads his

readers through these paths, tastefully illuminated by drawings by Joyce Bee, which range from exotic silk moths on the flysheets, through many insect orders to pieces of apparatus, and add to the pleasure of the book. There are five useful appendices; a list of books about insects, scientific names of species mentioned in the text, Giant Silkmoths, a wooden stand for vertical photography, and a list of societies, magazines and dealers in books and specimens. The book is well printed on good paper and is well bound, and should find a place on the book shelves of all nature lovers.—S.N.A.J.

Desert Locust Project, Final Report. United Nations F.A.O., 40/-. Obtainable from H.M. Stationery Office. 4to., 140 pp. Chapter I gives a survey of the periods 1960-1, 1962, 1963-66, and an analysis of the causes of a recession. Chapter II covers an ecological survey, and reports on various aspects of the organisation's locust establishments. Chapter III deals with recommendations, IV discusses the continuation of certain activities and their financing. V, The value of the project, its immediate impact on the various activities and some of its results with ideas on the future strategy. Appendices explain the 1960 plan with budget and a list of representatives of the countries concerned; a 1965 supplementary budget; and a list of 66 reports. There is a page of references and finally a list of sales agents and booksellers for F.A.O. publications on the two sides of the back cover.—S.N.A.J.

Two separates received from **Professor C. A. Clarke** concern further activities in the breeding of exotic swallowtail butterflies. The first is from the Malayan Nature Journal and is entitled "Mimicry and Papilio memnon. Some breeding results from England", by C. A. Clarke, E. M. M. Clarke and P. M. Sheppard, F.R.S. This reports the author's method of obtaining and breeding in England, P. memnon and its allies. Some aspects of the theory of mimicry are discussed, and selected results of the breeding work and genetic conclusions are outlined. A request for more helpers and also for funds is made.

The paper is illustrated by two coloured and two half-tone plates, each with six figures. There is also a map showing distribution of the species.

The other is from the Philosophical Transactions of the Royal Society of London (Series B. Biological Sciences, No. 791, Vol., 254, p.p. 37-89, dated 22nd August 1968. This is entitled "The Genetics of the mimetic Butterfly *Papilio memnon* L. by C. A. Clarke, P. M. Sheppard, F.R.S., and I. W. B. Thornton. The subject is very thoroughly described: the authors have made another study of the genetics of mimicry and have selected *Papilio memnon* for its polymorphic character. The distribution of its various forms and of its modela is shown in seven sketch-maps of south east Asia. After mention of materials and methods, descriptions are given of the female forms used; there are five coloured plates, each of twelve figures, illustrating the forms used, and also the models of the mimetic forms. Results are fully tabulated, and the Discussion, after reviewing previous investigation into the genetic control of mimicry, deals with three subjects under the headings of "The evolution of mimicry", "The evolution of dominence", and "Mimicry and the evolution of a super-gene". The paper is concluded by acknowledgements to a

long list of helpers, and a list of references. The number of these helpers shows the amount of interest aroused by these projects.—S.N.A.J.

Purnell's Encylopaedia of Animal Life, 3/6 weekly. This magazine edited by Dr. Maurice Burton, would seem to have as its main purpose the bringing before the public some of the excellent coloured photographs of natural history subjects which have become possible to-day. The subjects are arranged in alphabetical order, and the pictures are accompanied by desciptive matter on their habits, life, feeding, etc., but scientific details are kept to a minimum.

The alphabetical arrangement will probably meet with approval from the unscientific nature lover because of the variety of subjects per number. No. 1 deals with subjects ranging from mammals, birds, snakes and lizards, and insects to crustaceans. For the more scientifically inclined, an attempt at a systematic order would be preferable, something on the lines of the Harmsworth Natural History of some sixty years ago.—S.N.A.J.

From **Magne Opheim,** I have an interesting separate from Opuscula Entomologica 33: 371-374, entitled *Acleris nigrilineana* Kawabe, a resident of Northern Europe. The text is in the English language. While comparing *A. abietana* specimens from Norway with others, he was struck by their close affinity to the Japanese *A. nigrilineana.* The author describes the race from Oslo Fjord as *A. nigrilineana* ssp. *vikeniana* n.ssp. Genitalia dissections of both sexes of both species from various localities are given for comparison.—S.N.A.J.

Amphipyra pyramidea L. en dubbleart (Lep. Agrotidae) by **Ingvar Svensson,** Opuscula Entomologica, 33: 183-188, in the Swedish language, sets out the author's reasons for separating the species into *A. pyramidea* L. and *A. berbera* Rungs. There are half-tone illustrations of both species from Denmark, and the male and female genitalia. There is a summary in the English language.—S.N.A.J.

Also from Mr. Svensson I have his account, jointly with Roland Johansson, of the Pältsa expedition of 1964 (Lepidoptera); Opuscula Entomologica, 33: 119-128. This district in the north of Sweden near the Norwegian frontier, and Tuipal, west of the Finnish frontier, were explored mainly for microlepidoptera. It was hoped to establish *Catastia kistrandella* Oph., *Sophronia gelidella* Nordm. and *Tingama dryadis* Stgr. as Swedish species, and in this the expedition was successful.

New species found were *Coleophora unigenella* Sv., *C. thulea* Joh. and *Lithocolletis rolandi* Sv. There is a map of the district, and photographic views of the Terrain illustrate the paper, and there is a list of species found, tabulated to show their relative frequency at Pältsa and Tuipal in the years 1954, 1956 and 1964.—S.N.A.J.

Atalanta, Vol. 1, part 2, July 1968, contains four articles: Rhopalocera from the eastern side of Lake Tanganyika, by J. Kielland (in the English language), An Account of seven summer holidays spent in the Scandinavian mountains, by Av Mogens Schlüter, Lepidoptera new to Norway, by Magne Opheim, and finally an article by Mr Opheim on new localities for Norwegian lepidoptera.—S.N.A.J.

Pests of Coffee by **Dr. R. H. le Pelley,** xii+590 pp. Longmans 147/-. This exhaustive text book seems to deal with the subject in hand from every conceivable angle. Chapter I opens with an account of coffee-growing areas of the world, showing the plant to be able to grow anywhere in the tropics excepting on high ground subjected to frost, and other sites unsuitable for the growing of any plants. The various species of the genus *Coffea* are mentioned and the distribution in Africa is shown by maps. Chapter II, headed Coffee as a host plant, outlines the many ways in which it is exploited by insects. Climate conditions are discussed, as also are cultural practices from the plantation crop down to peasant plots of only a few trees, and even the gathering of wild berries. The damage caused by insect attacks is assessed.

Chapter III discusses the control of coffee pests from all its aspects, with stress on biological control. Species of pest are given as examples with their predators and parasites, down to fungi, bacteria, viruses and protoza. Under the heading of chemical control, methods of applying insecticides are discussed at length. The various insecticdes are listed and discussed, and mechanical means of disinfestation are also taken into consideration.

Part two is headed Pests and their Control, and lists the various species under their orders, discussing each with an account of its habits, predators, control and damage caused. Chapter IX on Nematodea is contributed by Dr. A. G. Whitehead.

Part III, Systematic Lists shows coffee insects listed together with a note of the part of the plant attacked or the method of attack, and the localities from which each has been noted. This list is followed by a list of parasites of coffee insects. There follows a bibliography of 1,106 entries and a supplementary one of references in Chapter IX. An index completes the book.

The book is well printed on good paper and is strongly bound in cloth boards. It is unnecessary to add that it will be found to be an essential part of the library of anyone concerned with the growing of coffee, or with training personnel for such an occupation.—S.N.A.J.

Mimicry in Plants and Animals by **Wolfgang Wickler,** translated from the German by R. D. Martin. 153 pp. World University Library, 16/- in the United Kingdom only. Although intended for University students this book cannot fail to be of enormous interest to any naturalist, and its language is intelligible to all.

Mimicry is discussed from all angles, and the wideness of the range must be seen to be believed. Many familiar cases are cited, but many more, not so familiar, leave one wondering more and more. Subjects range from trematodes to fishes and reptiles, moluscs, insects and plants each more astonishing than the last.

The book is lavishly illustrated by excellent coloured figures and black and white drawings by Hermann Kacher, and these add greatly to its interest: the translation also has been admirably handled. The book is bound in a strong paper cover, and the printing is good.—S.N.A.J.

CORRIGENDUM: In my Review of Current Literature, vol. 80 p. 330, *Eriocrania haworthi* Bradley (Lep., Micropterigidae) was incorrectly stated to be identical with *Chapmania kaltenbachii* Wood. The two species are of course quite distinct, and the reference should have been *Chapmania kaltenbachi* sensu Hering (*nec* Wood).—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.

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.

SPECIAL NOTICE

The Editor would like to buy in a few clean complete unbound copies of Vols. 61, 62, 63, 77, 78 and 79, at 17/6 per volume.

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

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AND JOURNAL OF VARIATION

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Collecting Lepidoptera in 1968

By R. Fairclough

These notes are much more concerned with daytime collecting, the number of night expeditions having been drastically reduced from the norm of a few years ago. Despite the generally poor weather in S.E. England it was a successful year, mainly because my son Alan joined me in the hunt through the summer as well as in the autumn, which he has done in recent years in our pursuit of *Acleris cristana* Schiff. I hope to write about this moth in the future when we have accumulated more records.

The 6th of April was a partly sunny day, and at Oxshott, accompanied by Mr. S. Wakely, we caught some *Amphisbatis incongruella* Staint., a moth which Tutt says is often overlooked because of its early appearance. A few were seen flying in the middle of the day, while others were taken by sweeping the heather. In doing this I picked up two *Coleophora pyrrhulipennella* Zell. cases. We moved on to Bookham where we found spinnings of *Caryocolum tricolorellum* Haw. in the stitchwort.

Ashdown Forest was sampled on the 10th, but with a N.E. wind and no sun there were no moths flying. The heather was beaten on to the net, more of the black *Coleophora* cases being found, while all the sweepings were kept in a bag. From this many of the small cases of *C. juncicolella* Staint. were collected in the next few days, while young larvae of *Amathes agathina* Rott. were also found. The *Coleophoridae* were put on potted heather, to be brought in when they had pupated, *juncicolella* being extremely hard to spot.

Eupithecia jasioneata Crewe from larvae found in Dingle the previous August began to emerge this week, but despite the usual attention with watering about a third of the pupae dried up, so that I was pleased that we had kept a good number.

A week was spent at Lanivet, Cornwall, from the 17th, mainly in exploration, but marsh fritillary (*Euphydryas aurinea* Rott.) larvae were found in a boggy area near the village, while the actinic light was tried in woodland at Luxulyan on the 20th, only ten common species turning up. The cliffs in various places were explored for wood vetch with *Lygephila craccae* Schiff. in view, little being seen, the patch of this plant in my own garden from seed saved from N. Devon some years ago being greater in extent than any seen on these slopes.

One of the highlights of the year was the catching of *Adela cuprella* Thunb. at Chobham on the 28th, already reported by Mr. Wakely. Three cases of *Coleophora ibipennella* Zell. found on birch yielded moths in June.

I tried the Betchworth junipers on the 2nd May for *Argyrethsia praecocella* Zell. without success as in previous years. There was a little stirring, but the first *Antispila pfeifferella* Hubn. of the year was caught.

A very successful week-end was spent at Portland on the 11/12th. Alan and I left home at six o'clock and were on the cliffs searching for larvae by ten. We soon met Col. Emmett, the organiser of the expedition, together with Messrs. Chalmers-Hunt, Ellerton, Uffen and Wakely. We were fortunate in having sunny weather for the larva hunting, but it was too cold by far to use a light at night. The Portland spurge made

pretty splashes of yellow on the rocks, but no *Acrolita subsequana* H.-S. were seen, though we caught one *Phalonia williana* Brahm (*Zephyrana* Treits.). Larvae of all the desired species were found, the following being bred later:—*Epischnia banksiella* Rich., *Euzophora cinerosella* Zell., *Agdistis staticis* Mill., *Lozopera francillana* F., *Metzneria carlinella* Staint., *Caryocolum inflatellum* Chretien., *Scrobipalpa ocellatella* Rich., *S. suaedella* Boyd.

Though I live in an area well stocked with holly, I have not seen the holly blue (*Celastrina argiolus* L.) for some years so that I was pleased to see one at Kew on the 14th May.

In the Loxwood district on the 18th only singles of the wood white (*Leptidea sinapis* L.), green-veined (*Pieris napi* L.), orange-tip (*Anthocharis cardamines* L.) and grizzled skipper (*Pyrgus malvae* L.) were noticed with a few speckled woods (*Pararge aegeria* L.) and small heaths (*Coenonympha pamphilus* L.). We were pleased to find *Col. olivaceella* Staint. cases on the stitchwort, five being found in a large area of the food plant.

As the white-letter hairstreak (*Strymonidia w-album* Knoch.) used to fly at Betchworth, I tried for larvae on the 24th, but was unsuccessful.

We took the lights to Chiddingfold on the 25th working near a stand of Lawson's cypress, the actinic tube being placed right in the middle of the trees in an attempt to catch *Eupithecia arcuethata* Freyer. The sky cleared after a cloudy, humid day and although the temperature was still 48 F. at midnight, no moths were flying, only seventeen kinds having been seen at the M.V. and half a dozan insects at the small tube.

My wife and I went to Potter Heigham from the 1st-5th June, our first stay in Norfolk. Hoping to find ova of the swallowtail (*Papilio machaon* L.), we visited Barton Broad on the 2nd. I had given up this search after some time and was collecting *Acleris comariana* Zell. larvae from the plants in the water underfoot with a few unknowns from spinnings in yellow loosestrife when my wife called out that a swallowtail was flying past me. We discovered that they were in good numbers and were able to catch some by netting those which came within reach. The way in which this large yellow and black butterfly became invisible at a moderate distance as it flew against the reed background was rather surprising. We were delighted to see one flying in a leisurely fashion round the garden of the house where we stayed, at times pausing to feed at a large honeysuckle on the wall. The owner said that swallowtails were a familiar sight in their garden.

We visited two patches of the local hoary mullein, but larvae of *Nothris verbascella* Hubn. were present at only one place. *Cnephasia* larvae and one *Gortyna flavago* Schiff. were also buried among the thick leaves.

I was pleased to breed an *Aristotelia morosa* Muhl. from the Barton loosestrife, and wished I had collected more of the spinnings. I had not expected this species here, as Meyrick gives only Wicken Fen, though I believe Mr. Wakely has found it at Wood Walton.

The M.V. light was used on the night of the 4th on the edge of a reed bed between Potter Heigham and Hickling. The cloudy, windy night turned out to be better than expected, good numbers turning up until we packed up at twelve thirty. It was pleasing to see fresh *Meliana*

flammea Curt., *Symyra venosa* Borkh. and *Nascia cilialis* Hubn. with a few *Apatele alni* L. and a late *Orthosia gothica* L., a total of fifty species being recorded.

Back in the home county at Mickleham two days later, Alan took an *Adela croesella* Scop. in a short burst of sunshine on a drizzly day. We returned the following day and with better weather managed some more, as well as two other wanted species, *Ancylis unculana* Haw. (*derasana* Hubn.) and *Lampronia luzulla* Hubn.

On a hot thundery day in the middle of the month Mr. Wakely and I went to the Ashford district. We were able to catch fresh specimens of *Idaea lineata* Scop., a moth I have not seen for many years.

Two evenings later, in one of the local woods, *Borkhausenia panzerella* Steph. was common with odd examples of *B. tinctella* Hubn. and *Ancylis laetana* F. After many misses, I managed to find *Lithocolletis ulicicolella* Staint. at last on the gorse bushes of Earlswood Common in a brief lunchtime search, tapping the moths out on to the net. That evening, the 19th, beating oaks at Ifield for *Acleris literana* L. produced only larvae of *Carcina quercana* F. and similar common species. Between showers on the 23rd at Plaistow I was delighted to take a *Spatalis bifasciana* Hubn., a moth not unlike a blackish form of the common *Pseudargyrotoza conwagana* F. and one which I had wondered if I'd overlooked in the past. One *Col. alnifolae* Barasch case was spotted on alder, and the moth bred in late July.

Alan and I revisited this area six days later taking *Ancylis obtusana* Haw. in a woodland ride and half a dozen *Dichrorampha pseudoalpestrana* Danil in a neglected damp field (too rare these days alas!) full of the foodplant sneezewort and dyers greenweed among other weeds.

July 1/2 was the night of the famous 'dust storm'. We took the lights to Oxshott to find out if *Archips piceana* L. still existed there, supposing that it would come to light as do its relations. We had a temperature of 70° F. throughout, packing at twelve-thirty because of the coming day's work, with moths still flying strongly. Fifty-seven 'macro' species were seen, pine feeders being prominent though *Hyloicus pinastri* L. represented by one example only, was an exception. *Lithacodia fasciana* L. was in bigger numbers than I can ever remember, while *Hypenodes turfosalis* Wocke had worked its way from the wetter ground to our sandy patch. There were large numbers of 'micros' on the sheets too, two new ones for us being *Exoteleia dodecella* L. (swarming) and a *Batachedra pinicolella* Zell which I felt pleased to have spotted among all the activity, which reminded me of the great nights of the early nineteen-fifties. As we saw no *piceana* in such perfect conditions one must conclude that it has disappeared from Oxshott, and one wonders if it occurs anywhere else?

While I visited a friend in Smallfield Hospital on the 4th, Alan collected a series of *Gypsonoma oppressana* Treits, from the poplars outside. This was new to us, but I saw others later on Earlswood Common.

Hoping to catch *Zanclognatha cribrumalis* Hubn. and *Witlesia pallida* Steph. we took the m.v. light to a reed bed near Pulborough on the 5th. Before dark we tried to knock out *Phyllocnistis saligna* Zell. from a row of old willows without success, while dusking for *pallida* was equally

useless. Between ten and one a.m. we had the same number of the larger species as five nights before, including a few of the fanfoot. These were rather worn as were those found on the reeds. Other marshland moths were *Spilosoma urticae* Esp. and *Orthonama lignata* Hubn., while one *Euphyia cuculata* Hufn. had probably strayed from the South Downs.

Returning to Plaistow on the 13th we had very little sunshine so that, through the ringlet (*Aphantopus hyperanthus* L.) was obviously common. only one silver-washed fritillary (*Argynnis paphia* L.) was seen. We were working alders hoping to see either *Heliozela resplendella* Staint. or *Stathmopoda pedella* L., but found none. Alan caught an unknown moth in this stretch which turned out to be *Scoliaula quadrimaculella* Boh, and then turned up two other species new to us, *Dasycera oliviella* F. and *Schreckensteinia festaliella* Hubn. The latter we were to meet quite frequently in Cornwall. An old orchard produced neither of the species, *Recurvia nanella* Hubn. or *Blastodacna atra* Haw. (*vinolentella* Meyr.), we had hoped to see on the apples.

We visited Juniper Valley, off Headley Lane, the following week-end during an evening, the flowers, particularly the pyramid orchids, black mullein and tufted vetch being very beautiful but the microlepidoptera not up to the same standard, only *Olethreutes rivulana* Scop. and *Buccalatrix nigricomella* Zell. being noted as common.

The number of small moths was much reduced on the 20th at Plaistow, but we saw a female purple emperor (*Apatura iris* L.) and many of the white admirals (*Limenites camella* L.) were quite fresh, an indication of the late season. We made the long walk to the dyers greenweed field to look for *Iwaruna vinella* Bankes and *Mirificarma lentiginosella* Zell., but were disappointed, catching nothing but *Gelechia sororculella* Hubn. from the sallows. It was about this date that we began to notice a falling off in results, no doubt due to the dull wet weather in S.E. England. This was a contrast with 1967 when the fine spell of July and August brought a big improvement over the earlier months which had been rather poor.

I tried Holmwood Common for the scabious feeding *Nemotois cupriacella* Hubn. and *minimella* Zell. on the 28th, but could see none of the plants, the recent practice of improvement for the public whereby the rides and areas behind the pond are mown probably being the cause.

We went to Mickleham the next day to search for *Parornix fagivora* Staint and *Oxyptilus pilosellae* Zell. There were few insects about and certainly not these. We took *Argyrilis atrella* Haw. and *Sorhagenia rhamniella* Zell., noting that *parvidactyla* was still on the wing, but that the second brood *Elachista* species were hardly out.

Alan accompanied my wife and I to Lanivet on the 4th August. He and I set off that evening to the cliffs beyond Crackington Haven where we scrambled down to a patch of vetch near the beach, setting the actinic light on top of the plant and hoping to attract *craccae*. Results were good, the more interesting moths seen being *Agrotis trux* Hubn., *Ammagrotis lucernea* L., a dark form of *Hadena conspersa* Schiff. and *Leucania putrescens* Hubn., but the blackneck was absent.

A marshy place on Bodmin Moor was tried the next day for *Glyphipterix schoenicolella* Staint. without success, but *Endothenia marginana* Haw. was fresh and common, and Alan saw and caught our

first *minimella*, something we had not expected. Two days later we went to the area where I had found the *aurinea* larvae in April, and were able to catch more *minimella* by sweeping the scabious. From the lichen-bearded sallows we knocked out some *Apotomis semifasciana* Haw. and one *Alcis jubata* Thunb. among hordes of *Hydriomena furcata* Thunb.

We made the long journey to S. Devon on the 7th to be greeted by rain. One male *Euplagia hera* L. was caught before conditions became too wet. Later in the afternoon as the rainfall eased, we beat an extensive length of hedges without seeing any more. A second visit five days later proved to be a blank for the desired tiger which appeared to be having a disastrous season. We found the change from looking out for very small moths to trying to ignore them and concentrate on large ones rather strange. In fact the commonest species by far among a wide selection was *Acleris variagana* Schiff.

On the 8th we went back to the cliff area where we had run the light in order to find out the extent of the vetch. We discovered small seedling plants scattered along the eroded soil under the ten foot drop from the precipitous slopes above on to the beach. Alan pursued a hazardous course up a scree, returning in triumph with a *craccae* in his net, put up from an isolated clump of the vetch. As we walked along the beach I caught another which flew out of the stones. We now knew that the moth was out.

After a day in the vicinity of Newquay where we found larvae of *Austrotortrix postvittana* Walk. in Euonymus, the moths emerging from the 28th, we returned to try the light where we had taken the *craccae*.

Once again we were lucky with the weather, the moths flying well including odd specimens of *jasioneata* and *Mecyna asinalis* Hubn., but there was no sign of the one we wanted. After this experience I concluded that *craccae* was a moth that came little to light. Friends' tales of this species have always been of larva collecting, or putting up the moths by day as we had done.

We went to Portreath on the 13th to see if *cristana* existed along a woodland path I had noted in April. We found none, though the usual cloud of *variegana* was present with some *comariana*, these being not so variable as those bred from Barton earlier. Passing on to Gwythian we were pleased to find six *Cryphia muralis* Forst. This was the end of our holiday which had been made more enjoyable by the knowledge that we had been blessed with much better weather than that back at home.

On the 16th, freshly returned to Surrey, we caught only three *cristana* in three hours and we were in no doubt that this was going to be a different season from 1967 when the moth was well out by this date. So indeed it turned out, and we wasted much time on all our earlier expeditions never seeing more than a few. To add to the difficulties the trees were seldom dry, so that we came to accept the constant showers from above, as the trees were hit, as normal. These were not however the conditions to cause *cristana* to fly even moderately freely.

Some pupae of *Nonagria algae* Esp. were collected in Sussex about this date and I went to Folkestone Warren on the 23rd, where a worn *Blastobasis decolorella* Woll. was caught. On the way home a lone *Moma alpium* Osbeck larva was beaten in the Ham Street woods.

Later in the month some alder spinnings collected with Mr. Wakely

at Thursley turned out to be better than they looked at the time, for two *Caloptilia falconipennella* Hubn. emerged in September. We had found some of the alders completely removed, and had to search in another part where we found the usually abundant *C. elongella* L. quite scarce.

Alan took a holiday the first week in September as he had done in 1967 so that we could work for *cristana*. The 1967 week was spoiled by a gale and this year the first two days were wet, but we were encouraged on the fourth when we knocked out fifty-five in a Sussex locality despite the wet bushes. On the morrow, with a good weather forecast, we set off on our first visit to Monk's Wood, only to meet rain on the way. We worked for the moth in the drizzle, seeing only six, half of which were, however, a form we had not seen in S.E. England. Also seen, apart from the ubiquitous *Ypsolophus radiatellus* Don., were *Y. sequellus* Clerck and *Caloptilia cuculipennella* Hubn. The woodland was quite impressive and we wished we had seen it under better conditions. The weather remained poor and on the final day of the week I led a field meeting at Brockham for *cristana*. We had a fine day but very few were caught. To compensate for this *Col. frischella* L. cases were common on the melilot in the old chalk pit.

The rest of the autumn week-ends were devoted to *cristana* whenever possible. The unsettled weather meant that we usually made for the nearest localities, and it was the 5th October before we were able to try an area in Sussex which we had explored the previous winter and had thought looked promising. This, combined with other places nearby, gave us our best catch of the season, seventy-six, including some of the rarer forms. I saw the last specimen on the 28th October, the absence of frost in that month having kept the moths up longer than in some years.

A full-fed larva of *Acherontia atropos* L. from the village was brouht to me on the 21st. It pupated successfully and was put in the airing cupboard, but despite every attention it died after four weeks.

Results from the home trap were poor in 1968, better species such as *Orthosia advena* Schiff., *Odontosia carmelita* Esp., *alni, Diclyca oo* L., and *Lithophane semibrunnea* Haw. which have been fairly regular in small numbers in the past being missing, nor were there any of the common migrants except *Plusia gamma* L. Compensation was provided by the finding of a *Eublemma parva* Hubn. in the bottom of the trap on the morning of the 10th July.

Blencathra, Deanoak Lane, Leigh, Reigate, Surrey. 28.2.69.

Death from the Roads — a Reply

By A. J. Showler, Ph.D., A.R.I.C.

Whilst the arguments put forward by "Old 'Un" (Ent. Rec. **81**: 15 (1969)) are interesting and at first reading plausible, there appears to be a number of misconceptions on which his hypothesis is based. I venture to suggest that the main reasons for the decline in insect numbers are a combination of three factors:—

(a) Rapid destruction of habitats by man in the post-war years; many woodlands have been destroyed, heathland has been built on, marshes drained, downland ploughed up in the knowledge that improved methods

of cultivation or improved stock or seed make this worthwhile. Now too, hedges are being widely removed in East Anglia.

(b) Change in the ecology of other habitats by, for example, reafforestation (especially with conifers), use of weedkillers which reduce much or all of the ground flora of a hedgerow or a plantation, and by the almost complete removal of the rabbit population in many areas for several years due to myxomatosis, with the consequent growth of scrub which now has a firm hold on many areas of land that it will never be removed (Ent. Rec. **81**: 19 (1969)).

(c) Overuse in the past years of persistent pesticides, e.g. D.D.T., D.D.D., B.H.C. (gammexane) and many others which are broken down into harmless compounds only very slowly (over a number of years) by natural processes. The effects of these are frequently cumulative, as is now well established, but fortunately the danger has now been recognised, and most herbicides and pesticides now being introduced are broken down within a few days of application.

Possibly a climatic change may be linked with these factors, but this would not be expected to have an adverse effect on *all* species at the same time. Even so, it could be argued that a number of moths have established themselves within the past few years, and this could be linked with a slight change in climate; however, it could equally well be linked with the availability of habitat or ecological niche.

What objections are there to "Old 'Un's" suggestion for the decline of insects in Britain? Firstly, he assumes that carbon monoxide can be dispersed widely in the atmosphere yet dismisses the possibility of pesticides being so dispersed. True, these are mainly solids or solutions or solids in liquids, yet not long ago a cloud of dust originating in the Sahara descended on those of us living in S.E. England.

Secondly, a pesticide once dispersed (and this can also be by water or animal means) is, or at least was, as already pointed out persistent and thus may build up in quantity, so that a comparatively large amount could be consumed by a larva during its period of growth. Carbon monoxide, however, is non-persistent and will be oxidised to carbon dioxide at ground level by any open flame and at higher altitudes by electrical disturbances in the atmosphere, so that the level present is always extremely low.

Lastly, there is no reason to suppose that carbon monoxide is more toxic to insects than to humans, and to suggest this may be so because an insect is smaller is a red herring—the *absolute* amount required to kill the insect will naturally be smaller, but the percentage of the gas in the air which proves lethal is likely to be of the same order. In the traffic jam cited, a car idling for an hour may use about 2 litres of fuel, and I calculate that this would produce about 180 l. of carbon monoxide if 7% of the exhaust gases is carbon monoxide. If this is dispersed in a volume of 20 cubic metres (*i.e.* 5 m. × 2 m. × 2 m. or a volume slightly larger than that occupied by the car on the road) it represents a concentration of almost 1%. If the gas diffuses upwards to a height of 20 m. and outwards for 200 m. only (not backwards or forwards as this is taken care of by the other cars in the jam) then the concentration falls to 0·001%, which is well below a lethal value, and clearly it must spread very much more than this if it is to reach Stornoway from Glasgow, as

is implied. Unless one visualises a "cloud of death" type poisoning it would in any case be better to consider a car travelling at 60 m.p.h. and producing three times the volume of carbon monoxide, but clearly even this would have no significance.

Thus I suggest that we must lay the blame mainly on the use of toxic, persistent pesticides and herbicides. Even so, in complaining of the lack of Orange-tips we should recall the benefits as well. In the two years I spent recently in Thailand I only heard of one case of malaria, mainly due to routine spraying with D.D.T. Surely, too, just as many pests have developed strains resistant to the pesticides, the Lepidoptera will follow suit? Since the initial onslaught was not against them, and probably not felt by them, they have had less time in which to develop resistance. In addition, the pests are frequently multibrooded, and so have passed through perhaps 100 generations since first sprayed with some noxious chemical in 1948, whereas many butterflies and moths have had only perhaps 15 generations experiencing this same adverse effect, and this is not long enough to allow even a favourable mutation to establish itself in a population. Given time, if we stop destroying the insects' habitats we ought to see the number increasing again.

Death from the Roads

By Rear Admiral A. D. Torlesse

The article bearing this title which appeared in the January number of the Record propounds a new theory to account for the current decline in butterfly population. (It is worth remarking, by the way, that the decline in moth population does not seem to be nearly so marked, but it is possible that our sense of balance in this respect has been disturbed by the wide use of the mercury vapour lamp.)

The Old 'Un's theory should not be difficult to test by experiment. Perhaps some entomologist with laboratory facilities under his control will try to discover whether the exhaust fumes of the petrol engine in the concentrations met with in the vicinity of a main road in summer are capable of killing or sterilising butterflies or are lethal to their larvae. But until this is done I for one am not prepared to accept exhaust gases as even a contributory cause of the butterfly decline, and this for two main reasons.

Firstly, such gas concentrations are very quickly attenuated, and there are other air contaminants. For instance, were anything of the kind operative, one would expect butterflies and moths to have long since been decimated near our industrial cities and our great power stations from the effects of sulphur dioxide, which affects the whole of the Midlands. But from eleven years' recent residence in the North Midlands I know that this is not a fact.

Secondly, there are so many much more likely reasons to account for the decline. The weather cycle of the past ten years cannot but have had a temporary (we hope) effect. The actions of many interests almost everywhere in these over-crowded islands—the builder, the industrialist, the farmer, the forester and the private gardener, all add up to ever-increasing loss of habitat and hence reduction of butterfly population. The

loss of the rabbit has upset the balance of vegetation nearly everywhere, and no doubt those butterfly species capable of doing so will take some time to adjust themselves to the new conditions.

In short, there are plenty of valid reasons for the decline, and, sad to relate, many of them are likely to remain operative permanently. The Local Authority may be persuaded to leave road verges unsprayed and to mitigate cutting routines, but the use of chemicals by farmer and forester will continue, and every year the few remaining "wild" breeding places in cultivated and residential areas will become fewer. In how many of our gardens, to say nothing of the farms, does the nettlebed still exist in those odd corners, where once the Small Tortoiseshells, the Peacocks and the Red Admirals used to breed?

It is, of course, a matter of common observation that individual species vary greatly in numbers from year to year; with many, perhaps most, species it is only occasionally that they occur in abundance; in the intervals, species regarded as common may become scarce. A recent example in my area is that of *Pararge aegeria* Linn. (Speckled Wood), which swarmed in parts of the New Forest from July to October 1967 but was relatively scarce in the same areas last year. There is nothing unusual in this; it has always been so, but perhaps we tend to forget it. May not nostalgia—the memory of those bumper years of individual species—account in part for our present discontent in a period of acknowledged butterfly decline. But in fact we are probably suffering from a concatenation of causes, and it is legitimate to hope that a few colder winters and brighter summers may do something to stop the rot.

To end, as we began, with the motor car, I noticed when visiting the West Country three years ago one effect of the enormous increase in motor traffic, which I should have expected, but did not. In the vicinity of Dartmouth, where I had last collected as a naval cadet in 1917, I was surprised to find that the luxuriant hedges and ditches of the narrow winding lanes no longer harboured the wealth of "geometers" that used to respond to my youthful beating stick. But a passing car provided the explanation, and it was not exhaust fumes; the wind of its passage in the narrow lane effectively beat the hedgerows, in which there was hardly a moth to be found. One has to desert the by-roads for cart-tracks and bridle paths to find the missing moths, but again, much good habitat has been practically sterilised.

Freeing Lepidoptera from Grease

A. J. Wightman, F.R.S.S.
67, The Spinney, Pulborough, Sussex. 5.1.69.

The problem of keeping a growing collection of moths free from grease, began to bother me upwards of sixty years ago, and I tried a number of fluids that might be suitable to remove this, also powders that might be suitable for drying off, as insects tend to look dirty if left to dry in the air, and I finally decided that white petrol suited me best, and that magnesia powder was first class, to bring up the hairs of the abdomen, and return the insect to its pristine glory, if that had been its condition, apart from grease, when the cleaning began.

In those early days, by no means all species were thought to need freeing from grease, and it was only the internal feeders that were so

dealt with, but over the years I found that the appearance of grease can be long delayed, and that to be safe it is well to treat all cabinet specimens, and that this is best done as soon as they are off the boards, for once grease has begun to spread, it soon reaches the thorax, and the whole insect must be treated, often with the result that some distortion occurs.

A kit of tools was evidently required and finally I decided that four boxes were needed, each of which would have thirty-two spaces, all numbered in sequence.

Box number one, simply a small store-box divided up into 32 spaces and numbered from 1 to 32, inked in with a pen.

Box two needed to be three inches deep and fitted with a plywood tray that had the requisite number of holes, cut through the wood, to take two-inch deep by one-inch wide test-tubes, all of which would have numbered corks. The wood could be quite thin, but not so thin as to warp. These holes can be easily cut with a centre-bit, which should be just larger than an inch, as the tubes must be easy to take out and replace.

The third box must be three inches longer than will be needed for the thirty-two divisions it will need, and this space is left free from any obstruction.

The easiest way to make the divisions in this box is to put in a shelf of half-inch deal with thirty-two holes cut in it, as in box two, but here there is a sheet of flyproof zinc fastened underneath to hold the magnesia that will be put in each hole.

Box four is a replica of this third box except that again plywood is used so that the divisions are shallow, and again the divisions have perforated zinc below them.

A tube of adhesive, a camel hair brush, and a few long pins will be needed, and then all is ready for the cleaning to begin, except for the petrol and magnesia powder already mentioned.

The insects to be cleaned have been assembled in box one, and it is a good idea when putting them in to follow a large insect by a small one in case, despite all the safeguards, two bodies get into a single tube from any mischance.

Take insect number one and break off the abdomen (hereafter to be called the body) and drop it into tube one, and proceed with all the other bodies, each in its proper tube.

Fill all the tubes to be used with the petrol, almost to the level where they will meet the cork when replaced, and replace all corks. Check that there is one body in each tube, and that the bodyless insects and body-containing tubes, are the same in number, and leave for forty-eight hours, or longer if this is more convenient.

After this period of soaking, all the grease will have been washed out of the bodies and they are ready for the drying off box number three.

Only now should the magnesia powder be placed in the divisions, it does not improve with exposure to air and dust. Take the bodies from the tubes and place each in its proper hole, see that they are all covered with the powder, and leave for an hour or two or, if desired, for a much longer period. When doing this I uncap the tubes one at a time, then it is clear which tube to fish in next. Use wide-spring forceps.

The next operation can now be undertaken, and consists in taking each body out of the magnesia powder and placing it in the fourth box division waiting to receive it, and again there is no hurry and it can remain there until convenient

The replacement of the bodies is a rather longer job than any of the other stages and is best not started until time is available to go through with it to the last detail.

With the camel-hair brush, gently stroke each body to remove any powder that may hang. It can usually be puffed off, but being so light will make an awful mess, and the most important spot to clean is the top where the adhesive has to be put.

Now take the first insect out of the box and pin upon a piece of cork, take the body that belongs to it, and put a small blob or globule of gum on it and press it back into position and hold it there until it holds or, to save time, pin the insect against the side of the store-box so that pressure is exerted by the box-side, and this I usually do, as in that position it is easy to make any small adjustment with a setting needle, and once the body is on there is no need to keep the insect in sequence.

There are a few snags that may be met with, the most frequent is that upon occasion the hindwings come away with the body, which is of no great matter as the wings and body can be put in the tube intended for the body, but when this body and attached wings come from the tube to the powder, they must be placed in such a way that they lie flat, and this is where the space in box three comes in. Fill it up with powder, smooth it flat, make a groove for the body, and see that you have the wings flat, then cover deep with powder. This will then be safe from distortion and be easily refixed and, when a case like this occurs, place the cork of the tiube it came from beside the body and put a piece of paper in the division it should have occupied. One cannot be too careful, especially when the cleaning is not done as a single operation.

Any chemist will be able to supply the magnesia powder. The white petrol I use is Shell aviation SPB I, and this must be ordered in two-gallon cans. It is best used only once, and when it is poured from the tubes they will need to be cleaned from the grease, the quantity of which is surprising and, if left in tube, forms a thick gummy layer at the bottom which is not too easy to remove The used petrol is still good for car or engine.

The magnesia powder is good for a lot of insects, but is best renewed after about a year, as it tends to cling to the bodies when stale (dirty).

An objection that has been urged against petrol is its inflammable nature, but this is no risk away from a naked flame.

A warning that must be given is that if, when insect is removed from the board, the body flies off, it must not be at once stuck on or it will be very difficult to deal with when degreasing. It is best to put the insect into number one box and the body into the right tube and it can stay there indefinitely.

The Treasurer would appreciate the early payment of outstanding subscriptions, and will be pleased to supply Banker's Order forms for future use to those subscribers asking for them. This method of payment saves the Treasurer much trouble, and saves the subscriber from remembering to pay at the commencement of the year.

Psilogramma jordana Bethune-Baker—its early stages with a note on stridulation (Lep. Sphingidae)

By GADEN S. ROBINSON
(Dept. Zoology, University of Durham)

Psilogramma jordana Bethune-Baker, Proc. Zool. Soc. Lond., 1905, p. 88.

P. jordana is a large Acherontiine sphingid endemic to Fiji and is probably an offshoot species from the Indo-Australian *Psilogramma menephron* (Cramer). Until recently there were probably less than ten known specimens but the use of MV traps has shown it to be a moderately common species in primary rain forest throughout Viti Levu.

Larvae have never been found, but mated females caught at light can readily be persuaded to lay eggs and the following description of the early stages is based on notes made by H. S. Robinson who made a series of foodplant trials and finally succeeded in rearing *P. jordana* on *Citharexylum spinosum* (L.) producing a series of dwarf adults. Repeated trials showed *Vitex trifolium* L. to be a foodplant which produces adults comparable in size to those caught in MV traps. H.S.R. also believes that *Premna* spp. may provide another "natural" foodplant. The descriptions below are based on larvae feeding on *Citharexylum.*

Ovum: (6 days) Long diameter 2·5 mm., short diameter 2·0 mm.
Apple-green when laid; within 48 hours develops a scarlet germ-line down one side. Ova lacking the scarlet line fail to hatch.

Ist instar: (6 days)
Cream-coloured, skin smooth and shiny, no apparent pattern. Caudal horn larger than body, black, rough and clearly bifurcate.

2nd instar: (5 days)
Pale cream-green, skin smooth and shiny, no apparent pattern. Caudal horn very little shorter than body, reddish brown, rough and with small visible bifurcation.

3rd instar: (3 days)
Pale apple green to sage green, some larvae with faint light diagonal markings. Forelegs red-brown. Skin rough. Caudal horn dirty greenish-black, bifurcation still just visible. A very long thin larva at all stages so far. In this instar 25 mm. long, diameter 2 mm., caudal horn 10 mm.

4th instar: (6 days)
Larvae of two forms: dark sage-green and leaf-green. Both forms have two conspicuous diagonal marks running forward and downward on segment behind head and segment before caudal horn. These marks may be dark brown or white in the dark form and are dark brown in the light form. In addition the light form has smaller black marks on each segment. Skin rough, caudal horn very rough. There are a number of very small "warts" on top of and behind the head, sometimes bright yellow, sometimes green or brown. They look like small fungus growths. "Back veins of leaf" camouflage very good indeed. Dark head and prolegs.

Instar 4A: (an optional instar, 2-3 days)
Colouring same as in instar 4 but distinguishable as larva has brown shiny "warts" on segment behind head and on anal segment. Dis

tinguished from instar 5 by difference in colour. Considerably larger than instar 4 and, on changing to instar 5, initially far larger with a larger head than larvae which have passed directly to instar 5 from instar 4.

Instar 5: (10 days—15 in the case of a larva from instar 4A)

Conspicuous shiny brown "warts" as big as a pins head on anal segment and segment behind head. Underside powder-blue. On sides, diagonal forward-sloping bands of lilac, white and bright leaf green. On back, a wide band of pinkish-brown, narrowing between segments, very dark in some forms and very light in others. Both instar 4 and instar 4A seem to pass into this form.

Pupa: (26 days)

Larvae burrowed in compressed tissue to pupate. When due for pupation larvae turn rose-pink on the back and sides, blue-green below. Emergence appears to be always at about 8 p.m.

Larvae passing through six instars have always turned out to be very large females. Small females from five-instar larvae occur as well and the large: small ratio of bred females irrespective of foodplant appears to be 50/50. Females caught in light traps are predominantly large and large females in captivity appear to be far more active than small females. It might reasonably be supposed that the large female possesses much larger food reserves than her smaller sister and hence is more readily able to undertake dispersal flights after mating, appearing in light traps in larger numbers than the relatively sedentary small females. Thus the large female seems to be the agent responsible for dispersal. However, until more data is available, one may only offer this hypothesis tentatively.

Stridulation:

On several occasions male *P. jordana* have been observed making curious abdominal movements and emitting a high-pitched rasping noise. The usual circumstance in which this has been observed is when a male has settled on a wall or a plant near an MV light and is disturbed in the early morning. Movement entails the retraction and extrusion of the valves from the terminal abdominal segment and stridulation appears to be produced by contact of the ventral edges of the valves with the edge of the terminal sternite. The purpose of this behaviour is a matter of conjecture; the colouring of *P jordana* is quite possibly aposematic (forewings mottled grey, hindwings rich brownish red) but stridulation is not associated with any form of hindwing display. It is interesting to note that stridulation is similar to that observed in *Psilogramma menephron* by G. C. Varley and H. S. Robinson in Malaya.

Lepidoptera from the Maltese Islands

By C. De Lucca

My last contributions to the study of the Maltese Lepidoptera appeared in 1956 (*Entomologist*, **89**: 253-256, October 1956) and 1965 (*Rapports et Procès-verbaux de reunions de la C.I.E.S. M.M.*, Vol. 18 (2). Monaco 1965). Owing to rather heavy duties I was not able to do more research in this field since that itme. Collecting continued to be done, however, and although it was carried out in a rather sporadic manner, it has yielded a good number of Heterocera and Microlepidoptera. I was recently able to go over the specimens and as work on them progressed

it was realised that a proportion of the catches were new to the Maltese Islands. Other specimens were rare or very rare, by present day standards, but only conventional methods of capture were used, i e. light and sugaring but no mercury vapour traps. In addition to my own work, specialists in various groups have undertaken the task of determination of the specimens, and I wish to express my thanks to all of them—H. G. Amsel, L. Bigot, Ch. Boursin, J. D. Bradley, D. S. Fletcher. It is now possible to put together the results of these researches.

The variety of the species recorded continues to emphasise the fact that the Maltese Islands, whilst rather poor in the number of the regular different species, like most small islands situated at no great distance from the mainlands, have a high proportion of occasional or rare species. This fact tends to be particularly true when one considers that the Maltese Islands are distant sixty miles from Sicily, which is much richer in Lepidoptera, about two hundred miles from the nearest Tripolitanian coast, and about one hundred and twenty miles from Cap Bon in Tunisia, these two North African regions containing again a much richer fauna, both in number and variety.

SYSTEMATIC LIST

Heterocera

Malacosoma neustria Linnaeus (Lasiocampidae). One specimen at Naxxar in the summer of 1956.

Amathes xanthographa Denis & Schiffermuller (Noctuidae, Noctuinae). One specimen caught by Mr P. Sammut at Rabat on November 14 1965.

Hadena bicruris Hufnagel (Noctuidae, Hadeninae). One specimen at light near Gharghur on June 24, 1956.

Polia corsica Rambur (Noctuidae, Hadeninae). Single specimens were taken on one occasion in April 1951, and in March and April 1960. The specimens have been referred by Boursin to the form *weissi* Draudt.

Bryophila pallida Bethune-Baker (Noctuidae, Apatelinae). Not uncommon at Buskett, near Rabat, in October. but it seldom comes to light. It is distributed in the Mediterranean region.

Xanthodes albago Fabricius (Noctuidae, Westermanniinae). One specimen at Sliema in August 1965.

Horisme scorteata Staudinger (Geometridae, Larentiinae). One specimen on December 20, 1965, at a locality called Maddalena, very near Gharghur.

Horisme tersata Staudinger (Geometridae, Larentiinae). One specimen caught at Gharghur on November 22, 1960. It belongs to the form *tersulata* which ranges in North Africa but is also recorded from Sicily. In an earlier paper (*Ent. Mon. Mag.*, **84**: 192, July 1948) recorded also *Horisme exoletata* which besides on Malta has so far been recorded only from Sicily. The food plant of the *Horisme* species is the *Clematis*, and there are two shrubs of *Clematis cirrhosa* growing wild at Wied id-dis. near Gharghur.

Sterrha laevigata Scopeli (Geometridae, Sterrhinae). One specimen at Maddalena on September 18, 1957.

Sterrha fatimata Staudinger (Geometridae, Sterrhinae). A North African species. One specimen came to light at Gnejna, near Mgarr, on August 31, 1956, and another was caught at Lunzjata, Gozo, on September 13, 1957.

Scopula ornata Scopoli (Geometridae, Sterrhinae). One specimen at Ta'Qali on September 8, 1957.

Scopula flaccata Staudinger (Geometridae, Sterrhinae). One specimen came to light at Gharghur on June 21, 1960.

Scopula incarnaria Herrich-Schaeffer (Geometridae, Sterrhinae). One specimen caught by Mr. P. Sammut near Rabat on August 21, 1965.

Microlepidoptera

Ancylolomia tentaculella Hubner (Crambidae, Crambinae). This species was not uncommon at Ta'Qali on September 8, 1957. Thirteen specimens were captured.

Tollia pectinatella Zeller (Crambidae, Crambinae). One specimen caught on the same night and from the same place as *tentaculella*. The place consists of flat country covered all over with short grasses.

Evergestis renatalis Oberthur (Pyraustidae). One specimen caught by Mr. P. Sammut at Rabat on March 20, 1966.

Cataonia erubescens Chretien (Pyraustidae). One specimen at light near Melleha on September 1, 1957.

Aciptilia spicidactyla Chretien (Pterophoridae). A new form peculiar to the Maltese Islands, and named *insularis* was described by L. Bigot (*Lambillionea*, **61**, No. 7-8, p 49-51) from specimens which I found at Gharghur, Melleha and Gnejna from 1953 to 1960; it is therefore widespread in Malta. The type is in my collection, the paratypes in my collection and that of Mons. Bigot. The form is remarkable for its small size in comparison to the normal race found elsewhere on the Continent. It may perhaps merit specific status.

Leioptilus carphodactylus Hubner (Pterophoridae). Three specimens at the Salina, Malta, on November 20, 1950. Another one was caught from the same place on March 28, 1960.

Stenoptilia pelidnodactyla Stein (Pterophoridae). One specimen near Chambray, Gozo, on September 9, 1954.

Fatmocelina mauritanica Baker (Gelechidae) A species found in North West Africa. One specimen was captured at Maddalena on May 22, 1960.

Cherocampa (*Borkhausenia*) *lunaris* Haworth (Gelechidae). One specimen at Maddalena on May 14, 1960. The species is found over Central and Southern Europe.

Thysostoma (*Stathmopoda*) *guerini* Stainton (Cosmopterygidae). One specimen at Lunzjata Valley, Gozo, on September 13, 1957.

Coleophora versurella Zeller (Coleophoridae). This species is not rare at Melleha during September.

Coleophora binotapennella Duponchel (Coleophoridae). One specimen on September 8, 1957, at Melleha. The larvae of this and the preceding species (*versurella*) live on *Atriplex* and *Chenopodium*, plants which are common at the locality mentioned, which is a seaside one. Stainton says that *binotapennella* lives also on the

branches of *Salicornia herbacea*, a halophilous plant which is common at Melleha locality known as Ghadira and which is near the sea.

Paratinea merdella Zeller (Tineidae). One specimen at Gharghur on June 20, 1957.

Besides the above species, which as far as I can ascertain are new to the Maltese Islands, the following species which are considered rare at present have also been captured over the same period of years: *Agrotis spinifera, A. leucogaster, Mythimna unipuncta, Mythimna bicolorata, Mythimna L-album, Epia silenes, Earias insulana, Aegle vespertalis, Thalerastria bipartita, Autophila dilucida, Scopula margine-punctata, Eupithecia breviculata, Eupithecia phoeniciata, Pyrausta nubi-lalis, Actenia brunnealis.* The remarkable species *Homoeosoma saxicola* has also been met with several times.

10 Church Square, Gharghur, Malta, G.C.

Insects collected under a Swallow's Nest in Lincolnshire

By O. M. White

During July 1953 a pair of swallows (*Hirundo rustica*) nested in an outbuilding at the Gibraltar Point (Lincolnshire) Nature Reserve, and after each visit of a parent to the three young some insects would drift down from the nest, still alive but unable to fly, and drop on a concrete slab underneath, from which I collected 86 such specimens between July 22 and 25. Damage to the insects varied from slight (*Haematopota*) to extensive (*Chironomus*—antennae and some legs missing). All except one were adults.

At about 0845 GMT on July 25 the last of the young birds flew and no more insects could be found under the nest. At 0945 a thermometer was placed by the nest and registered 69°F, 5° warmer than outdoors. The basic nest material then seemed hard and dry, and there was no visible sign of any puparia, which, I thought, might have been included among the mud used in building, and I concluded that the insects concerned must have been among the airborne prey brought to the nest by one or both parents and intended as food for the young, but for some reason were dropped, perhaps carelessness, or the young may have been fully fed.

The area in the swallows' foraging range included habitats from coastal to agricultural land. The weather during these four days was fair to fine in daylight, excepting slight rain on July 22.

The insects are listed at the foot of the note, and they include several species additional to the preliminary county list (1). Teh nomenclature follows the available *Handbooks* and Kloet and Hincks' *Check List*, excepting *Pammene aurantiana* Staud., an account of which appeared in *Ent. Rec.*, 69: 205.

Having obtained permisison from the Trust, I collected diptera in the Reserve also by searching and selective sweeping during the rest of this week, obtaining there nine of the same species as were taken by the swallows.

The following very kindly determined these subjects:
Mr. E. A. Fonseca, Anthomyiidae and certain of the Muscidae.
Mr. H. Oldroyd, of the British Museum (Natural History), Tabanidae.
Mr. S. Wakely, Eucosmidae.

INVERTEBRATES RECOVERED UNDER THE SWALLOWS' NEST

	Qty.
INSECTA: HEMIPTERA	
APHIDIDAE Unidentified	3
LEPIDOPTERA	
CARADRINIDAE	
Procus furunculus Schiff.	1
Charaeas graminis L.	1
EUCOSMIDAE	
**Pammene aurantiana* Staud.	2
?P. aurantiana	7
HYMENOPTERA	
CHALCIDOIDEA	
Unidentiefied	1
DIPTERA	
CHIRONOMIDAE	
**Chironomus annularius* Deg.	27
Unidentified	1
STRATIOMYIDAE	
Microchrysa polita L.	1
(R) *Nemotelus uliginosus* L.	6
(R)**N. notatus* Ztt.	8
Nemotelus sp. lost	1
Oxycera trilineata F.	2
TABANIDAE	
**Haematopota bigoti* Gob.	2
THEREVIDAE	
(R) *Thereva nobilitata* F.	1
EMPIDIDAE unidentified	1
DOLICHOPODIDAE	
Dolichopus griseipennis Stan.	2
(R)**Poecilobothrus fumipennis* Stan. (*principalis* Lw.)	1
Unidentified	1
PALLOPTERIDAE	
Palloptera umbellatarum F.	1
CHAMAEMYIIDAE	
(R)**Chamaemyia juncorum* Fln.	1
HELOMYZIDAE	
**Trixoscelis obscurella* Fln.	1
TACHINIDAE	
**Lydina aenea* Mg.	1
CALLIPHORIDAE	
(R) *Calliphora erythrocephala* Mg.	1
MUSCIDAE	
**Azelia zetterstedti* Rond.	1
(R) *Helina duplicata* Mg.	1
**Spilogona aestum* Villen.	1
(R) **Dexiopsis lacteipennis* Ztt.	2
(R)*Fannia canicularis* L.	1
**F. serena* Fln.	1
ANTHOMYIIDAE	
Hylemyia coarctata Fln.	2
**Delia trichodactyla* Rond.	1
**Egle aestiva* Mg.	1
ARACHNIDA: ACARINA	
Unidentified larva	1

DAILY NUMBER OF INDIVDUALS

Date: July	22	23	24	25
No.:	38	9	32	7

NOTATION:

(R) Species also found in the Reserve during the same week.
*Addition to preliminary county list (1).

REFERENCE

White, J. H. 1947. A Preliminary List of the Lincolnshire Diptera. *Transactions of the Lincolnshire Naturalists' Union.*

78 Eastdale Road Nottingham. 24.i.69.

Some proposed additions to Clark's colour notation for British Acrididae (Orthopt.)

By R. L. Hard

Clark's notation for the colour varieties of Grasshoppers (1943) will, no doubt, be more widely used now that a summary of it has been available in a more readily obtainable form (Ragge, 1965) for some three years. Although intended as a practical system, ambiguities are unavoidable if it is oversimplified, and several forms cannot be described if it is used as at present. The following proposed alterations and additions are ones that I have used myself last season, and I hope that they may be of some use.

In several species, particularly *Myrmeleotettix maculatus* Thunberg, there is often a difference in pigmentation between the prozona and metazona of the pronotum. Using the system as it stands, such a specimen could be described thus:

T *vv-bm vv-bbm* . . . P fm *vv-bm* cl *a*, etc.

This is totally inadequate, as the two colours are not mottled, but separated into clear bands. Neither can one tell which band is at which end of the pronotum. It could be avoided by the addition of *-a* and *-p* respectively for the metazona and prozona, as is done for other features. The example above would become:

T *vv-b vv-bbm* P fma *v* fmp *v-b* cl *a*, etc.

I believe these varieties are more common than is generally thought, but the hind part of the pronotum is usually the darker, and tends to blend in with the upper surface of the elytra.

There are two lines bordering the fascia postocularis of the head, of which one may be absent. Clark named both, describing the light line as the linea lateralis, and the dark one as the fascia postocularis lateralis. After Richards and Waloff (1954), and Ragge (1965), it is customary to refer to only one of these lines, under the heading of the fascia postocularis, e.g. fp. *b* & *n*. This is suitable for a species like *Chorthippus albomarginatus* (Degeer) in which the linea lateralis is normally absent, but not for the others, as only one of the lines can be recorded, the one chosen depending on their relative prominence. Or worse, a broad linea lateralis as in *Stenobothrus lineatus* (Panzer) may be referred to as a 'pale fascia postocularis', and be interpreted as synonymous with the fascia postocularis interna of Clark. It would therefore be better if the dark bordering line were to be included under the heading of 'fp', and the linea lateralis recorded separately. Under this system, a typical record for the head would be:

C fm *v* li *b* fp *g* & *n* ll *a*.

Both coarse and fine spotting or mottling can be accounted for by Clark's notation, but not lining. Dark lines, such as those sometimes running inside the stria postulnaris on the elytra of *M. maculatus* for about two-thirds of its length, are frequent, but not sufficiently so to be worth giving separate names. Conspicuous lining may often be found running horizontally along the outer surface of the hind femur of *Chorthippus parallelus* (Zetterstedt), and probably in other species. I

propose the symbol l (lineatus) for such cases. An example of its use in the description of elytral colouration, from a 'semi-mottled' variety of *M. maculatus*, is:

E *g b-nl gbb-nm gbb-nm* st *a* ls *a* sp *b-a*.

It is open to question whether coarse mottling in the position of a common feature, like the stria postulnaris, but on the same ground colour as the surrounding area should be included under the heading of the whole area. For example, if the mottling is in the position of the stria postulnaris, which of the following is the better: E *gbm gbm gbm* st *a* or E *g gbm gbm* st *a* sp *gbm*? I consider that the latter is more explicit, but the borderline cases are difficult. Quite a strong disruptive effect can be produced by mottling in the form of two different shades of the same colour, even when neither can be described as that colour compounded with black or white. Considering the practical intention of this notation, to invent symbols denoting 'light' or 'dark' would lead to an unnecessary attention to minutiae. Unusually dark or light shades can be described as *b-n* or *v-a* for example. If there is mottling where neither can be considered as such, doubling of the colour thus: *bbm* or *vvm*, does not produce any ambiguity.

The elytron may often appear darker than it actually is, as a result of the darkness of the hind wings. Indeed, the elytra may be completely lacking in pigment and still appear brown, particularly in *C. albomarginatus*, e.g. in a 'brown brown mottled sides' male: E *b-a* - -. It is probably best to describe these by their apparent colour as it is difficult to distinguish them unless the elytron is drawn forward, and it is impractical to do this for many specimens in the field. The shade thrown by the body also makes the wings seem darker. The darkening towards the tip affects the lower zones of the elytra, and is prominent in *M. maculatus* and other species. It is partly due to the dark tips of the hind wings, but can only be described as mottling, which it is not. Its inclusion as a fourth feature under the main elytral heading would solve the problem, for example E *b bb-nm bb-nm* would become E *bbbb-n*. The width of this patch is very variable.

Meanwhile, no *complete* account of colour variation in any British grasshopper has been published, although excellent keys to the more common varieties have been compiled. The English varietal names now used are convenient, and avoid the confusing mass of latin names used by lepidopterists, but are not of international application. Perhaps latinised names based on and describing the colours would widen their application but prevent confusion. It would be interesting to have other views on this question.

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Ragge, D. R. 1965. Grasshoppers, Crickets and Cockroaches of the British Isles. Warne.

Richards, O. W., and Waloff, N. 1954. Studies on the biology and population dynamics of British grasshoppers. *Anti-Locust Bull.*, 17.

Notes on Odonata from the Eastern Cape Province

By L. P. Hersalek

For the past two years the writer has been observing and collecting dragonflies during the years 1967 and 1968. All collecting and recording was performed in the Eastern Cape Province and particularly in the Port Elizabeth-Uitenhage area. The chief rivers investigated in this area were: the Van Stadens River, which runs at places through a very steep rocky gorge and also through forested districts; the Swartkops River; Maitland River; Baakens River and the Brak River. Other small streams were investigated, but their presence during some months of the year is totally absent due to their drying up and are consequently nameless.

I should put the number of species of Odonata occurring in the Eastern Cape Province as slightly over fifty, though Per Brink, writing in "*South African Animal Life*", Vol. II (as a result of the Lund University Expedition to South Africa in 1950-51, only recorded forty-three. To these forty-three I have added a further 6 species unrecorded by the Lund University Expedition; and they will be dealt with below:

(All species dealt with taken during October, December or January.)
Diplocodes lefeburei Ramb.

This small black Libellulid has not, according to "*Dragonflies of Southern Africa*" by Elliot Pinhey been recorded in the Cape Province, though it does occur in Natal and warm localities. I found the species at the Swartkops River near Despatch (just outside Uitenhage) in December 1967 and 1968. The dragonfly in the past two years inhabited the same reed-overgrown stagnant pools that lie just a few yards away from the main river. I found it to have a very quick and wary flight and very difficult to capture. The fact that this local species has occurred successively for two years increases the hope that it is breeding here.

Orthetrum abbotti Calvert

A very small blue bodied libellulid compared to the other members, I found this species only a mile or two outside Port Elizabeth inhabiting a very reedy dried-up stream occurring in hilly surroundings. It was not difficult to take *abbotti* as it settled frequently near the tips of the reeds. Pinhey accounts for *abbotti's* distribution as Cape to Kenya, but gives no localities for the former.

Hemnianax ephippiger Burm.

A medium sized aeshnid. Again this species seems to inhabit warm localities and is not recorded by Pinhey in his distributions as occurring in the Cape. This dragonfly, with typical powerful easy flight of the *Aeshnidae* was caught by the writer at the same stagnant pools at Despatch as *Diplocodes lefeburei* Ramb, already dealt with earlier. Most prominent is the second abdominal sky-blue patch in the male which is quite visible from some distance.

Chlorolestes umbrata Sélys

C. umbrata is a beautiful banded damselfly (synlestidae). The bands on the wings are of deep chocolate brown and white primrose. The dorsum of the thorax is also fully coated with blue pruinosity. A good

series of this species was taken along the Van Stadens River from the Van Stadens Pass (some 25 miles from P.E.) to Van Stadens Dam situated in hilly to mountain country. The damselfly tended to keep to very shaded areas of the river. Only the male is banded and I found it more numerous than the female.

Agriocnemis exillis Sélys

An extremely small damselfly, less than an inch in some cases. Pinhey does not record it at all from the Cape Province. I found it in large numbers, though locally gregarious in a rocky river bed amongst hills at Witteklip some 25 miles from P.E. west. The species tended to keep together amongst some very tall and thick reed-like canes near the river. They settled often, but the presence of the canes prevented easy collecting. Many *exillis* would rise at one's approach and filter between the reeds.

I might add that at this same river occurred another local species—*Metacnemis valida* Sélys—a robust blue damselfly that occurs only in rocky localities and settles on boulders and stones situated in the river or by the side.

Pseudagsion angolense Sélys

A black and orange species of damselfly that I found quite common in some areas, especially at the Van Stadens River (at the Pass) where it occurred quite freely just skimming across the water in a lazy fashion. Specimens were also noted at the Swartkops River.

The following species I found rare, local or common in the Eastern Cape Province:—

Anax speratus Hagen

This enormous *aeshnid* measuring some five inches or more has been found by the writer only at the Van Stadens Pass, and there only two or three occurred. It is an orange to brown-red species that like all *anax* hawkes up and down a stretch of water — now and then it will deviate from its path and soar high into the surrounding forest trees.

Anax imperator subsp. *mauricianus* Ramb.

The writer found this dragonfly fairly common in most areas. At one area *imperator* occurred only a few yards from the sea at the Maitland River Mouth.

Lestes virgatus Burm.

This brilliant green bodied damselfly the writer found only at the Brak River some 14 miles from Uitenhage—there it occurred in numbers, often choosing the shade of trees. *Virgatus* flew alongside specimens of *Lestes plagiatus* Burm, which I found common at Van Stadens River, Baakens River and localities in Grahamstown.

Chlorolestes longicauda Burm.

This metallic green *Synlestid* was found during October, December and January at Witteklip (a more or less mountainous district) from which the largest specimens were obtained, and some of these were beginning to show signs of the white pruinose bands that occur in this species during certain months—specimens also from Van Stadens Pass/River, Baakens River and Brak River.

Allocnemis leucosticta Sélys

An amber tinted winged species that inhabits, as I found, wooded and

shady areas near a river. At the Van Stadens Pass this species was present—also at the Baakens River and Witteklip.

Trithemis kirbyi Sélys subsp. *Ardens* Gerst.

A local fast flying libellulid. With a brilliant red body and large amber basal patches to the wings, this is an attractive species. Though far from common, I have noted it at the Swartkops River, Witteklip and Van Stadens River singly. I found it very alert and difficult to capture as it would settle on a projecting dead twig, wings projected down, ready to take off. As soon as one made a movement towards it, the dragonfly would then dart away.

Crocothemis sanquinolenta Burm.

A small broad-bodied red dragonfly which is locally common at the Van Stadens River. This species has a quick flight, and when settled, raises its abdomen high into the air which appears very un-dragonfly like.

Crocothemis erythraea Brullé

Larger than *sanquinolenta*, broader in body, and more red coloured. Recorded at Despatch, Swartkops River and at the Baakens River, though not in many numbers.

Chlorocypha fitzimonsi Pinh. (Fam. CHLOROCYPHIDAE)

It is only recently, while inspecting my collection of Odonata, that I noticed amongst a series of *C. caligata* Sélys two specimens (♂ ♀) of *C. fitzimonsi* taken during June 1967 at the Van Stadens Pass, very near the same locality where *caligata* was collected. *Fitzimonsi*, I believe, is unrecorded from the Eastern Cape Province and is a recently described species (Pinhey 1950), occurring only in Natal (Pinhey "Dragonflies of Southern Africa").

There is no difficulty about telling *caligata* from *fitzimonsi* as the former has a brilliant sky-blue abdomen, the latter has the first six abdominal segments red; the last four being the same blue as *caligata*. Both species like to settle on rocks in midstream and on twigs or bushes near the river.

Finally, to end these notes, I have made a list of species of *Odonata* from the Eastern Cape Province. These species without localities are species recorded by Lund University Expedition (1950-51) or by Pinhey and as yet unrecorded by the writer from this province.

ABBREVIATIONS

V.S.R. .....Van Stadens River
V.S.P. .....Van Stadens Pass
Swart. R. .....Swartkops River
Wit. .....Witteklip
P.E. .....Port Elizabeth

Sub-Order ZYGOPTERA	*Locality*
Fam. SYNLESTIDAE	
Chlorolestes umbrata	V.S.R.
C. fasciata	P.E., Hogsback Mts.
C. longicanda	Wit., V.S.R. and P., Baakens R.
C. tessellata	—
Fam. LESTIDAE	
Lestes plagiatus	Wit., V.S.R. and P., Grahamstown and Baakens R.

L. virgatus	Brak River only.
Fam. PROTONEURIDAE	
Ellattoneura glauca	V.S.P.
Fam. PLATYCNEMIDIDAE	
Metacnemis valida	Wit. only
Allocnemis leucosticta	V.S.R. and Wit.
Fam. COENAGRIIDAE	
Ceriagrion glabrum	Brak, Baakens, V.S.R., Wit. and Swart. R.
Pseudagrion angolense	V.S.R., Swart. R.
P. citricola	—
P. kersteni	Wit., V.S.R., Baakens R.
P. massaicum	Grahamstown
P. natalense	—
P. salisburyense	Grahamstown
Ischnura senegalensis	Maitland R., Brak R. and V.S.P.
Enallagma glancum	Brak. R.
Agriocnemis exilis	Wit. only
Fam. CHLOROCYPHIDAE	
Chlorocypha caligata	V.S.P. only
C. fitzimonsi	V.S.P.
Sub-Order ANISOPTERA	
Fam. GOMPHIDAE	
Notogomphus praetorius	Wit.
Paragamphus cognatus	Grahamstown
P. hageni	—
Ceratogamphus pictus	V.S.R., Wit. and St. Albans
Fam. AESHNIDAE	
Aeshna miniscula	Grahamstown
A. rileyi	—
Anax imperator subsp. *mauricianus*	Brak R., Swart. R., St. Albans, P.E. and V.S.R.
A. speratus	V.S.P. only
Hemianax ephippiger	Swart. R. (Despatch) only.
Fam. CORDULIIDAE	
Phyllomacromia picta	—
P. sophia	—
P. tropicalis	—
Fam. LIBELLULIDAE	
1. *Orthetrum abbotti*	P.E. only
2. *O. caffrum*	V.S.R.
3. *O. chrysostigma*	Wit. and Swart. R.
4. *O. farinosum*	Baakens R., V.S.P. and Brak. R.
5. *O. stemmale* subsp. *cupense*	Wit., V.S.P. and Swart. R.
6. *Palpopleura jacunda*	—
7. *Diplocodes lefeburei*	Swart, R. (Despatch) only
8. *Crocothemis erythraea*	Swart, R. and Baakens R.
9. *Crocothemis sanquinolenta*	V.S.R.
10. *Sympetrum fanscolombei*	Wit., St. Albans and Swart. R.
11. *Trithemis arteriosa*	Common everywhere

12. *T. kirbyi* subsp. *ardens*	Wit., V.S.R. and Swart. R.
13. *T. risi*	Brak R., V.S.R. and Wit.
14. *T. doralis*	Wit.
15. *T. stictica*	V.S.R., Swart. R. and Brak R.
16. *Zygonyx torrida*	—
17. *Pantia flavescens*	St Albans, Wit.

Total: 49 species

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Brink, Per. 1950-51. *South African Animal Life.* Vol. II. Cape Town.

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Willowdene, P.O. St. Albans, dist.,
Port Elizabeth, C.P., South Africa.

Notes and Observations

TEICHOBIA FILICIVORA MEYRICK FEEDING IN HARTSTONGUE FERN.—I had a similar experience to that of Mr. R. Fairclough (Ent. Rec. **81**: 63). In May 1968 a party of microlepidopterists, which included Mr. Fairclough, visited Portland, and some of us collected fronds of hartstongue (*Phyllitis scolopendrium* (L) Newman) for *Teichobia verhuellella* Staint. From the leaves I picked I had five *verhuellella* between the 14th and 20th of June and one *T. filicivora* on the 19th June. I rather think I included this unexpected record in the account we wrote of our Portland visit for the Proceedings and Transactions of the British Entomological and Natural History Society, but added it after Mr. Fairclough had seen the MS; this report is still to be published. These two independent records from different counties establish beyond question that hartstongue is an alternative foodplant of *T. filicivora.* — A. M. EMMET, Labrey Cottage, Victoria Gardens, Saffron Walden, Essex. 23.iii.1969.

SOME EARLY AND LATE LEPIDOPTERA. — On 28th March 1968, a single specimen of *Spilosoma lubricipeda* L. was taken in the Rothamsted light trap at Alice Holt, Hampshire. This year a further exceptionally early occurrence was a single *Lithosia lurideola* Zinck. taken on 11th February.

During the past three months there have been several late records of micros at light, notably *Crambus tristellus* Schiff. and several species of *Acleris*, details of which are given in chronological order below. In each case the record is of a single, male specimen:—26th November 1968: *Acleris rhombana* Schiff.; 20th December 1968: *Crambus tristellus* Schiff.; 10th January 1969: *Acleris rhombana* Schiff.; 22nd January 1969: *A. ferrugana* Schiff.; 23rd January 1969: *A. ferrugana* Schiff. and *A. tripunctulana* Haw.; 24th/25th January 1969: *A. ferrugana* Schiff. and *A. tripunctulana* Haw. It may also be of interest to record that a single *Vanessa atalanta* L. was observed by Mr. C. Walker flying in bright sunshine at Frensham Great Pond, near Farnham, Surrey, on the afternoon of 21st December 1968.—T. G. WINTER, Entomology Section, Forestry Commission Research Station, Alice Holt Lodge, Nr. Farnham, Surrey. 6.iii.69.

EUCOSMA PUPILLANA CLERCK, ETC., IN S.E. LONDON.—A few hours after switching on my m.v. lamp about nightfall on 21st July 1967, I was greatly surprised to find sitting on the lampstand a rather small but beautifully fresh example on the local Tortrix *Eucosma pupillana* Clerck —the first I had seen alive—and the more so, because that particular night (though in the middle of a good four-week period) was coolish and otherwise unproductive. I think this is the first record of the species for the immediate environs of London. It has mainly been taken not far from the coast, and more often, I believe, away from the south-east; it is no doubt restricted, in part at least, by the localization of its foodplant, *Artemisia absinthium* (wormwood). Within the last decade it was discovered in the Dartford Marshes area in north-west Kent, some 10-11 miles east of here, but soon afterwards the locality was largely destroyed. My capture suggests that somewhere nearer Blackheath a colony may exist but I have never, to my knowledge, met with the foodplant anywhere in or near this district, and much doubt its occurrence therein at the present time. Actually, *pupillana* is not quite the only wormwood insect that has turned up here, a specimen of *Euzophera cinerosella* Zell. (det. S. Wakely) having come to the lamp on 20.vi.60. Both moths probably originated far afield, but an alternative possibility is that they (or rather their larvae) will feed in the roots of certain other species of *Artemisia*—doubtless not the ubiquitous *A. vulgaris* (mugwort) but perhaps, for instance, *A. abrotanum* (the 'southern-wood' of gardens).

Much less unexpected, but also new to the local list, was a slightly worn *Lozotaeniodes formosana* Fröl. which appeared at the light on 13th July. This pine-feeder, only comparatively lately established in S.E. England, is already on record for S.E. London (Camberwell, at light, S. Wakely), but may not have been previously noted in the Kentish sector of the metropolitan area. It has a better chance than *pupillana* of having bred here, for, as I have shown (1965, *Ent. Rec.*, **77**: 68-71), the local conifers must harbour a considerable fauna. Last year produced nothing of comparable interest in this group, and favourable nights were far fewer.—A. A. ALLEN, 63 Blackheath Park, London S.E.3. 29.iii.69.

NOTES ON A FEW GARDEN BUTTERFLIES AT BLACKHEATH, 1968.—I have regretfully to report a very sharp falling-off in the numbers of *Celastrina argiolus* L., the Holly Blue, here last season, in sad contrast to the brave show it put up in the two previous years (cf. Allen, 1967, *Ent. Rec.*, **9**: 23, 318). The first brood scarcely materialized at all, and I can only record one or two doubtful sightings. The second showed a small improvement, with singletons on four dates and on one, 18.viii, no less than three. I gather that the species fared little or no better elsewhere in the London area—at least on the southern side. The most marked feature of the two-year outburst was the suddenness of both its onset and its decline; had the insect been able to build up its numbers gradually over several years, its present position would most likely be stronger. The collapse is probably due to parasites having gained a temporary ascendancy; if so, however, and given a 'reasonable' summer to follow, *argiolus* should be able to hold its own.

Other butterflies here did not do so badly in 1968, though the non-appearance of *Lycaena phlaeas* L. was a disappointment. *Maniola jurtina* L. and *Augiades sylvanus* Esp. (or *Ochlodes venata* B. & G. if we really must so call it) were well up to standard. *Parage aegeria* L. made

its now customary annual visit on 16th August, and, for the first time in several years, the second brood of *P. megera* L. put in a fleeting appearance on the 20th and 23rd of that month; unlike last year its first brood was not seen. *Polygonia c-album* L. was doubtless present in small numbers, but the only quite definite sightings were single ones in March and October; another in September, disturbed before it could be seen at close range, was almost certainly this. *Aglais urticae* L. had a much better season here than any for long past, yet *three* was the most ever to be seen at a time and that not often—in stark contrast, for example, to its occurrence (as I was credibly informed) in hundreds in an enclosed garden at Farningham, Kent, about the second week of September, absolutely covering the flowers. *Vanessa atalanta* L., too, made a distinctly better showing than usual here, with a rather faded individual on the last day of July and several in the autumn. One very fresh specimen, having in the second week of October found the michaelmas daisies that run riot in the garden, settled down amongst them and seemed disinclined to wander, being noted on several successive days in almost the same spot. While feasting one's eyes on this splendid fellow it was a sombre reflection that the rigours of our climate foredoomed him to perish leaving no progeny, whereas his hardier cousins the 'tortoiseshells', feeding a little way off, would—barring accidents—survive to breed. Again, this welcome visitation was made to look extremely modest by the news that my housekeeper, visiting relations at Selsdon near Croydon (12.ix.), had noticed about a dozen Red Admirals crowding on flowers outside their house. I suppose that the buddleia bushes, etc., on many parts of the coast were teeming with at least these two Vanessids last autumn, quite in the manner of 'the palmy days of yester-year'.—A. A. ALLEN, 63 Blackbeath Park, London, S.E.3. 30.iii.69.

ERANNIS MARGINARIA F. IN JANUARY.—It may possibly be worth noting that a specimen (male, of course) of this moth was found here as early as 24th January last, resting on the outside of a window—having, no doubt, been attracted by light the previous night. Considering that South (1st ed.) gives March and April as its months of appearance, this seems a remarkably early date for the species, though I must leave it to others more expert to judge of that. The very mild second half of January was presumably responsible, and in this connection I may remark that on going outside to box the moth I noticed a queen wasp buzzing about the privet hedge there just as though it were only October. Another *E. marginaria* appeared in the very same position at the top of the window on the night of 16th March, this time well within its normal period.—A. A. ALLEN, 63 Blackheath Park, London, S.E.3. 30.iii.69.

Obituary

ALBERT GEORG CAROLSFELD-KRAUSE

It is with great regret that I have heard of the death of my old friend, which took place on 14th January 1969.

Carolsfeld-Krausé was born in Roskilde on 22nd December 1905, the only child of a Roskilde chemist and photographer. He studied at the Old Latin School in Roskilde until he was 18 years old. Just before his

final degree, he had to break off his studies as his father had died, and it was essential that he should help his mother in his late father's business.

When he reached the age of 32, he commenced a course of study at the Blaagaards Seminarium (Teachers' Training College) in Copenhagen, and on completion he taught at various Copenhagen schools until he secured a post at the Katrinedal School in Vanløse Alle, Copenhagen, where he taught during the remainder of his life, having completed 25 years in April 1968, when he was the guest of honour at an official celebration.

He served with distinction in the Danish Resistance during the war, and was a member of the Danish equivalent of the Home Guard for several years after the war. He was a strong-minded but exceedingly kindly man, and he had the reputation for answering all the questions put to him by his pupils, in just the correct manner to be sure that they would learn from his replies, but without any degree of patronage. He was popular with both pupils and staff at his school. I had occasion to appreciate his style on the only visit I was able to pay to his home, when his explanation of the exhibits at the Castle of Roskilde and at other such places of interest which we visited, amounted to a shorter history of Denmark, and was most interesting.

I first made contact with C-K (as he was known by his friends) through the good offices of Dr. Joseph Klimesch of Linz, who spent much of his time interesting microlepidopterists in the Nepticulina, a study of which he was the focal point. This was in 1947, and C-K and I had corresponded regularly ever since. I have kept ihs letters in the hope that some time I might be able to go through them, extracting the many interesting references to the Nepticulina. He did not write much for publication. In his early days he was a close friend and disciple of H. P. S. Sønderup, the Danish expert on leaf-miners.

C.-K had been entrusted with the preparation of the Nepticulina volume of Microlepidoptera Palaearctica, and his close study of the family brought to light so many queries that his progress with the volume was slowed down. He worked in close touch with the late Dr. Hering and also with Mr. Bakkendorf of the Copenhagen Natural History Museum.

He suffered a coronary thrombosis in 1967, which naturally interrupted his studies, and although he resumed teaching as soon as was possible, his health remained delicate, and eventually circumstances made it essential that he should hand over the Nepticulina project.

His last letter to me was full of cheer, and stated that his health was greatly improved, but a further thrombus developed and he died quite suddenly, shortly after retiring for the night .

The sympathy of all his friends goes out to his widow and his daughter.

S.N.A.J.

EDGAR JAMES HARE

(1884-1969)

The death of Edgar Hare on February 23rd 1969 in his 85th year has robbed the brotherhood of British Lepidopterists of one of its most ardent, cultured and colourful figures. He was above all one of those happy people who never seem to grow old and indeed was in full harness till he passed away reading a book in bed.

The son of the Rector of Little Dunham in Norfolk where he spent

his youth he went to Marlborough College where Edward Meyrick was then an assistant master about whom he used to tell many anecdotes. It was probably the influence of this famous entomologist that gave him the first flair for collecting which he applied with enthusiasm right to the end of his very active life. I first met Edgar Hare at Wicken Fen in 1922 when I was an undergraduate at Cambridge. This meeting developed into a lasting friendship which took me in his delightful company to many parts of the British Isles from the South Coast to Shetland, for he cast his net widely and there were few noted localities or species which did not engage his assiduous attention. He was a frequent visitor to the west of Ireland and to the Highlands where as recently as 1967 he travelled right across Scotland to secure a special Pyrale which journey proved most successful. He always planned his season most meticulously and seldom returned without his desiderata. In this way he built up a superb collection of the Macrolepidoptera and Pyrales all beautifully set and arranged. His series of the Coronet moths (*Hadena*) could hardly be excelled. The well-known woods at Hamstreet in Kent were one of his favourite resorts and it is indeed fitting that his ashes have been strewn there. Every September for many years he used to visit Prawle in South Devon. The occasion in 1938 will not be readily forgotten by either of us when with a host of insects appearing nightly to light and sugar we packed up at very short notice to return home when the situation became increasingly menacing at the time of Munich. This Devon locality proved quite a gold mine providing him with such choice species as *Hippotion celerio, Apames dumerili, Plusia chalcites, Uresiphita polygonalis* and in 1967 *Hellula undalis*, a small Pyrale new to the British list.

Visitors to his charming residence in the country near Longfield in Kent where he lived for over thirty years, will not readily forget the kind hospitality of Edgar and Suzanne Hare. She came from a French family associated with the wine industry of the Boreadux region. For he was indeed a connoisseur of that delectable product of France. He never gave up his interest in the Classics and used to enjoy reading the great Greek tragedies in their original text. After leaving Marlborough he went straight into the legal profession which was to be his *métier* for life. Soon after being called to the Bar he joined Queen Anne's Bounty which he served for over thirty years with an interval when he served in the 1914-18 War. He eventually became its Treasurer and finally the Secretary of this Church Body which merged with the Ecclesiastical Commissioners in 1948. For his long and signal services he was awarded the C.B.E.

He joined the South London Entomological and Natural History Society in 1902 and eventually became a Life Member with 67 years of continuous membership to his credit, though he never served it in an official capacity. He was a regular attendant at the Dinners and Exhibitions of this society and seldom missed a Verrall Supper. All who knew Edgar Hare have indeed lost a good friend, for with his charm, zest and above all his sense of humour he endeared himself to all who came into contact with him and he inspired others to follow his example. All sympathy goes forth to his widow and to members of his large family which extends to the fourth generation. C. G. M. de W.

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, Formosa, and other countries. Expected pupae *Pseudanteraea discrepens* and possibly other species from Central Africa. List on request by sending 1/- stamps.—*Robert Keiser*, Frederik Van Eeden Plein 3, Antwerp 1, Belgium.

For Sale.—Papered Foreign Butterflies. List available.—*D. Brown*, 25 Charlcote. Near Warwick, Warwickshire.

Wanted.—Specimens of *Pararge aegeria*, and *Pieris napi* from Scotland and Northern England.—*George Thomson*, 98 George Street, Dunblane, Perthshire.

Required.—Would any entomologist or botanist expecting to visit Lebanon, Syria, or Turkey in Asia, consider trying to obtain living stock of the local subspecies (*pseudorapae*) of *Pieris napi*, preferably by collecting the eggs from wild cruciferae where the butterfly is flying? If so please contact *S. R. Bowden*, 53 Crouch Hall Lane, Redbourn, St Albans, Hertfordshire.

Urgently Wanted for field work, pupae of *Biston betularia*. Female pupae 1/- each or exchange.—*Dr. H. B. D. Kettlewell*, Department of Zoology, Parks Road, Oxford.

Two Mid XIXC Victorian 12 Drawer Mahogany Butterfly Cabinets. Ring Ashford (Middx) 55785 for Full Details.—*F. W. Westwood.*

Urgently Wanted.—20, 30, or 40 drawer Solid Mahogany Cabinet in good condition.—Full details to *T. W. Harman*, 26 Highfield Road, Chesterfield, Derbyshire.

Wanted.—Information *and* data on the distribution and habitats of *Coccinella 11-punctata* (Eleven-spot Ladybird) for an investigation into this species. *All* records welcome.—*J. Muggleton*, Dept. of Botany, Science Laboratories, South Road Durham.

For Sale.—Private collection Ornithopthera, and 500 species from Russia, Japan, Australia, New Guinea, Malaya, Africa, and Solomon Islands. Many Charaxes and Papilios. To be sold as one lot.—Please reply to *R. H. Morgan*, 108 Titirangi Road, New Lynn, Auckland 7, New Zealand.

Urgently Required—A good clean copy of "The Butterflies of Southern Africa" (Part 1, Papililionidae and Pieridae) by G. van Sen, published by Transvaal Museum in Pretoria.—Reply with details to "The Entomologist's Record", 59 Gurney Court Road, St Albans, Hertfordshire.

Wanted.— 'Entomologist's Gazette" Vol. 12, part 2 to complete series. Reasonable price paid.—*Dr. Neville Birkett*, Kendal Wood, New Hutton, Kendal, Westmorland.

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.

CONTENTS (May, 1969)

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION
(Founded by J. W. TUTT on 15th April 1890)

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AND JOURNAL OF VARIATION

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

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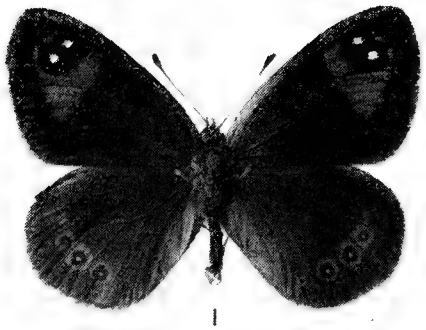

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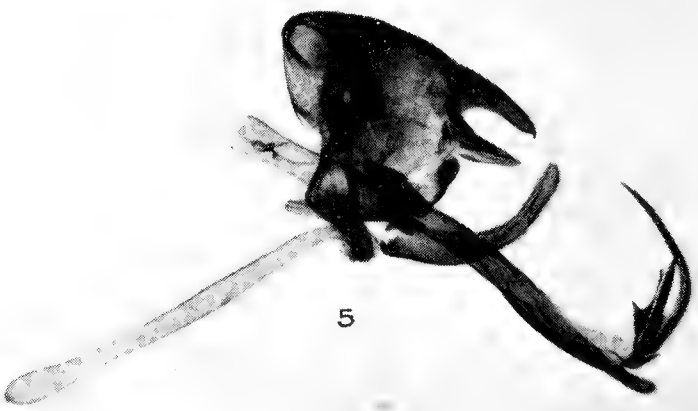

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Photograph: N. H. Wykeham.

A new Species of *Tarsocera* Butler (Lepidoptera: Satyridae) from the Cape Province

By C. G. C. Dickson

Although this species is fairly close, superfically, to *T. dicksoni* (van Son)* the male genitalia are decidedly different in certain respects and, especially as regards the aedeagus, more like those of *T. cassus* (L.). On the upperside of the forewing there is less fulvous colouring in the lower median area, in the male, and with the colouring here duller than in the corresponding sex of *dicksoni;* while other differences are noted hereunder.

Tarsocera southeyae spec. nov.

Male. Upperside.

Forewing. Fulvous colouring distinct in cell up to a black cross streak, and less distinct from this streak to end of cell and up to the large sub-triangular reddish area. Below cell, a fairly small wedge-shaped fulvous marking from near base does not extend clearly beyond a point approximately below origin of vein 2, the distinct reddish colouring here, being bounded outwardly by a short downward dark streak from origin of this vein—and the outward restriction of the reddish marking at this point being a good character by which to distinguish *T. southeyae* from *T. dicksoni.* The large reddish patch which partly surrounds the prominent, black, bipupillate sub-apical ocellus, clearer and more sharply defined than in *dicksoni,* and of a rather lighter and more salmon-coloured tone than in that species.

Hindwing. As in *dicksoni,* including the reddish-ringed ocelli, varying in number from 3-4 in different specimens.

Underside.

The dark ground-colour of a rather less dark tone, on the whole, than in *dicksoni.*

Forewing. Very similar to that of *dicksoni* (allowing for variation in different specimens) but the light, irregular submarginal line running down to, or a little below, vein 2 rather less sharply defined and further from the wing-margin.

Hindwing. The irregular curved transverse streaks and other dark markings less distinct and, where present, the light edgings of the markings not as clear as is usual in *dicksoni.*

Body and ancillary parts superficially very much as in the two allied species; but the antennae (except in one specimen, in which it is pronounced) without, or with less, ochreous colouring, in places.

*Van son, G., 1962. J. ent. Soc. S. Afr., **24** : 142-146, Pl. II.

EXPLANATION OF PLATE III.

Tarsocera southeyae spec. nov.

Fig. 1—♂ Holotype, *Tarsocera southeyae* spec. nov. (upperside).
Fig. 2—♂ Holotype, *Tarsocera southeyae* spec. nov. (underside).
Fig. 3—♂ Genitalia of *T. cassus* (L.). (Signal Hill, Cape Town. 24.x.1968.)
Fig. 4—♂ Genitalia of *T. dicksoni* (v. Son). (Piquetberg Mtn., 30.x.1956.)
Fig. 5—♂ Genitalia of *T. southeyae* spec. nov. (Jansenville, 27.ix.1968.)

Figures of imago approximately natural size.

Figures of genitalia 14 times natural size.

Length of forewing: 24-25·5 mm. (the former measurement, in holotype).

♂ Holotype, EASTERN CAPE PROVINCE: Jansenville, 27.ix.1968 (Mrs. R. J. Southey); specimen presented by Mrs. Southey to the British Museum (N.H.); British Museum Reg. No. Rh. 17105.

Paratype in the author's collection, data as holotype, 1♂.

Paratypes in Coll. R. J. Southey, as holotype, 4 ♂♂.

Paratypes in Coll. Transvaal Museum, as holotype, 1 ♂; Willowmore, 13.ix.1958, 1 ♂ (H. D. Brown).

This species can be separated at a glance from *T. cassus* on account of the far more extensive fulvous colouring in the forewing of the latter (i.e., if the males only of each species are compared) and the less well defined and less bright reddish patch towards the apex. The female of *T. southeyae* has not as yet been identified. (In the foregoing connection, *T. cassus* from the Cape Peninsula is being considered; a particularly dark insect from the more easterly portion of the Cape Province has the fulvous of the forewing upperside less apparent than in *T. cassus* from nearer Cape Town, but has been found to have the same form of aedeagus and appears therefore to be conspecific with *cassus* from the Cape Peninsula, in spite of some difference in wing marking.)

T. southeyae, as a species, is, it is believed, also widely distributed in a westerly direction—judging by the similarity in the male genitalia of specimens from Little Namaqualand (Kamieskroon, etc.) to the genitalia of *southeyae* from Jansenville. The Namaquland males which have been seen have not been as well coloured as regards the large reddish outer patch of the forewing upperside, this also applying to a male from S. of Doorn River (well S. of Van Rhyn's Dorp). In this latter specimen the fulvous colouring in the median area of the forewing is more noticeable, but the outer patch is reduced in size. The above specimens have the fulvous area of the forewing underside more restricted and darker than in most of the Jansenville examples of *southeyae*, but the markings of the hindwing underside and their light edgings are generally more distinct than in these specimens.

When studying this group of butterflies it is found that the aedeagus, with its strongly spined distal end, provides remarkably clear-cut taxonomic characters. The male genitalia of *T. cassus* (L.) and *T. dicksoni* (van Son) are figured in the accompanying plate (Figs. 3 & 4) for comparison with those of *T. southeyae* (Fig. 5). It should be mentioned that in the original description of *dicksoni* (*op. cit.*) the male genitalia of a species other than that of the holotype of *dicksoni* were depicted by van Son—both species concerned resembling each other closely in wing markings.

Referring briefly to the genitalia of *dicksoni* and comparing them with those of *cassus*, it will be seen immediately from the figures that the uncus and schaphium are much longer in the former species, while the aedeagus are quite distinct in each case, even apart from the difference in the distal ends. In *dicksoni* only three somewhat slender, almost straight and moderately long, pointed, distal spines are present, in addition to a very slender curved spine on the far side of these spines, corresponding to the very long curved spine of *cassus* but very much reduced in size.

In *T. southeyae* the uncus and schaphium are shorter than in *dicksoni*, but (if several preparations are compared) are found to differ little in length from those of *cassus;* the aedeagus (and especially its distal end) is very different from that of *dicksoni* and differs significantly, if less markedly, from that of *cassus*. The actual disposition and form of the spines have been found to be very constant in numerous specimens of *cassus* from widely separated localities, and to give positive proof of the identity of these specimens in all cases. The arrangement of the spines in *southeyae* is as follows:—One large central, pointed, upright spine, and to the near side of this (when viewing the aedeagus as it appears in the illustration) a spine of approximately half the length of the former and placed in a lower position, and below this latter spine and of about half its length, a spine with a decidedly rearward inclination; on the far side of the large central spine, a similarly broad-based but considerably shorter spine, with a short tooth-like spine anterior to it, and posterior to the second-last spine mentioned, a very long spine which curves forward well beyond the other spines; while the extreme distal end of the aedeagus consists of a stout projection with a rounded extremity (as in other species of the group). It should be mentioned that, in the figure, the large central spine has obscured a large part of the spine on the far side of it.

This beautiful Satyrid butterfly has been named with much pleasure after my friend Mrs. R. J. Southey of Steynsburg. The following note on the butterfly has been furnished by Mrs. Southey:—

"On my return from a trip to Namaqualand in September 1968, with Mr. and Mrs. Ken Pennington, I went from Cape Town to Port Elizabeth. Speaking to me on the phone, my husband R. L. Southey, who is a keen observer of nature, told me he had seen numbers of large dark brown butterflies on the roadside near Jansenville, and advised me to come home that way. I took his advice, and some distance from the village, on the road to Graaff-Reinet, I saw a few and with some considerable difficulty finally netted eight specimens. The 27th September was a very hot, windy day, and with closely stranded barbed wire fences over which they constantly flew, I was badly handicapped. Twice I scaled the fence, only to find my prey had returned to the road verge, to the coarse grass which was growing there. Invariably when the butterflies flew over or through the fences they settled for a few moments on the ground, in the shade of what I understand to be the "noons"—*Euphorbia ferox*—which is the overwhelmingly predominant vegetation in that area.

"A week earlier my husband had noticed these butterflies in great numbers, but apart from odd specimens at intervals along the road, which I took to be the same insects, there were not many to be seen on 27th September. Of the eight I caught four were worn and four moderately fresh, and it seemed possible that the brood had hatched some time earlier.

Dr. L. Vári kindly sent to the writer for examination and inclusion as a paratype the earlier example of *T. southeyae* (which had been taken by Mr. H. D. Brown at Willowmore), following a thorough investigation by him of the specimens and additional species of this group in the Transvaal Museum, from the point of view of the genitalia, with a view to eventual publication of the results of these studies.

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

Insect Conservation in Mixed Woodland and Ancient Parkland[1]

J. M. CHALMERS-HUNT, F.R.E.S.

Insect consevation in our native woodlands and the management of woodland reserves from an entomological standpoint is of increasing urgency nowadays, yet still there appears to be little available literature in this field. The purpose of this paper is to outline some of the main features of the subject, with a view to showing what ought to be done to try to safeguard these areas and the many rare and interesting insects they contain before it is too late.

WOODLAND BIOTOPES

It is important that samples of all types of woodland in every stage of development and on all geological formations should be preserved in the interests of insect conservation, and for these to contain as great a variety of suitable habitat as possible. The differences in the nature of woodland biotopes are of vital significance because each biotope supports characteristically distinct insect communities, and if a particular biotope no longer exists, certain species may be lost. There are a good many kinds of woodland biotope, so that for the sake of conciseness, they are listed as follows:—

(i) Glades, rides, heathy patches, woodland paths, edges of woods particularly those facing south, wooded downland and railway cuttings in woods, grassy and flowery verges and clearings containing the following associated woodland ground flora, e.g. Golden-rod (*Solidago virgaurea*), Devil's-bit Scabious (*Scabiosa succisa*), Cow-wheat (*Melampyrum pratense*), *Viola* spp., St. John's Wort (*Hypericum*), *Wood Spurge* (*Euphorbia amygdaloides*), *Potentilla erecta*, Vetches (*Vicia* spp.), Bilberry (*Vaccinium*), Honeysuckle (*Lonicera*), *Brachypodium*, *Dactylis*, *Luzula*, etc.

(ii) Bogs, ponds and their surrounds, ditches, wet mossy places.

(iii) Damp gullies, ravines.

(iv) Coppice, including oak, aspen, birch, hazel, sweet chestnut; Seedling aspen, stool oak; Sallow, aspen, elm and dogwood stands; Blackthorn and hawthorn thickets.

(v) Plant debris and litter, birds' nests, chestnut stump clippings, bundles of faggots, piles of brushwood and similar timber; fallen leaves. fruits and catkins; burnt areas.

(vi) Standing dead trees and lying dead trees (Note: these appear to constitute two distinct biotopes, as faunas of standing and lying dead wood seem to be different); Rotting stumps, decaying logs, dead or dying spruce and related conifers; Fungi on decayed wood, on trunks, rotten or old boughs, or in damp conditions generally; Wood mould and red rot of various trees; Ivy covered trees and walls; Old lichen covered trees and fences.

[1]Originally printed and circulated by the Society for the Promotion of Nature Reserves on the occasion of its Biennial Conference held in May 1968, and now reissued with revisions.

(vii) Ancient beeches, oaks and elms in parkland; Old beech woodland. Birch trees of great age; High canopy.

(viii) Sallow and alder carr.; Osier beds; Marshy woodland containing Valerian (*Valeriana* spp.), *Angelica*, *Cardamine pratensis*, Yellow Loosestrife (*Lysimachia*), *Symphytum*, *Spiraea*, *Myrica*, and other associated wet woodland plants.

(ix) Deer dung, putrifying remains, excrement, dead animals.

(x) Ants' nests, especially those of the Wood Ant (*Formica rufa*).

SOME ASPECTS OF MANAGEMENT

1. *The Preservation of Woodland in which the Environment has not Appreciably Deteriorated*

It seems desirable to maintain so far as possible good areas of more open woodland with a plentiful growth of young oak, birch, sallow, aspen, etc., among the larger trees, and where the wood becomes very thick and straggly with little room for shrubs and too dark and dense for ground flora to flourish, to make clearings here and there to let in sunshine and allow flowers and herbs to spring up. Moderate sized clearings (especially if surrounded on all sides by mature woodland) soon develop a rich insect fauna which tends to remain until densely wooded conditions begin to be restored. Grass under the trees and in the clearings is on the whole favourable, and Golden-rod which favours such places should be encouraged as it supports a number of local species.

On the other hand, we consider the judicious removal of some rhododendron should be undertaken if creating too much shade, and in a reserve, virtually all dense conifers. Where bramble and bracken become dominant and all-pervading it is a good plan to get rid of most of these from time to time, except where the brambles flower very freely, since the flowers are attractive to insects. To encourage the many wood-feeding species and the associated fauna, fallen timber, stumps, etc., should be left to decay naturally, and standing dead wood should be left, rather than felled.

Although many insects feed on a particular tree at any stage of its growth, there are others which are associated only with young, mature or old trees. It is therefore necessary that a reasonable acreage of coppice should be cut down each year, thus ensuring that trees of all ages from one to twelve years will always be available to provide the needs of a wide range of insects associated with this kind of habitat. In addition, a small acreage of trees should be left to mature without cutting, to provide for those species associated with the older trees.

If it is considered necessary to control vegetation by the use of herbicides, these should only be painted on and *never sprayed*, for the consequence of such action could be incalculable.

Broadly speaking then, the ideal wood, from an entomologist's point of view, would be managed as follows:—

(a) There would be the maximum viable number of species of tree.

(b) There would be enough of each species of tree to ensure that at any time there were young, mature and old specimens.

(c) The wood would not be meticulously tidy; for example:—Bonfire areas would be left undisturbed to mature and there would therefore be several such areas to be used in three to five year rotation. Fallen and decayed stumps would not all be removed

— there would always be a few mature 'derelict' areas. Epiphytes, such as ivy and fungi, would be allowed to survive and indeed thrive in selected 'marginal' areas. Finally, drainage should not be exemplary; a relatively water logged area should not be eliminated.

2. *Restoration so far as Possible and when Expedient of the Status Ante of Woodland*

In the case of woodland that has become derelict, but which was formerly suitable as an entomological environment, it may be desirable to restore it in some degree to its former state. This is sometimes possible with careful planning, and the creation of suitable habitats. It is important, however, that such habitats be of viable size, that they should not fragment existing ones, and furthermore, that they should be relevant to any that may be already in existence on a reserve. It is not proposed here to enter into detail but the undermentioned general prescriptions are noteworthy.

(i) The creation of ponds by damming small valleys.
(ii) Reduction of coppice stems by singling of e.g., hornbeam, ash and sweet chestnut.
(iii) The formation of glades.
(iv) Introduction of normal coppicing of e.g., hazel, birch, aspen and sweet chestnut.
(v) The opening up of rides with stepped margins, to form a central grassy area flanked by shrubs which gradually merge into the woodland beyond. This system produces highly favourable conditions for many insects, especially if due consideration be given to sunny aspect.

SOME SUGGESTIONS CONCERNING CONSERVATION OF ANCIENT PARKLAND AND RELICT FORESTLAND

Knole Park. The conservation of relict forestland and of old trees of parkland is very urgent, since too many of these places show little or no sign of regeneration. Knole Park, for instance, is an extremely important locality with many old beech trees in various stages of decay, and associated fungi. Largely owing to the excessive numbers of deer, however, there are very few areas in the park where any regeneration is possible, and attempts at planting young trees have been half hearted, with only a few planted here and there in the clearings.

The danger, therefore, that continuity in these woodlands will be seriously affected in the near future is obvious; Knole may be good for another century but its existing timber will at some time run out if nothing is done very soon. Clearly then, all existing decaying trees in old woodlands should be protected, natural regeneration should be allowed to occur by limiting grazing and the trampling of seedlings, and artificial planting of trees in these localities should also be carried out. Thus a considerable effort is required if an adequate supply of development media for the invertebrates dependent on rotten wood and lignicolous fungi is to be constantly maintained.

Windsor Great Park and Forest. One of the finest localities in the whole country for species associated with wood, is Windsor Forest (in the broad sense as including the Park), and it is regrettable that

destruction of so many fine old trees seems to have been proceeding in the Forest to make room for conifer planting, for it is these old trees (oak and birch) that harbour the great rarities, the 'primary forest relicts'.

It may, perhaps, be assumed that conditions in the Great Park (as opposed to those in the Forest) will remain more favourable, but two points should be noted. (1) There has been a tendency of late years, when trees fall or are felled, to bulldoze the stumps out of the ground or burn them. This surely serves no sufficient purpose and should be forbidden—as also should the removal of fallen or felled trunks, etc. not suitable for timber because too decayed (the top parts of the tree, in such cases, may always be removed without adverse effect on the fauna). Before the 1940's there was always plenty of old timber left lying about, and the fauna was correspondingly richer. (2) During the same period, considerable areas in the Park have been enclosed and converted to arable land. In general this may have done little harm so far, but there seems a danger that the practice may be extended. For instance, it has been noticed that of late years still more and larger areas have been enclosed—for what purpose is not at present clear.

In view of its unique entomological interest, we regard it as urgent that as much as possible of Windsor Great Park (if not also the remaining fragments of forest proper) be protected against any further inroads. This, incidentally, applies equally to Sherwood Forest and to Moccas Park, Hereford, if not already secured.

RESERVE DISCIPLINES—SOME RECOMMENDATIONS[1]

1. *Wardening. The Collecting of Insects. Introductions*

We should like to stress that entry to reserves be strictly controlled, but that within their confines, judicious collecting and release for population studies, as well as collecting for the purpose of case histories and the preparation of surveys, be encouraged. On the other hand, we wish to emphasise the necessity for preventing collecting from being carried out for commercial purposes, a practice that may now be on the increase, particularly since the attempted conditioning of the public by a well-known author, broadcaster and dealer into believing that indiscriminate rearing of butterflies — irrespective of their origin — and release of the progeny, assists conservation.

The subject of introductions in its various aspects is ably treated by Perring and Streeter (1968). Broadly speaking, to release insect populations away from the place of origin is considered harmful, and only in exceptional circumstances and under strictly controlled conditions is it sometimes beneficial to do so. It is essential furthermore—and we cannot too strongly emphasise the importance of this—that no attempt at introduction should be made without prior notification to the Biological Records centre[2].

2. *The Keeping of Records*

Accurate lists with data of as many invertebrate Orders as possible should be prepared for each reserve. It is important that adequate records be kept of existing conditions obtaining prior to management, and of all

[1]The policies outlined under this head apply to all forms of reserve, woodland or otherwise.

[2]Biological Records Centre, Monks Wood Experimental Station, The Nature Conservancy, Abbots Ripton, Huntingdon.

changes that take place subsequently in the course of management, particularly in regard to biotopes and the status of the fauna. It would be a good plan too, to publish the effects of such management operations, preferably in a periodical devoted to conservation[1].

SOME WOODLAND AND OLD PARKLAND LOCALITIES OF ENTOMOLOGICAL INTEREST IN S.E. ENGLAND, WITH BRIEF NOTES ON CERTAIN LOCAL OR RARE INSECTS FOUND THERE

Though there are many insect species in this region in urgent need of conservation, it must be understood that owing to limited space, we can only cite a few of them here; and for the same reason, the number of interesting localities given could have been considerably increased, and the notes much extended.

Several localities referred to hereunder are situated not far from the metropolis. We would like to state that these ought not to be neglected by conservationists simply because they are submerged in the outer suburbs; their importance is increased because they have acted as refuges for insects from surrounding areas, and it is probably true to say that the same applies to other suburban woods.

Blean Woods (part National Nature Reserve). Mixed woodland, stool oak, sweet chestnut, beech and hornbeam coppice, with oak standards on gravels over London clay. Lepidoptera: Blean is famous as a locality for the Heath Fritillary (*Melitaea athalia*), which depends for survival upon the growth of Cow-wheat (*Melampyrum pratense*) in woodland clearings, and the butterfly would undoubtedly become extinct (as has been the case at Chattenden and elsewhere) were it not for periodic coppicing. Coleoptera: *Borboropora kraatzi*, an extremely rare rove beetle associated with the Wood Ant; *Platyrrhinus resinosus*, a weevil breeding in the black fungus *Daldinia concentrica*, growing on old ash, beech, etc.; *Tropideres sepicola*, associated with faggots and old gnarled boughs, etc. Hemiptera-Heteroptera: *Sehirus biguttatus*, a rare shield-bug associated with Cow-wheat; *Aradus aterrimus*, amongst chippings of chestnut stumps. Diptera: *Phaonia apicalis*, taken by L. Parmenter, in 1964, the only British record.

Darenth Wood (S.S.S.I). Mixed woodland including old stool oak on Blackheath pebble beds, Woolwich bed loams and Thanet sand and chalk. One of the classic hunting-grounds of London collectors of the last century. The number of rare species, especially of Lepidoptera, Coleoptera and Hemiptera-Heteroptera is very considerable.

Epping Forest (Corporation of City of London P.O.S.; S.S.S.I.). Old high forest; hornbeam, beech and oak. Another classic hunting-ground of the 19th century. Coleoptera: *Graphoderus cinereus* and *Ilybius subaeneus*, rare water beetles, in a pond at High Beech; *Enicmus rugosus*, in powdery fungi on old logs; *Lathidius norvegicus*, only known on a single specimen from Oslo, until discovered on a beech that had been burnt in Monk Wood; *Hippodamia 13-punctata*, a very rare ladybird; *Soaptia testacea*, on trees in which there is red rot; *Aphodius conspurcatus*, in horse or cow dung; and *Malthodes crassicornis*, a great rarity. Hemiptera-Heteroptera:

[1]As yet there exists no such periodical in this country; however, one hopes that it may not be so long now before the need for one is fully realised, and a national magazine for the conservation of nature in Britain as a whole becomes available.

Spathocera dahlmanni, associated with Sheep's Sorrel (*Rumex acetosella*), especially on ground recently burnt; *Eupicoris baerenspringi* an even rarer species of gnat bug, taken on beech trunks. Diptera: *Ferdinandia ruficornis*, a very rare hover fly which develops in the sap of wounded trees.

Ham Fen (S.S.S.I.; K.T.N.C. Reserve). Valley fen on chalk, with sallow carr and many rare plants; primeval in character. Lepidoptera: Scarlet Tiger (*Panaxia dominula*), perhaps its last Kent station, since its recent extermination at Kingsdown by a dealer. Noted also for many other local species.

Ham Street Woods (National Nature Reserve). Manly oak standards, with hornbeam, some ash and hazel coppice. Not to be confused with Orlestone Forest (*see below*). Comparatively little entomologising has been done here as yet, but owing to good management, the locality is certainly deserving of more attention than heretofore. Lepidoptera: *Agrotera nemoralis*, a rare and beautiful Pyralid on hornbeam.

Knole Park (S.S.S.I.; part National Trust). Beech-oak parkland and open woodland, with many ancient trees. Particularly good for Coleoptera, e.g. *Phyllodrepa puberula*, a very rare rove beetle found under bark, true habitat unknown perhaps associated with birds' nests; *Synchita separanda* on beech bark; *Geotrupes vernalis*, taken under deer dung by Dr. Massee. Diptera: *Parachesia tigrina*, extremely rare, associated with fungi and rotten wood, taken by A. A. Allen; *Spania nigra*, also very rare, taken by P. J. Chandler.

Orlestone Forest, commonly known as "Ham Street" (Forestry Commission; part K.T.N.C. Reserve). Damp mixed woodland on Weald clay plateau with oak standards, coppiced aspen, birch, sallow, etc., interspersed with heathy patches, grassy flower rides. These conditions were much more prevalent a decade or so ago, since when owing to the effect of poison sprays and extensive conifer planting, much of the character of the wood has changed. It must be said though, that owing to co-operation from the Forestry Commission, a small but unspoiled and highly suitable area in Long Rope and Faggs has lately been established as a Trust Reserve.

Orlestone Forest constitutes what is generally regarded as the finest locality for woodland Lepidoptera in the whole of the British Isles. It is of outstanding importance for a number of reasons. For example: the the exceptional fact that it is the home of several species now known from nowhere else in Britain, and its great interest for the number of comparatively rare species that occur there in relative plenty. Two of particular interest are the magnificent Clifden Nonpareil (*Catocala fraxini*), and the extremely local Lesser Belle (*Colobochyla salicalis*). Both despite their names feed on Aspen—*fraxini* on the larger tree foliage; *salicalis* on the young growth, especially the tender hairy leaves of seedlings. Other Orlestone specialities, whose larvae feed on the leaves of a variety of deciduous trees and associated ground flora, are The Purple Emperor (*Apatura iris*); Lunar Double-stripe (*Minucia lunaris*), on stool oak foliage; Sub-angled Wave (*Scopula nigropunctata*); Pretty Marbled (*Jaspidia deceptoria*); Scarce Merveille du Jour (*Moma alpium*), and a great many more. Orlestone is also an exceptionally good locality for many rare Coleoptera, Hemiptera-Heteroptera, and Diptera.

Windsor Great Park and Forest (Crown Land; S.S.S.I.). For Coleoptera associated with wood, this is apparently the finest locality in the whole country, not even excepting the New Forest; for though the latter covers a much larger area—and may possess a larger fauna when the whole Order is considered—Windsor has more species found nowhere else in Britain. The area is also evidently prolific in rare Diptera; and there can be little doubt that other Orders connected with old trees and forest habitats are richly represented. Coleoptera: *Velleius dilatus*, one of our largest rove beetles, confined to hornets' nests in trees, always rare; *Bolitochara reyi*, the only British capture; *Euryusa sinuata*, *Tacyusida gracilis*, *Euconnus pragensis*, *Batrisodes adnexus*, *B. delaportei*: all 5 likewise found nowhere else in Britain, are the most notable examples of a highly interesting and remarkable series of myrmecophiles or 'guests' of the ant *Lasius brunneus*, which nests in old decayed tree trunks, especially oak. *Atomaria rubricollis*, *Corticaria pietschi*, both unique as British; and many, many more, too numerous to mention.

In conclusion, and as a matter of interest, we may remark that a few years ago, while the Duke of Edinburgh was visiting the South London Entomological and Natural History Society booth during National Nature Week, that great conservationist, the late Dr A. M. Massee, spoke to his royal highness with considerable emphasis of the paramount need for the preservation of the ancient trees in Windsor Park.

Other Noteworthy Localities. Tilgate Forest, Sussex; Abbey Wood, Kent; Chattenden Wood and Roughs, Kent; Selsdon Wood, Surrey (good for Diptera); Vert Wood, Sussex; Farningham Wood, Kent (good for Hymenoptera); Warley Common, Essex; Scratch Wood, Middx.; Whippendell Wood, Herts.; Seal Chart, Kent; Ockham Common, Surrey; Challock Woods, Kent; Stanmore Common, Middx.; High Halstow, Kent; Black Park, Bucks.; Cobham Park, Kent (particularly good for Coleoptera); Hoads Wood, Kent (rare Lepidoptera); Wimbledon Common, Surrey; Cosford Mill, Surrey; Dering Wood and King's Wood, near Leeds, Kent (rare Hymenoptera); Sparrow Wood, Kent; Ashdown Forest, Sussex; Norbury Park, Surrey; Beckley Woods and Eridge Park, Sussex; Angley Wood, Kent; Covert Wood, Kent.

ACKNOWLEDGEMENTS

I am most grateful to Mr. A. A. Allen of Blackheath, for records of many Coleoptera, Hemiptera-Heteroptera, and Diptera in need of conservation, as well as a great deal of information on several notable localities, especially Windsor Great Park and Forest.

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Aggregation in *Agonum dorsale* Pp. (Col., Carabidae)

By J. Muggleton

The report of an aggregation of *Agonum dorsale* Pp. on Holy Island, off the Northumberland coast, by Benham (1969), raises again the need for a satisfactory explanation of winter aggregations in this species. Such aggregations have been reported on several occasions and these reports are summarised by Greenslade (1963a) in a list of aggregations in the British Carabidae. I have recorded aggregations of *A. dorsale* at Staines, Middlesex (Muggleton 1966, 1968). However, there does not appear to be any information available on the factors which stimulate the formation and dissolution of these aggregations and it will be worthwhile considering what these may be.

Greenslade (1965) gives the time of emergence of the adults as August and September and it seems probable that the beetles immediately seek shelter under various objects giving them protection against dessication and predators during the daytime. Herrström (1949) showed that when given the choice between sunlight, half shade and full shade, *A. dorsale* chose full shade. Therefore the beetles are negatively phototactic and this must be their primary motivation in seeking shelter under various objects.

The factors controlling the formation of the aggregations fall into two classes. Firstly there are those factors which determine when an aggregation first appears and secondly there must be those factors which induce the beetles to come together in aggregations. At this point it is important to note that the beetles do not enter diapause, but remain active throughout the period of aggregation and will scatter in all directions directly the object they are sheltering under, is lifted.

At Staines a record of the first appearance of the aggregation was made in 1965 and 1967. In 1965 it happened on 12th December and in 1967 on the 2nd September. The factors influencing the timing of aggregation may be either seasonal or biological. The small amount of evidence, given above, of variation in the timing of the first appearance of aggregation would appear to rule out seasonal changes (e.g. temperature and photoperiod) as the factors responsible for the timing. Biological controls, such as an internal timing factor, would also appear to be ruled out.

However, more information is needed, on the dates on which aggregations first appear, before a definite conclusion can be reached. At the moment I would favour another form of biological control which has been put forward by Penney (1969) for the control of summer diapause in *Nebria brevicollis* Fab. Penney suggests that the summer diapause in *N. brevicollis* may be induced when the fat content of the body reaches a critical level. A similar explanation would fit in with the activity of *A. dorsale*, thus the beetles may not enter their hibernation quarters until they have built up sufficient internal food reserves. From observations at Staines, the initial build-up of the aggregation is a fairly rapid process, although the numbers present vary throughout the winter.

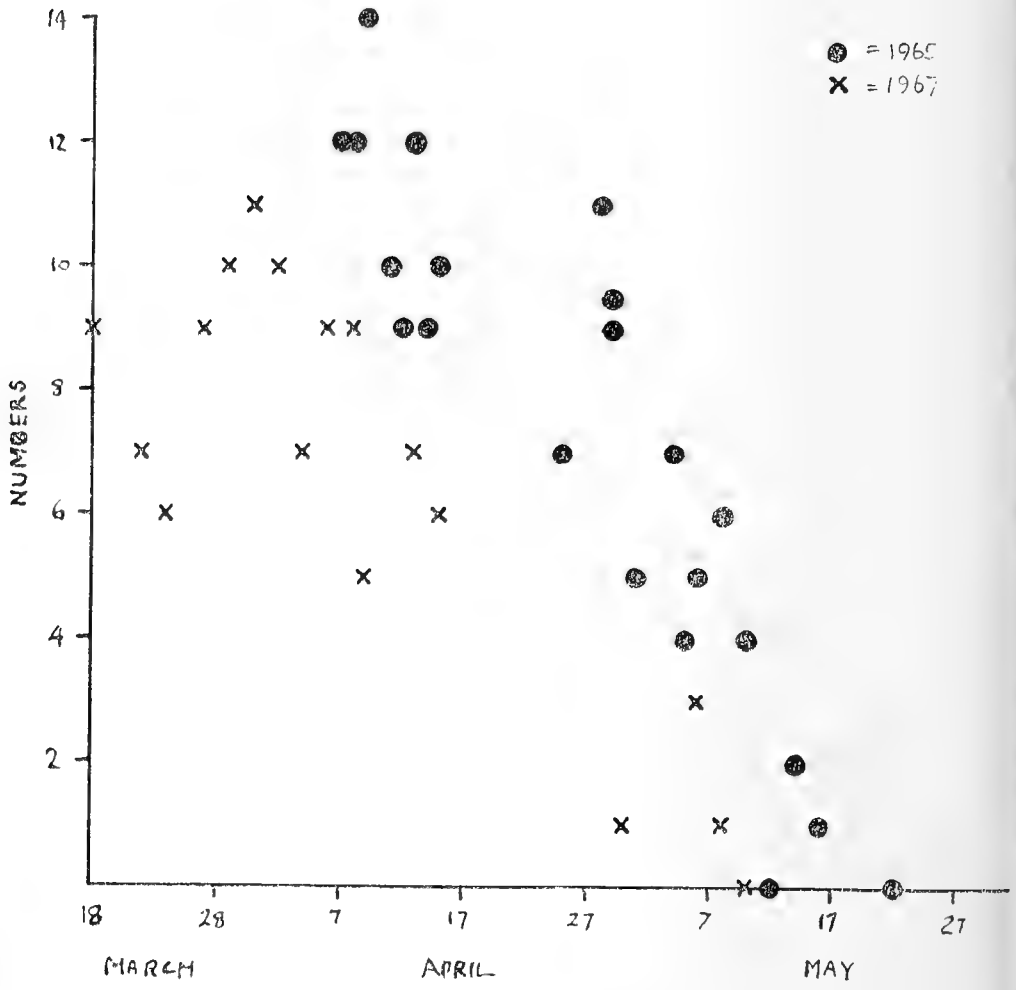

FIGURE 1.—Numbers of *A. dorsale* aggregated under a stone at Staines, from mid-March to May in the years 1965 and 1967.

Assuming that conditions are correct for the formation of an aggregation, we must now consider what further factors act to bring the beetles together into aggregations. It is possible that some selective advantage may be gained from the aggregations. Two possibilities suggested by Greenslade (1963b) are that excessive transpiration may be reduced in an aggregation (by the production of a localised area of high humidity) or that the aggregation may keep the sexes (here, I would substitute popula-

tion for sexes) together until mating can take place. A further possibility is that the green and orange coloration of the beetles constitutes a warning coloration which is made more effective by a large number of individuals. What mechanisms could be responsible for bringing the beetles together? Greenslade (1963b) shows that activity in *N. brevicollis* appears to be inhibited by a pre-existing aggregation. Thus a beetle will move from one uninhabited stone to another, until it comes into contact with other individuals, at which point it will stop. This could apply to *A. dorsale*. Another possibility is that the beetles emit a scent which attracts other individuals of the same species. A third possibility is that the beetles have a very specific requirement for their hibernating site and that this brings all the beetles in one locality together.

Alternatively aggregations may have no selective advantages and may be attributable *solely* to the scarcity of suitable hibernating sites. This has been suggested for aggregations in other members of the Carabidae by Greenslade (1963b), although he thought it may not apply to *A. dorsale*. Benham (1969) has suggested that it may be the reason for aggregation in *A. dorsale*. At Staines the aggregations occurred under the same stone from 1965-1968 (no aggregation had appeared under this or any other stone up to the beginning of February 1969) although there are plenty of other stones nearby. This supports the idea that the beetles need a highly specialised environment in which to hibernate. I can think of no other reason why they should return to the same stone. This stone is sheltered by a piece of tin and therefore the ground beneath it is drier than under the other stones. It is on a slight north-facing slope and during the winter does not receive so much sun as the other stones. It is also the last place from which snow clears. From March to May 1967 the temperature under the stone at the times the aggregation was counted, ranged from 10°F. above the shade temperature to 7°F. below the shade temperature. It was on average 1·5°F. higher than the shade temperature. Whether scarcity of habitats is the sole cause of aggregation or whether it is the mechanism that has evolved to produce a selectively advantageous aggregation is a question which cannot be answered at this stage.

The dissolution of the aggregation is a gradual process. This is shown in Figure 1, which gives the number of beetles in the aggregation at Staines from mid-March until the end of May, in the years 1965 and 1967. It can be seen that the aggregations followed the same pattern in both years (a similar pattern occurred in 1966, only with fewer individuals). This suggests that the dissolution of the aggregation is determined by seasonal changes such as temperature, humidity or photoperiod. It can be seen that as well as the gradual decrease in the numbers in the aggregation, there is a day to day variation in numbers. This implies that the beetles leave the stone during the period of aggregation and then return. Thus the beetles are not always under the stone and could be influenced by photoperiod at this time. The day to day variation in numbers is not directly related to temperature, but is likely to be related to humidity. However, the process of dissolution may be related to the gradual increase in temperature from March to May. On the other hand dissolution could be under some kind of inherent biological control. Other possibilities are that it could be controlled by depletion of food reserves or by the maturation of the gonads.

The pattern of the build-up of the aggregation under the stones and its gradual dissolution closely follows the behaviour of the population of *A. dorsale* studied by Pollard (1968). He found that the beetles overwintered in a hedge bottom, but although large numbers of the beetles were found he did not see any aggregations (pers. comm.). It is probable that, when or where conditions are not suitable for the formation of aggregations, the beetles are able to overwinter successfully without forming an aggregation. Pollard (1968) found that during May there was a gradual dispersal of the beetles from the hedge to a neighbouring field, where breeding took place. In a similar manner the dissolution of the aggregations under the stone is followed by dispersal to other stones, where the beetles can be found in cop.

Summary.

Several factors have been suggested which could be involved in the control of the formation and dissolution of aggregations in *Agonum dorsale* Pp. These factors can be separated under three headings, firstly, those responsible for the timing of the formation of the aggregation, secondly, those factors inducing the beetles to aggregate and thirdly, those responsible for timing the dissolution of the aggregation. I suggest that these are respectively, the build-up of food reserves, the scarcity of suitable habitats, and seasonal climatic changes. This presents a complicated picture which remains to be tested by observations on aggregations of this beetle.

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ORGYIA ANTIQUA L. AT LIGHT. — I can add two more records of the vapourer moth coming to light: Appledore, 14.ix.1954; Sheffield 26.viii. 1965. On both occasions the moths came in early, within half an hour of lighting up and while it was still twilight.—AUSTIN RICHARDSON, Beaudesert Park, Minchinghampton, Glos. 6.v.1969.

Warwickshire M.V. Recordings 1968

By David Brown

This was the first year I had run an M.V. Moth Trap. The Trap was home-made incorporating various features which I considered quite beneficial to the "harvest". These included an additional trap below the entry aperture, extra high baffles and the whole trap was operated on a time switch salvaged from a street lighting authority.

Charlecote is a little countryside village containing an extensive deer park. The neighbouring countryside is well leaved (mainly Elm) and rather flat.

Generally the trap was operated from dusk to dawn within an established garden which I suspect to be rather enclosed for best results. Indeed when convenient I installed the trap at a higher level on an adjacent flat roof which has an aspect over flat country of some miles. When operated from this point the catches were noticably higher.

One evening neighbouring friends living on a hillside overlooking many miles of countryside kindly allowed the trap to be operated in their garden. Quite by accident I forgot to connect the choke and of course fused all the lights. The incident was made worse as they were in the middle of showing friends a few films. This however did not deter them from allowing my trap on other evenings.

I ran the trap from mid March to the end of November and caught over 150 different species (not including micros). Five types of hawk moths were caught during the year.

19 *Deilephila elpenor* L. (Elephant Hawk)
12 *Laothoe populi* L. (Poplar Hawk)
10 *Mimas tiliae* (Lime Hawk)
3 *Smerinthus ocellata* L. (Eyed Hawk)
1 *Deilephila porcellus* L. (Small Elephant Hawk)

Both forms of *Biston betularia* (Peppered Moth) were caught although Ab *carbonaria* was by far the more common.

The following were the top 10 of the most common moths:—

	Total numbers
1. *Triphaena pronuba* L. (Yellow Underwing)	2521
2. *Diarsia brunnea* Schiff. (Purple Clay)	1148
3. *Apamea secalis* L. (Common Rustic)	811
4. *Leucania pallens* L. (Common Wainscot)	739
5. *Apamea monoglypha* Hufn. (Dark Arches)	662
6. *Axylia putris* L. (Flame)	551
7. *Agrotis exclamationis* L. (Heart and Dart)	489
8. *Ochropleura plecta* L. (Flame Shoulder)	456
9. *Amathes c-nigrum* L. (Setacious Hebrew Character)	420
10. *Diataraxia oleracea* L. (Bright line brown eye)	395

The maximum catches in each month and the date were:—

	Moths
March 28th	20
April 22nd	24
May 28th	100
June 17th	420
July 8th	560
August 23rd	4,000 (approx.)

September 8th	420
October 20th	250
November 11th	7

August 23rd was an ideal night for moths, really warm with no wind. I ran the trap on the roof mentioned earlier. I could hardly believe my eyes as I inspected the trap the following morning for inside were layers upon layers of moths! The egg cartons could not be seen for them—a gratifying sight. Having counted up to 2,000 the moths were becoming restless, jostling each other and flying so much that I was unable to count individually and consequently I estimated reasonably accurately the remainder to be a further 2,000.

The more interesting or rare moths caught were:—

Cerura vinula (Puss moth)	1st June
Cucullia umbratica L. (Shark)	4th June
Polychrisia moneta Fab. (Golden Plusia)	28th June
Harpyia furcula (Sallow Kitten)	28th June
D. porcellus (Small Elephant Hawk)	1st July
Pseudoips prasinana L. (Scarce Silver Lines)	5th July
Cosmia pyralina Schiff. (Lunar Spotted Pinion)	13th and 19th July
Gastropacha quercifolia L. (Lappet)	4th August
Eremobia ochroleuca Schiff. (Dusky Sallow)	23rd August
Atethemia xerampelina Esp. (Centre Barred Sallow)	30th August
Nymphalis io L. (Peacock Butterfly)	8th September

I was very pleased to catch *D. porcellus* on the night of the 1st July (following the African Dust Storm). *P. prasinana* was also a very pleasing catch, but the most unusual was *N. io* on September 8th.

It is interesting to note that while on holiday in Ripon, Yorkshire, on August 2nd two *Plusia bractea* Schiff. (Gold Spangle) moths visited the trap.

I feel my first year with a trap has been most interesting and rewarding.

Charlecote, near Warwick.

Ross-shire and Sutherland Lepidoptera Records

By Derek C. Hulme

Some important notes and papers giving lepidoptera records from the northern counties of Scotland have been published recently. These include "Some Random Scottish Records" by Austin Richardson (*Ent. Rec.*, **77**: 16-17), "Lepidoptera of the Beinn Eighe Nature Reserve" by John E. Knight and F. R. Sutton (*Ent. Gaz.*, **17**: 125-128) and "A Holiday in Ross-shire, Scotland in late July 1967" by E. P. Wiltshire (*Ent. Rec.*, **79**: 310-313). The first paper includes five species from Loch Maree; the second, a full list of species collected on this Ross-shire reserve in 1961/64 and the third, notes the lepidoptera of the Contin district—only seven miles from my home at Muir of Ord. I feel, after being resident in Ross-shire since late 1963, that I should add a contribution.

I have had little spare time for serious mothing though I have made a point of noting every specimen that has come my way. The present list for Vice-Counties 105 (West Ross), 106 (East Ross), 107 (East Sutherland)

and 108 (West Sutherland) is very far from complete. A few widely separated nights operating a blended light have produced a number of nocturnal species not encountered by other means and highlighted the inadequacies of my rather random method of observation.

The National Grid 10km square is given for each locality except Muir of Ord, which is NH55 unless otherwise stated. Lepidoptera taken solely at Muir of Ord, not requiring special comment, are listed at the end of Part One. Species recorded for Handa are given separately at the end of Part Two. Nomenclature is after Heslop's *Revised Check-list of the British Lepidoptera*, 1964.

Part One—Ross-shire

Pieris brassicae L. Fairly common with a flight period extending from 29th May (1964) to 2nd October (also 1964) *P. rapae* L. Rare. One at Mellon Udrigle (NG89) on 20th July 1960. Muir of Ord, 8th/29th May 1964, five and (NH54), 25th July 1965, one. *P. napi* L. *South* 1941 states that its range northwards does not seem to extend beyond Ross. The species is fairly common in East Ross, with a flight period from 23rd April (1968) to 23rd September (1966) though none observed in the period 20th June/28th July. Not quite so common in West Ross though seen along the coast from Lochcarron (NG93) northwards to Inverbroom (NH18) *Eumenis semele* L. Three on dunes at Big Sand, Gairloch (NG77), 11th/14th August, 1963. Three on low sandstone cliff at Rosemarkie (NH75), 8th August, 1967. *Erebia aethiops* Esp. Fairly common at Muir of Ord (NH54 & 55) and Strathpeffer (NH45), especially in late July/mid-August period. *Maniola jurtina* L. Common at Muir or Ord (NH44, 45, 54 & 55), with a flight period from 27th June (1968) to 29th August (1968). Few noted in West Ross but a colony recorded on Tanera More, Summer Isles (NB90), 13th July 1965 and 6th July 1966. *Coenonympha pamphilus* L. Fairly common at Muir of Ord, with a flight period from 14th June (1968) to 27th August (1966), and recorded also in squares NH44, 45 and 65. *C. tullia* Müll. Glen Torridon (NG85), 5th and 17th July 1966, seven and one. Five on Ben Wyvis (NH46) on 26th July 1968. *Vanessa atalanta* L. Seen on twelve occasions at Muir of Ord in the years 1964/68—all but two specimens flying in the month of September. *V. cardui* L. One at Tarbet Ness lighthouse (NH98) on 17th June 1965. Singles at Muir of Ord on 16th June; 20th, 22nd, 23rd and 25th September 1966 and 2nd October 1968. *Aglais urticae* L. Fairly common at Muir of Ord between the extreme dates of 28th March (1965) and 27th October (1964). Observed also in squares NC19; NG87, 88, 89; NH06, 09, 44, 45, 46, 54, 59, 65, 75, 85, 86 and 98. *Argynnis aglaia* L. Two at Muir of Ord (NH44 & 54) on 21st July 1966 and one at Strathpeffer (NH45) on 10th August 1967. *Clossiana euphrosyne* L. One specimen only taken and examined carefully before release at Muir of Ord on 24th June 1965. *South* 1941 states that it is not uncommon in Sutherland but I have not encountered this species in that county. *C. selene* Schiff. Fairly common in a very restricted locality at Muir of Ord, between 17th June (1967 and 1968) and 19th July (1965). Earliest specimen caught at Munlochy (NH65) on 5th June 1968. *Lycaena phlaeas* L. Noted between the dates of 21st August (1967) and 26th September (1968) at Muir of Ord, but not in numbers until 1968 when 22 were recorded. One also at Strathpeffer (NH45) on 25th August 1968. *South* 1941 states that it does

not extend beyond the Caledonian Canal while *Ford* 1945 gives a wider distribution to the north coast of Scotland. *Polyommatus icarus* Rott. Thinly and widely distributed over East Ross. Seen in flight between 22nd June (1967) and 29th August (1968) in squares NH44, 45, 55, 65, and 75. Increase in 1968 when 32 were counted at Muir of Ord. One on Tanera Beg, Summer Isles (NB90) on 1st July 1968—my only record for West Ross. *Celastrina argiolus* L. A ♀ caught at Munlochy (NH65) on 4th July 1966. *Erynnis tages* L. An unexpected specimen taken at Muir of Ord on 23rd May 1964. Four noted here between 29th May and 9th June in 1965 but not found in subsequent years.

Lasiocampa quercus L. A larva on heather at Mellon Udrigle (NG89) on 20th July 1960. *Macrothylacia rubi* L. A larva on silverweed at Mellon Udrigle (NG89) on 20th July 1960. Fifteen larvae on grasses at Gairloch (NG77), 11/14th August 1963. *Saturnia pavonia* L. Commonly seen in the larval state in squares NG77, 99; NH06 and 44. *Lithosia quadra* L. A ♂ taken resting on broom in bright sunshine at Muir of Ord on 26th June 1967. *South* 1961 does not mention a Scottish record. *Parasemia plantaginis* L. A ♀ taken in Glen Torridon (NG85) on 5th July 1966.

Hepialus fusconebulosa Deg. A wing found in my Muir of Ord garden on 17th July 1964. *H. hecta* L. Singles at Muir of Ord on 15th and 22nd July 1965 and 7th July 1968. *South* 1961 gives "Scotland to Aberdeen and the Hebrides".

Amathes sexstrigata Haw. One flying at dusk at Muir of Ord on 25th July 1966. *South* 1961 gives the range "as far north as Moray". *Euschesis janthina* Schiff. Three at blended light at Muir of Ord on 18th August 1965. *South* 1961 again gives "as far north as Moray". *Noctua pronuba* L. Recorded in square NH55 only, with a mere ten specimens in five seasons. Tentative flight period, 29th July to 31st August *Ceramica pisi* L. A larva found in Kerrysdale (NG87) on 18th July 1960. *Cerapteryx graminis* L. Common in late July and throughout August. Recorded in squares NG77; NH06, 55 and 86. *Orthosia gothica* L. Found in late April at Muir of Ord and Strathpeffer (NH45). Six taken at blended light on 29th April 1966 included a Scottish variety with markings outlined in yellow. *Hydraecia oculea* L. One at Dingwall (NH55) on 7th August 1963. *Aporophyla lunula* Stroem. Singles found in Muir of Ord garden shed on 31st August and 4th October 1966. *Agrochola lychnidis* Schiff. An ab. *serrina* F. at Muir of Ord on 31st August 1966. *South* 1961 states "through Scotland to Perthshire it is very local". *Tiliacea citrago* L. Singles taken at Muir of Ord on 22nd September 1965, 31st August 1966 and 25th August 1967. *South* 1961 gives only two Scottish records. *Plusia gamma* L. Common only in 1966 when over 150 seen at Muir of Ord between 5th June and 30th October. Also one at Munlochy (NH65) on 8th June 1966. *Phytometra viridaria* Clerck. A typical specimen at Muir of Ord on 9th June 1968. *South* 1961 states that it does not appear to occur beyond Inverness-shire.

Scopula lactata Haw. About 20 in Glen Torridon (NG85) on 5th July 1966. *Xanthorhoe spadicearia* Schiff. One at Muir of Ord on 7th June 1966. *South* 1961 gives the range northwards to Aberdeen. *X. montanata* Schiff. Recorded in squares NH08, 54, 55, 98; NB90. Fairly common with a flight period of 16th June (1966) to 25th July (1964 and 1966). *Colostygia pectinataria* Knoch. Fairly common at Muir of Ord in July. One in Glen Torridon (NG85) on 10th August 1963. *C. didymata* L. One

in Strathconon (NH25) on 27th July 1966. Fairly common at Muir of Ord mid-June to mid-August. *Anticlea derivata* Schiff. Singles at electric light at Strathpeffer (NH45) on 29th April 1967 and Muir of Ord on 19th April 1968. *Entephria caesiata* Schiff. Abundant on lichen-covered conglomerate rock faces in Urray (NH44 and 45) and Strathconon (NH25). *Euphyia bilineata* L. Besides Muir of Ord records, I have notes of one at the Falls of Glomach (NH02) on 24th July 1965 and two on Tanera Beg, Summer Isles (NB90) on 1st July 1968. *Dysstroma citrata* L. At Muir of Ord and one taken at Gairloch (NH77) on 13th August 1963. *Thera firmata* Hübn. Singles taken at Muir of Ord on 21st and 22nd September 1965. *South* 1961 states that it is found up to Aberdeen, and also in the Hebrides. *Rheumaptera hastata* L. A ssp. *nigrescens* Cockerell in Glen Torridon (NG85) on 5th July 1966. *Epirrhoe alternata* Müll. Over 20 taken at Muir of Ord between 22nd July and 10th August 1966. Also a late specimen at Gairloch (NG77) on 13th August 1963. *Pelurga comitata* L. One in dunes at Gairloch (NG77) on 14th August 1963. *Abraxas grossulariata* L. Four on Tanera More, Summer Isles (NB90) on 13th July 1965. *Erannis aurantiaria* Hübn. Single ♂♂ taken at Muir of Ord on 10th November 1965 and 18th November 1966. *South* 1961 quotes few Scottish records with the range extending northwards to Inverness-shire. *Selenia bilunaria* Esp. One of the second generation at Cromarty (NH86) on 4th June 1965. *Phigalia pilosaria* Schiff. Single ♂♂ taken at Muir of Ord on 1st February 1964 and 28th February 1966. *South* 1961 gives Aberdeen as the northern limit. *Alcis repandata* L. A melanic specimen in Inverewe Garden (NB88) on 12th July 1965. *Ectropis biundularia* Borkh. Singles at the Falls of Rogie (NH45) and Glen Torridon (NG85) on 5th July 1966. *Ematurga atomaria* L. Abundant with records from squares NG85; NH02, 06, 19, 45 and 55, between the extreme dates of 26th April (1964) and 15th July (1965). *Bupalus pinaria L.* Common at Muir of Ord and also recorded in Glen Torridon (NG85) on 5th July 1966.

Obsibotys fuscalis Schiff. One at Braemore Junction (NH27) on 3rd July 1966. *Crambus hortuellus* Hübn. Common at Muir of Ord; also a few noted at Braemore Junction (NH27) on 3rd July 1966 and ten on Tanera More, Summer Isles (NB90) on 6th July 1966. *Agriphila culmellus* L. Abundant in squares NH25, 44, 45, 54 and 55 and also seen in NG91; NH27 and 68. Flight period 30th June (1966) to 3rd September (1965). *A. tristellus* Schiff. Fairly common at Muir of Ord, flying between 22nd July (1964 and 1965) and 3rd September (1966). Recorded also in Strathconon (NH25). *Alucita hexadactyla* L. Singles at Muir of Ord on 6th November 1964, 19th October 1967 and 23rd October 1968.

Hofmannophila pseudospretella Staint. Common in our new house in 1964 and 1965. Not recorded in subsequent years which makes me wonder whether we brought ova and larvae with us in carpets and furniture from Derby. It is a Ross-shire insect, however, as I found two in a Kyle of Lochalsh hotel (NG72) on 28th June 1957. *Anthophila fabriciana* L. Fairly common at Muir of Ord (NH54 and 55) in the years 1964/66 but not one observed here subsequently. Flight period 24th May to 20th October. One taken at Ullapool (NH19) on 1st July 1968. *Argyresthia goedartella* L. Eight at the Falls of Rogie (NH45) on 26th July 1967.

The parish of Muir of Ord (Urray) is one of the wildest and least known in Britain. It embraces more than fifty peaks over 2000 feet; no

less than sixteen of these are over 3000 feet and the highest, Sgurr a' Choire-Ghlais, is only six feet lower than Snowdon! Most of the ground is utterly remote heather moor, with shapely peaks and rocky cnocs. The numerous lochs and streams drain into the River Orrin—the longest river in Ross-shire. The only fertile and well-wooded areas are close to the Moray Firth and in lovely Strathconon. The rapidly expanding village is built on alluvial flats of glacial gravel and sand, overlying the Middle Old Red Sandstone. Further inland exposed conglomerates give way to the Moine Series schists. The following moths were taken solely in Muir of Ord (NH55), many by my eldest son, Kyle. It is hoped to fill out this bare list with flight period and other data at a later date.

Poecilocampa populi L., *Spilosoma lubricipeda* L., *Phragmatobia fuliginosa* L. (including ♀ ssp. *borealis* Staud.).

Amathes glareosa Esp., *Euschesis comes* Hübn., *Diataraxia oleracea* L., *Hadena thalassina* Hufn., *Orthosia cruda* Schiff., *O. stabilis* Schiff., *O. incerta* Hufn., *O. gracilis* Schiff., *Leucania pallens* L., *L. lythargyria* Esp., *Arenostola pygmina* Haw., *Apamea monoglypha* Hufn., *A. crenata* Hufn., *A. secalis* L., *Procus fasciuncula* Schiff., *Amphipyra tragopoginis* Clerck. *Apatele rumicis* L., *Griposia aprilina* L., *Antitype chi* L., *Eupsilia transversa* Hufn., *Citria lutea* Stroem, *Conistra vaccini* L. ab. *mixta* Staud., *Plusia bractea* Schiff., *P. pulchrina* Haw., *Hypena proboscidalis* L.

Sterrha aversata L. (NH44 and 55), *S. biselata* Hufn., *Xanthorhoe munitata* Hübn., *X. designata* Hufn., *X. fluctuata* L., *Colyostygia multistrigaria* Haw., *Earophila badiata* Schiff., *Perizoma blandiata* Schiff., *P. alchemillata* L., *Lampropteryx suffumata* Schiff. (including melanic ab. *piceata* Steph.), *Electrophaes corylata* Thunb. (an ab. *ruptata* Hübn.), *Lygris testata* L., *L. populata* L. (NH44 and 55, including ab. *fuscata* Prout), *Cidaria fulvata* Forst., *Chloroclysta siterata* Hufn., *C. miata* L., *Dysstroma truncata* Hufn. (NH44 only), *D. concinnata* Steph., *Thera obeliscata* Hübn. (an ab. *obiterata* B. White), *Hydriomena furcata* Thunb. (ab. *sordidata* F.), *Chesias legatella* Schiff., *Trichopteryx carpinata* Borkh. (ab. *fascinata* Prout), *Ortholitha mucronata* Scop., *Oporinia dilutata* Schiff., *O. christyi* Prout, *Operophtera brumata* L. (including a ♂ ab. *huenei* Prout), *Eupithecia intricata* Zett. (ssp. *millieraria* Wnuk). *E. icterata* Vill., *E. indigata* Hübn., *E. sobrinata* Hübn., *Gymnoscelis pumilata* Hübn., *Lomaspilis marginata* L., *Deilinia pusaria* L., *Campaea margaritata* L., *Gonodontis bidentata* Clerck, *Itame brunneata* Thunb. (NH44 only).

Udea lutealis Hübn., *U. olivalis* Schiff., *Crambus pratellus* L., *C. perlellus* Scop., *Stenoptilia bipunctidactlya* Scop., *Amblytilia punctidactyla* Haw. (NH44 and 55), *Platyptilia pallidactyla* Haw.

Pandemis corylana F., *Syndemis musculana* Hübn., *Acleris schalleriana* L., *A. variegana* Schiff., *A. ferrugana* Schiff., *Laspeyresia succedana* Schiff., *L. aurana* F., *Grapholita jungiella* L., *Epiblema farfarae* Fletch., *E. costipunctana* Haw., *Pardia cynosbatella* L., *Epinotia stroemiana* F., *Ancylis unguicella* L., *A. badiana* Schiff., *Olethreutes palustrana* Zell., *O. lacunana* Schiff., *O. rivulana* Scop., *Celyphoides cespitana* Hübn.

Endrosis sarcitrella L., *Diurnea fagella* F., *Agonopterix arenella* Schiff., *Coleophora anatipennella* Hübn., *Plutella maculipennis* Curt., *Nemophora swammerdammella* L.

(to be continued)

The Name of the Meadow Brown

By Lieut-Col. C. F. Cowan, F.R.E.S.

The only name by which it is proper to refer to our demure but happy denizen of the hayfields, apart from meadow brown, is *Maniola jurtina* (L.). Commonest of its misnomers, and doubly incorrect, is *Maniola (Epinephele) jurtina"*, while trebly wrong is *"Maniola (Epinephile) jurtina"*. The name having been as accident-prone as any, right from the "year dot", it may be worth brief comment.

Linnaeus, in both the tenth and twelfth editions of his *Systema Naturae*, described the species *Papilio jurtina*, giving citations of many earlier references and illustrations, and adding that it was a well-known insect of "grassland in Europe and Africa". Then, a couple of places further on in each edition, he described *P. janira*, citing no other references and remarking "Europe, woods. Like *jurtina* but without the yellow patch on the forewing upperside and with three dark dots on the hindwing below".

For some time, although all writers knew that these were respectively the female and the male of the same species, none liked to correct the Master. The two parallel names were quoted side by side. Eventually, by common consent, the name for the male became regarded as the "proper" one, and *janira* was generally accepted early in the 19th century.

Then the unwritten rules were made more strict, and one of them, based on the "page-precedence" principle, became increasingly favoured. The result of this was that, towards the end of the 19th century, *jurtina*, with two places precedence, became the name almost universally employed, and continued so for the first half of the 20th century. Finally, a change in the Code introduced the "First Reviser" rule to cover such cases. This meant that the correct name would depend entirely on the first author who had equated the two names and, having done so, selected one to have precedence over the other.

Among all the other repercussions caused by changing the rules, a frantic search ensued to find who first acted in this case. This resulted in the view that a definite choice "of *janira* as a name to take precedence over the name *jurtina* had been made by Fabricius as early as 1778", and that this selection was the earliest one. Acceptance of this would have caused such an upset to universal practice that a successful application was submitted to the International Commission on Zoological Nomenclature who, in their Opinion 506, ruled that the name *jurtina* should have precedence regardless of any previous designation. That opinion, with all the relevant references, was published in 1953 (*Opin. Decl. int. Comm. zool. Nomencl.*, **18**: 177-196).

Actually, all this was technically unnecessary, as Denis and Schiffermüller, in their profound and prescient work of 1775 on the Viennese butterflies, had done that very thing, and were undoubtedly the first revisers. Or were they? Perhaps they, in their turn, were anticipated, so it is well that the Commission has settled the question for all time.

Thus the correct specific name is *jurtina*. What of the generic?

One of the authors who had found it embarrassing to say that Linnaeus' two species were one and the same was Schrank, in 1801, 23 years after Linnaeus died. While placing them in a new genus, *Maniola*, he

seems to have solved his dilemma by ignoring both names and, perhaps, with the departed in mind, called the species *lemur*. In fact, subsequent action has ensured that *Papilio jurtina* Linn., 1758 and *Maniola lemur* Schrank, 1801, are objectively identical species.

Next, in 1819, Hübner introduced the name *Epinephele* for a group which included our species. Founded on the Greek noun *nephelē*, a dark cloud, it has been sorely misspelt in the past, probably mainly by emendators who wanted to base it on the Greek for love. While the existence of *Maniola* was overlooked, *Epinephele* became generally used, and in that period when *janira* was also general, it was designated as the type-species. We thus have the remarkable situation where a species finds its male (*Maniola jurtina*) and its female (*Epinephele janira*) in different genera not through any structural difference, which is by no means a rare occurrence, but purely through a series of accidents in nomenclature. The case is not unique, a parallel instance being the well-known American Papilionid *Euphoeades glaucus* (L., 1758) with a dimorphic female form named *Jasoniades turnus* (L., 1771); two more Hübner genera simultaneously published, the former having precedence through action by a first reviser.

Although, then, it can be said that *Maniola*, *Epinephele*, *jurtina* and *janira* are all perfectly valid names, no one now denies that the two last are conspecific. Once one equates these two, *janira* falls as a junior synonym by the International Commission ruling, and *Epinephele* falls as a junior synonym on priority. The name of the Meadow Brown is *Maniola jurtina*. There is no point in continually repeating *Epinephele*. Furthermore, it is bad form to insert that name in parentheses between the correct generic and specific names; a formula reserved for citation of subgenera under the International Code (Art. 6, also Rec. 44A).

This is not a scientific paper, and a long list of references can be dispensed with. Those interested can find them all in the very thoroughly indexed posthumous work by Francis Hemming, 1967, "Generic Names of the Butterflies and their Type-Species". *Bull Br. Mus. nat. Hist.* (Ent.) Suppl. 9, published by the British Museum (Natural History). It is hoped soon to publish a short note on the much misunderstood 1775 work by Denis and Schiffermüller.

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Aquatic Bugs of a Fish Pond

By J. M. Julka*

(Central Inland Fisheries Research Institute, Barrackpore)

Central predatory aquatic bugs are voracious feeders on the fish fry and compete with them directly for food by feeding on the same micro-organisms which form the principal food of fish (Hungerford, 1919; Champlain, 1923; Alikunhi *et al*, 1955; Ganguly and Mitra, 1961). A knowledge of these bugs will afford useful information in the success of fish culture.

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Regular collections were made, from February 1963 to January 1965, from a perennial fish pond, situated in the middle of a residential colony about one km. in the south-east of Central Inland Fisheries Research Institute, Barrackpore. The pond is more or less rectangular in shape (about 35 m. long and 21 m. broad) with steeply sloping margins. The bottom in the littoral zone is made up of broken bricks, pebbles, dead molluscan shells and sand mixed up with clayey soil, while in the middle zone it is characterized by a surface composed of dark clayey soil mixed with dead and decaying matter.

The aquatic bug fauna, collected during a period of two years, consisted of the following 21 species.

Family Corixidae

Micronecta scutellaris (Stål)
M. quadristrigata Breddin
M. thyesta Distant
M. albifrons (Motsch.)
M. haliploides Horvath
Corixa distorta Distant
Agraptocorixa sp.

Family Notonectidae

Anisops bouvieri Kirkaldy
A. breddini Kirkaldy
A. waltairensis Brooks
A. barbata Brooks
A. sardea (Herrich-Schaffer)
Nychia marshalli (Scott)

Family Pleidae

Plea frontalis (Fieber)
Plea sp.

Family Nepidae

Ranatra filiformis (Fabricius)
R. elongata Fabricius
R. digitata Hafiz & Pradhan
R. varipes Stål
Laccotrephes griseus (Guér)

Family Belostomatidae

Diplonychus rusticum (Fabricius)

The relative frequency of occurrence for all the species was determined by calculating their frequency indices by the formula:—

$$\text{Frequency index} = \frac{\text{Total number of samples examined}}{\text{No. of samples in which the species is present}}$$

The results are shown in the table and it is evident that *M. scutellaris*, *A. waltairensis*, *A. bouvieri* and *A. breddini* may be considered as well-represented forms contributing substantially to the bug fauna of the pond. Four species, viz., *M. quadristrigata*, *R. filiformis*, *R. elongata* and *Plea frontalis* were moderately represented and the rest of the species occurred less frequently.

TABLE

Name of species	No. of samples in which sp. is present		Frequency index	
	1963-64	1964-65	1963-64	1964-65
M. scutellaris (Stål)	31	37	0·94	1·00
M. quadristrigata Breddin	9	25	0·27	0·68
M. thyesta Distant	5	6	0·15	0·16
M. albifrons Motsch.	3	4	0·09	0·11
M. haliploides Horvath	2	3	0·06	0·08
C. distorta Distant	2	2	0·06	0·05
Agrapto corixa sp.	—	1	—	0 027
A. waltairensis Brooks	32	22	0·97	0·59
A. bouvieri Kirkaldy	25	19	0·76	0·51
A. breddini Kirkaldy	25	19	0·76	0·51
A. barbata Brooks	8	4	0·24	0·11
A. sardea (Herrich-Schaffer)	1	1	0·03	0·027
N. marshalli (Scott.)	4	3	0·12	0·08
R. elongata Fabricius	9	21	0·28	0·57
R. filiformis (Fabricius)	13	13	0·39	0·35
R. digitata Hafiz & Pradhan	3	—	0·09	—
R. varipes Stål	—	1	—	0·027
L. griseus (Guér)	—	2	—	0·05
P. frontalis (Fieber)	10	20	0·3	0·54
Plea sp.	—	2	—	0·05
D. rusticum (Fabricius)	—	6	—	0·16

Total number of samples examined, 1963-64=33
1964-65=37

The author is grateful to Dr. B. S. Bhimachar, former Director, Central Inland Fisheries Research Institute, Barrackpore, for his able guidance. He is also thankful to the Ministry of Education for the award of a Senior Research Scholarship, during the tenure of which these investigations were carried out.

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A further note on *Limnia paludicola* Elberg (Dipt., Sciomyzidae)

By L. N. Kidd

In a previous note (Kidd, 1967), I referred to the species described by Elberg (1965) as *Limnia paludicola*. Commenting on my remarks in a footnote, the late J. E. Collin pointed out that "small differences *within the range of normal variation*, must be expected, especially in

the case of differences in *certain parts* only of its genitalia". He concluded by saying that to him it appeared obvious that *paludicola* Elb. could not be considered a distinct species from *L. unguicornis* Scop.

Since writing the above note I have, through the kindness of Dr. L. V. Knutson, been able to examine specimens of the genus *Limnia* taken in Finland, Sweden, Denmark, Germany, Austria, Italy, Belgium, France and England, and further British material was kindly sent to me by Mr. P. J. Chandler and Mr. L. Parmenter.

The material sent by Dr. Knutson had already been separated into the above two species and working over it myself I separated as *L. paludicola* the same specimens already determined as this species by Dr. Knutson. In each case the specimen seemed to be distinct in the shape of the anterior and posterior surstyli of the male as pointed out in the original description. Furthermore, none of the slight variations noted in *unguicornis* appeared to approach *paludicola* in form.

Elberg (1965) has pointed out that there are differences in distribution by habitat in Estonia, and in correspondence with me he says that he has found *L. paludicola* only in habitats with *Sphagnum* or peat, and has never found *L. unguicornis* on fens, swamps, marshes, etc. But in river valleys and on swampy shores of eutrophic lakes both species are often found together. However, in this case he states that transitional forms are not encountered. He further points out, "the independent status of the new species is not in doubt, since there is apparently a distinct reproductive isolation between their populations". Further distribution records of both *L. paludicola* Elb. and *L. unguicornis* Scop. are given in Elberg (1968) which deals with Sciomyzidae taken in Lithuania.

When describing *L. paludicola* Dr. Elberg stated that the female could also be easily distinguished from that of *L. unguicornis* by the colouring of the thorax. In *paludicola* the median longitudinal stripe of the scutum is dark brown and is only lightly, if at all, dusted. A number of females provisionally identified as *paludicola* by Dr. Knutson agree with Elberg's description and two females taken by myself at Askham Bog, Yorkshire, in July 1954 also appear to be this species .The latter determination also seems to be confirmed by two males taken at Askham Bog on the same day, which possess the male genital characters of Elberg's species.

In view of the fact that Mr. Collin dissected only seven specimens (see Collin 1966) it may well be that he only examined one species. Whilst it is still possible that intermediate forms may eventually be found between *L. unguicornis* and *L. paludicola*, until these turn up I venture to suggest that it is a little premature to write-off the latter as an unacceptable species.

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Kidd, L. N. 1967. A note on *Limnia paludicola* Elberg (Dipt., Sciomyzidae). *Ent. Rec.*, **79** : 22.

Werneth Park Study Centre and Natural History Museum,
Frederick Street, Oldham, Lancs.

Current Literature

De Nederlandse Bladrollers (Tortricidae) by **G. A. Graaf Bentinck** and **D. Diakonoff;** Monographs of the Dutch Entomological Society No. 3, 201 pp. + 99 plates, 70 Guilders.

The abstract with which the book commences reads: "An iconography of the Dutch Tortricidae proper (i.e. excluding Cochylidae), comprising photographic illustrations of wings and ♂ ♀ genitalia of each of the 276 species recorded from the Netherlands, with keys to genera and species, and brief descriptions of colour and pattern of each species, of the ♂ and ♀ genitalia, larva, life habits, occurrence and distribution in the Netherlands."

With the above description, it might be thought that little remained to be said about this work, but the handling of the subject must also be brought to the notice of the would-be reader.

The Introduction opens with an account of the ltierature on the subject since Snellen's De Nederlandische Vlinders, Microlepidoptera published in 1882. This is not confined to Dutch works, but includes many in other languages which would be of use to Dutch students of the group. There follows the author's acknowledgements of the help given by many well-qualified people. An important section of the Introduction deals with the making of genitalia preparations and the apparatus necessary for carrying out this important operation. The method of studying wing neuration is also treated, and the Intorduction closes with a list of the abbreviations used for the names of authors cited with the species.

The text proper opens with a description of the Tortricid wing neuration with large line drawings of the neuration of *Pandemis corylana* F. and *Bactra lanceolana* Hb., and also line drawings of the ♂ and ♀ gentitalia of *Archips xylosteana* L. represenitng the Tortricinae and of *B. lanceolana* Hb. as representing the Olethreutinae.

The subfamilies are then keyed, and these in turn are keyed for genera, and finally the genera, as they occur, are keyed for species. Each species is given a short description as indicated in the Abstract. A short glossary of terms follows, and then a systematic list of the Dutch species. Other appendices include a bibliography or the works quoted, an alphabetical index of genera and a similar index of species.

The plates follow; 28 of them illustrate the wing pattern by enlarged photographs, 15 to a plate. Where necessary the ♂ and ♀ wing patterns are both shown. Plates 29 to 99 illustrate the ♂ and ♀ genitalia from photographs, four species to a plate.

The volume is very well printed on good paper, with the plates on glazed art paper; it is issued with a strong paper cover, and although, as is to be expected, the text is in the Dutch language, the book is one which will be of great use to anyone interested in the European Tortricidae, and should find its place in the libraries of all microlepidopterists.—S.N.A.J.

Notes and Observations

MARITIME LEPIDOPTERA FOUND AWAY FROM THE SEA.. — The following instances of moths, normally restricted to coastal zones, being found inland may be of interest. All the insects were taken in a light trap here in Burghclere, on the Berkshire-Hampshire border, the distance to the nearest sea-coast (not counting Southampton) being about 40/45 miles.

Aspitates ochrearia Rossi: two in 1963; three in 1964, and one in 1967.

Hydraecia paludis Tutt: One in 1968. This has been identified at the British Museum, and a slide made of the genitalia.

I know that some moths, usually found at the sea-side, are in fact more addicted to sand or shingle than to salt water. Examples are *Agrotis vestigialis* Hufn., found in sandy areas inland, and *Dasypolia templi* Thunb. found on screes in the Central Highlands of Scotland. But as far as I know *A. ochrearia* and *H. paludis* have a genuinely maritime distribution.

I wonder whether any other readers have noticed similar inland wanderers.—AIR MARSHAL SIR ROBERT SAUNDBY, K.C.B., Oxleas, Burghclere, Nr. Newbury, Berks. 8.v.1969.

A PREVIOUSLY UNPUBLISHED RECORD OF ADOXOPHYES ORANA F. v. R.—Mr. Wakley's interesting note on *Adoxophyes orana* (*antea* p. 95) prompted me to look out the only specimen that I have ever taken of this local Tortricoid. It is ♂ an was disturbed from some bushes at High Halstow, Kent, about mid-day on June 5, 1959.—J. M. CHALMERS-HUNT, St. Teresa, Hardcourts Close, West Wickham, Kent. 9.iv.1969.

PARASITISM AND DISEASE IN CAENOPHILA SUBROSEA STEPHENS (ROSY MARSH MOTH).—Having collected larvae of *Caenophila subrosea* in Carnarvonshire in May 1968, I was fortunate to rear a variable series of this very local and handsome Noctuid. When full-grown, the larvae spun slight cocoons in damp moss and the pupae were then kept relatively moist to stimulate to some extent natural conditions, with the result that there were casualities in the pupal stage.

On the other hand, I lost several larvae from parasitism as well as a fair number from a curious form of virus. The body of a larva killed by this virus was characteristically rigid and quite hard to the touch, and if not long dead, strangely similar in general appearance to a normal healthy larva. The first case of death from virus was noted in a larva a day or so after it had been collected. thus indicating that the disease was a feral condition.

Several of the larvae were parasitised by *Apanteles rufienus* Hal. (det. G. E. T. J. Nixon), the batches of yellowish cocoons producing numerous examples of this small hymenopteron. From another larva, there issued a single grub which formed a neat, moderately proportioned blackish oval cocoon 16mm. long, from which on June 29, there emerged a reddish-brown ichneumon, *Netelia ocellaris* Thoms. (det. J. F. Perkins). Mr. E. A. Sadler (*in litt.*) asked me to put on record that in 1968 he bred from a small *subrosea* larva from the same locality as those above, a single specimen of the hymenopterous parasite, *Rogas nigriceps* Wesm. (det. R. D. Eady).—J. M. CHALMERS-HUNT, St. Teresa, Hardcourts Close. West Wickham, Kent. 9.iv.1969.

TETRIX SUBULATA (L.) (ORTHOPTERA: TETRIGIDAE) IN PEMBROKESHIRE.—O 18th May 1968 a female of this ground hopper was captured a mile north o Haverfordwest, Pembrokeshire. The habitat was the transition betwee *Juncus effusus* (L.) marsh and grazing pasture where the ground had bee liberally trampled by cattle.

TIPULA CZIZEKI DE JONG (DIPT.; TIPULIDAE) IN LANCS., MIDDX. AND SURREY —During the autumn of 1968 a watch was kept for *T. czizeki* which closel resembles the common species *T. oleracea* L. and *T. paludosa* Mg. Th latter two have long periods of emergence, and though all three can occu in October, *T. czizeki* is apparently only to be found in that month. An males seen in October were collected since these may indicate a nev period of emergence, whereas females would probably represent the en of the earlier autumn peaks of the common species. The occurrence of *T. czizeki* was established at three localities and one may suspect that this i an overlooked rather than rare species. R. L. Coe (1950, *Handb. Ident Brit. Int.*, **9** (2): 1-66) gives the distribution of *T. czizeki* as Yorks., Lancs. Bucks., and Herts, and there are records for a few other counties.

T. czizeki was first taken on 20th October within 400 yards of my hous in Middlesex where males were flying freely over an old rubbish dump The situation is completely open at the top of a west facing bank. Th fly was confined to an area of about 10 square yards where the grass, *Po pratensis* L., was long and there was fairly dense field thistle, *Circium arvense* L. I had gone to this spot to collect some *T. obsoleta* Mg. which was abundant on 13th October, but by this time the emergence was over This spot was rather interesting since open grassland is normally so poo in Tipulid species. My next encounter with *T. czizeki* was on 23rd Octobe when a very brief visit was made to Meathop Moss, near Grange-over Sands, North Lancs. A male was found, together, with a few *T. pagana* Mg., flying over *Eriophorum* and *Erica* bog.

Two males and a female *T. czizeki* can be recorded for Wisley, Surrey Mr. K. Harris has been retaining for me the tipulids caught in a Rotham sted tungsten bulb light trap which runs every night in his garden next t Wisley Common. The specimens were in a box containing material fo October-November. There are many possible source habitats in the immediate neighbourhood.

My thanks are due to Lake District Naturalist's Trust for kindly grant ing me permission to collect on their Reserve at Meathop Moss.—ALAN E STUBBS, 91 Clitherow Avenue, Hanwell, London, W.7.

CATOPTRIA PERMUTATEILUS H.-S. (CRAMBUS MYELLUS Hübn.) IN MORAY SHIRE.—Whilst working M.V. light in a mixed wooded area on the out skirts of Forres on 12th August 1968, three specimens of this species visited the sheet. I understand that the insect has not previously been recorded for Morayshire. — M. J. LEECH, 8 Dukes Way, Formby, Lancs. 25.iv.1969.

HARMINIUS UNDULATUS DEGEER (COL. ELATERIDAE) IN NORTHUMBERLAND.— On 18th May 1968, whilst out collecting at Dead Wood, between Rochester and Byrness in Redesdale, Northumberland, with Dr. A. G. Long, a pupa of the above species was found in a decaying birch stump. Dr Long kindly gave me the pupa which emerged on 9th June. From literature available, the distribution of this rare species seems to be confined to

cotland and it is therefore worth recording that it has been found south f the border.—M. J. Leech, 8 Dukes Way, Formby, Lancs. 25.iv.1969.

The Holly Blue (Celastrina argiolus L.): A Very Early Date—I am riting, rather tardily, I feel, to record the capture of a male *Celastrina rgiolus* L. at Maidencombe, near Torquay, South Devon, on the after-oon of 20th March 1966, where I was staying with Mr. F. H. Lees, as his is a very early date for this butterfly to be on the wing. Actually, am given to understand that this is the second earliest known date for British specimen. The location was on the cliff top with a southern spect, near some ivy, on the bloom of which the larva must have fed uring the previous autumn. Obviously the pupa must have been very avourably situated, from the warmth point of view, to encourage the utterfly to emerge at such an early date in the year. The weather at he time was bright and sunny, but no more specimens were seen for hree weeks, as the weather continued to be rather cold.—Peter Crow, 2 Harvey House, Westcote Road, Reading, Berks. 19.iv.1969.

The New Plusia—After reading Mr. B. J. Lempke's article in the April Record (*antea* 101) on *Autographa* (*Plusia*) *festucae* L. and *A. gracilis Lempke*, I have had a good look at my short series of what I had hitherto regarded as *festucae* and guided by the second paragraph in his article and the excellent photograph accompanying it, I have satisfied myself that of six specimens that I took at Aviemore on 3rd and 5th July 1949, within a few yards of each other, two are *gracilis*.

It would be interesting to know whether this species has been recorded from any locality further north in Scotland.—H. Symes, 52 Lowther Road, Bournemouth, Hants. 23.iv.1969.

Stomopteryx sangiella (Stt.) in Kent.—A series of a *Stomopteryx* species emerged between 4th and 16th June 1967, later determined by Mr. J. D. Bradley, after examination of the genitalia, as *Stomopteryx sangiella* (Stt.). The larvae were collected on the North Downs feeding upon *Lotus corniculatus* at the same time as I first discovered the larval cases of *Coleophora niveicostella* (Zell) on *Thymus serpyllum* on 31st March 1967. It is hoped that further careful observation this spring will provide full information. As far as I can ascertain, the only previous records of *sangiella* are mid-Sussex, 1929 (*Entomologist*, **65**: 163), and Meyrick (*A Revised Handbook of British Lepidoptera*: 641) gives Durham as a locality, and there have been several recent records of its occurrence in Ireland.—N .F. Heal, Fosters, Detling Hill, near Maidstone, Kent. 21.iv.1969.

Current Notes

Insect Distribution Maps Scheme—Mr J. Heath of the Monks Wood Experimental Station of the Nature Conservancy at Abbots Ripton, Huntingdon, asks for those interested to be advised that this scheme is now being extended to the Orthoptera, Dermaptera and allied orders. He states that recorders are urgently required all over the country, and that full details of the scheme will be sent to all who write to him at the above address.

For the scheme to be thoroughly successful it is most important that as many recorders are available as is possible and the lack of an advanced knowledge of these insects should not deter those interested: this will make an excellent opportunity to improve their knowledge.

Obituary

LEONARD PARMENTER

Leonard Parmenter was born on 22nd December 1903 in London; he was educated at Marylebone Grammar School and the City of London School. He entered the banking business and retired as a branch manager, which experience enabled him to take over the treasurership on the retirement of Mr. Clifford Craufurd with such effciency. He spent much time working out statistics helpful to the management of the Record, and in giving to the full of his skill and energy with the object of increasing the circulation of the magazine, with its enlargement as an ultimate objective.

He was a life member of the City of London Natural History Society, in which he had held most of the offices, and he joined the South London Entomological and Natural History Society in 1946, and became a life member of that society also.

His interest in the diptera is dealt with in a separate article, but there are many young dipterists who have been stimulated and helped by his writings and advice. He made a great point of studying literature from abroad, and the application of information from these sources enabled him to add several species to the British list, and also to add to our knowledge of some of the rarer British species.

During the 1939-45 war, he served in the Intelligence Corps for four years, with the rank of captain.

The energetic help which he gave to the London Society was very greatly appreciated, and, with H. W. Andrews, he did a very great deal to extend the interest of "South London" members in the diptera eventually having many skilled workers in the order to his credit.

His good nature was appreciated by all but, very wisely, he never allowed this good nature to deter him from following what he considered to be the correct course: on the other hand, if he were convinced that he had been wrong on a point, he changed his stand accordingly with a very good grace.

Parmenter's retirement to Ferndown in Dorset looked like the commencement of a happy period of his life wherein he would be able to be close to his family, and follow his hobbies of entomology and gardening. Unfortunately, last year vascular trouble compelled him to limit his activities drastically, but this wise curtailment failed to improve matters, and a coronary thrombosis necessitated his removal to Poole Hospital, where he received treatment. He stayed there for the customary six weeks, but it was found that he failed to respond to the treatment, and he returned home to the care of his own doctor. He failed however, to recover sufficiently to enable him to follow his interest in his diptera collection and correspondence, and died on the 4th March. The great effort made by his wife to give comfort to the last months of his life was apparent to all his friends, and to his widow and their two daughters and their families we offer our very sincere sympathy.

There are very many dipterists who will miss his kindly advice and help, and I will always look back on the all too few years I had the privilege of working together with him in the management of The Record with pleasure and admiration for his skill and personality.—S.N.A.J.

PARMENTER AS A DIPTERIST

In his younger days Len Parmenter was a keen ornithologist, and as recorder to the Ornithological Section of the London Natural History Society—the society which retained his main loyalty throughout his life—he was very active in the pursuit of his hobby. But in the early 1930s he became interested in Diptera, and from then onwards this was the principal occupation of his leisure hours. I believe the main factor which led him to turn from birds to flies was the arrival of his children: he once told me that when he had to take regular turns at baby-sitting he cast round for a natural history interest which could be pursued within earshot of the infants, i.e. in his own back garden. His bird-watching friend, C. L. Collenette, who worked on Lepidoptera as an Associate of the British Musuem (Natural History), suggested the Diptera as a group which would meet this criterion—and indeed over the years the list of flies which Parmenter captured in that very small garden at Thornton Heath grew to a huge length. Collenette introduced him to the professional Dipterists at the Museum, and although one of them told him that the Diptera were not a suitable Order for an amateur to take up, Parmenter was not to be discouraged, and quickly found in flies an absorbing interest, of which he never tired.

There were perhaps two aspects which stood out as characterising Parmenter's work in the field of Diptera. Firstly, he was above all an ecologist. Over some 30 years he contributed dozens—possibly hundreds—of papers and short notes to a wide range of entomological and general natural history journals, and a very large proportion of these dealt with the activities of living flies—their relations with plants, their feeding habits, courtship behaviour, predators, etc. He probably added as much as anyone has done to our knowledge of the habits of British flies in the wild. This achievement was partly due to his readiness to write up his observations for publication. How often one has read in obituary notices about the loss of useful knowledge when an experienced naturalist dies, who has not had the inclination or opportunity to put his knowledge into print. This cannot be said of Parmenter. But he did not fall into the error of writing too much, since whatever he wrote was essentially readable, and concerned flies as living organisms in relation to their environment, not as dead specimens or as taxonomic concepts; and while it could be argued that too much space is taken up in the journals on theoretical work, which is often superseded later, the facts that Parmenter reported from his experience in the field must be of permanent value.

Parmenter's collection of flies was not a thing of beauty. It was housed entirely in store-boxes, and he collected so rapidly that there was never time to arrange the species in orderly rows and columns. It was often difficult to see where a cluster of one species gave way to the cluster of the next one in the genus! He did not set his specimens carefully, but took only the minimum of trouble necessary to facilitate identification. He rarely got down to the delicate work of preparing microscopic mounts of genitalia, which was not congenial to him. But he always tried to name his captures himself, only referring them to specialists when he was baffled, or when some group was being revised. He was interested in the whole of the Order, though perhaps especially in Brachycera and the Syrphidae, groups where the adult flies have distinctive habits. Leaf-miners were another special interest, manifesting his ecological bias.

All these characteristics emphasize that he was primarily a field naturalist. Now of course many if not all of our leading Dipterists (and other entomologists) have gone through this phase, and have then withdrawn into narrower specialist interests centred indoors. Parmenter was unusual in combining intellectual ability with a continuing predilection for field work throughout his life. Perhaps it is significant that in their book *Flies of the British Isles* (1951) Messrs Colyer and Hammond acknowledge their indebtedness to Parmenter "for many hours of congenial company whilst collecting and for much valuable practical knowledge imparted to them, *particularly in the field.*" [my italics].

He was instrumental in adding a number of species to the British list, and several to science. This arose from his practice of collecting practically every fly he could, and of doing this on a micro-habitat basis. Thus when a specialist came to work on a particular group of flies Parmenter could always be relied on to produce a boxful of specimens collected over a long period from many parts of Britain, all with very full data of habitat, etc. He was an indefatigable recorder, and his notes were very efficiently organised for future reference.

His second marked attribute was the attention he paid to young Dipterists. Over a long period he was responsible for encouraging in the study of flies a number of young men who have since achieved great success in this field, and he was always ready to put his encyclopaedic knowledge of the Order and of its scattered literature at the disposal of those less experienced than himself. In pursuance of this constructive attitude he wrote over the years a large number of educational articles in such journals as the *Bulletin of the Amateur Entomologists' Society* and *Countryside.*

Such was his devotion to amateur entomology and to the encouragement of beginners that after a long spell of holding senior offices in his beloved London Natural History Society, culminating in a period as president, he was content to take on the comparatively humble office of secretary of its struggling entomological section, rather than see the section languish.

Parmenter was a tireless correspondent to within a few months of his death, and although he was on terms of friendship with virtually all the leading professional and amateur Dipterists in the country, and corresponded and exchanged separates with many foreign Dipterists as well, he could always spare the time — and thought — to write helpful and stimulating letters to a beginner, and these letters and the activities which they directly inspired will ensure for many of us that he is not forgotten in our day.—R.M.P.

EXCHANGES AND WANTS

For Sale or Exchange.—Butterflies and moths. Many species from Africa, Madagascar, Formosa, and other countries. Expected pupae *Pseudanteraea discrepens* and possibly other species from Central Africa. List on request by sending 1/- stamps.—*Robert Keiser*, Frederik Van Eeden Plein 3, Antwerp 1, Belguim.

Wanted.—Specimens of *Pararge aegeria*, and *Pieris napi* from Scotland and Northern England.—*George Thomson*, 98 George Street, Dunblane, Perthshire.

Urgently Wanted for field work, pupae of *Biston betularia*. Female pupae 1/- each or exchange.—*Dr. H. B. D Kettlewell*, Department of Zoology, Parks Road, Oxford.

Wanted.—Information *and* data on the distribution and habitats of *Coccinella 11-punctata* (Eleven-spot Ladybird) for an investigation into this species. *All* records welcome.—*J. Muggleton*, Dept. of Botany, Science Laboratories, South Road Durham.

For Sale.—Private collection Ornithopthera, and 500 species from Russia, Japan, Australia, New Guinea, Malaya, Africa, and Solomon Islands. Many Charaxes and Papilios. To be sold as one lot.—Please reply to *R. H. Morgan*, 108 Titirangi Road, New Lynn, Auckland 7, New Zealand.

Urgently Required—A good clean copy of "The Butterflies of Southern Africa" (Part 1, Papililionidae and Pieridae) by G. van Sen, published by Transvaal Museum in Pretoria.—Reply with details to "The Entomologist's Record", 59 Gurney Court Road, St Albans, Hertfordshire.

Wanted.—Male Ornithoptera *Croesus lydius* and ♂ *O. croesus croesus*.—Full details to *Dr. A. D. Morton*, 37 Templeway West, Lydney, Glos.

Wanted.—A Second-hand Robinson M.V. Moth Trap, with or without electrical fittings and in reasonable condition.—*B. F. Coles*, Rose Cottage, Weston-on-the-Green, Bicester, Oxon.

CHANGE OF ADDRESSES

P. H. Lawson, Ridlarks Cottage, Ridlarks Lane, Limpsfield Chart, Oxted, Surrey.

H. L. Burrows, 9 Ascol Drive, Plumley, Nr. Knutsford, Cheshire.

Dr. A. Eve, Books for Naturalists, Ford Mill, Hillfarrance, Taunton, Somerset.

CONTENTS (June, 1969)

LEPIDOPTERA OF KENT, VOL. II

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

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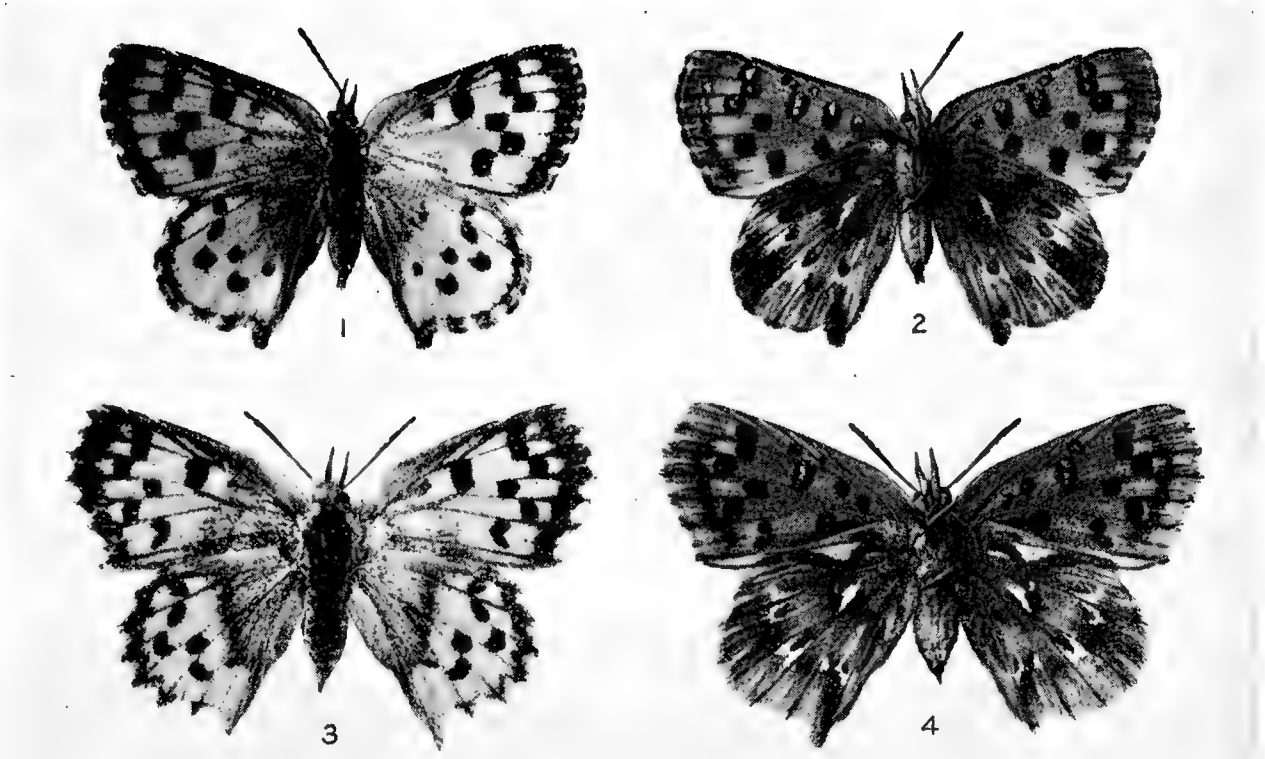


Poecilmitis atlantica and *P. brooksi tearei*: *Neallotype* ♀♀.

Fig. 1. ♀ Neallotype, *Poecilmitis atlantica* (upperside).
Fig. 2. ♀ Neallotype, *Poecilmitis atlantica* (underside).
Fig. 3. ♀ Neallotype, *Poecilmitis brooksi tearei* (upperside).
Fig. 4. ♀ Neallotype, *Poecilmitis brooksi tearei* (underside).

Descriptions of the Neallotypes of Two Cape *Poecilmitis* Butler (Lepidoptera: Lycaenidae)

By C. G. C. Dickson

When describing *Poecilmitis atlantica* and *P. brooksi tearei* (Entomologist's Record, **78**: pp. 181-182 and 217-219 respectively, 1966) only the males of these insects were dealt with by the present writer, and descriptions are now being given of the females.

Poecilmitis atlantica.

Forewing with the distal margin rounded, or nearly so.

Upperside.

Blue from wing-bases (as is usual in females of the *P. thysbe* group) much duller and in the forewing more restricted than in the male.

Forewing. Blue extends to a black spot in cell (leaving a broad, rather light brownish costal strip above cell) and has its outer margin running down irregularly to a point about half-way along innermargin. (Some slight iridescence occurs, in places, over the orange area, beyond the edge of the main blue colouring). The black spotting (well developed in the neallotype) and margins as in the male but the spot in area 1a very distinct and well clear of the blue area. Cilia with broad blackish-grey spaces at vein-ends and narrow white, or nearly white, divisions (as in the neallotype); or dark-greyish with inconspicuous lighter divisions.

Hindwing. Blue from base of about same extent as the "solid" blue in the male but running, narrowly, along innermargin closer to anal-angle; in cell, more or less bounded by a narrow black disco-cellular streak. No iridescence over the orange portion of the wing beyond the blue area. The black spotting completely developed but, in the neallotype anyway, less heavy than in the forewing. Wing margined narrowly with black, the edging broader superiorly, where it merges into a brownish streak above vein 7, and not in all specimens entirely continuous towards anal-angle. Cilia much as in forewing but the chequering not as well defined on the whole, even in specimens in which it is more clearly variegated (but, in such specimens, with long white spaces in areas 6 and 7).

Underside.

Forewing. Like that of male; in the very clearly marked neallotype the submarginal dark, curved streak largely obscured by steely scaling in areas 4 and 5. Cilia as in male, the clearness or otherwise of the dark and light spacing varying in individual specimens in accordance with that of the upperside.

Hindwing. As in male, in general, some specimens showing more contrast than others in the dark and light markings of the wing—this being marked in the neallotype, in which there are well defined, dark, roundedly-pointed projections forming an irregular series across the median portion of the wing. The characteristic liturae and other light markings not, or hardly, metallic in any of the specimens examined. One paratype with a clear, narrow, dark edging to the wing. Cilia as in male, and varying in the degree of variegation, as in forewing.

Length of forewing: 13-14 mm. (13 mm., in neallotype).

♀ Neallotype, WESTERN CAPE PROVINCE: Lambert's Bay, 6.x.1966 (W. Teare); specimen presented by Mr Teare to British Museum (N.H.); British Museum Reg. No. Rh. 17107.

Paratype in author's collection, data as neallotype, 30.viii.1963, 1 ♀ (C.G.C.D.).

Paratype in Coll. W. Teare, as neallotype, 1 ♀.

Paratypes in Coll. K. M. Pennington, W. CAPE PROVINCE: as neallotype, 4.i.1967, 1 ♀ (K.M.P.) Junction Elands Bay and Lambert's Bay roads, 29.ix.1967, 1 ♀ (K.M.P.). Additional specimen seen—specimens loaned for examination by Mr Pennington.

Paratype in Coll. Transvaal Museum, as neallotype, 7.x.1966, 1 ♀ (R. Badham).

In some of the females which obviously belong to this species the blue of the forewing (and sometimes that of the hindwing also) is rather more extensive than in the neallotype and at least one of the paratypes. Unlike the males of the two insects, certain females are, in fact, apart from their smaller size, difficult to separate from some of the females of the more usual representative of the *thysbe* group which occurs in the vicinity of Lambert's Bay (*vide* Ent. Rec., **78**: 182).

The writer was not successful in procuring good specimens of the female when visiting Lambert's Bay in early September, 1966, as the few specimens which were seen proved evasive and difficult to catch—although several perfect males were netted. The late Russell Badham and W. Teare took examples of both sexes in this locality in the same year, as did K. M. Pennington and others on various occasions. The butterfly has a wider distribution than was apparent from the earlier captures.

Poecilmitis brooksi tearei.

Forewing without the sharp angulation of the male, marginally, at the end of vein 4.

Upperside.

Blue from bases, in all wings, somewhat more extensive than in the majority of females of the nominate race.

Forewing. The small additional extent of the blue, mainly apparent in the lower portion of the wing. Cilia dark at vein ends, with the intervening spaces orange inwardly and white outwardly—the white portions not very prominent.

Hindwing. Black streak closing the cell relatively broad, the blue area as a whole bounded outwardly by rather diffuse black scaling—a noticeable feature in all specimens under examination. Cilia, with the conspicuous white portions towards the upper angle of the wing, less pronounced in the neallotype than in at least one of the paratypes.

Underside.

Like that of females of the nominate race, allowing for some individual variation in such specimens.

Length of forewing: 14-16·5 mm. (14 mm., in neallotype).

♀ Neallotype, WESTERN CAPE PROVINCE: Riversdale, 19.x.1966 (W. Teare); specimen presented by Mr Teare to British Museum (N.H.); British Museum Reg. No. Rh. 17106.

Paratypes in Coll. W. Teare, data as neallotype, 2 ♀♀.

In the above specimens the costal margins of all wings are, on the upperside, at least partly scaled with black or blackish-brown, to a fair

depth. The black spotting and other marking is also well developed in these specimens. It is of interest to find that the present female specimens do diverge somewhat from nominate females of *P. brooksi*, with the difference understandably less than in the males of the two races—as is normally the case with closely allied taxa of this group.

When revisiting the type-locality in 1966, in company with the late Mr Russell Barham, Mr Teare was fortunate enough to secure further males as well as the females, of this butterfly, and according to him the males were in all cases as distinctive as the original ones and gave full confirmation of the subspecific status of this insect.

The preparation of this article would not have been possible without the kind co-operation of the late Mr Russell Badham and Mr W. Teare in furnishing the necessary material.

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

Acrolepia perlepidella Stainton (Lep.: Plutellidae)

By J. M. Chalmers-Hunt

EARLY HISTORY

The earliest reference to this very pretty little moth is to be found in Stainton (1849: 19), at which time it appears that only two specimens were known. After describing it as new, he says:—"Two specimens: one in the Bentleyan collection (as Formosella), one in Mr Douglas's collection." In Stainton (1854: 170), a third example is recorded thus: "a specimen recently taken in Darenth Wood, in May, is in Mr Shepherd's collection".

The discovery in Britain of a species new to science and of such attractive appearance doubtless created a particular interest, and by 1858 it had been found at "Brs" (=Bristol) and as such was recorded in Stainton (1859) but without details. According to Hudd & Griffiths (1914: 37), the "Brs" records in Stainton's *Manual* were contributed by two well-known microlepidopterists, Messrs. Sircom of Brislington and P. H. Vaughan of Redland.

Barrett (1879) states that W. H. Grigg, of Bristol, caught several specimens of the moth in 1876. The foodplant was still unknown, nor had anyone previously even suspected the correct pabulum, but in the spring of 1879, Grigg with considerable ingenuity, succeeded in discovering the foodplant as *Inula conyza*, and in breeding the insect from mines that he had collected from it. Some of these mines he presented to Barrett, who (*loc. cit.*) wrote a detailed description of the nearly full-grown larva, of the cocoon, as well as a most interesting account of some of the larval habits. No mention is made of the locality of Grigg's *perlepidella*, but in Hudd (1884: 85) is the following note: "Leigh Woods and the bank of the Avon. Mr Grigg succeeded in discovering the larvae of this local insect, mining the leaves of *Inula conyza* in Leigh Woods, in the spring".

In E. R. Bankes coll. in BMNH are ten *perlepidella* bearing data. Some of these are labelled as from Grigg, others as from W. Machin and Hodgkinson, but all appear to have come from the Bristol district. One that is labelled "W. H. Grigg/Bristol/1892", may have been among the

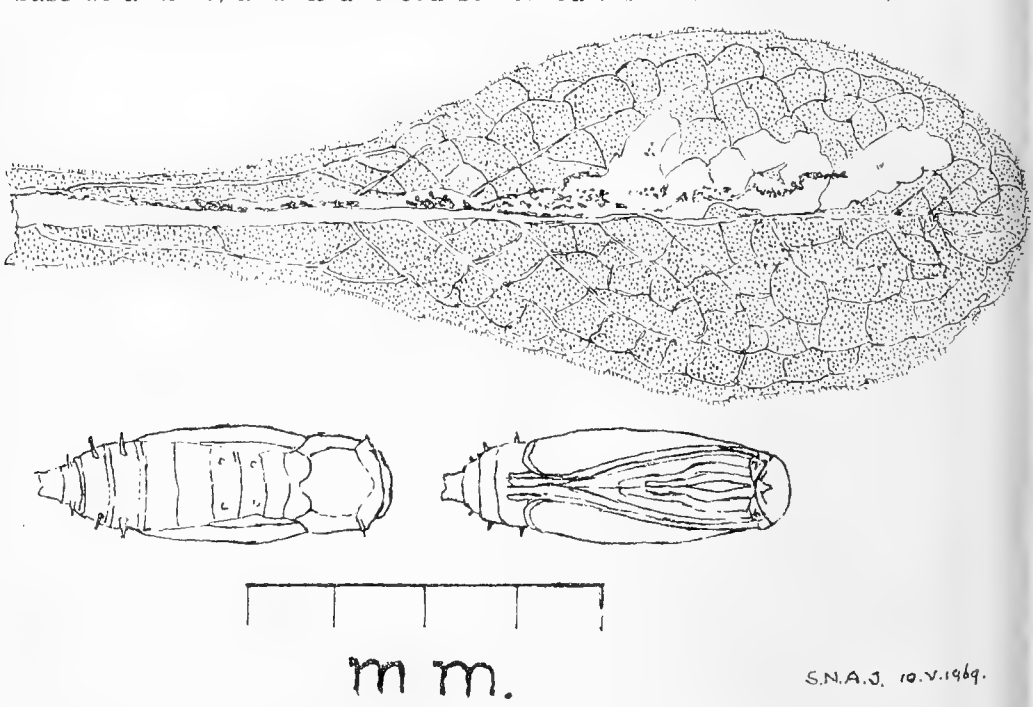
last to have been taken there, at least we have no knowledge of its having been seen there since.

RECENT OCCURRENCE

On May 11, 1967, after a lapse of some 75 years during which the species appears to have remained unnoticed in this country[1], Mr E. S. Bradford was examining a plant of *I. conyza* from the downs above Trottiscliffe, Kent, when he was delighted and not a little astonished to perceive thereon a freshly emerged *perlepidella*. The plant was one of several *I. conyza* that were dug up for him by Col. A. M. Emmet as food for *Coleophora conyzae* Zeller, on the S. London field meeting on April 29 that year. The following year, at the S. London meeting at Trottiscliffe on April 28, several members took leaves of *I. conyza* which were evidently mined by the larva of *perlepidella*, but failed to breed the insect.

I next visited the locality on April 25, 1969, and on this occasion was fortunate to find several mined leaves. A small larva accidentally disclosed from its mine measured 4mm., was yellow with dark yellowish-green dorsal line, and had a brownish-black head. During the whole of its existence, the larva apparently never quits the mine, and though I vainly endeavoured to induce this particular larva to recommence feeding—trying it with both the old mine, and as a last resort the parenchyma of a fresh leaf—it failed to do so and eventually died from starvation.

On a further visit on May 2, I found a number of full-grown larvae, also several cocoons each of which was situated in a leaf stalk at the base of a mine, and in due course reared a series of the insect, the moths



[1] I have since come across the following record by T. Bainbrigge Fletcher for Gloucestershire, in Fletcher & Clutterbuck (1943, *Proc. Cotteswold Nat. Fld. Club*, **28** (2), 66): "Rodborough, 28.v.43, flying around *Inula conyza*". Furthermore, Mr J. Newton (*in litt.*) tells me that he took a specimen from near Tetbury, Gloucestershire, on 22.v.1925 (C.-H.).

emerging from May 16 to May 28, with no parasites. I understand that mines have also been taken this year at Trottiscliffe, by Col. Emmet and Messrs. Wakely and Heal, all of whom reared moths.

When I gave Mr Jacobs the mine shown for illustrating, the larva was not visible so that I assumed that it had finished feeding and was either preparing for pupation or had already done so. What I did not know then, however, was that the larva feeds at night, and towards full-growth may rest during the daytime at the base of the mine out of sight. This was evidenced by the fact that after drawing the mine, the following morning Mr Jacobs noticed that a further lobe had been added to it during the night!

There is a coloured figure of the imago by Jacobs (1949-50), but in my specimens the orange, purple-fuscous and pale yellow markings are more contrasted, so that the insect appears a good deal more handsome than it is depicted. This is explained by the fact that the only model to be had was an old specimen.

The species seems to be quite local, at least in Kent, and I could only find the larva to occur over a range of about half a mile. Examination of the food-plant immediately beyond these limits, both to the west and to the east of this chalk down, showed no sign of its presence. I suspect that the species may still occur near Bristol (notwithstanding the statement in Turner (1955: 178) that it is "now possibly extinct" there), almost certainly so on the limestone slopes about Rodborough, Glos., and perhaps elsewhere on steep hillsides that have escaped the plough and where there are good concentrations of the foodplant.

In conclusion, I wish to thank Mr S. N. A. Jacobs for his drawing of the pupa and mine, and at the same time to draw attention to the curious lateral protruberances on the pupa.

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1 Hardcourts Close, West Wickham, Kent, 10.vi.1969.

Apatura iris
Return of the Prodigal Son

By Major-General C. G. Lipscomb, C.B., D.S.O.

For several years now I have reared larvae of Apatura Iris on Sallow bushes in my garden with varying degrees of success, releasing the resulting butterflies in Blackmoor Copse Reserve.

Up to last winter I had always kept the larvae enclosed in a sleeve and had noticed that although the great majority spun pads and started to hibernate on Sallow twigs near the top of the sleeve a proportion of them eventually moved down a foot or so to a final resting place in a fork as near the bottom of the sleeve as they could get.

The timing of this second move varied but I have never known it to occur after the end of December. Last autumn I had two larvae from ovae found in July and determined to see what happened when they were given the free run of a Sallow bush in my garden.
fruits and catkins; burnt areas.

The bush selected was about 5 ft. high, sheltered by a high hedge from the East and South but open on the other two sides. At the base the trunk was 4 inches in circumference and a fork 8 inches above the ground divided the bush into two main branches which had no contact with each other. A cage of ½ inch wire netting was constructed to enclose the bush but at no point did any part of it touch the wire. Apart from the last few inches of the trunk below the fork, which was partly hidden by bits of grass, the whole of the rest of the bush could be kept under observation and examined in detail without dismantling the wire.

During the first week in October both larvae were removed from a sleeve in another part of the garden and placed on the bush where they continued to feed spasmodically for another two weeks when they took up winter quarters alongside dormant leaf buds at the base of the leaves they had been feeding on. Larva A. positioned itself high up on a shoot near the top of the bush and Larva B. about half way down on the underside of a lateral shoot.

The larvae were kept under constant observation and no movement of any sort was noticed until larva A. was found to be missing on Christmas Day. Every visible part of the bush was examined most thoroughly more than once but not a trace of the larva could be found and I regretfully came to the conclusion that either it had left the bush altogether, which seemed unlikely, or it had been eaten by some unkown predator, which again seemed unlikely or possibly had gone to ground on that part of the base of the trunk that was partly obscured by grass.

On Easter Monday, April 7, I noticed that larva B. had moved up its shoot a matter of four inches and positioned itself alongside the terminal bud which had just started to open. I gave the rest of the bush a casual glance and was astonished to see larva A. at rest alongside the terminal bud of a shoot at the top of the opposite fork to the one from which it had disappeared. I can only conclude that it must have passed the previous 3½ months right at the base of the bush in the one place I couldn't examine and incidentally making a round trip of ten feet at the minimum. Two days later both larvae began to feed and showed no further disposition to wander.

I can think of no reason why an *iris* larva should make this long and dangerous journey in mid winter. Heslop in his book, Notes and Views of the Purple Emperor, mentions finding hibernating larvae near the base of a Sallow bush and no doubt they arrived there in the manner I have described but it still does not explain why they make the journey long after they have ceased to feed and part way through the period of hibernation. Perhaps somebody can offer an explanation.

New Species of Macrolepidoptera and a Mimicry Complex from Fiji

By Gaden S. Robinson

(Department of Zoology, University of Durham)

Summary

Eight new species of macrolepidoptera from Fiji are described. A hypothesis is put forward to account for polymorphism in the four species of Lymantriidae found in Fiji.

In June, September and December 1968, H. S. Robinson and I revisited Nandarivatu, a locality in the north of Vitu Levu, Fiji. We operated two MV light traps for a total of thirteen nights and collected some 300,000 lepidoptera. One light trap was operated at the Forestry Department rest-house in the village of Nandarivatu on the boundary between primary montane rain forest and conifer plantations at a height of 850m. above sea level. In a previous paper (Robinson, 1968) this height was erroneously given as 1100m. The other light trap was operated at one of the two nearby hilltop radio stations, Koro-O and South Ridge, at just under 1000m. above sea level. A number of new species were collected of which seven are described below. Two of these also occur in lowland rain forest and an eighth appears to be restricted to lowland forest.

The fauna of the Fijian montane rain forest appears to contain a number of undescribed endemic elements which have no close allies or representatives in the island chain of the Solomons and New Hebrides linking Fiji to New Guinea, the home of the closest allies to these montane endemics. This is not surprising, however, as little collecting has been done in the montane forests of the New Hebrides and the Solomon Islands, and in all probability there is a vast montane fauna awaiting discovery on these islands.

All type material and genitalia preparations of the species described below have been deposited in the British Museum (Natural History), hereafter referred to as B.M.(N.H.).

Prospalta caerulea sp. n. (*Noctuidae, Acronictinae*)

Female: Head, thorax and abdomen greyish-brown, paler beneath; abdomen marked ventrally with a pair of black spots on each segment. Legs grey-brown speckled with rufous scales. Forewing grey-brown, irrorated and speckled with red-brown and black particularly around the reniform. Costa marked medially with five distinct black spots. Orbicular blue-grey edged with black, conspicuous. Reniform large, conspicuous, elongated, orange-brown fringed with white, open anteriorly. Postmedial line black, narrow, becoming obsolete on joining the distal margin of the reniform. Forewing apex pale orange-brown; terminal fascia blue-grey, brown towards the inner margin. Termen fringed with brown. Hindwing grey-brown. Holotype wingspan 37mm.

Male: Similarly patterned to the female; the paratype is worn and somewhat faded.

Diagnosis: The closest apparent ally of this species is *Prospalta incertissima* Bethune-Baker **comb. n.** (*Nov. Zool.*, **13**: 209) from Malaya, Sumatra, Borneo and New Guinea. *Caerulea* lacks the small and com-

pact reniform and triangular green basal patch of *incertissima*. *Incertissima* has blue-grey markings only at the forewing apex and lacks the distinct straight postmedial of *caerulea*. The male genitalia differ markedly: in *caerulea* the valves are expanded distally; in *incertissima* they taper. *Caerulea* possesses a long process arising midway along the length of the valve, absent in *incertissima*.

Distribution: Known only from rain forest on Viti Levu—extremely rare.

Holotype: ♀, Fiji, Savura Creek (near Suva), 1966/67 (H. S. Robinson), in B.M.(N.H.).

Paratypes: ♂, Fiji, 1966/67 (H. S. Robinson), in B.M.(N.H.). 2♀♀, Fiji, Nandarivatu, 27-30.ix.1968 (H. S. and G. S. Robinson), in B.M.(N.H.).

Giaura sokotokai sp. n. (*Sarrothripinae*)

Male: Head and thorax grey above, speckled with black and rufous; abdomen brownish grey above, silver-grey beneath. Underside of head and thorax silver-grey. Legs silver-grey below, rufous above. Forewings steel-grey speckled with black and rufous, basally rufous-purple. Terminal fascia rufous, fringes grey. Subterminal line black, serrate, edged outwardly with grey. Dark rufous-purple medial and postmedial transverse bands obscured towards the middle of the wing by rufous and grey clouding which extends to the posterior margin, indistinct. Hindwing silvery-white clouded with grey at the termen, fringed with white. Paratypes exhibit some variability of marking, especially in the edging of the transverse bands with lines of deep rufous or black scales. Wingspan of holotype 24 mm.

Female: Similar to the male.

Diagnosis: The closest apparent allies of this species are *Giaura tetragramma* Hampson (*Ann. Mag. nat. Hist.* (7) **16**: 549, 1905) from Fiji and the Solomon Islands and *Giaura rebeli* Tams **comb. n.** (*Ins. Samoa* 3, fasc. 4: 208, 1935) from Samoa. Close examination and comparison of *tetragramma, rebeli* and *sokotokai* indicates their close affinity; therefore I remove *rebeli* from its original generic placing in *Barasa* and place it in the genus *Giaura*. In *sokotokai* the subterminal line is serrate: in *tetragramma* the line is straight: in *rebeli* it is intermittent but practically straight. *Rebeli* is smaller and paler than *sokotokai*. *Sokotokai* and *tetragramma* which fly together may also be differentiated by examination of the male genitalia. The long and uniformly narrow processes from the valves of *tetragramma* are expanded and flattened at the tip in *sokotokai*. The tip of the process bears a line of very small and fine black spines in both species but in *sokotokai* this is lengthened and widened so as to be easily visible to the naked eye in a preparation.

Distribution: Known only from the type locality.

Holotype: ♂, Fiji, Nandarivatu, 27-30.vi.1968 (H. S. & G. S. Robinson), in B.M.(N.H.).

Paratypes: 2 ♂♂, 2 ♀♀, data identical to that of holotype, in B.M.(N.H.).

This species is named after Mr Esira Sokotoka, Posts & Telegraph Department Supervisor at Nandarivatu to whom H. S. Robinson and I are indebted for his generous assistance in operating light traps at Koro-O and South Ridge.

Anua fijiensis sp. n. (*Noctuidae, Catocalinae*)

Male; Head, thorax and abdomen yellow above, brownish-yellow below; coxae and femorae yellowish brown, tibiae and tarsi blackish brown. Forewing lemon-yellow with a greenish tinge, darker basally. Terminal fascia reddish-brown, an oval grey-brown patch at the base fringed with black; two conspicuous black marks on the subterminal boundary towards the costa; two faint postmedial lines of purple-brown dots. Reniform black fringed with purple-brown, ringed with black, conspicuous. Orbicular a small purple-brown dot. Hindwing uniformly bright yellow. Wingspan of holotype 74mm.

Female: Similar to the male.

Diagnosis: This species bears a superficial resemblance to *Anua kenricki* Bethune-Baker (*Nov. Zool.* **13**: 259, 1906) from Ceram, Buru and New Guinea. *Kenricki* lacks the black spots on the subterminal boundary and the reniform is much paler than in *fijiensis*. The orbicular stigma is circular in *kenricki*, a dot in *fijiensis*. The hindwing of *kenricki* is paler than that of *fijiensis* and the greenish tinge of the *fijiensis* forewing is absent. *Kenricki* usually has a brown patch in the posterior of the medial fascia adjacent to the subterminal boundary and this is absent in *fijiensis*.

Distribution: Known only from the primary montane rain forest around Nandarivatu, over 900m. above sea-level—fairly common.

Holotype: ♂, Fiji, Nandarivatu, 27-30.vi.1968, (H. S. & G. S. Robinson), in B.M.(N.H.).

Paratypes: 2 ♂♂, data identical to that of holotype, in B.M.(N.H.).

Parallelia koroensis sp. n. (*Noctuidae, Catocalinae*)

Male: Abdomen grey-brown; palps, head, thorax, femora and tibiae red-brown, tarsi black-brown. Antennae black-brown, basally white on the upper surface; palps tipped with white. Forewing purple-brown, a subterminal black dot on each vein; postmedial band brown, darkening inwardly. Inner line brown, enclosing a mauve-brown medial band. Termen diffusely speckled with mauve. A faint white line bounds the apical patch. Hindwing grey-brown speckled with mauve at the termen, a small black subterminal dot on each vein, ringed with mauve. Wingspan of male holotype: 57mm.

Male genitalia: Valves small, bearing a large trifurcate claw-like clasper at the base; uncus simple, elongated; juxta with two long chitinous projections.

Female: Similar to male.

Diagnosis: The closest apparent ally of this species is *Parallelia mediifascia* Wileman & South (*Entomologist*: **53**, p. 273, 1920) from the Philippines, from which it differs markedly. In *mediifascia* the forewing apex is acute, the outer line is erratic but distinct and the postmedial band is bluish. In *koroensis* the forewing apex is blunt, the postmedial straight but indistinct at the base of the wing and the postmedial band is dark brown. The hindwing termen in *mediifascia* is white whereas in *koroensis* it is speckled with mauve, the mauve concentrated into rings around the subterminal dots.

Distribution: Known only from the primary montane rain forest around Nandarivatu, some 900m. above sea level.

Holotype: ♂ Koro-O (Nandarivatu, Fiji), 6.ix.1967, (H. S. Robinson). In B.M.(N.H.).

Paratypes: 2 ♂♂, Nandarivatu, 27-30.vi.1968, (H. S. & G. S. Robinson). In B.M.(N.H.).

Diomea fenella sp. n. (*Noctuidae, Ophiderinae*)

Male: Head, thorax, abdomen and legs deep purple-brown flecked with white, legs white at articulations. Fore- and hindwings deep purple-brown with two subterminal lines of crescentic white markings. Postmedial transverse line of white crescentic markings on both fore- and hindwings. Reniform dark, suffused. Conspicuous diffuse white fascia at base of forewing. Anal angle of hingwing with a conspicuous rectangular white mark flecked with purple. Wingspan of holotype 35mm.

Paratype: Appears to be a dark aberration, the white markings of the holotype replaced by deep red-brown.

Genitalia: Complex and remarkably modified; valve with two short slender processes, one large superior club-like process and one very long slender appendage. Flap-like distal portion of valve furnished with long hairs. Uncus simple. Aedeagus with a group of fine spines just below the hooked tip.

Female: Unknown.

Diagnosis: The closest apparent ally of this species is *Diomea rotundata* Walker (*List Lep. Ins. B.M.*, **13**: 1110, 1857) from India and Ceylon to Formosa, the Philippines and New Guinea. All specimens of *rotundata* which I have seen are smaller than the holo- and paratype of *fenella* by at least 5mm. wingspan. *Fenella* lacks the white postmedial costal mark of *rotundata;* the reniform is diffuse and not a solid black mark as in *rotundata.* The genitalia differ markedly, *rotundata* lacking processes on the valves. The aedeagus of *rotundata* lacks a hooked tip and there are no cornuti or fine spines on the vesica.

Distribution: Known only from two specimens taken in Suva, Fiji.
Holotype: ♂, Fiji, Suva, May 1966, (H. S. Robinson), in B.M.(N.H.).
Paratype: ♂, Fiji, Suva, May 1966, (H. S. Robinson), in B.M.(N.H.).

Mecodina variata sp. n. (*Noctuidae, Ophiderinae*)

Male: Head, thorax and abdomen purple-brown, palps red-brown. Fore tibiae and tarsi red-brown, fore femur, mid- and hindlegs dark grey. Forewing dark purple-brown, darker medially, reniform and orbicular black. Postmedial line red-brown, indistinct, terminating in a black subapical patch and bowing inward to join a black crescent below the reniform, ending at the posterior margin. Subterminal line of black spots fringed with brown. Basal line deep purple-brown. Hindwing dark purple-brown, a large black crescentic mark in the anal angle, three postmedial black dots fringed outwardly with white, a line of minute subterminal spots.

Paratype male: Uniform purple-brown, forewing darker medially but unmarked except for cream orbicular. Hindwing crescent cream, hindwing dots as in the holotype.

Second paratype male: Greyish black with a cream submedial band in the forewing; postmedial line cream, obsolete towards posterior margin. Hindwing crescent and dots cream. Holotype wingspan 46mm.

Female: Similarly patterned to the first paratype male but paler and markedly more russet, especially at the base of the forewing and on the thorax. Hindwing crescent practically obsolete.

Diagnosis: The nearest apparent ally of this species is *Mecodina striata* Hampson (*Gen. Spec. Noct.*, p. 492, 1926) from New Guinea. The forewing apex of *striata* is right-angled: *variata* has a concave termen and acute apex. There are no subterminal spots on the hindwing of *striata*. In *striata* the boundary between the paler basal fascia and darker medial fascia runs through the reniform; in *variata* the boundary passes between reniform and orbicular. In *striata* the postmedial line is approximately parallel to the termen: in *variata* it bows sharply inwards posteriorly.

Distribution: Coast to 1000m. on Viti Levu, Fiji: rare in lowland forest but moderately frequent in montane rain forest.

Holotype: ♂, Fiji, South Ridge (Nandarivatu), 6.ix.1967, (H. S. Robinson), in B.M.(N.H.).

Paratypes: ♂, Fiji, 1966-67, (H. S. Robinson), in B.M.(N.H.). ♂, Fiji, Nandarivatu, 27-30.vi.1968, (H. S. & G. S. Robinson), in B.M.(N.H.). ♀, Fiji, 1966-67, (H. S. Robinson), in B.M.(N.H.).

Dasychira flavobrunnea sp. n. (*Lymantriidae*)

Male: Head and thorax brownish cream above, thorax paler below; abdomen mouse-grey. Palps and head black below. Antennae cream, pectinations brown. Legs cream, banded with black at articulations. Fore tibia with a black spot above and a black longitudinal streak below. Mid- and hind tibiae with the black spot only. Forewing brownish yellow, postmedial band narrow, cream, edged with black distally, brown proximally. Reniform cream ringed with brown, obliquely elongate. Medial fascia cream, narrowing and shaded with brown posteriorly, bounded inwardly by a brown serrate line. Basal to this line a white transverse band edged by a black dentate line bounding a basal fascia of brownish yellow fading to white at the costa and base. Basal line fine, black, serrate. Terminal fascia brownish yellow, veins black, terminal line of black scales, fringe of brownish yellow scales. Subterminal line of crescentic black spots 1mm. from termen, diverging further posteriorly. In two of the paratypes the terminal and basal fasciae heavily marked with black; base of forewing still white. Hindwing uniform dark grey, fringes paler. Wingspan of holotype 38mm.

Female: Unknown.

Diagnosis: Closely related to *Dasychira nandarivatu* Robinson (*Ent. Record* **80**: 253) but the dark hindwing and overall yellowness of the forewing makes *flavobrunnea* distinct. The subterminal line of crescentic black spots is further removed from the termen in *flavobrunnea* than in *nandarivatu*. The genitalia of the two species are similar but the claspers of *flavobrunnea* are longer and more curved than those of *nandarivatu*. The aedeagus of *flavobrunnea* bears two groups of many fine thorn-like cornuti, absent in *nandarivatu*.

Distribution: Known only from the type locality.

Holotype: ♂, Fiji, Nandarivatu, 16-20.xii.1968, (H. S. & G. S. Robinson), in B.M.(N.H.).

Paratypes: 3♂♂, data identical with that of holotype, in B.M.(N.H.). ♂, Fiji, Nandarivatu, 27-30.ix.1968, (H. S. & G. S. Robinson) in B.M.(N.H.).

Euproctis mimetica sp. n. (*Lymantriidae*)

Male: Head, thorax and abdomen ochreous, palps and underside of head black. Legs ochreous, banded with black on the upperside at articulations; upperside of tibiae with a black spot in the middle. Antennae ochreous speckled with black, pectinations streaked with brown. Forewing ochreous yellow speckled with brown scales. A wide brownish-black stripe extends from the posterior margin of the wing, bowing outward and terminating 4 mm. from the costa. Two black spots on the inner margin of the black stripe at the distal margin of the cell; two faint brown subterminal spots slightly distal to the outer boundary of the stripe. Termen marked with small blackish-brown dots. Hindwing dark grey-brown, paler distally. Holotype wingspan 41 mm. The paratype caught in June 1968 lacks the black stripe and is not as yellowish as the other specimens; however its genitalia are identical to those of the holotype. Forewing ochreous, marked only with the two black dots at the distal end of the cell, two faint brown subterminal spots and a faint basal line of brown scales enclosing a paler basal fascia. A faint postmedial brown spot towards the posterior margin. Hindwing more brownish than the holotype.

Female: Unknown.

Diagnosis: This species has no apparent allies; the black stripe alone serves to distinguish it from all known *Euproctis* species.

Distribution: Known only from the type locality.

Holotype: ♂, Fiji, Nandarivatu, 27-30.ix.1968, (H. S. & G. S. Robinson), in B.M.(N.H.).

Paratypes: 2 ♂♂, data identical with that of the holotype, in B.M (N.H.). ♂, Fiji, Nandarivatu, 27-30.vi.1968, (H. S. & G. S. Robinson), in B.M.(N.H.).

With the description of this species the total number of Lymantriid species recorded from Fiji is four. There are the three Dasychiras, *fidjiensis* Mabille & Vuillot, *nandarivatu* Robinson and *flavobrunnea* sp. n. forming a compact tripartite group and *Euproctis mimetica*. I described (1969) the wing pattern variation of male *D. fidjiensis* and from the original descriptions it will be seen that in *D. flavobrunnea* and *E. mimetica* (above) and *D. nandarivatu* (Robinson, 1968) the males are also polymorphic. Several female *D. nandarivatu* have been obtained recently and, as in *D. fidjiensis*, are larger than the males and lack variation in the wing pattern.

The common feature of polymorphism in male Fijian Lymantriids is the presence or absence of dark brown or black transverse bands on the forewing; I can find no other examples of Lymantriid species which exhibit this type of variation. Thus I believe that significance must be attached to this common polymorphic state.

In the case of the three *Dasychira* species, polymorphism might be considered to be apostatic (see Clarke, 1962), an adaptation to prevent a predator "getting its eye in" or, as Tinbergen puts it, developing "specific searching images". Apostatic polymorphism is not rare but the probability of it taking a practically identical form independently in these three species is remote: therefore it might be thought to be an inheritance from a common ancestor which possessed this type of apostati

polymorphism. *D. nandarivatu* and *D. flavobrunnea* appear to be very closely related indeed, *D. fidjiensis* being a rather more distant cousin. Unfortunatly these three species appear to have no close allies so no further indication of inherited polymorphism can be obtained. However, Clarke suggests that apostatic polymorphism enhances the probability of sympatric speciation with the divergence of the two or more polymorphic forms and speciation would involve the destruction of the polymorphic state. Thus it appears that the theory of inheritance of apostatic polymorphism is untenable.

The presence of a comparably polymorphic *Euproctis* species (again, a most unusual phenomenon) suggests that some sort of mimicry complex might be involved and mimicry must be Batesian for polymorphism to occur.

D. nandarivatu, D. flavobrunnea and *E. mimetica* are known only from primary montane rain forest on the island of Viti Levu. No specimens of these species have been taken at heights of under 850m., therefore the complex must only operate in the collective habitat of primary montane rain forest. In this zone *D. fidjiensis* is common, *D. nandarivatu* fairly frequent and *D. flavobrunnea* and *E. mimetica* extremely rare. *D. fidjiensis* is a successful and widespread species, occurring commonly from the coast to at least 1000 m. on Viti Levu and on at least two other islands as well. *D. nandarivatu* is restricted but successful and the other two species are plainly not successful. *D. fidjiensis* appears to be avoided by the fowls and mynah birds which scavenge around light traps and is probably distasteful. As such, it is the prime candidate for model. Being at least mildly distasteful and fairly uncommon compared with other species of lepidoptera it also fulfils what Clarke states to be the most favourable requirements for apostatic polymorphism to evolve.

Assuming *D. nandarivatu, D. flavobrunnea* and *E. mimetica* to be palatable there is a selective advantage in their mimicking *D. fidjiensis* and thus they have evolved polymorphic patterns which mimic the two most striking morphs of *D. fidjiensis*. Increasing success of the mimics would result in increased predation of model and mimics and disruption of the mimicry complex would occur. Selection would perhaps then favour the evolution of further patterns in the model different from those of the mimics until predation of mimics or survival of the model rose to a sufficient level to stabilise the mimicry complex again. It is possible that this has happened: *D. fidjiensis* has a variety of patterns at its disposal but the most striking morphs are still the banded ones. From subjective evidence it appears that *D. fidjiensis* exhibits a greater variety of wing patterns in montane rain forest than in the lowlands. After his first visit to Nandarivatu in September 1967 H. S. Robinson noted (in an unpublished report) "very remarkable and beautiful variations of *D. fidjiensis*".

In this mimicry complex however, the situation does not appear to be a simple case of three palatable species mimicking one distasteful species. It is difficult, for example, to take *E. mimetica* to be a mimic of *D. fidjiensis*, the two morphs of each are so markedly dissimilar. However, *E. mimetica* could in all probability masquerade as *D. flavobrunnea* which in turn bears a very striking similarity to *D. nandarivatu*. Thus

I believe the scheme of mimicry to be as shown diagrammatically below in Fig. 1.

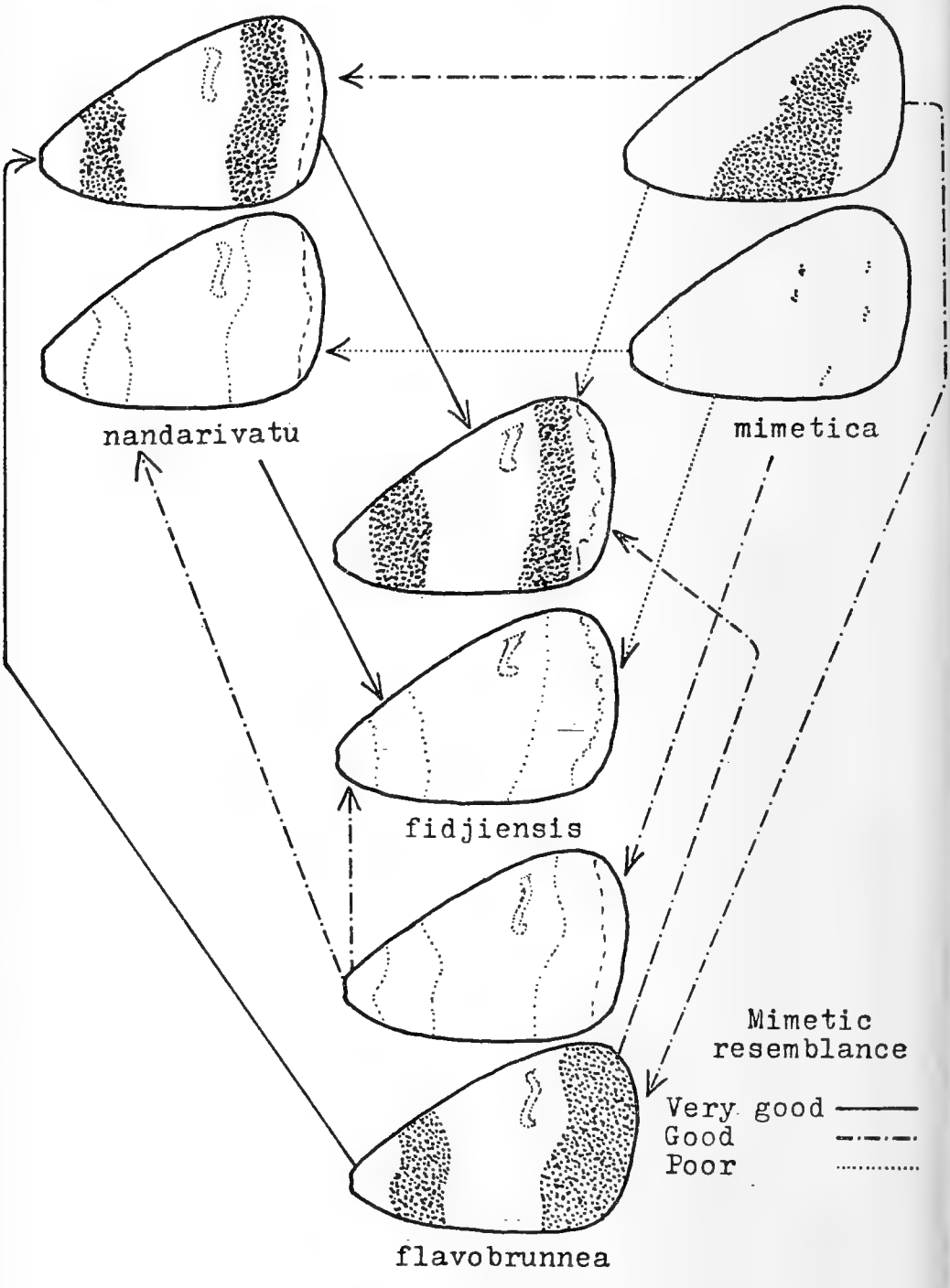

Figure I.

Until definite experiments show the pattern of predation of the morphs of each species, presumably involving the apparently rare insectivorous birds of the mimicry zone, I am in no position to claim this theory as any more than a hypothetical explanation of what may well prove to be a most intriguing problem.

In conclusion I would like to thank Dr. L. Davies and Mr J. Richardson of the Department of Zoology, University of Durham and Messrs A. H. Hayes and D. S. Fletcher of the British Muesum (Natural History) for their generous help in the preparation of this paper.

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West Midlands records of *Hydraecia, Procus* and *Oporinia* Species

By L. J. Evans, F.R.E.S.

Since working on records for the Midland Plateau Survey, a project of the Birmingham Natural History Society (Recorder F. A. Noble), I have been making genitalia dissections for critical identification of the local melanic forms and other species difficult to identify. Recently my interest has been further stimulated by the Lepidoptera Distribution Maps Scheme organised by the Biological Records Centre at Monks Wood. On referring to back numbers of the 'Record' for information, I came across the *Hydraecia* and *Procus* records of R. F. Bretherton (1953) and A. Richardson (1951), and as I cannot find any published records for the West Midlands, I was prompted to write these few notes.

HYDRAECIA SPECIES.

H. oculea L. Only appears sporadically at M.V. light in my garden in N.E. Birmingham, also at Sutton Park, Warwickshire, a semi-natural park which is about 2 to 3 miles further N.E. from Birmingham. Wyre Forest, one 8.viii.59.

H. crinanensis Burr. I have not found this species in the area as yet. My only specimen came with four *oculea* from another collection all labelled Harlech, N.W. 10.viii.52, C. Bantock.

H. paludis Tutt. Neither have I found this species in the area, but Noble (1964) records one specimen at light one mile west of the centre of Birmingham.

H. lucens Freyer. By far the commonest of the group in this area. Three or four at light in my garden which is bordered by a field of coarse grasses, is a good haul for one night. At Sutton Park, a heath and woodland area, it is only taken occasionally.

PROCUS SPECIES.

With the exception of *Procus fasciuncula* Haw. which in North Birmingham shows little variation from the usual brownish-fawn colour (reddish-fawn in Sutton Park), the other four species of the genus occuring in this part of the Midlands are mainly melanic.

P. strigilis Clerk. Occurs commonly as the melanic form and frequently as the white-banded semi-melanic form over the greater part of the West Midlands. I have only taken the normal (brown) form at Randan Wood, Worcs., and Wyre Forest, Worcs. and Shrops.

P. latruncula Schiff. I have never seen in N.E. Birmingham any form other than the wholly black one which I find more commonly than *strigilis*. A count of the two species in my garden during two evenings in 1968 produced 18 *latruncula* and 6 *strigilis*. *Earliest* date recorded 31.v.57.

P. versicolor Bork. Again I have only seen the wholly dark form. Randan Wood, Worcs., one, July 1963. Sutton Park, Warks., six, 19 and 24.vii.65.

The male of this species is very easily indentified when the genitalia are mounted on a microscope slide. The projection below the 'beak' which most authors tell us is slightly curved upwards, is not always a very good indication. The dark projection (clavus) on the inside of the valve near the base is longer and pointed in *versicolor*, and stumpy in the previous two species; also in most cases the hump on the back of the valve is shorter in *versicolor*, and usually I find the whole structure to be more deeply pigmented.

P. literosa Haw. Although much darker than the coastal form, those found locally present no difficulty in identification. Six to eight specimens taken most evenings in season, sometimes as many as sixteen at M.V. in my garden.

P. strigilis and latruncula I find more frequently in open country where the grass is not cut very often. *Versicolor* on the other hand appears to prefer fairly open woodland.

In the summer of 1965 a count was made in Sutton Park of the number of each species coming to M.V. light.

	7.vii.65	17.vii.65	19.vii.65	24.vii.65	7.viii.65
P. strigilis	0	1	3	1	0
P. latruncula	0	4	3	1	0
P. versicolor	0	0	2	4	0

From the above information it would seem that the order of appearance is somewhat similar to that noted by R. F. Bretherton, but further counts are necessary for confirmation.

OPORINIA SPECIES.

O. dilutata Schiff. Found mainly as the melanic form all over the West Midlands. Darkest specimens recorded from Edgbaston Park (2 miles west of Central Birmingham).

O. autumnata Bork. Occurs fairly commonly, only slightly darker than normal in the Far Forest area of Wyre Forest. Randan Wood, two 15.x.60. Sutton Park, two larvae beaten from birch 25.v.66.

O. christyi Prout. Randan Wood, two males 15.x.60; these are much darker than several taken near Cranham in the Cotswolds, 7.x.61. May's Wood, Warks. (no date), D. W. Scott.

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Notes on Three little-known Species of the *Alberganus*-Group of the Genus *Erebia*

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

An outstanding feature of the *Erebia* species is the simplicity of structure of the male genitalia. Yet in spite of this the formation of the claspers enables one to recognise at a glance any of the fourteen groups into which the known species of the genus fall.

The present paper was undertaken with the object of recording that *Erebia dabanensis* is a North American species; but it was found necessary to deal with the two other species that are most closely connected to *E. dabanensis* at the same time: namely *E. kozhantshikovi* and *E. youngi*.

At the time of writing my Monograph of the genus (1936), most specimens of *E. dabanensis* in collections were from the East Sayan Mountains. The two specimens from which the species was described were said to have been, " . . . trouvée le 10 Juillet dans les montagnes nommés Chamar—Daban . . . Irkoutsk", that is a little south of Lake Baikal. All specimens supplied by Staudinger were from a few localities in the East Sayan (including the Khamardaban Mountains), and the Tunkun Mountains. At a later date the species was recorded from the district of the Schuihya River in the Polar Urals. These I have never seen. Just before publication of my work, Staudinger obtained some specimens from the Anadyr Mountains, in the extreme N.E. of Siberia. A little later he sent me 2 male and one female of these; dissection proved them to be *dabanensis*. The species therefore had a far greater range in distribution than it was supposed to have. It may possibly therefore, have spread far to the west also.

E. youngi was the only species of the three recognised in North America. There were at that time only a few specimens known. One that I had obtained through the kindness of Dr. J. McDunnough, from the Canadian National Collection, was the only one to have been dissected A short time afterwards a few specimens were recorded from a locality 30 miles west of Aklavik (Leussler, 1935). I had then mounted the genitalia of some 15 specimens of the three species, and felt satisfied they were distinct species. A certain amount of structural variability was present in both *E. dabanensis* and *E. kozhantshikovi*. Subsequent work by Dr. dos Passos showed this was the case in *E. youngi* also. A few comments on this variation are necessary. The most striking feature of the claspers in the *alberganus*-group species is the distal, or terminal part This is a compound structure, composed of the parts known as the "shoulder" and "head" of the clasper, merged into one solid piece. The proximal part, or body of the clasper, is featureless, the distal, variable both in size and shape. An idea of the appearance of this part and some of its variation is given by the photograph in my Monograph; *E. dabanensis* pl. 41, figs. 379, 380, 381, and pl. 42, fig. 384; *E. kozhantshikovi* pl. 41, figs. 382, 383; *E. youngi* pl. 42, fig. 385. The dorsal ridge of the distal part carries a complete range of spines extending over its entire length. In *E. dabanensis* the length of the spined ridge is greater than that of the corresponding ridge of the proximal part; in *E. youngi* it is markedly shorter; in *E. kozhantshikovi* the two are practically equal. In the fig. 382, previously mentioned, the distal ridge appears the shorter, but this is the

result of twisting in mounting the specimen. Taken as a whole, the clasper in *E. dabanensis* and *E. kozhantshikovi* is obviously greater in length than the dorsal structures (tegmen and uncus), taken together. In *E. youngi* it is approximately equal to them, or slightly less or greater. Finally, the spine "system" of the claspers (a very reliable character in all Erebias) is distinctive. In *E. dabanensis* the spines are coarse and well separated; in *E. kozhantshikovi* somewhat finer and closer together; in *E. youngi* very fine and touching. Whatever purpose these spines serve the coarser are evidently the most effective, the finer consequently require to be more numerous and hence closer together.

In 1946 Dr. dos Passos sent me 3 male and 2 female specimens from a series of an *Erebia* he had obtained from the McKinley National Park, in Alaska. I dissected the males and to my great surprise found that 2 were *E. dabanensis* and one *E. youngi*. This was the first occasion when *E. dabanensis* was recognised to be a North American species. This discovery of course raised other questions concerning the two species and also the race described as "*E. herscheli*" by Leussler in 1935. All this necessitated much work that could only be done in America, and in early 1946 Dr. dos Passos and I myself were working on the Argynninae, so the question of these Erebias was left for a more convenient time. It has remained in abeyance until last autumn (1968), when I chanced to be looking over my microscope slides of *Erebia*. Then I brought the matter to Dr. dos Passos's notice and he without further delay dissected another 15 of his Alaskan specimens as well as some from Yukon and the N.W.T. He had previously dissected others and the total result gave 10 *E. dabanensis* and 13 *E. youngi*, the latter including the holotype of *E. herscheli*. Of these, 8 *E. dabanensis* and 4 *E. youngi* were taken in the McKinley Park area, some actually on the same day. Some of the series he had described as *E. youngi rileyi* (dos Passos 1947), proved to be *E. dabanensis* and some *E. youngi*. The *herscheli* all proved to be *E. youngi*, which agreed with the one specimen of this insect of the extreme north that I had dissected. Later Dr. dos Passos sent me photographs of all these slides. The *E. dabanensis* varied as the Palaearctic insects, the *E. youngi* (including *rileyi* and *herscheli*) also varied but to lesser degree. It should be remembered that when comparing the relative proportions of parts of the claspers, these structures must be kept in absolute profile, for they are affected by both a longitudinal curvature and a slight, inward twist, as in most *Erebia* species. The form of the claspers can therefore be distorted in mounting the specimen, and efforts to correct a false appearance may often push the dorsal structures off their true profile. Slight pressure by the cover glass in mounting is the only method to maintain a true profile position of all the parts, and it is only in such position that the actual shape and dimentions of the various parts can be appreciated. Some workers profess to avoid any pressure in mounting, and condemn the use of it as distortion; but they overlook that it is of no value to show a picture that conceals the real formation. Even under moderately tight cover glasses one cannot always be sure of preventing movement, owing to the ever present difficulty of controlling the quantity of balsam under the cover. An example of this is the slight alteration in the clasper in my fig. 382, which I previously mentioned.

Two important facts are now established: *E. dabanensis* is a North American species, and it and *E. youngi* exist together and fly at the

same period, in central Alaska. The distribution of *E. dabanensis* may be extensive, for one specimen came from the neighbourhood of Slana in south Alaska, which is not far from Palmer.

An unfortunate fact must be considered. So far as the available material goes, it is doubtful if *E. dabanensis* and *E. youngi* can be distinguished by their superficial appearance. It is possible that in the future fresh specimens may enable some distinction to be noted. Another trouble is uncertainty concerning the types of *E. youngi*. The type-locality lies in the *dabanensis*-zone of Alaska, so the type-series might include both species, as was the case in the description of the name "*rileyi*". This emphasises the superficial similarity of these species and how essential it is that there is no uncertainty about the actual type, which must be dissected if it is to be of any value. Dr. dos Passos has undertaken to clear up these points; and also whether "*herscheli*" can be distinguished from *E. youngi*.

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Some Aspects of the Fauna of the Nuba Mountains, Sudan

By J. L. Cloudsley-Thompson, M.A., Ph.D., D.Sc.

The Nuba Mountains of southern Kordofan lie between 10° 30′ and 12° 30′ N, 29° 00′ and 31° 00′ E. They consist of a series of ranges of large granitic outcrops covered with comparatively shallow soil in the *Acacia*—tall grass forest region of the Sudan (Plate 1a). The general appearance of the landscape is of a vast plain interspersed with large *jebels*. The maximum elevation (Jebel Heiban) is 1,345 m. (4,500 ft.). In the valleys and plains separating these hills there is often dark, heavy soil and the vegetation is predominantly thorny.

The area does not appear to have been investigated zoologically, but is of botanical interest owing to the species flourishing there which really belong to more southern regions. For example, on Jebel Daier the most northerly massif may be found the bamboo *Oxytenanthera abyssinica* Munro and various other trees and shrubs characteristic of the south. Especially striking is the pink-flowered poison-tree *Adenium honghel* A. D.C. and the 'tebeldi' or baobab *Adansonia digitata* L. The large, broad-leaved *Fiscus platyphylla* Del. is characteristic of flatter ground; the ebony *Diospyros mespiliformis* Hochst. and *Celtis integrifolia* Lam. near the sandy edges of water-courses. In valleys and on heavier soils, the thorny flora consists of 'talh', *Acacia seyal* Del. with *A. albida* Del. Both tall and short grasses are present, the most important of the former being *Hyparrhenia* spp. The candelabra *Euphorbia calycina* N. E. Br. and the sausage-tree *Stereosperum kunthianum* Cham. are also not uncommon in the area (Andrews, 1948).

As we had not previously visited this part of the Sudan, my wife and I decided to spend the Christmas vacation 1967 there, with our two

younger sons who had come out for the holidays. We drove from Khartoum through Omdurman direct to El Obeid camping the first night just beyond Fattasha. There is much more vegetation west of Omdurman than there is on the east side of the Nile. I think the water-table must be higher. Moreover, termite mounds are common to the west but do not occur so far north on the east bank of the river. Although we had not camped close to a termite mound, the ground was strewn with galleries of *Macrotermes bellicosus* (Smeath.), and I was astounded at the loudness of the hissing sound that these insects made. It was clearly audible from a distance of several metres. The next night was spent among the *qoz*, north of El Obeid. The road, in fact, is sandy for about 100 miles and we had to use four-wheel drive and low gear-ratio for much of it. Our second night's camping site was visited by five small, short-legged camel-spiders, (Solifugae), *Rhagodessa melanocephala* Simon, including juveniles and a male of unusually reduced size. A normal sized male of this species, previously recorded only from Darfur (Benoit, 1964) was found by me at Kabushiya (Meröe), north of Shendi, in November 1966 (Plate 1b). It measured about 5 cm. in length as compared with 3 cm. for the specimen from near El Obeid.

From El Obeid we drove through Dilling and Kadugli to Talodi where we stayed as guests of Dr. Faysal Ali Saad and Omer Ahmed who entertained us with typical Sudanese hospitality and arranged for us to see a 'kambala' of dancing. The furthest south we went on this trek was Jebel El Liri at the southern extremity of the Nuba Mountains where the terrain levels off north of the 'sudd' region of the Nile. We returned to Khartoum via Er Rahad, Umm Ruwaba, Tendelti and Kosti. At El Liri we met a man who had been mauled by a lion a few months earlier, but we were unlucky and found no game ourselves. At our camp just north of Talodi, however, we saw some bush-babies, *Galago senegalensis* E. Geoffr, by head-lights of the Land Rover. These charming little creatures are very common in the Nuba Mountains. We also saw a dead fox, *Vulpes pallida* (Cretzschmar) on the road, as well as numerous vultures, eagles, hawks, owls and other large birds including one or two ground-hornbills, *Bucorvus abyssinicus* (Boddaert).

The climate of the Nuba Mountains is reputed to be hotter and more humid than it is away from them. Certainly the mountains are high enough to influence the rainfall, especially near Kadugli, Dilling and Talodi. Thus the average annual precipitation at Kadugli is 765 mm. (30 in.) whilst in the region immediately to the west it is only 567 mm. (22 in.) (Lebon, 1965). Climatic data for El Nahud, to the north-west and El Obeid to the north of the Nuba Mountains are as follows:—Mean daily maxima exceed 39°C (102°F) at El Nahud in April and at El Obeid in May. The highest maxima are 42·9°C at El Nahud in April and 46·1°C at El Obeid in August. [The highest temperature ever recorded in Sudan is 52·5°C (126·5°F) at Wadi Halfa on April 29th, 1903]. The mean daily maxima at El Nahud and El Obeid in December are 32·8°C and 31·4°C and the highest maxima 42·9°C and 46·1°C respectively. Mean daily maxima in the two localities in December are 19·2°C and 18·3°C respectively, the lowest minimum at El Nahud being 7·2°C in February and at El Obeid −0·4° in January. [The lowest temperature recorded in the Sudan is −2·0°C (28·5°F) in Wadi Halfa on December 26th, 1917] (Ireland, 1948).

PLATE V.

(a) Granite outcrop and associated vegetation, Nuba Mountains

(b) *Rhagodessa melanocephala* Simon (Solifugae). Male

Photos: J. L. Cloudsley-Thompson.

Diurnal cycles of temperature and relative humidity measured north of El Obeid (Dec. 23rd-25th) and in the Nuba Mountains (Dec. 26th-28th) are given in Fig. 1. From this it can be seen that temperatures were considerably higher and relative humidities correspondingly lower in the mountains. It should, however, be pointed out that Dec. 23rd-25th coincided with unusually cool weather in Khartoum and it is probable that temperatures were lower in the mountains during that period than when they were actually measured. There can be no doubt that the greater richness of the arthropod fauna in the Nuba Mountains as compared with surrounding plains is directly related to higher rainfall and consequently richer vegetation. The region lies to the south of the 13th parallel N. which, as has already been pointed out, marks a sharp division of the flora and associated fauna to the east of the Nile (Cloudsley-Thompson & Idris, 1964).

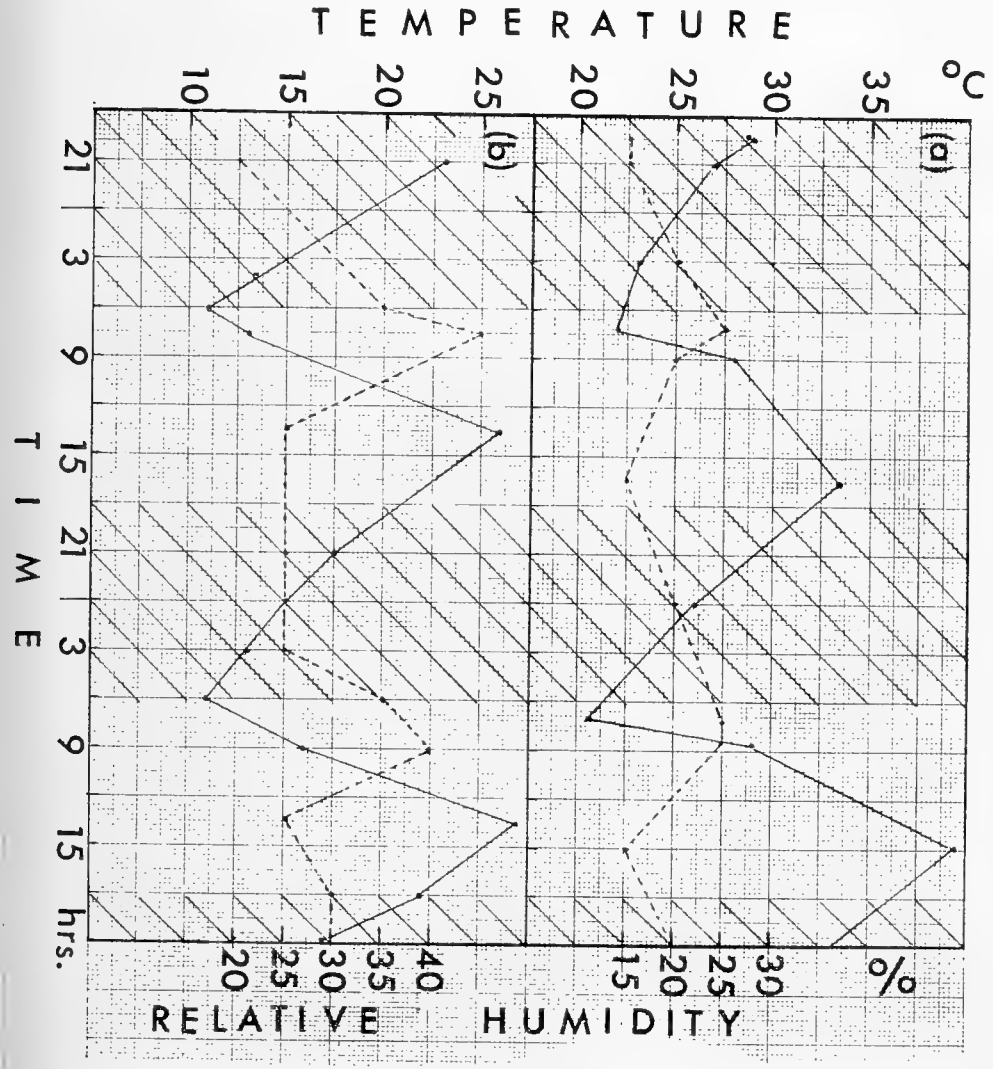

Fig. 1. Diurnal cycles of temperature (solid lines) and of relative humidity (broken lines). (a) North of El Obeid (Dec. 23rd-25th); (b) in the Nuba Mountains (Dec. 26th-28th, 1967).

Between Dilling and Kadugli, near a dried water course, we collected a number of woodlice (Isopoda) and centipedes (Chilopoda), animals not

normally found far from permanent rivers or irrigated areas at this latitude.

Other Arthropoda included scorpions, *Leiurus quinquestriatus* H. & E., and the following species of termite were very common in the area: *Odontotermes smeathmani* (Fuller) and *Trinervitermes geminatus* Wasmann (*det* W. V. Harris). Unfortunately the tubes containing specimens of Arachnida were broken in the post to Musée Royal de l'Histoire naturelle at Tervuren, Belgium, and Prof. P. L. G. Benoit was only able to identify *Oxyopes* sp. (juv.), *Sparassus* sp. (juv.) and *Selenops radiatus* Latr. (juv.). The insect fauna of the mountains seemed to be unusually rich in praying-mantids. My collection of insects kindly identified by Dr. Paul Freeman and his colleagues at the British Museum (Natural History) included; ORTHOPTERA: MANTODEA — *Pseudoharpax abyssinicus* Beier, *Stenovates Pantherina* (Saussure), *Hoplocorypha* sp. (nymph), *Leptocola* sp. (nymph), *Tarachodes* group (♂); TETTIGONIIDAE: *Tylopsis irregularis* Karsch; ACRIDIDAE: *Acrotylus variegatus* (Brancksic); HEMIPTERA: *Odontopus sexpunctatus* Lap., *Dieuches albostriatus* Fabr., *Poophilus obscurus* Walk., *Rhaphidosoma* sp. (not in B.M.), Pyrrhocorid nymph, Alydid nymph, Reduviid nymph (*Reduvius* sp.?); COLEOPTERA: TENEBRIONIDAE. *Adesmia* (sub. gen. *Macropoda*) (sub. sp. of *inaequalis* Fahr.)., *Adesmia* (*Macropoda*) (not in B. M.), *Mesostena angustata* Fairm., *Curimosphena villosa* H.-R., *Gonocephalum strigosum* Reiche (?), (+ 2 undetermined species) and 3 Platypodidae.

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On a New Species of Dermaptera from India

By G. K. Srivastava, Calcutta

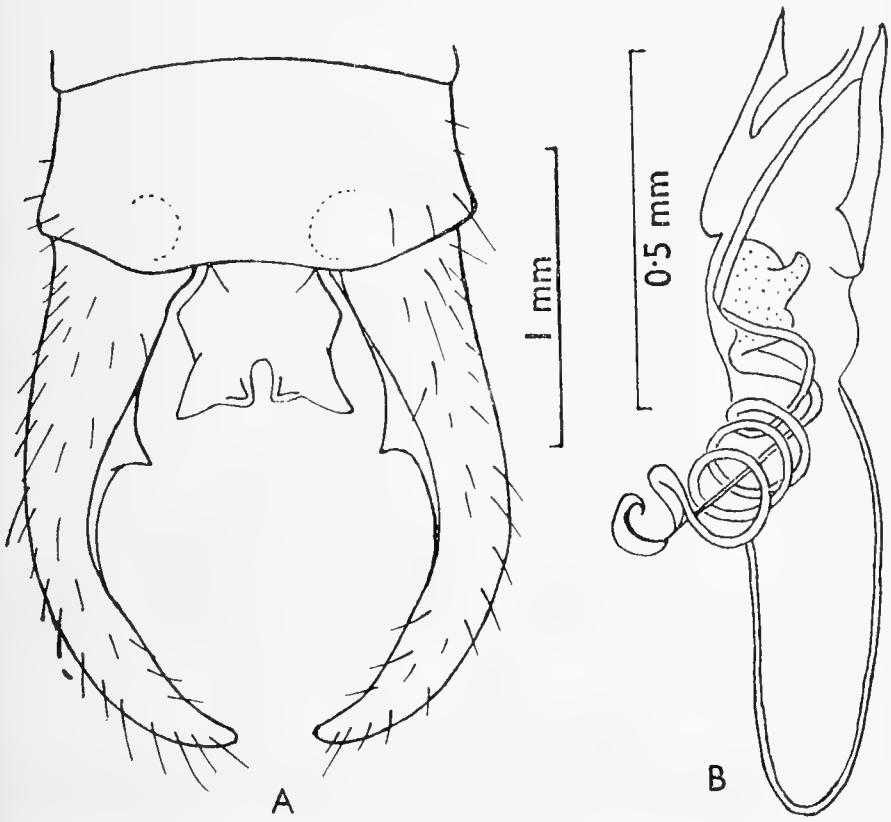
Superfamily LABIOIDEA
Family LABIIDAE
Subfamily LABIINAE

Chaetospania anamalaiensis sp. n.

Male: Colour: Head, pronotum, elytra and wings brownish black. Antennae brownish black with apical segments yellowish. Legs brownish yellow, femora shaded with black. Abdomen dark brown with shades of black, basally. Form depressed and surface pilose.

Head triangular, posterior margin emarginate in middle, sutures indistinct, frons tumid, eyes smaller in length than the cheeks and first antennal segments. Antennae 11-segmented (?), second segment small; third long and cylindrical, as long as fourth and smaller than first; and fifth a little longer than third but smaller than first, remaining segments

long and cylindrical. Pronotum as long as broad, anterior margin convex, sides straight, gently widened posteriorly, hind margin and angles rounded, median suture indistinct; prozona tumid and well differentiated from flat metazona. Elytra longer than the pronotum, without keel, caudal margin slightly obliquely truncate, surface with long, golden yellow hairs. Wings one third of the elytra in length. Legs with femora thick; tibiae long and cylindrical; tarsi with first segment slightly shorter than



Chaetospania anamalaiensis sp. n.♂ : A. Ultimate tergite and forceps. B. Genitalia.

third; second small. Abdomen depressed, narrowed basally, lateral tubercles on third and fourth tergites indistinct, sides of abdominal segments broadly convex. Ultimate tergite smooth, posterior margin emarginate mesad, postero lateral angles prominent, weakly tumid elevations above the roots of forceps. Penultimate sternite transverse, posterior margin faintly emarginate in middle. Pygidium prominent, narrowed at base, sides diverging up to basal one third where there is a small, obtuse tubercle, the remaining two third portion emarginate in middle, posteriorly lateral angles acute and a deep cleft in middle, about one third of the length of pygidium, thus dividing it into two halves, bent downwards, with a small tubercle on either side of the mouth of cleft. Forceps with branches remote, depressed in basal half, then curved, cylindrical and tapering with apices pointed, inner margin with a short, sharp tooth bent downwards, a little before middle. Genitalia (Text fig. B).

Female—Unknown.

Measurements (in mm.)—

	Male
Length of head	0·85
Width of head	0·91
Length of eye	0·22
Distance between eyes	0·68
Length of first antennal segment	0·28
Distance between the bases of antennae	0·45
Length of pronotum	0·79
Width of pronotum	0·79
Length of elytra	1·02
Width of elytra	0·45
Length of wing	0·34
Length of ultimate tergite	0·57
Width of ultimate tergite	1·25
Length of body (without forceps)	5·31
Length of forceps	1·48

Material.—Holotype, ♂, Anamalai Hills, Cinchona, 3500 ft., v. 1968, P.S. Nathan; genitalia mounted between two coverslips and penultimate sternite mounted on a card and both pinned with the specimen; deposited in the Zoological Survey of India, Calcutta.

Affinities.—The described species comes very close to *Chaetospania foliata* (Burr) from Ceylon but differs in having ultimate tergite transverse pygidium with a median deep notch posteriorly and forceps with branches depressed in basal half with a small, sharp tooth at the inner margin, a little before middle.

Acknowledgments.—I am thankful to the Director, Zoological Survey of India, Calcutta, for providing facilities. My thanks are also due to Mr. P. S. Nathan for sending this interesting material to me.

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The Coleopterous Fauna of Stones at Staines, Middx. Part 2

By J. Muggleton

(Department of Extra-Mural Studies, University of Durham)

The first part of this paper (Muggleton 1968) gave a list of twenty-seven species of Coleoptera found under a group of stones at Staines, Middx. It also included a description of the habitat. This second part includes some additional species found since October 1968 and some earlier records which I had overlooked. There are also some additional notes on species previously recorded. Most of these records are the result of a more detailed study, than had been possible previously, in the months October to December. One correction to a previous record is included. Finally I have made an analysis of the species list with reference

to Dibb's (1948) bionomic classification of the British Coleoptera.

Additions to the 1968 list.

(Additional species are marked by an asterisk. Roman numerals indicate the months of occurrence of each species).

Family CARABIDAE

Nebria brevicollis Fab. Add xi, xii.

**Asaphidion flavipes* Linn. One specimen was found in the run of an ant's nest on 30.iv.67. The quick movements and form of this species give it an ant-like appearance. However, it does not appear in Walsh's (1954) list of myrmecophilous species.

Agonum mulleri Hb. A further specimen was found on 12.x.68.

Family HYDROPHILIDAE

Megasternum obscurum Mm. Add xii.

Family SILPHIDAE

**Choleva agilis* Ill. Occurred as single specimens at the end of 1968. It probably hibernates under the stones, x, xi, xii.

**Ptomophagus subvillosus* Goeze. A single specimen was found on 30.x.68. It has previously been found, nearby, in carrion.

Family STAPHYLINIDAE

Oxytelus rugosus Fab. Add xi, xii.

**Philonthus decorus* Grav. A single specimen was found on 26.v.67.

**Philonthus fimetarius* Grav. Found both in 1967 and 1968, especially frequent in May, iv, v, viii, x.

Ocypus olens Mu. Previously noted as no longer occurring. One specimen was found on 24.x.68 and this marks the reappearance of this species after two years absence. Add x.

**Quedius fuliginosus* Grav. One specimen was found on 4.xii.68.

**Xantholinus linearis* Ol. Two specimens were found in November 1968

Tachyporus hypnorum Fab. Add x.

Tachinus humeralis Gr. Add x, xi, xii.

**Tachinus subterraneus* Linn. A single specimen was found on 2.xii.68.

Family RHIZOPHAGIDAE

Rhizophagus parallelocollis Er. The record for *R. depressus* Fab. in the 1968 list should refer to this species.

**Rhizophagus dispar* Gyll. One specimen was found on 24.x.68, on the remains of a dead slug (*Arion* sp.).

Family CURCULIONIDAE

**Otiorrhynchus sulcatus* Fab. One specimen was found in the summer of 1961. This species occurs quite frequently on the surrounding vegetation.

Bionomic Classification.

In the following part of this paper I have attempted to use Dibb's (1948) bionomic classification of British beetles to give a more detailed picture of the type of habitat provided by the stones. By finding which habitat-groups are best represented in the habitat we can see more clearly the factors which have contributed to the existence of the present fauna. Such analysis could be used for comparisons between habitats,

providing it is borne in mind that some of the groups include a broader range of surroundings than others and that all the species in one habitat-group do not necessarily occupy the same position in the food chain.

For Table 1, I have followed Dibb's classification. In those examples where the species are not dealt with by Dibb, I have used my own observations and the habitat notes in Fowler (1887-1891) to classify the species as follows:—

Bembidion lampros Hb., ripicole, limicole; *B. quadrimaculatum* Linn, ripicole, limicole, arenicole; *Philonthus cognatus* S., detriticole, muscicole; *P. decorus*, lapidicole, detriticole, muscicole; *P. fimetarius*, detriticole; *Ocypus globulifer* Fc., lapidicole, muscicole; *Quedius fuliginosus*, detriticole.

In Table 1 there are nineteen 'regular' species and eighteen 'casual' species.

TABLE 1.—The percentage of the total, regular and casual species belonging to each habitat-group.

Habitat-group*	Total	Regular	Casual
Ripicole (On banks of rivers, etc.)	21·3	15·7	27·2
Limicole (On or in mud)	13·5	10·5	22·2
Arenicole (On or in sand)	5·4	5·2	5·5
Lapidicole (Under stones)	32·4	52·0	11·0
Truncicole (On or in tree trunks or stems)	10·8	10·5	11·0
Herbicole (On or in herbaecous plants)	5·4	5·2	5·5
Muscicole (In moss)	24·0	31·4	22·2
Fungicole (On or in fungi)	10·8	10·5	11·0
Detriticole (In plant refuse)	51·3	47·3	55·0
Cadavericole (On or in dead animals)	16·2	10·5	11·0
Stercoricole (On or in excrement)	24·3	26·3	22·2
Domicole (In human habitations)	2·7	5·2	—
Nidicole (In nests)	2·7	—	5·5

*An explanation of each term is given in parentheses.

The table shows that the best represented habitat-groups are the Detriticoles and the Lapidicoles. It can be assumed that the lapidicoles are species which seek the shelter of the stones as a protection against dessication and predators. On this basis it would not be valid to group all the regular species as lapidicoles. Animal and plant debris is plentiful under the stones and must be the primary attraction for the detriticoles. The high percentage of detriticoles amongst the casual species can be explained by the presence, nearby, of large quantities of garden refuse. Thirty-one per cent. of the regular species are muscicoles and this could be a reflection of the dampness of the habitat. In 1968, for example, there was a large increase in the amount of the moss *Brachythecium rutabulum* (Hedw.) B. & S., both on top of and around the stones. The ripicoles and limicoles form a large percentage of the casual species, and this is probably a result of the proximity of the river. As might be expected the remaining habitat-groups are poorly represented in this habitat. In other localities (e.g. in open country) one would expect to find a larger percentage of cadavericoles, stercoricoles, nidicoles and alticoles contributing to the coleopterous fauna of stones.

In conclusion, I would suggest that the factors most affecting the coleopterous fauna of this habitat are, the physical presence of the stones themselves, the large amount of detritus available, the dampness of the surroundings and the nearby river.

Summary.

A total of thirty-seven species have now been recorded from this habitat. Of these nineteen may be regarded as regular and eighteen (including two formerly regular species that are no longer found) as casual species. It is shown that the majority of the species belong to two habitat-groups, the lapidicoles and the detriticoles.

ACKNOWLEDGEMENTS

I should like to thank Mr. H. R. Last who, through the A.E.S. Advisory Panel, identified some of the Staphylinids. My thanks are also due to Mr. P. M. Hammond and Mr. R. T. Thompson, of the British Museum (Natural History), for their identifications of some of the remaining species.

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Cercyon laminatus Sharp (Col. Hydrophilidae) New to Britain; with Corrections to our List of Species, and Further Notes

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

Cercyon laminatus Sharp (1873) is a very distinct species which cannot be confused with any other occurring in Britain. It is one of the larger members of the genus, and except for its size and colour (the former a little variable) has, as its author remarks, quite the appearance of a species allied to *litoralis* Gyll. or *depressus* Steph., on account of its relatively elongate, flattish, loosely-built form. The shape is oblong-oval with elytra widest at or rather behind middle, and sides of pronotum rounded before the obtuse hind angles so as to form an angle with sides of elytral base in dorsolateral view. The coloration is distinctive: head and most of underside black, upperside pitchy-yellow-brown with pronotum rather paler at sides; apex and margins of elytra (and often less clearly, base and sutural region), metasternal lamina, antennae except club, palpi, and legs, a lighter yellowish or straw-colour. Also highly characteristic are the very large eyes (not noticed by Sharp in his description), very narrow scutellum, unusually elongate antennal club, and vary narrow, keel-like, almost blade-like mesosternal lamina (whence the name of the species). These features together render the insect quite unmistakable, and somewhat isolated within the genus. The puncturation is fairly fine and uniform, the striae are impressed behind, and the limbs long.

Recorded by Sharp (1873) from Hiogo, Japan, in dung — and also (according to Hansen, 1964) under seaweed on the coasts. Some years ago Mr J. Balfour-Browne determined for me as this species two examples of a *Cercyon* obviously new to us which had flown to mercury-vapour light here on 6th and 8th August, 1959. A third was captured in the same way on 22nd June of the next year. The species had previously been taken, also at light, in several North German localities, chiefly in the area between Hamburg and Berlin, but only since 1956; and is said to be general by now in the Hamburg district; mostly at ultraviolet (m.v.) light in damp situations in warm still weather. In an interesting note Lohse (1959) gives details of its occurrence in many parts of Germany during the three years following its discovery there, and points out that it has already become established over a large part of central Europe and may well be synanthropic. In Denmark (Hansen, *l.c.*) the species has occurred rarely so far and in the same conditions as here. Dr Hansen notes that it is occasionally taken (elsewhere in Europe) in compost, refuse, and the dung of pigeons or fowls, but always more often at m.v. light. The small tally of British captures to date is completed with two further specimens at my lamp on 17.vii.67 and one more on 30.vi.68 and another which I have just recently seen, taken by Sir Eric Ansorge at Chalfont St. Peter, Bucks., in his light-trap (1.vii.68).

This interesting addition to our list is yet another in the series of Oriental species that have in recent times colonized or obtained a foothold in western Europe, having been originally described from Japan; examples are *Philonthus rectangulus* Shp., *P. parcus* Shp., and *Atomaria lewisi* Rtt. The latest of this class to be found in Britain — another Sphaeridiine—is *Cryptopleurum subtile* Shp. (see Johnson, 1967); it too occurred at light in Germany at about the same time and in the same area as the *Cercyon*, and has now spread similarly; I captured a single specimen at the lamp here two years ago (Allen, 1968). The great attraction of artificial light (at all events ultraviolet) for these two species is curious, since, although their native congeners certainly come to it, in my experience they do so only very occasionally—yet many of the genus *Cercyon* abound almost everywhere. On the other hand *C. laminatus* has not yet been taken in Britain in the field, and the breeding-habitat of the Blackheath specimens is unknown; I have never found it in the garden (where many of the genus occur) or elsewhere. It seems possible that the large development of the eyes in this species is not unconnected in some way with its marked lychnophilic tendencies. The nights on which my specimens appeared were quite exceptionally warm and close, and a host of insects came with them.

C. aquatilis Donis. (1932). — This so-called species, described on two examples from the willow swamp at Windsor, must be sunk as identical with *C. haemorrhoidalis* F. (=*flavipes* F.) I reached this conclusion through examining the type and paratype in Donisthorpe's collection and was glad to learn that Mr Balfour-Browne fully agreed. In fact *aquatilis* is not even abnormal *haemorrhoidalis*, but quite typical. Donisthorpe must have been misled by the habitat into assuming it to be a species near *C. marinus* Thoms. (=*aquaticus* Lap.)—with which he compares it—or at any rate a marsh-dwelling one; the very common dung and compost-feeding *C. haemorrhoidalis* clearly never occurred to him

as a possibility. The beetles had most likely been swept off the adjacent fields into the pothole in the swamp by previous flooding.

C. bifenestratus Küst. — Mr Balfour-Browne considered that this species should be struck off the British list, as he was satisfied that it had been introduced in error; the exponents being only *C. marinus* Thoms. That was the case, at least, with the single representative of *bifenestratus* in the Power collection—one of Newbery's original catch from 'the broad ditch near Sandown Castle, Deal' (vii.96; *Ent. Rec.*, **11**: 265). Even so, the species could perhaps occur with us and a look-out should be kept for it. The characters are given in Fowler & Donisthorpe (1913), but there is a further important difference in sternal structure (see Vogt, 1969: 190, figs. 9, 10).

(Fowler, *l.c.*, remarks at the end of his note on this species: "Colour differences are usually worth very little consideration in the genus *Cercyon* except in two or three well-marked species". With this estimate I cannot fully agree. Provided they are not too narrowly defined, and, of course, that the maturity of an individual is taken due account of — in our species sufficiently indicated by a quite black head—, colour characters can be decidely helpful, not least those of the antennae and palpi. The existence of numerous colour-aberrations in Continental catalogues does not invalidate this conclusion, for, as is so often the case, our insular races seem on the whole a good deal less subject to such variation. Such a definite form as the var. *binotatus* of *C. litoralis* will naturally give no trouble).

C. subsulcatus Rey.—This name must disappear from our list and be replaced by *sternalis* Sharp (1918), as it turns out that authors have been in error in synonymizing the two species. Sharp made no reference to *subsulcatus*, but a year after his paper was published Deville suggested that Sharp's *sternalis* might be the same, without in any way affirming their identity. Both in Britain and on the Continent the idea was adopted, and it was not till 1949 that Méquignon showed the true *subsulcatus* to be a Mediterranean insect (found chiefly in the Camargue), while *sternalis* was widely spread in France. Some have doubted his interpretation of *sternalis*, believing it to be *convexiusculus* Steph. (see below). Vogt, however (p. 183-5) conclusively proves that Méquignon was, after all, correct; Rey's species differs decisively from Sharp's in most of the important characters—though nearest to it. As it seems confined to southern France, it need not further concern us here. (For *sternalis* and its characters, etc., see the final part of these notes).

C. granarius Er.—Introduced as British in 1879, and included with reserve by Fowler (p. 260), who gave two localities (Birmingham district and Walton-on-Thames). Sharp (p. 275) stated that he had but one specimen, given to him long before by Crotch. However, Mr Balfour-Browne has examined this and found it to be only *convexiusculus*, and tells me he has not seen the true *granarius* from Britain. I think it very possible that Fowler's '*lugubris*' (now a synonym of *convexiusculus*) was largely *sternalis*—not at that time separated while in any case his *granarius* was almost certainly *convexiusculus*, and the same is probably true of any other British records of the former. It is to be noted, however, that Fowler assigns the mesosternal characters correctly, having most likely taken them from the literature.

I have never seen the present species, which has a simple flattish type of sternum without a lumen (Vogt, p. 190, fig. 18) and, according to Reitter (1909), the elytral intervals *as shining as the pronotum* with fine *and equally thick* puncturation becoming obsolete behind. The italicized points *taken together* should prevent confusion with either *analis* Payk. or *convexiusculus* Steph., with either of which it might possibly be found mixed in some of our collections. *C. granarius* appears to be uncommon in Germany, Denmark and Sweden, in wet situations. It could perhaps be found here (the smaller obscurer Cercyons not being in much favour among collectors), but, until it is, it would be best omitted from our list.

C. pumilio Sharp (1918).—It is virtually certain that this is only a dwarf example of *sternalis* Shp. The 'species' was based (p. 277) on a solitary individual from Hammersmith Marshes; Sharp admitted it was 'closely allied' to his *C. sternalis*, which he had described from the latter locality, and in fact there appear to be no real differences that reduction in size would not account for. This was also Mr Balfour-Browne's opinion, and it is adopted by Vogt (p. 189). Accordingly, *pumilio* should be sunk as synonymous with *sternalis*.

Notes on the 'subgenus' Cercyon Rey.—Our three species *convexiusculus* Steph., *sternalis* Shp., and *tristis* Ill., together with others in Europe and America, comprise a group of very closely allied forms; of which those known to Rey were placed by him (1886) in his subgenus *Cercyon* (primarily on characters of the meso- and metasternum). Sharp (1918: 274) considered that it should be raised to generic rank; but fortunately we need not follow him in this, since Vogt (pp. 187-190), after a thorough discussion of the question, concludes that there is no valid basis for so treating it. He draws attention to the significant fact that throughout the genus the more important interspecific differences of sternal structures frequently cut across the obvious affinities of species; so that if it is used for grouping, nearly related species will often be widely separated and a patently artificial system will result. Thus while the *convexiusculus* group species are plainly symphyletic, another which on all counts belongs elsewhere—*bifenestratus* Küst.—has a similar type of sternum, and indeed Rey included it with them as a *Cercyon*; further, there are other even more distant species showing a tendency to the same structure. It is evidently a plastic or labile character within the genus, probably (as Vogt suggests, p. 191) in some way adaptive and influenced by habitat; for those species with the most advanced sternal structure are all found near water, and not in dung or compost like most of the others—though the correlation is not perfect.

The three very similar British species included by Sharp under *Cercyon* are the ones most liable to be mixed in collections, so it will be as well to say something of them and give a revised key. Sharp (p. 275) included also *granarius* Er., but, as we have seen, the insect on which he seems to have relied for his knowledge of that species was misdetermined and the true *granarius* does not belong to the present group.

Looked at from below or from the side, both the meso- and metasternal laminae in these species (i.e., the median shiny and punctate part of the mid- and hind-breast) are seen to be much developed, being considerably raised above the level of the coxae and having under their point of approximation or contact a distinct space, or 'lumen' (Sharp's term), which can readily be seen from the side even in ordinarily carded

specimens whose underside is clean and not too heavily clogged with gum. The size or form of this space and/or the length, breadth, etc., of the two laminae differ in each species of the group. The lateral view is figured by Vogt† (p. 190) for them and most of the mid-European (and British) Cercyons; these instructive figures should be studied by anyone interested in recent evolutionary trends within the genus.

(Small convex black species with apex of elytra lighter, legs and antennae, except club, rufotestaceous to pitchy; elytra duller than pronotum, the intervals alutaceous, at most finely punctured, much more finely than striae or pronotum and less thickly than the latter; and only, if at all, in the front half. Sternal structure, see above; aedeagus characteristics for each (Vogt, p. 178). In damp places, flood rubbish, etc.)

1/2 Striae almost fading out towards apex, except for the one or two innermost, intervals quite flat, sculptured as 4/3; apex very gradually and obscurely lighter. Lumen (see above) intermediate in size, distinctly open; mesosternal lamina larger, convex in side-view, broader. (Palpi mostly dark, legs piceous Usually larger and broader) . . . *tristis* Ill. (=*minutus* auct.)

2/1 Striae distinct throughout: apex plainly reddish; lumen less open, mesosternal lamina smaller, flatter. (Usually smaller and narrower.)

3/4 Striae not deepened towards apex, intervals quite flat, punctate in front as a rule but sometimes hardly visibly, often less dull; reddish colour at apex merging into the black; palpi* with segment 4 (last), and sometimes 2 also, darker than 3, or the whole more or less blackened. Lumen small, not quite closed, apposed ends of laminae blunt in side-view; the mesosternal narrower, both laminae scarcely alutaceous and very shining. (Legs often lighter) ..... *convexiusculus* Steph. (=*lugubris* Payk.)

4/3 Striae a little deepened towards apex, where the intervals are very slightly convex; these hardly visibly punctuate even in front, with a dull sheen ('*sericeo-subopacis*', Sharp); reddish colour at apex well marked off from the black; palpi wholly clear testaceous or brownish-yellow. Lumen large, practically closed, apposed ends of laminae in side-view acute, often just overlapping; the mesosternal broader, both laminae plainly alutaceous. (Legs often darker) ..... *sternalis* Shp. (=*subsulcatus* auct., nec Rey)

The colour differences, though not to be relied on entirely, nevertheless appear constant enough to be useful, either for a preliminary sorting or as confirmatory characters. Broadly speaking one may say that 'palpi paler than legs' points to *sternalis*, 'legs paler than last segment of palpi' to *convexiusculus*, and 'palpi *and* legs somewhat dark' to *tristis*. Specimens unnaturally darkened by having been kept too long in laurel etc. will not, of course, show clearly the differences of the elytral apex; as always in such cases, they are best degreased long after setting and dried rapidly on a hotplate, when the originally paler parts will often be restored to something like their pristine clarity.

As regards incidence, etc., Sharp (1918) apparently considered all three species rare, with *tristis* the least so and *sternalis* the most. My experience is rather the reverse. I have met with only a single *tristis* (Windsor, 10.vii.37) but have found *sternalis* not rarely in several places: Ruislip Reservoir, Middx.; Wicken Fen; Allhallows-on-Sea, Kent; and Windsor (one, with the last). *Convexiusculus* I have taken only at Blackheath, beside a pond long since drained, and one at London Colney, Herts. The late Joesph Collins (1919: 68) had a long series from Yarnton, Oxon., determined by Sharp as *sternalis*, but only three *convexius-*

†He also figures the aedeagus of all the mid-European (and British) species (pp. 176-8).

*Maxillary, of course, as in other cases where 'palpi' alone are referred to.

culus from as many places in the same county, and a single *tris'is* ('Oxford'). Joy (1932) marks the last-named as 'local', but both the others 'rare'. I can record *sternalis* also from Hurn (Hants.), Pevensey and Chichester (P. Harwood, in my collection) and one in the Power coll. from near Lewes; and *convexiusculus* from Wye and Westerham (Kent), Bishop's Stortford, and Killarney (P. H., coll. A.A.A.); Eltham and Shooters Hill (Kent) (Sussex) one (Power coll.). There seems to be no marked differences in habitat, but *sternalis* at least is not averse to coastal and brackish localities.

Vogt (p. 185) shows that var. *intermixtus* Sharp was rightly assigned by its author to *lugubris* Payk. (i.e. *convexiusculus*); of which it can only be regarded as a small narrow form, such as occur in many of the genus. Its ascription to *C. tristis* in certain catalogues (first by Knisch, 1924) is erroneous.

Acknowledgments

I should like to thank Herr Vogt for sending me (unasked) his highly interesting and valuable paper on the genus, which by a happy chance arrived as I was about to prepare these notes; and Mr J. Balfour-Browne for the original determination of *C. laminatus*, for his conclusions as to several species listed as British, and for permission to make use of these and of the British Museum collections.

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63 Blackheath Park, London, S.E.3. 9.iv.1969

CORRECTIONS: Reference my note on *Caenophila subrosea* Stephen at p. 179 of the June issue. In the 6th line down, for "stimulate" read "simulate". In 7th line down, insert "no" between "were" and "casualties" so as to read "There were no casualties in the pupal stage". — J.M.C.-H.

A Crane-fly's Day

By R. M. Payne, F.R.E.S.

In his book *The Natural History of Flies* Mr. H. Oldroyd remarks of crane-flies: "not very much is known about the details of the adult life of most species. They sit about on exposed surfaces . . ." Certainly, casual observation of their lethargic habits would lead one to endorse this last statement, but recently I was able to verify it in a particular case by keeping a Tipulid under observation on and off for a total period of 34 hours.

My garden at Loughton, Essex, contained a large clump of ordinary single Marguerites (*Chrysanthemum maximum*) which was partially shaded by an apple tree. At 11.30 a.m. B.S.T. on 17th July 1966 I noticed a female of the large black and yellow crane-fly *Nephrotoma maculata* (Mg.) resting on a Marguerite leaf some three feet from the ground near the edge of the clump, and the idea came to me to try to keep the insect under observation as closely as might be practicable for as long as possible—to see in fact just how it spent its time.

The weather was dull and cool, with a northerly breeze, the temperature in the garden being only 57 deg. F. When I first saw the crane-fly it was resting motionless along a horizontal leaf, wings superimposed and legs extended, its head facing north-west.

I returned to the spot an hour later (12.30 B.S.T.) when rain was falling lightly and the breeze had freshened. The fly was on the same leaf, but had turned to face the opposite direction. At 12.45 it had turned again and was now facing north-east, and it was in precisely the same position 15 minutes later.

At 1.20 p.m. it was on an adjacent leaf an inch away, but in the same attitude as at one o'clock. By 1.35 rain was falling more heavily, but the fly had apparently not moved: by two o'clock the leaf was quite wet, but the insect remained motionless. The rain had stopped by 2.30, but our fly had not altered its position.

At 2.40 the sun had come out, and the temperature (shade) was now 60 deg. F. The fly had veered round on its leaf to face east. I noticed that in this position its head was in shadow most of the time. It apparently remained like this until 3.30 (I saw it at 2.55 and 3.15), when I began a continuous watch. Its four anterior tarsi were then flat along the surface of the leaf, but the two hind tarsi dangled over the edge, the only point of contact with the leaf being at the junction of tibia and tarsus.

During the first 15 minutes of my continuous watch the fly seemed quite unaffected by the frequent gusts of wind which caused the whole stem to sway, though at one stage it moved its left front leg so that the tarsus now hung over the edge of the leaf like the two hind ones. But at about 3.45, in a strong gust of wind, it suddenly lifted its left hind tarsus on to the leaf surface, and almost at once clambered quickly six inches up the stem, its wings whirring all the time. It came to rest on the side of the unopened bud at the top of the stem, facing north, its wings again superimposed. After about a minute it moved round to the opposite side of the bud, and hung there for 30 seconds, when it again moved round, to face east.

It stayed in this position for five minutes, the four anterior tarsi clasping the bud, the two hind legs hanging in the air. Then in another gust at 3.51 it moved an inch or two down the stem. Now the two middle legs hung in the air, while the two front tarsi clasped the stem above and the two hind tarsi rested vertically along the stem below. The insect still faced east, having the sun at its back, so to speak.

While I continued to watch it in this position, one hind leg occasionally fluttered off the stem and then back again. At 3.56 the two middle tarsi moved in to clasp the stem. The body was now almost vertical, with the snout at right angles and almost touching the stem.

No further move occurred until 4.10, when the sun went in behind a bank of cloud. Now, with wings fluttering, the fly moved up again to clasp the bud, this time facing west. Again the four anterior tarsi stretched over the surface of the bud, but I noticed that the two hind legs just touched the stem at the joint of tibia and tarsus.

At 4.15 it clambered round to the opposite side of the bud, wings held at right angles to each other during the move.

I had now watched the insect without a break for 45 minutes, but I then had to revert to periodic inspections for the next seven hours.

By 4.20 it had moved three inches downwards to rest in an angle between stem and leaf. With almost vertical body, all six tarsi were merely touching stem or leaves—no tarsi were flat along a surface. In such a position the insect may have felt insecure, for it frequently moved its legs to slightly different points of contact with stem and leaves. It was facing north.

By 4.30 the temperature had dropped to 57 deg. F., and clouds covered the sky. The insect remained in the same position. Rain was falling by 4.35, and I again noticed the moving of legs from one posture to another. At 4.45 there was steady rain, but the fly had not moved its body. Now the front right tarsus was flat on the stem, and the other tarsi were merely touching a surface at their tips or at the joint with the tibia, except for the middle left tarsus which was hanging in the air.

I now visited the fly at ten-minute intervals until 5.50. During this time it remained in the angle between stem and leaf, with the middle left leg in the air. The sky cleared, but with the fresh northerly breeze the temperature did not rise. At 5.45 it was 56 deg. F.

But at six o'clock the fly was up at the top of the stem again, hanging from the bud, and it apparently stayed there all the rest of the evening, and indeed throughout the night. While at 6 and at 6.15 it was facing east, by 8 p.m. it had moved round the bud to face north-west. I visited it at 15-minute intervals after that, and saw no change in its position until 9.30, when it was facing south-west. The temperature was now 52 deg. F. The next change was noticed at 10.15, when it was facing south-east. By 11 p.m. it had moved very slightly to face almost due east, and when I went to bed at 11.15 it was still in this position.

At 7.30 a.m. B.S.T. on the following morning (18th July) it was in exactly the same position, hanging from the bud. I was not able to make any observations during that day, which was again cool and cloudy, though occasionally sunny, and with a fresh north-easterly wind. But on my return home at 6.30 p.m. B.S.T. (temperature 58 deg. F.) the fly was in a leaf-axil of the same stem, some six inches below the bud (which

had now partially opened). It was facing north-east. An hour later it was hanging just below this leaf, facing the same direction. At 8 p.m. it was four inches higher, clasping the stem with its middle legs, fore legs extended upwards to a leaf and hind tarsi laid along the stem. It was swinging loosely from side to side in the strong breeze. While I watched, it opened its wings to a right angle and then closed them again after a few seconds.

I now kept a continuous watch on it for 20 minutes. At 8.5 it clambered up the side of the partly-open flower-head, whose petals were in a vertical position, and at 8.13 to the top of the flower, where it stayed motionless until 8.20 in an almost horizontal posture straddling the flower, apart from a single move sideways through 90 deg. at 8.14. Once it opened its wings to a right angle for about 15 seconds. During this period it was facing between north and east.

When I came back at 8.30 it was down on the side of the flower again. At 8.45 it was hanging on the stem just below the flower, but then climbed back to the side of the flower, to rest vertically, this time with one wing held out at 45 deg. for half a minute. It was still in this position (facing north-east) each time I visited it, at 15-minute intervals, until 9.45, usually with wings superimposed, though at 9.15 (temperature 56 deg. F.) it had one wing out at 45 deg.

I paid my final visit at 10 p.m. B.S.T. This time it was hanging from the flower-head by its four anterior legs, swaying in the wind.

At 7.30 on the following morning it had gone, and a search nearby failed to reveal it.

I am in no doubt that I had a single insect under observation over the whole period of 34½ hours, and that it did not take to flight at any time during that period. I do not think that it is the habit of crane-flies to return to the same post after flight, and the chance of another female taking precisely the same position in the garden is too remote to consider seriously. The species was not common in my garden in 1966, and in a search during the period of these observations I only came across a single other specimen, and this was 100 ft. away and on the other side of the house.

Nephrotoma are not normally day-flying insects (Lewis & Taylor, 1965), but I was surprised that it did not apparently take to the wing on the night of 17-18th July. Species of *Nephrotoma* used frequently to fly into the house on summer evenings, but it may be that the low temperature or the strong winds kept it from flight. Certainly no Tipulids at all came indoors on that particular evening. Its disappearance during the second night might well have been a simple consequence of the higher temperatures—a London minimum of 55 deg. F. was recorded, compared with 48 deg. F. the previous night.

At no time did I see the fly feeding, or indeed doing anything other than moving its legs or wings or, occasionally, changing its position within a total distance of 6-9 inches. Despite the periods of heavy rain, it was never seen *beneath* a leaf, but always on an exposed surface.

Whether it was newly emerged, or an old insect, I do not know. It was certainly quite undamaged, but on the other hand mid-July is late for this species. I did not attempt to mark the specimen, because I did not want to risk disturbing its natural behaviour in any way: this

would have jeopardised the purpose of the observations.

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The Old Lady *Mania maura*

AN ELUSIVE QUARRY

As a boy I was gladdened to receive as a Christmas present a copy of Kirbys British Butterflies and Moths—the Young Collectors Series.

The illustration of the Old Lady particularly fascinated me and I longed to add the damsel to my growing collection.

I learned that it was common almost everywhere and had a habit of entering houses and secreting itself in the curtains.

For years I shook all the curtains, but nothing ever came out—not even dust.

The years rolled on and one August saw me sugaring roadside trees near Monks Wood and this time I was fortunate in seeing one for the first time; unfortunately she spotted me as well and cleared off, and as it subsequently turned out, the fleeting glimpse accorded me was the only occasion I saw the moth in my life.

Ultimately I settled in Doncaster and one of the amenities I enjoyed was a fair-sized garden abutting the racecourse.

Entomologically it was fairly prolific and over the ensuing twenty odd years I notched up 18 species of butterflies out of the 40 accredited to Yorkshire, together with 219 species of moths, including a gradually acquired series of that great Yorkshire rarity—the Red Underwing, nupta; only once previously recorded in 1876.

Countless gallons of sugar never produced one Old Lady, and I was reluctantly forced to the conclusion that the Doncaster area was not one of its habitats, and that in general it is nothing like as common as some text books would suggest, in fact I would lay a small bet that it is poorly represented in most northern collections.

The space reserved in my cabinet for the Old Lady remains empty, a sad reminder of the unpredictable in collecting, yet the gloom of disappointment is lightened by compensations from time to time, and I derive some consolation from the fact that although I have failed to rear the Old Lady, I have at any rate succeeded in breeding a nice series of fraxini. It's a queer world.

L. G. F. Waddington.

CORRECTIONS: Aquatic Bugs of a Fish Pond (*antea* 174) First word of text; for Central read Certain. p. 176 7th entry in Table, for *Agrapto corixa* read *Agraptocorixa*.

Three lines having been omitted from Mr. Alan E. Stubbs's note at the head of p. 180, we repeat the note in its entirety:

TETRIX SUBULATA (L.) (ORTHOPTERA: TETRIGIDAE) IN PEMBROKESHIRE.—On 18th May 1968 a female of this ground hopper was captured a mile north of Haverfordwest, Pembrokeshire. The habitat was the transition between *Juncus effusus* (L.) marsh and grazing pasture where the ground had been liberally trampled by cattle.

T. subulata is not recorded from Pembrokeshire by Dr. D. R. Ragge in his book *Grasshoppers, Crickets and Cockroaches of the British Isles*, London, 1965.—ALAN E. STUBBS, 91 Clitherow Avenue, Hanwell, London, W.7

Current Literature

Animal Life of Europe by **Dr. Jakob Graf** (English version prepared by **Pamela and Maurice Michael**) 595 pp.+16 pl. (12 coloured) and copious text figures by **Fritz Bäuerle, Miss L. Hausdorff** and **Dr. Neubauer.** Frederick Warne & Co., Ltd., 75/-.

We welcome this book as yet another English version of a good popular continental work, and the scope of this one is wider than anyone has a right to expect of a single volume; nevertheless the author has managed to give sufficient information to enable the reader to run down a definite or very close identification of any living creature he may encounter within the grographical scope of the book.

The author has set out a very good scheme to achieve the above end, commencing with a systematic arrangement of the classes and orders of the animal kingdom on a scientific basis, but from time to time he leaves the hard and fast way of science to make use of more obvious features which will help the amateur in his determination of his finds, often comparing creatures which could be confused although they are actually in different orders.

The cover papers illustrate a simplified classification of the animal kingdom into classes, at the front, and at the back, the division of the classes into orders. The first pages instruct the reader as to how he should use the book, and a few remarks on the classification criteria of the mammals merges into the treatment of the species. The system adopted throughout the book is to give a good figure of the creature under discussion in the margin by the relative paragraph. These figures are extremely well drawn with very few unimportant exceptions. Birds follow the mammals and they are treated equally thoroughly. Firstly the orders are mentioned each with a marginal illustration of the head or foot or other distinguishing characteristic. The parts of a bird's body and arrangement of feathers are shown under the names used in the text together with diagrams of the various tail forms similarly named. Nests, nest holes and egg laying follows with marginal figures of typical nests. A couple of pages are given to feeding places and pellets followed by silhouettes of characteristic birds. The species are then dealt with, four coloured plates assisting with the distinction between some rather similar species. The reptiles and the fishes complete the treatment of the vertibrates.

The Arthropods follow, and after a few pages descriptive of the various classes, the orders are shown with marginal figures illustrative of the order under discussion. Thereafter the orders are treated more or less separately, but throughout there are overlappings, for the determination is based on broad similarities which are mentioned in the page headings, thus: "colourful beetles", "Black and dark brown beetles", "Water beetles and bugs", "Ground insects often mistaken for beetles", "Cockroaches" and so on. Insect larvae follow, classified under habitat rather than form thus: "larvae living on plants and on the ground", "larvae living under ground", in sound and rotten wood and in water and so on. The tiny Arthropods on plants include Aphids, Thrips, mites and scale insects. Parasitic insects on animals and people form a group, followed by domestic pests. Isopods, spiders, Crustacea, Moluscs and finally worms.

An appendix deals with bird songs, many with a musical score, and indices of popular and of scientific names complete the book.

The printing is good and the illustrations mainly excellent; the book is bound in strong cloth boards, and is one which must appeal to all nature lovers whether scientific or unscientific, and it will be an excellent companion for those travelling on the continent of Europe, with a particular appeal to English-speaking people. Messrs Warne are to be congratulated on their decision to add this adaptation to their list of publications.—S.N.A.J.

The Microscope Made Easy by **A. Laurence Wells,** 256 pp. 8vo+8 coloured and 7 black and white plates. Frederick Warne & Co. Ltd., 15/-.

This year we have this second edition of the 1957 book, and it will be of use to all amateur microscopists. The matter is treated in a chatty way, beginning with the objects of microscopy, the various types of microscope, without going too much into optical details, and their treatment with some useful details as to the designation of the powers in inches, millemetres, and magnification.

Chapter II is headed "Rough Mounting" and sets out the amusement to be gained from looking at everyday objects. Crystals form the subject of chapter III, vegetable fibres and animal hairs, chapter IV, with a brief description of their various parts and how to mount them: vegetable fibres and their treatment follows.

Chapter V deals with pond life microscopy and the means of collecting material and its after treatment for the cultivation of single species. Desmids, diatoms and foraminifera are treated separately and are followed by a chapter on marine microscopy, and another on material to be found in garden and hedgerow. Chapter IX deals with mounting materials and appliances, and includes several home made articles. Various mounting materials and media are described together with their particular applications. Mounting methods are dealt with in Chapter X including the drawing of objects under the microscope, and the final chapter is on storing one's preparations. Before the index, a short list of makers of microscopes is given, and another on suppliers of accessories and specimens which should be of great use to the amateur.

The book is strongly bound in imitation cloth boards and is well printed on good paper. The plates, especially the coloured ones are extremely delicate and show what can be done with natural colours and by skilful staining. It should certainly find a place with all amateur microscopists, and they will be well advanced before they put it aside.—S.N.A.J.

Cold Water Aquariums and simple out-door Pools by **Neil Wainwright** 81pp.+4 black and white plates. Frederick Warne & Co. Ltd., 12/-.

Although the breeding of certain insects as feeding materials is all that can be said to be of entomological interest in this book, it is one which should have appeal for more than a few our readers. The setting up of indoor tanks and outdoor pools is detailed and also many species and varieties of aquarium fishes mentioned. The breeding of aquatic insect larvae, worms and small pondlife for feeding is dealt with, and there is a short bibliography and a list of three periodicals on the subject. The book is bound in paper boards, with a bright jacket, and enjoys the usual good Warne printing.—S.N.A.J.

Die Lepidopterafauna Mazedoniens IV. Microlepidoptera. By **Dr. Joseph Klimesch,** 203 pp.+10 figures. Skopje Museum (Post Box 341 Skopje).

The Rhopalocera, Grypocera and Noctuidae of the area have been dealt with by J. Thurner of Klagenfurt in the previous three volumes and Dr. Klimesch now puts on record nearly 1200 species of microlepidoptera from the Jugoslav, Bulgarian and Greek Macedonia, and adds very considerably to the knowledge of the species from that area. The Author has spent a very considerable amount of time collecting microlepidoptera in this area, and his skill in finding obscure species, so well known to his friends, has enabled him to add considerably to previously known species.

In his foreward Dr. Klimesch analyses the representation of the families in Jugoslav Macedonia as compared with the whole of Macedonia, showing 1074 species against 1199 for the whole area. He mentions many species with special interest and also analyses the numbers and percentages of species from various specified zoographic categories. A list of some of the harmful species is given with the crops affected by them.

The entries in the list are numbered consecutively, and are accompained by data as to time of appearance, localities and other interesting details where these are available.

A list of 66 books and papers dealing with the subject opens up the literature to the reader and, with the expanding travel facilities, the entomologist will be encouraged to visit this very fruitful area. — S.N.A.J.

Proceedings and Transactions of the British Entomological and Natural History Society, Vol. 1, part 1.

This part marks the end of the Proceedings and Transactions of the South London Entomological and Natural History Society and the commencement of a new series under the society's new name; it is introduced by an editorial note to that effect.

The President's address to the 1969 annual general meeting, after dealing with Society affairs, has as its subject the butterflies of Britain in relation to those of the adjacent parts of the continent with an appendix showing the species resident in Britain and also in various ranges of adjacent countries. Another list shows butterflies recently extinct in Britain and still resident in adjacent European countries; butterflies regularly immigrant to the British Isles, and finally butterflies resident in the adjacent countries but not the British Isles are listed.

The reports of the council, the Treasurer, the Curator and the Librarian conclude the business of the annual general meeting. Accounts of meetings of the society follow including a list of the fungi observed on the fungus foray in the Oxshott district.

Articles include The Millipede *Polyxenus lagurus* (L) in Aberdeenshire by Guy D. Morrison, Some Records of Diptera Predators and their Prey by L. Parmenter, A List of Berkshire Psocoptera by T. R. New, Studies in the Geography of Lepidoptera VIII: A Note on the Ecology and Distribution of Zygaenidae in the Middle East by E. P. Wiltshire C.B.E., F.R.E.S., and On a Collection of *Zygaena Fabricius* (Lep. Zygaenidae) from Turkey by W. G. Tremewan.—S.N.A.J.

Hymenopterist's Handbook. Edited by **B. A. Cooper, B.Sc., A.R.C.S.,** 160 pp., 30/-. The Amateur Entomologist 1943, Vol. 7, No. 40.

This book was first published in 1945, and in a preface to the 1969 edition, Mr R. W. J. Uffen points out that a completely revised edition was contemplated, but this was not practicable. However, as an alternative, a facsimile of the original out-of-print and much called for edition should be produced, and a supplement incorporating new material should follow it at the earliest possible date.

A glance at the contents, printed on the cover, shows it to contain papers by many outstanding field workers, many of them, alas now dead. It is heartening to think that their work, much of it for the young and inexperienced, shall not fall into the limbo of rare publications.

There is a preface on the Hymenoptera followed by 21 pages of classification and keys to the various families by G. J. Kerrich, I. H. H. Yarrow and Robert Benson with illustrations clarifying some anatomic details. Articles follow on collecting, breeding, apiculture, plant galls, microscopy and many other aspects of the study of these insects, all by qualified writers, and having in mind that many of the Hymenoptera, especially the parasites need special care if useful specimens are to result, many of these articles are of special interest, not only to the beginner.

Special techniques for the study of insects whose feeding habits, subterranean, wood-boring etc., present difficulties, are offered, and these will doubtless stimulate the individual to produce his own modifications to suit his purposes.

There are 34 of these papers in all, many illustrated by good line drawings, including a glossary of terms used, and the whole is fully indexed. This collection of papers is a most excellent project which brings much practical experience into the hands of all hymenopterists: the A.E.S. is to be congratulated on this production and it is to be hoped that the supplement foreseen by Mr. Uffen will not be too long in making its appearance.

The book has a stiff paper cover and is produced on good paper by the offset process.—S.N.A.J

CHANGE OF ADDRESSES

T. B. Silcocks, The Quest, Glen Avenue, Abbots Leigh, Bristol.

Mr. and Mrs. P. H. Lawson, Ridlands Cottage, Ridlands Lane, Limpsfield Chart, Oxted, Surrey.

R. M. Payne, 49 Galton Road, Westcliff-on-Sea, Essex.

D. A. Richardson, 116 Malvern Avenue, South Harrow, Middlesex.

Mr. L. Price, 17 Glen Park Crescent, Kingscourt, Stroud, Glos.

Group Captain L. W. Burgess, The Thatched Cottage, Tile Barn Lane, Brockenhurst, Hants.

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.

Wanted.—Specimens of *Pararge aegeria*, and *Pieris napi* from Scotland and Northern England.—*George Thomson*, 98 George Street, Dunblane, Perthshire.

Wanted.—Information *and* data on the distribution and habitats of *Coccinella 11-punctata* (Eleven-spot Ladybird) for an investigation into this species. *All* records welcome.—*J. Muggleton*, Dept. of Botany, Science Laboratories, South Road Durham.

For Sale.—Private collection Ornithopthera, and 500 species from Russia, Japan, Australia, New Guinea, Malaya, Africa, and Solomon Islands. Many Charaxes and Papilios. To be sold as one lot.—Please reply to *R. H. Morgan*, 108 Titirangi Road, New Lynn, Auckland 7, New Zealand.

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AND JOURNAL OF VARIATION
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THE ENTOMOLOGIST'S RECORD

AND JOURNAL OF VARIATION

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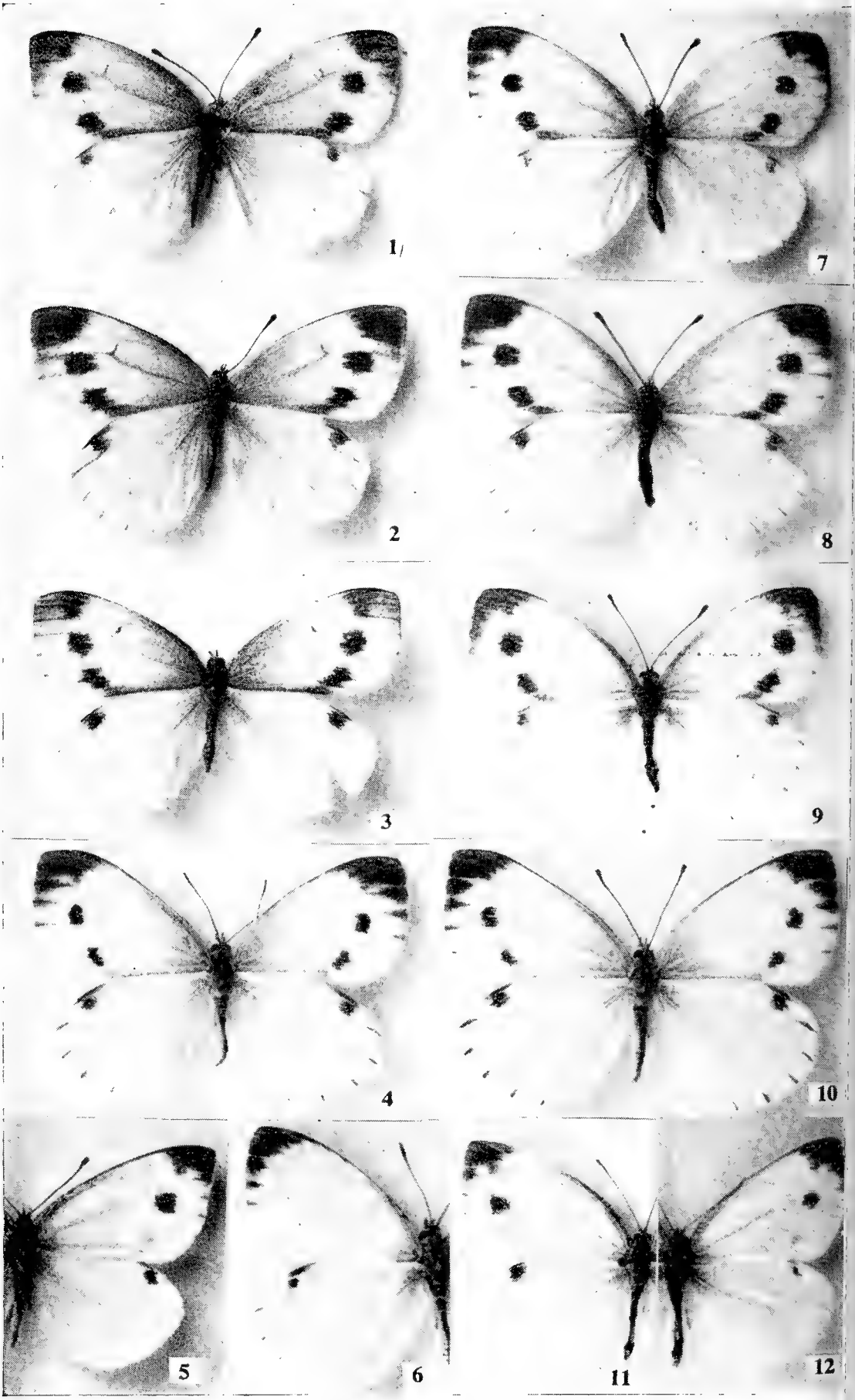
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On the Discovery of a fourth Hybrid race among the Palaearctic species of the genus *Pieris*

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

Only three years ago I first recorded that two races, then known as forms of *P. napi*, were in reality natural hybrids. This discovery rested on the recognition of the reactions of the androconial scales to artificial cross breeding. In many experiments the development of the androconial scales was found to be disrupted; imperfect development, contortions, inverse curvature of any contour, all appearing in variable degrees of intensity and with variable frequency. I have illustrated examples of many such effects in the past (Warren, 1961, pl. 3, figs. 61-68; 1963, pl. 3; 1966, pl. 2, figs. 1-7 and 9).

Not long ago I was able to add that *meridionalis* Heyne was a third of these hybrid races (Warren 1968), and now I have established yet a fourth, which appears to belong to the Asiatic strain.

Some years ago Wojtusiak and Niesiolowski described specimens they had captured between Naltchik and Kara-su in the Caucasus in August between 1000 and 1500 m. as *P. napi* subsp. *balcarica* (W. & N. 1964). Their lengthy description is difficult to appreciate. They say the males have a resemblance to *P. rapae* with the apical markings upper side forewings short, the discoidal spot "not large". The females are quite different more as *P. napi* or *napaeae;* spots and markings "large". They go on to note that Sheljuzhko (1935), records *dubiosa* Röber from the Teberda district saying the north Caucasian form agrees well with the figure of *dubiosa* in Seitz· Later on they say that "in all probability" their specimens are identical with those from Teberda, and differ from all other forms known in the Causasus. Sheljuzhko's knowledge was the result of personal experience and he is always an accurate observer. His reference to the Sietz figure of *dubiosa* proves that some of his specimens had the triangular discoidal spot characteristic of that race in the male, and probably the apical markings also. Before dealing further with *balacarica* I must refer to Röber's description and figure of *dubiosa*; both have been ignored, yet both are very informative.

EXPLANATION OF PLATE

1, 2, 3. × *P. balcarica* W. & N. Female, Basuriani, Caucasus (Minor). August 1964. 1800 m.

4. × *P. meridionalis* Heyne. Female. Calabria. (Bred 1967.)

5. × *P. balcarica*, male. Basuriani, Caucasus (Minor). August 1964. 1800 m.

6. × *P. meridionalis*, male. Calabria. (Bred 1967).

7, 8, 9. × *P. dubiosa* Röber. Females. Vizzavona—Tattone, Corsica. July-August 1926.

10. × *P. meridionalis*, female. Calabria. (Bred 1967.)

11. × *P. dubiosa*, male. Sierre de Guadarrama, Castile.

12. × *P. dubiosa*, male. Herculesbad, Transylvanian Alps. August 1952. (Reduced discoidal spot, but typical apical markings.)

All exactly natural size and 2nd generation. Photo, E. J. M. Warren.

Röber contrasted *dubiosa* with *P. rapae* in general and the details of the black apical markings upper side forewings with *P. krueperi*, and illustrated a male with a striking, triangular discoidal spot upper side forewings. Verity was the first to follow this strange combination of characters in his work (Verity 1922). Müller commenting on Verity's paper somewhat disdainfully remarks that Röber himself had noted this already (Müller & Kautz 1939, p. 120). (All the same Müller and Kautz failed to realise that *dubiosa* existed.) Though Röber is said only to have known the males, the females actually correspond with the description just as exactly, and in them the likeness to *P. krueperi* is often very striking. It may be as well to note the resemblance lies in the apical markings, the "true transverse pattern" as distinct from the "nervural pattern" as Verity puts it (Verity 1922, p. 142). The inner end of the black marking is cut off more abruptly, while the white ground breaks into the under side of the black destroying the usual, even curvature of that edge. Even though slight, this feature catches the eye readily, when pronounced it alters the look of the apical marking to a surprising extent. The likeness is further increased by the form and size of the discoidal spots upper side forewings in both sexes, and the forewing being broader and rounder than in *P. napi*, though perhaps slightly narrower than in *P. krueperi*, which is what was implied by Röber's remark about it being "narrow". These characteristics were commented on, and also the constancy of type in this insect at Vizzavona in Corsica by Bretherton and de Worms (1963). They have long been known to collectors familiar with the insect in Spain and Corsica. Haig-Thomas writing about "var. *dubiosa*" says "the insect is also larger and the forewings are much broader than in *P. napi*" (Haig-Thomas 1929).

This likeness to *P. krueperi* is also seen in *pseudorapae* but much less markedly, the general characters of the discoidal spots will always distinguish the latter from *dubiosa*. (See details at end of this paper.)

Verity named the Asiatic race "*pseudorapae*" in 1908. At that time this action was recognised as automatically restricting the name "*dubiosa*" to the Spanish race, and *pseudorapae* has been used in this sense in all countries for the past 40 years or so, notably by those who lived in the Near East and specialised in the lepidoptera of that region (Graves 1925; Wiltshire 1957; the late R. E. Ellison sent me specimens under this name—see Warren 1961, pl. 1, fig. 22).

The name "*dubiosa*" has also been much used for the Mediterranean insect (Cooke and Straubenzee 1928; Haig-Thomas l.c.; Bretherton and de Worms, l.c.).

The first time I saw *dubiosa* in Corsica in 1926 I felt it could not be conspecific with *P. napi*, it seems that others thought likewise. I possess two notes on "*dubiosa*" by the late Capt. Hemming. He writes:—"I can add one piece of additional information; some years before the war Querci, collecting in Portugal, found *dubiosa* plentiful in the region of the Serra d'Estrella. I bought a considerable series from him. These included specimens in fresh condition taken over a long period: June; August; early October; late October. October seems to have been the period of the year when this insect was most abundant. I also have a short series taken near Oporto . . . which I associated with *dubiosa*". again Hemming writes, this time about Esper's *napaeae*·—"Esper's figure

(pl. 116, fig. 1 ♂) is very pale and with rounded forewings. I should not have been surprised if it was found to be a *dubiosa*". (Hemming in. litt. both notes bearing his signature.) His reference to the wing shape shows he was familiar with true *dubiosa*. This character was stressed again a few years ago, as already noted (Bretherton and de Worms 1963). Hemming's suggestion may be nearly correct, for *napaeae* might be a natural hybrid, *napi* × *bryoniae*. Such a hybrid form exists at low levels in some valleys of the Berner Oberland. It shows many characters of *dubiosa*. Verity noting the likeness to *bryoniae*, concluded *napaeae* to be a second generation of that species (Verity 1922). Now the question of the two localities given by Röber has been brought up again (Riley and Bowden 1969). They wish to disassociate the name "*dubiosa*" from the western race (i.e. to disregard the details of Röber's description and his figure).

Their paper is based on false premises, so make things rather confused. One useful point, however, emerges from it. They accept on the strength of breeding experiments by Bowden that *meridionalis* of Caliabria and *dubiosa* of Corsica are the same subspecies (Riley & Bowden 1969). Bowden had previously made experiments crossing Corsican *dubiosa* with *P. napi* and *P. bryoniae*. On the results of these experiments he concluded *dubiosa* was separable from both these species by "important genetic differences" which "might" be as great as those between *napi* and *bryoniae*. But he concludes *dubiosa* cannot be quite specifically distinct from these species and retains it as a subspecies of *napi* (Bowden 1966). As he now finds *dubiosa* and *meridionalis* genetically the same, we must accept that *meridionalis* differs from *napi* and *bryoniae* as *dubiosa* does. He accepts both as subspecies of *napi*, rather for want of a better definition. In his view then these races were not fully, specific entities, but yet something more than normal subspecies.

All this agrees with the evidence I have derived from the developments in the androconial scales, which has shown that *dubiosa* and *meridionalis* are both hybrids of a similar strain (i.e. the European strain, Werren 1968). Both differ in similar manner from *napi* and *bryoniae*, yet they cannot be separated from them as species, in the accepted sense of the term, or connected with them as subspecies. Bowden and I have been describing the same phenomenon from different view points, but this does not alter the meaning, or lessen the accuracy of the work. It serves, however, as a timely reminder that the results derived from the study of the androconial scales, or breeding experiments, largely correspond. Taxonomically both are equally reliable and therefore of equal value; they are corroborative; but the scale developments are more informative and definite. By breeding it is possible to establish the degree of divergence separating two individuals but it is impossible to ascertain whether either or both are of hybrid origin. This will help readers to realise that the results obtainable from breeding experiments, though important, cannot transcend anatomical facts. When Riley and Bowden say *meridionalis* and *dubiosa* have been proved by breeding experiments to be "belonging to the same subspecies" this means that both agree genetically to a certain extent; as all subspecies of any species probably do. But this does not mean that all subspecies must be the same; that there is only one subspecies in a specie. *Dubiosa* and *meridionalis* are

doubtless, genetically alike, both being hybrids of the European strain, but physically they are very different races. Anyone looking at the plate accompanying this paper will not need to be told this. The two resemble each other about as much as *P. brassicae* and *P. napi* do. (Figs. 4, 10, female; 6, male *meridionalis* from Calabria; figs. 7, 8. 9, *dubiosa* female from Corsica; 11, male from Castile; 12, male from Herculesbad, Transylvanian Alps). There is of course variation as in all *Pieris* races, and more in *dubiosa* than *meridionalis*. But recognition of either in the 2nd generation could never cause much trouble. One need only note that *meridionalis* never develops the characteristic, apical markings, or the large, equal-sized, rounded discoidal spots on the upper side forewing such as are typical of the female *dubiosa*. In *meridionalis* the discoidal spots are rectangular and always angled, the lower one much the smaller. The male *meridionalis* is normally without a discoidal spot on the upper side, and should one appear it is never of any pronounced size, let alone of a heavy, triangular form. Further, the discoidal spots give another, less obvious, but absolutely constant character distinguishing the males of the two races. In *dubiosa* there are two well-marked spots on the under side of the forewings, the lower one of which always shows through on the upper side. (This can even be seen, faintly, in the photographs figs. 11 and 12.) Such spots are only rarely present on the under side in *meridionalis*, and the lower one never shows through on the upper side. The characteristic features of *dubiosa* were commented on by Bretherton and de Worms, who state that at Vizzavona "*dubiosa* is a very striking insect" differing markedly from ordinary *napi* (B. and de W. 1963).

To say that *dubiosa* of Corsica and *meridionalis* of Calabria are the same displays a complete indifference to the characteristic features of both races. Yet this alleged identity was made the basis for their proposed changes in nomenclature by Riley and Bowden. To accept this one has to assume, either that a well-known race that has been recorded from 5 countries and has been the subject of many detailed papers, does not exist, or that *meridionalis* implies two different things and can be used for either as occasion demands. This will strike most readers as incredible; but it is the meaning, in plain language, of the statement that "the Andalusian locality is pre-occupied by subsp. *meridionalis*" (Riley and Bowden 1969).

Starting from such a hypothesis their subsequent arguments become a chain of interdependent misconceptions; *meridionalis* does not pre-occupy the Andalusian locality; so *dubiosa* was not restricted to Asia Minor, and *pseudorapae* was not a synonym of *dubiosa* until they made it so, by citing a specimen of *pseudorapae* as type of *dubiosa*, which left the Andalusian insect without any name. Such a citation of a type is meaningless. It invalidates two familiar names, replacing them with one, and fills the gap by using another familiar name as representing two different things.

There is no need to consider this matter further. Having clarified the seeming discrepancy between Bowden's research work and my own we can return to *P. balcarica*. For a long time I was unable to form any certain view about it. Then Mr Yuri Nekrutenko of Kiev sent me a small series of Caucasian specimens, 5 male and 4 female, taken at Basuriani in the Caucasus in August at 1800 m. These must be *balcarica*

and they agreed with the various descriptions I have. The discoidal spot upper side forewing in the males is variable but distinctly marked, in one it is large and square with a straight outer edge as in *P. mannii* (see fig. 5). Such a specimen would account for Sheljuzhko's reference to the figure of *dubiosa* in Seitz. The females are remarkable, suggestive of *P. napi* or *napaeae* as Wojtusiak and Niesiolowski noted, but almost more like *P. mannii*. This resemblance was also noted by Sheljuzhko (1935). The discoidal spots and apical markings upper side forewings in the females are almost square and the two spots the same size (figs. 1, 2, 3). The general appearance of the specimens also suggests *dubiosa*, but the forewings are not so broad or rounded (compare with figs. 7, 8, 9). and the insect is smaller and the apical markings denser. The race is evidently a constant one. On examining the scales I was not surprised to find *balcarica* was another branch of the hybrid strain, showing great disturbance of the scale development.

It may be useful to note that the two specimens described as *P. napi caucasica* by Verity (Rhop. Pal. 1908, p. 144, pl. 32, fig. 21, male, 22 female), is a form of *P. bryoniae*. In his later review of the *napi* and *bryoniae* races, he places his "nymotypical *caucasica* fig. 22", in his Grade II, which covers the typical, monogenerational *bryoniae* forms (Verity 1922, p. 130). Müller states Verity's fig. 22 is a *bryoniae* with a white ground colour (Müller & Kautz, 1939, p. 117), but questions if such occur in the Caucasus. Kautz, later, (l.c. p. 147), corrects this, having received specimens from Sheljuzhko, which he figures (l.c. pl. 10, figs. 9-12).

It is interesting to note Sheljuzhko's comments on the "sehr veränderliche" summer generation of what he calls *P. napi suffusa* Vty. in the Caucasus and Transcaucasus (1931). As he suggested *balcarica* was *dubiosa* it can only be supposed that his *suffusa* was *pseudorapae*. The late R. E. Ellison sent me specimens of what he called "1st generation *pseudorapae*" that had such extremely suffused markings on the under side hindwings that I always concluded "*suffusa*" was the name of the 1st generation of that race. Sheljuzhko's remarks on the very variable summer generation agree with what is known of that insect. The male can be as often without as with a discoidal spot on the upper side and these spots in the females are very variable also. I have been sent both types of male from several localities, ranging from Turkey to the Tian Shan, with the suggestion that they were distinct species; but the scales proved they were not. Apparently some collectors identify their specimens entirely by the presence or absence of the discoidal spots in the males.

Some of the mistaken views as to what "*pseudorapae*" and "*dubiosa*" stood for are probably due to the fact that Müller and Kautz failed to recognise either in their book. They did not even seem to know that any *napi*-like insect existed in Spain, much less in Corsica. The only mention they make of the Iberian Peninsula is to note that the "var. *lusitanica*" flies in Portugal, but they do not tell one anything about it, except that it appears to be a form with strikingly enlarged discoidal spots. There is still more to learn about the distribution of all these hybrid races. Kautz says that in Lombardy both *P. napi* and *meridionalis* occur, separately, or in some cases together, probably as a mixed race. (Müller & Kautz, 1939, p. 144). That the two meet in northern Italy is

more than likely, they may well interbreed; this would account for specimens such as he figures (Müller & Kautz 1939, pl. 3, figs. 8, 9). There might, however, be a possibility that *dubiosa* actually occurs in Lombardy, considering it has got as far north as the Transylvanian Alps in the Balkans, and its presence in Corsica. What exists in Sicily is still very uncertain, quite possibly both *meridionalis* and *dubiosa* or hybrid populations; even a remnant of *P. napi*.

It may be useful to note the characters that distinguish the four hybrid races; in the summer generations.

× *P. dubiosa* Röber. Slightly smaller than *meridionalis* or *pseudorapae*. Apical markings and discoidal spots upper side, and shape of forewings suggestive of *P. krueperi*. Two discoidal spots in female, large, rounded, equal sized; one in male, variable, well-marked or very large, often triangular, the point directed towards the base of the wing the outer edge flat as in *P. mannii*. Two discoidal spots under side forewings in male, the lower showing through on the upper side. Spain, Portugal, Corsica, Greece, Transylvanian Alps.

× *P. balcarica* W. & N. Smaller than the other races, resembles *dubiosa* but also *P. mannii*. Apical markings and discoidal spots upper side forewings, square and equal in size in female; often square in male but also less developed. Lower of two discoidal spots under side forewings in male shows through on upper side. Caucasus.

× *P. pseudorapae* Vty. Equal in size to *meridionalis*. Markings and spots upper side variable in both sexes. The females mostly suggestive of *P. napi* or *meridionalis;* discoidal spots larger than in *meridionalis*, the upper one square but the angles rounded off; lower one markedly smaller, rectangular. Male with or without one spot, when present very variable in size, slightly rounded. Lower of two spots under side forewings showing through on the upper side. Constantinople, Turkey, Syria, Iraq, Persia, Turkestan, Tian-Shan.

× *P. meridionalis* Heyne. Large. Markings upper side resembling *P. napi* in both sexes, sometimes *P. brassicae*. Discoidal spots upper side: male, normally without any, if present small and amorphous. In female rectangular and angled, the lower one markedly smaller. Usually without any spots under side forewings but if a trace of them is present the lower one never shows through on the upper side. Italy and south-east Europe.

Readers will note that *pseudorapae* stands rather between *dubiosa* and *meridionalis*. These four races are familiar to most collectors of Palaearctic butterflies and it will be appreciated that the names as used here were those first given to them. Some few may wish to change them and use "*dubiosa*" for "*pseudorapae*", that they can have supposed it possible to wipe out one in order to use the name elsewhere passes the bounds of credibility. That any type citation could be held to validate such an action, reflects very badly on the whole process of type citation.

Hybrid races such as these are referred to by specific names, as though true species, but the generic name has to be preceeded by the sign of multiplication.

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Macros and a few Micros in South Essex, 1968

By R. Tomlinson

Apart from a successful visit paid to the local Martinhole Woods on March 9, with Don Down for *Apocheima hispidaria* Schiff., nothing of note appeared until my next field trip on April 21. This was made to Hall Woods, Langdon Hills with my friends Derek and David Grimsell. We ran the generator with a 125 watt mercury vapour bulb from 8.40 until 11 p.m. in a sheet operation. Seventeen species of moths came to the sheet, including *Selenia tetralunaria* Hübn., *Polyploca ridens* Fab. (this species is pretty well melanic around this area), and several *Lampropteryx suffumata* Schiff. of which I kept three. Mr. Huggins has never found that *suffumata* is common in Essex. As for *ridens*, he has not seen a great number of Essex specimens in recent years, but before the war he saw several at various places, and never a dark one.

A nice *Orthosia advena* Schiff. came to the Robinson trap in the garden on the night of April 24, and a perfect *Cucullia verbasci* L. on the following night.

It was about this time that I took three specimens of what I like to call the two-spotted form of *O. gothica* L. all within ten nights. In this form the lower bar of the "character" mark is missing, leaving two dots on each wing. I captured one in 1966 and another in 1967. Tutt mentions

that this occurs "sometimes", and I shall see whether this form continues to increase or not in this area.

A fine *Anaitis plagiata* L. came to the trap in the garden on 29th May, another the following night, the same date when I visited the Essex Naturalists' Trust reserve in the 85 acre Grays chalk quarry, an overgrown wild place in which a party of us got lost in July 1967. However, I made sure of our next visit when my friend A. Cox and I set up the generator with the 125watt bulb and white sheet, and my newly purchased Heath Trap on that night. We ran them for two hours, and in spite of the night being fairly cold, some nice moths came to light. The commonest one was *Horisme vitalbata* Schiff., and there was quite a number of *Hadena w-latinum* Hübn. I made another field trip with the generator with the 125 watt bulb and white sheet, and my newly purchased Heath trap to One Tree Hill Wood on the evening of June 1. It was a fine night and a goodly number of moths came to light; there were about 60 in the Heath trap alone after only one hour. The best of these were some magnificent *Dasychira pudibunda* L., *Perizoma affinitata* Steph., *Asethena albulata* Hübn., *Plagodis dolabraria* L., and *Perizoma flavofasciata* Thunb. At home, the trap had caught 86 moths including a *Hadena thalassina* Hufn.

I ran the Robinson trap at Mucking for four nights from June 11, taking three *Leucania obsoleta* Hübn. the first night, and three *Selenia lunaria* Schiff. on the last night, June 14; both good finds.

I paid a visit to my friends and fellow collectors, the Pymans, at Little Baddow, on June 22, and we launched an offensive against the night-flying lepidoptera with the generator and a white sheet, at the Heath trap, and a few sugared trees in the nearby wood. The outcome of this was an *Electrophaes corylata* Thunb. from the sheet and a nice *Ectropis luridata* Borkh. (*extersaria* Hübn.) from the Heath trap, the latter a new moth for me.

I put the trap on at Mucking again for three nights commencing June 26, and this paid off the first night by capturing one *obsoleta*, and a *zanclognatha tarsipennalis* Treits., on the next night a *Thumatha senex* Hübn., a *Sterrha interjectaria* Boisd., two *Scopula emutaria* Hübn., and a *Zanclognatha cribrumalis* Hübn., but nothing special on the following night.

I ran the generator light and Heath trap in a locality at Mucking called Golden Gates, where I have permission to collect, on June 29, with a friend, but only the usual stuff came in, albeit some very nice *Comibaena pustulata* Hufn. and a *Zanclognatha nemoralis* Fab. What made the night noteworthy was the fact that at about 12.30 a.m. the pyjama-clad estate manager appeared with a torch in one hand and an Alsatian dog straining at the leash in the other. He thundered at us about the police telephoning him to inquire about the great light shining on his property It is true that we should have let him know we would be operating there and solemnly promised that we would do so next time, and sheepishly packed up and went home.

It was a really good night on June 30 and the trap in the garden held more than 400 moths. Of these, by far the best were a *Pyrrhia umbra* Hufn and a *Plemyria rubiginata* Schiff., both new species for me. I put the trap at Mucking for the four nights from July 1, and caught another *umbra* and a *Xanthorrhoe quadrifasciata* Clerck the first night, three *obsoleta*

on the third, and another on the fourth together with an *Ortholitha mucronata* Scop. I netted a *quadrifasciata* at Golden Gates flying in the sunshine on July 7.

The trap at home caught a *Sterrha vulpinaria* H.-S. and a *Scopula imitaria* Hübn. on July 9, a *Hemistola immaculata* Thunb. on the 12th and an *Apamea ophiogramma* Esp. on the 18th, and what was one of my best captures of the year, an *Itame brunneata* Thunb., the Rannoch looper. I note that Mr. A. J. Dewick caught two specimens of this species in his trap in the latter half of July 1955 (exact date not given) (*Ent. Record* **67**: 235). I believe that mine, like his, probably strayed across from the continent, maybe as a result of the curious "desert wind" which occurred about that time. My *brunneata* is the third Essex record.

Two more *ophiogramma* turned up in my garden trap the next night. Other new moths for me at this time were *Apamea oblonga* Haw. at Mucking on July 21, a *Diarsia brunnea* Schiff. on 23rd, and also spotted a *Crambus pinellus* L. in the trap, but this got away. Another (?) appeared in the trap there on 25th, but this escaped too.

It was at this time I started to take an interest in the micros, and the Pyralids in particular. I was reminded of the most interesting article by Mr. S. Wakely (Ent. Record **72**: 17) on the occurrence of *Evergestis extimalis* Scop. in Kent, and he ended his article by saying: "There is plenty of scope for *extimalis* to spread to other areas, and it will be interesting to see if this happens". I found an *extimalis* in the trap at Mucking on July 25, an *E. pallidata* Hufn. in the trap at home on 28th. an *extimalis* in the Heath trap at Grays chalk quarry on August 11, two in the trap at home on August 19, one on 22nd and two more in Grays chalk quarry on August 31.

To return to macros, I had a perfect *Cucullia absinthii* L. caught in the trap at home on July 28, and another *brunnea* on August 3. On my field trip to Grays quarry with the Grimsells on August 11, some nice macros came to light, including *immaculata*, *Melanthia procellata* Schiff., *Ecliptopera silaceata* Schiff., a very worn *Colostygia pectinaria* Knoch and a worn *X. quadrifasciata.* Cloudy and rainy conditions set in for six days and nights from August 12 when I ran the trap at Mucking. Good finds here were a slightly worn *Gastropacha quercifolia* L. on the 13th, *Cosmia diffinis* L., on 14th, a *Nonagria sparganii* Esp., on 15th and a very fine *Hadena rivularis* Fab. on the 16th.

I went bird watching to Rainham marsh with two friends on September 2, a bright sunny day, but very windy. We had an excellent view of more than 50 gadwall, 84 teal, a few shoveler, shelduck, mallard and a pintail, but the place is really noted for the waders at this time of year. Ruff fly around there in flocks and several rarities have been seen there in the recent past. As we were leaving the marsh, I kicked up a little fluttering moth which at first glance appeared to be nothing more than a washed out *Calothysanis amata* L. I boxed it and it turned out to be a specimen of *Rhodometra sacraria* L.; it may well have bred locally for it was in perfect condition. I stopped behind another hour beating the undergrowth after my friends had gone home, but failed to flush any more.

The trap at Mucking caught two *sparganii* on September 4, an *extimalis* and a *Spaelotis ravida* Schiff. on the 5th, a *plagiata* on the 6th, an *Ennomos autumnaria* Wernb. and another *sparganii* on the 7th.

A. Cox and I ran the generator and the Heath trap at Martinhole Woods on the evening of September 6th, and most of the normal stuff came in, but just as we were about to pack up at 11.30 p.m. a small geometer flew on to the edge of the sheet—an *Acasis viretata* Hübn. and a new species for me. A *Paradiarsia glareosa* Esp. came to light in Hall woods, Langdon Hills on September 27, and another to the trap at Mucking the same night.

An *Antitype flavicincta* Schiff. appeared in the trap at home on the nights of October 2nd and 5th. A very late *C. amata* came to the garden trap on October 24, and another very late moth was a *Crambus pratellus* L. at Mucking on November 1.

David More had told me of the scheduled meeting at Stanford-le-Hope of the South London (now the British) Entomological and Natural History Society on Sunday, 15th September. It was the unforgettable week-end of the torrential rains which caused floods everywhere, so I did not have much hope of anyone turning up at the station at the appointed time of 9.30 a.m. Anyway, I clumped down there in my waterproofs through the rain, saw a man staring closely at the moths on the windows and walls of the station up-line side, and I asked quietly: "South London?" He shook hands and introduced himself as Mr. Eric Bradford, who I later discovered to be the man who does the excellent micro illustrations in the A.E.S. Bulletins. He called two more men over and introduced them as Mr. Barry Goater (President of the B.E.N.H.S.) and his son, Ricky. I thought how keen they were to drive down all the way from the Borehamwood area through the dreadful rain to attend a field meeting. I went home and fetched some pillboxes and we drove to Mucking, parking the car by the level crossing, and walked to Musket marsh past the Church. The little path across the marsh was awash in several places, torrential rain was still lashing down and a spectacular thunder storm raged overhead. In spite of all this, we went looking for larvae of *Cucullia asteris* Schiff. on the sea aster, but the weather was just too much and we gave up. I invited them to my home where we did some armchair entomology; a memorable occasion in a fairly good year.

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Collecting Round Toramina — Sicily

By Gerhard Hesselbarth and Anthony Valletta

For so many years we have been discussing a collecting trip together sometime, somewhere! At last this much desired dream came true. We met at Taormina, Sicily, in the late evening of Easter Sunday, April 7, at the Pensione Holiday somewhat discouraged of a successful hunt, as the previous days had been wet and gloomy, and we were still afraid that the following days would be just as bad. In fact, the following Monday and Tuesday were extremely wet.

This was our first meeting after many years of correspondence and so we had a lot to talk about. However, we both hoped for the best.

The morning of Wednesday the 9th gave us some hope, as the sky was clear and Mount Etna was very clearly visible with smoke coming

out of the still snow-covered crater. Immediately after breakfast, we started off to the slopes of Castel Mola, only half-an-hour walk from our Pensione, and by 9 a.m. we were with our nets in our hands ready for the first catch. This locality is very rich in flora: we admired the gorgeous golden colours of the *Ferula nodosa, Spartium junceum, Euphorbia dendroides, Oxalis cernua, Ruta chalepensis, Phlomis fruticosa, Calendula arvensis, Brassica nigra* and *Biscutella laevigata,* just to mention a few, on a green carpet of different grasses dotted with a variety of colours mostly of the different species of *Trifolium* and *Anthyllis* against a back-ground of *Opuntia ficus-indica, Artemisia vulgare* and *Teucrium fruticans.*

As the morning got warmer, the thirsty butterflies were soon on the wing to get the first sip of nectar after so many days of fasting. The first on wing was the *Vanessa cardui* L. which was still on the move flying northwards. We may add at this stage that a mass migration of this butterfly was noticed in Malta on the 26th March and the following days; during our stay in Sicily it was the most common butterfly we came across in every locality we visited. Hesselbarth who was in Taormina a week earlier observed this butterfly flying northwards without stopping at the rate of two per minute at a height of one metre above the ground. *Pieris brassicae* L. and *P. rapae* L. were quite common. A few *P. mannii* and *Euchloe ausonia* soon appeared, as well as *Anthocaris cardamines turritiferens* Vrty. and *Glaucopsyche alexis* Poda. Battered *Pararge megaera* L. were also seen and *G. cleopatra* L. was noticed laying on the leaves of its foodplant, *Rhamnus alaternus.* Only one *Zerynthia hypsipyle,* which we missed, was seen and the last butterfly taken that day was a *Cupido minimus* Fuessl. By 11 a.m. the weather became gloomy again. That morning we also disturbed a *Heliothis peltigera* Schiff and a *Synthymia fixa* F.=*Metoptria monogramma* Schiff. Several hairy brownish caterpillars were noticed on all sorts of plants but mostly on the *Teucrium fruticans.* We succeeded in breeding a few which turned out to be *Amata marjana* Stdr. We had more rain that afternoon and evening.

Thursday the 10th was warm and sunny and again we collected in the same area being encouraged by what we took on the previous day in such a short time. We took the same species as on the 9th as well as *Colias crocea* Fourc., *Coenonympha pamphilus* L., *Pararge aegeria* L. and *Vanessa atalanta* L. Several *Macroglossum stellaterum* L. were also on the wing following one direction. At 1.30 p.m. we had to pack up as the weather became very dull and rather cold.

We were both eager to take the *Anthocaris damone* and the *Z. hypsipyle,* so on Friday we hired a car and Henning Hesselbarth drove us to Zafferana on Mt. Etna, passing through Giarre. We were shocked when we got there to see that it was in the grip of winter . . . only dry leaves from last autumn covered the ground, and just a few species of ferns and *Aristolochia rotunda,* the foodplant of *Zerynthia,* were just a few inches above the ground. One *Plusia gamma* L. was seen in that area, however, *Pieris brassicae, A. cardamines* and *M. stellaternum* were noticed further down on the main road.

On our return from Zafferana we chose a different route through Piedimonte and the Valle Dell'Annunziata where we took *Papilio machaon* L., *Lycaena phlaeas* L., *P. napi, Leptidia sinapia* L., *C. crocea,*

P. aegeria and *Glaucopsyche alexis* Poda. Here Henning joined us in the hunt making use of the spare net. This was a pleasant drive under a clear sky; we had the chance to chat a bit with an inquisitive farmer who after all was so generous in offering us a basketful of first-class lemons which we most heartily accepted.

Saturday the 12th was an excellent day, warm and sunny. We started early towards Monte Ziretto, an hour-and-a-half hard walk through a winding road and hundreds of steps; however, along one side of the road many different species of wild flowers were an attraction to several butterfiies, mostly *A. cardamines* and *G. alexis* with a sprinkling of Whites and not forgetting *V. cardui.* To our surprise, we took as we went along, *Libythea celtis* Fuessl., a species we never expected to see or take.

We reached our collecting ground, some 400 metres above sea-level, by 9.30 a.m. In this locality we noticed a different kind of flora to that of Castel Mola, mostly *Scrophularia peregrina, Antirrhinum majus, Convolvulus althaeoides, Pisum elatius, Muscari comosum, Asphodelus racemosus* and *Fistolosus, Linaria triphylla, Tordylium apulum* and *Gladiolus communis.* Here we still increased our bag by taking more *P. napi,* more *E. ausonia* and *P. mannii,* and we saw again *Z. hypsipyle* but this time netting it as well. The sun was very hot that morning and we were very thirsty; a kind farmer soon quenched our thirst by offering us a few juicy oranges which he was just picking. We returned to Taormina very tired by 4 p.m. ready for a cup of tea and a good wash.

The last day of our collecting was Sunday the 13th. We again explored Monte Ziretto but this time we went higher up in search of the *Z. hysipyle* which we found flying in the wheat-sown fields. New species were taken again including *Carcharodus alceae* L., *Lycaenopsis argiolus* L., and *Polygonia c-album* L. We came across only one moth . . . *Nomophila noctuella* Schiff. At 2.00 p.m. we decided to go back as menacing clouds soon started to appear. When we were halfway and still with the nets under our arms we were noticed by a lady and her two daughters who were spending the day in their small country-house. They wanted to know what we were after, and seeing us perspiring, the kind lady offered us a glass of home-made wine from the stock she stored in a cupboard. She did not fill the glasses saying: "This wine is too strong for you and you still have to walk!" We enjoyed such a cool drink and we felt very grateful to her. Before we left we wished her the best of luck and a much greater crop of grapes this autumn.

Thus ended our first collecting trip together in Sicily. May we have more of such trips in the years to come.

Early on Monday morning, April the 14th, we were both at Catania Airport, this time looking in different directions, one to the North and the other to the South. Later in the day, the Hesselbarths landed in a heavy snow-storm at Stuttgart Airport and at Valletta Luqa Airport swept by gusts of strong wind, a disappointing contrast after the mild days in Sicily.

LIST OF DIFFERENT SPECIES TAKEN

Papilio machaon sphyrus Hb.
Zerynthia hypsipyle latevittata Vrty.
Leptidia sinapis sartha Ruhl.
Anthocaris cardamines turritferens Vrty.

Euchloe ausonia romana Calberia or *Euchloe orientalis kruegeri* Pincitore Marott.
Pieris mannii todaroana Pincit.
Pieris brassicae L.
Pieris rapae L.
Pieris napi meridionalis Heyne.
Gonepteryx cleopatra L.
Colias crocea Fourc.
Vanessa cardui L.
Vanessa atalanta L.
Polygonia c-album L.
Pararge megera australis Vrty.
Pararge aegeria L.
Libythea celtis Fuessl.
Coenonympha pamphilus L.
Lycaena phlaeas L.
Lacaenopsis argiolus L.
Glaucopsyche alexis Poda.
Cupido minimus trinacriae Vrty.
Carcharodus alceae australis Zell.

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Eriozona syrphoides Fallén (Diptera, Syrphidae) in North Wales A new British species and genus

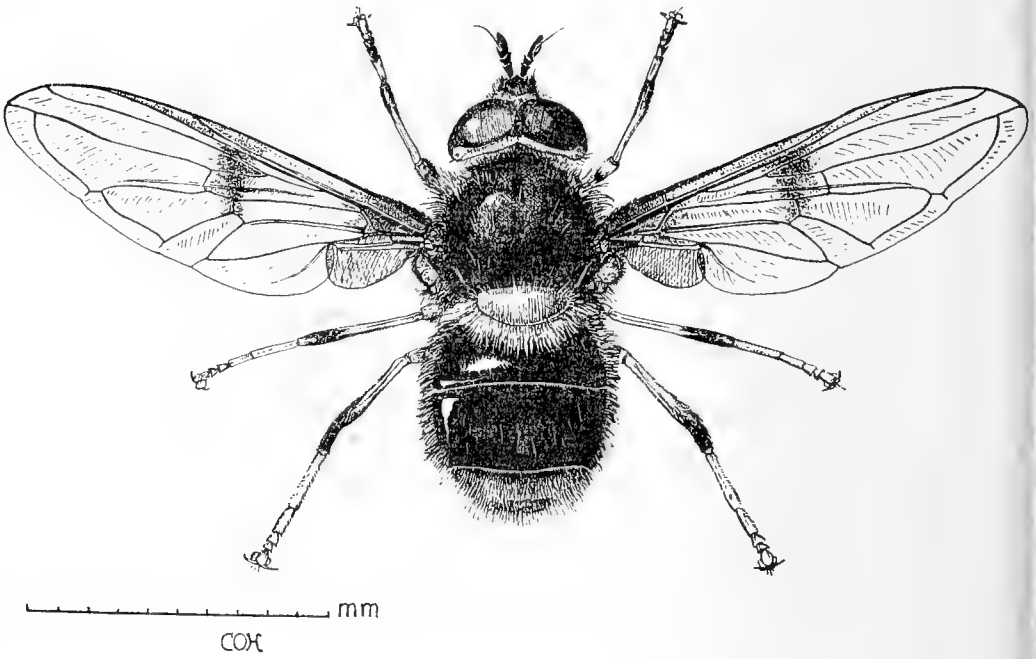
By Peter Crow

The study of the British Diptera, which I took up three years ago and to which I am now much attached, has turned out to be most interesting, healthful and rewarding. It has opened up a new avenue of entomological thought too, which I find to be most stimulating.

Readers will have read recently of my finding our rarest Therevid fly in Windsor Forest in 1967, and in 1968 I had the great pleasure of taking on the 28th August at Llan Ffestiniog in Merioneth a large and handsome Hover fly, *Eriozona syrphoides* which, so far as I can trace, is the first record for Great Britain. The insect is a male specimen and the genus is new to these islands too. At the time I was busy looking for lepidopterous larvae and my attention was caught by this fly, which was sitting on a flower of the Devil's Bit Scabious, *Succisa pratensis* Moench, about twenty yards away. Something told me I must not miss this from the way it was sitting on the flower and fortunately I netted it in spite of my intense excitement. From the plate it will be seen that the fly is a large one and has a superficial resemblance at a distance to that handsome Syrphid *Volucella bombylans* L.

From the researches made of the known occurrence of the creature in Europe I have found that Professor Dr. Pius Sack has stated that

syrphoides is a mountainous species which can be found locally, not rarely, on umbelliferous plants in the limestone Alps. The area where I took the insect is essentially a slate area! Lundbeck has stated that it is somewhat rare in Denmark, where it occurs on flowers in fens and



meadows. He gives the distribution geographically as North and Mid Europe down to Austria, Hungary and in North France; towards the North to North Sweden and Finland. The life history appears to be unknown. So readers will realise how interesting my discovery is and how hopeful in time I am of discovering further new species of Diptera in Great Britain.

I often wonder now how it was in the old days when collecting Lepidoptera that I was so unaware of the presence of the Syrphidae. as these can be really sizeable as well as most beautiful creatures. May I here say that I am still just as attached to the Leps., in fact more so than ever, as my new Fly interest has made me more observant and I now get many more butterfly aberrations than I used to.

In a later article I shall be dealing with the art of collecting the Diptera in the hopes of raising more enthusiasm for this order amongst collectors. In the meantime who knows what good fortune awaits me in the glorious Merioneth countryside, so completely untapped seriously by entomologists.

Thanks are due to Messrs Ken Smith and M. Speight for their help in identifying the insect and to Mr. D. M. Ackland for assisting me in confirming the identification. To Mr. C. O. Hammond I would like to express my best thanks for the beautiful drawing he has made of the insect for the 'Record.'

12 Harvey House, Westcote Road, Reading, Berkshire. 15.vi.1969.

Notes on some British Scydmaenidae (Col.), with corrections to the List

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

In these notes (as in other contributions on similar lines) Kloet & Hincks's *Check List*, 1945, is taken as the basis on which the necessary corrections known to the writer are to be made. These, therefore, are dealt with under the names used in that publication, even if, as in a few cases, a change may since have been indicated in the literature. Again, I take the opportunity to add some remarks on diagnostic points, notable records, or other matters of interest where the occasion arises.

Eutheia Steph.—There appear to be no alterations required in our five species of these uncommon flattish Scydmaenids with truncate elytra; but it may, perhaps, be as well in passing to advert once more to the error found in much of the literature up to the mid-century. This was pointed out in 1950 by Palm and Bergvall (the latter name misprinted Bergyall in my note on the subject, 1953) who showed that it was the males, not the females, that have the antennae longer and less clubbed and the eyes larger—when there is any marked difference. Both Fowler (1889) and Joy (1932) should be amended accordingly.

Three of our species are very scarce. One of these, *E. plicata* Gyll., has been noted a good many times—mostly singly with ants or by evening sweeping—but Donisthorpe (1927: 40), in giving details of his capture of a specimen in the New Forest, expresses a doubt about many of the British records which I am inclined to share. Possibly some of them really refer to the more seldom recorded but actually less rare *E. schaumii* Kies; this was the case with Sharp's single exponent of *plicata*. In the various British collections in the British Museum (Nat. Hist.) all I have seen is the above-mentioned specimen of Donisthorpe's. The late Cmdr. J. J. Walker took the species on several occasions at Cobham Park and Blean Woods, Kent; much of his material seems to have been lost, but there are two from the latter place and one, also by Walker, from the New Forest in the Hope Dept., Oxford. There is a remarkable record of eight examples from cut grass at Yelverton, Devon, by J. H. Keys—reference not to hand—which I consider requires confirmation; the conditions rather suggest *schaumii*. *E. plicata* is easily recognized on sight by its superior size and the presence of distinct temples behind the eyes.

E. formicetorum Reitt.—A species so little known in this country that any capture is notable. I cannot add to its published localities (New and Windsor Forest; Prattle Wood, Oxon), but can give a few further particulars from Windsor. Donisthorpe took it singly with the ant *Lasius brunneus* on two occasions, the first in August 1924. In late July 1940 I met with an example in wood-mould from a beech trunk, a few *L. niger* being present; and in early July 1942 two more, with two *E. scydmaenoides* Steph., in damp fungoid wood near the foot of an old beech—no ants being seen. The occurrence of the latter species in such a situation is worthy of note, since it is normally found in cut grass, manure, compost or other rotting vegetation. (It is widespread but, in my experience, usually occurs singly; here at Blackheath I have taken it but once, on the wing.)

E. linearis Muls. (=*clavata* Reitt. (♀), Fowl.).—Another very rare

species in Britain, for long recorded only from Sherwood Forest, where it was taken by Blatch and others of his generation; but not, I believe, for many years past. It is always found under bark, as might be expected from its being the flattest of our species. In May 1934 I captured a female under bark of an oak stump in Windsor Forest, but it has never been found again, despite all the collecting done there. Finally I can add the New Forest as a locality, having detected a single male so labelled in the Champion collection. The late G. H. Ashe believed he had *E. linearis* from Shute Park, S. Devon; the locality, an old deer-park, is a possible one for this forest insect, but an example he submitted to me from there was only *scydmaenoides*.

Cephennium Müll. & Kunze—Three species of this genus stand on our list. However, Pearce (1957) has pointed out that the common one known here up to then as *C. thoracicum* M. & K. is not that species but is *C. gallicum* Gang., and Besuchet (1958: 896) has since shown that our three supposed species must almost certainly be reduced to one, namely *gallicum*. This I believe to be correct. *C. edmondsi* Donis. (1931), described from Slapton Ley, Devon, appears to be a slightly smaller form of the latter, with perhaps very minute antennal differences (see Joy, 1932: 622), but scarcely worth even sub-specific status though the form, which lives in fine shingle on the foreshore, seems constant; it is doubtless a local habitat-race. The aedeagus does not differ from that of *gallicum*. *C. pallidum* Edmonds (1931—the name there appears as *palllida*) was described from the same locality and habitat on two specimens—one of which, the apparent type, I have been able to examine. I can see none of the chraracters of sculpture, etc., alleged to distinguish the 'species', which I believe to be based on nothing more than immaturely-coloured individuals of the *edmondsi* form of *C. gallicum*. Dr. Besuchet (*l.c.*) was of the opinion that if there were really two species of *Cephennium* in England the second could hardly be other than *C. thoracicum;* since writing that, he has, I think, seen the type of *pallidum*. (The '*C. intermedium* Aubé' included doubtfully by Fowler (p. 85) on a single specimen from Hampshire in 1859 has, of course, never been confirmed, and was probably an importation or else an extreme variant of *C. gallicum*.)

Neuraphes rubicundus Schaum.—As far as I can ascertain, this species does not occur in Britain; the insect doing duty for it in our collections is *N. talparum* Lokay (1921). The latter ranges more widely on the Continent than *rubicundus*, and unlike it, occurs in Fennoscandia. From what I have seen, it appears safe to assign all records of *rubicundus* to *talparum*, while practically all those of *N. carinatus* also prove referable to it (cf. next paragraph)—not excluding my own for Windsor Forest in 1941 and 1943 (*Ent. mon. Mag.*, **77**: 32; **79**: 47). The true *N. rubicundus* (which may, conceivably, yet be found with us) is larger and more elongate, and has a tubercle on each side of the head just internal to the frontal (or strictly, juxta-ocular) foveae, between which the surface is concave or broadly impressed; in *talparum* this part is convex (with at most a fine short central line) and there is no pair of tubercles between the foveae, which are larger (very large and deep), and the middle of the vertex is raised. The habitat seems rather varied, and is certainly not confined to moles' nests as the name might suggest; the species is widely scattered about England from north to south.

N. carinatus Muls.—Although well distinguished in reality from its

ally *talparum* (our '*rubicundus*'), this species has been much misunderstood in Britain, partly, no doubt, on account of its rarity; but also because its characters have not been adequately stated in our literature, resulting in wide confusion with *talparum*. Fowler (p. 75) stresses the shorter antennae, but in fact they appear fully as long, if not relatively longer by reason of the smaller slenderer form of *carinatus;* while both he and Joy (p. 480) omit several good and important differences. That Fowler could not have known the real *N. carinatus* is proved by his having assigned to it the specimen in Sharp's collection labelled *glyptocephalus* Saulcy (a *nomen nudum*), which I have examined and found to be *N. talparum*. It may be useful to list the chief points in which the present species differs from *talparum*, on the basis of the few British examples I have inspected (omitting the peculiar male characters of the head and elytra described by Machulka (1931: 80-1), which I have not seen and which may not be developed in our race):—

Slightly smaller and evidently narrower; darker, pitchy-castaneous; antennae thicker (not shorter), very robust, segments 3-10 appreciably more transverse, 7-8 plainly so; segment 3 of maxillary palpi thicker and more swollen; head shorter, only half as long as pronotum, eyes smaller, frontal foveae and post-antennal prominences less marked, vertex without the slight prominence of *talparum;* pronotum a little more elongate with the keel continued to base and sometimes prolonged forward also; elytra more elongate, outer basal impressions reduced to shallow foveae.

The species appears to be exceedingly rare and local here; it may well be restricted to moss on sheltered chalky hillsides in a few places in the south-east, and is probably thermophilous—being absent from Fenno-scandia—and at least to some extent myrmecophilous. Donisthorpe (1927: 77) notes it as having been found with *Formica fusca* and *Lasius brunneus*, but does not refer to his capture of it at Box Hill; Machulka (p. 81) gives also mildewed beech-leaves as a habitat. Alleged records for northern counties prove to be only *talparum;* indeed, it is highly probable that *no* British records of *carinatus* up to now are genuine, for the few captures known to me of the true species do not seem to have been published. Of what I regard as the latter I have seen four specimens (all quite alike) representing only two localities: Brasted, Kent (28.vii.22) and Box Hill, Surrey (7.v.22), both *in coll.* P. Harwood; and two further examples from the latter locality, one in Donisthorpe's collection (30.v.12) and the other in mine (E. A. Waterhouse, *ex coll.* E. W. Janson). No doubt all four were from the above type of situation. I have, besides, a note of one taken by evening sweeping on the chalk downs at Chipstead, Surrey (27.vii.16), from the late E. C. Bedwell's collecting-diaries; it of course requires checking, but stands a good chance of being correct.

N. longicollis Motsch.—Machulka (pp. 85-6) shows that Motschulsky's description under this name is unrecognizable and in any case can hardly represent the species to which his name has long been applied. That species must therefore take the name *praeteritus* Rye (1872), as to whose interpretation no doubt exists.

N. planifrons Blatch.—This species, described from Sherwood Forest in 1890, was in fact recognized as long ago as 1931 by Machulka (p. 87) as identical with *N. plicicollis* Reitt. (1879), but his paper has been overlooked by British coleopterists. The species is a distinctive one and there can be no doubt that Machulka's view is correct, and that Blatch's name must fall as a synonym. Fowler, naturally, was unacquainted with the

insect when he wrote vol. 3 of his *magnum opus*, but it is of interest to note that he had examined a specimen in the Sharp collection labelled '*S. sharpi* de Saulcy' (p. 75) and referred it to *rubicundus*. I find, however, that it is a typical *plicicollis;* Fowler must have overlooked the absence of frontal foveae. According to Machulka (*l.c.*), mature individuals of this species have dark elytra, but most of our British examples appear unicolorous red-brown or rufous, like *talparum* or *sparshalli*. Noteworthy features are the broad flat smooth and shining head, relatively strongly clubbed antennae and strikingly long raised hairs on the elytra. Apart from the very different head, the general resemblance is rather to *talparum* than to *sparshalli* or *helvolus* and I have found it mixed with the former in collections at least as often as with either of the latter, and occasionally even 'masquerading' as *carinatus*. In fact, it is a *Neuraphes* s. str., not a *Scydmoraphes* like those which follow (or if, with Machulka, one adopts a more analytical view, a *Neuraphes* sg. Pararaphes). *N. plicicollis* is proving somewhat widespread in England, but is very scarce as a rule. Its capture in numbers in sphagnum moss at Easthampstead, Berks. (E. M. Eustace) is remarkable for a mainly subcortical and rotten-wood species.

N. minutus Chaud.—We have here a situation parallel to that between *N. rubicundus* and *talparum;* the insect regarded in this country as *minutus* Chaud. (formerly *sparshalli* v. *minutus*) turns out to be an allied but different species, *helvolus* Schaum—much mixed in collections with *sparshalli* Denny, to which it is very close. Chaudoir's species, it would seem, has not yet been taken in Britain; should it occur, it may be known by its very small size and very distinctly, even strongly, punctured head. Our descriptions and key-characters seem to be based largely, or at any rate partly, on the true *minutus* and this has naturally caused confusion. *Helvolus* is constantly smaller than *sparshalli* and tends to be darker; the antennae less elongate, penultimate joints more transverse, the last markedly shorter, almost as broad as long; the head flatter, rather more triangular, with large shallow punctures, shining, post-antennal prominences feeble, forehead between them flatly convex, without any median impression. In *sparshalli* the head is less plainly narrowed forwards, more convex and duller behind, the prominences marked, the space between distinctly concave, smooth and nearly impunctate. Normally these differences are clear, but there are cases where very careful comparison or adjustment of the light-source is needed before they can be appreciated.

N. helvolus will most likely prove as widespread as *sparshalli* with us; in some collections, indeed, it is the only one of the two represented. At present, such is the confusion between them that nothing useful can be said of their relative distributions. *Sparshalli* appears to be more often taken singly, whereas *helvolus* has occurred quite freely in one or two places—as at Littlington, Cambs. (Power) and Sharpenhoe, Beds. (Harwood). Whilst all British records of *minutus* probably refer to *helvolus*, those of *sparshalli* (far more numerous, of course) must nearly all be ambiguous until checked. Power's records, however, for the latter—Highgate, Wanstead, Birdbrook, Lee, Claygate, Woking (Fowler, p. 76)—are correct, as I have satisfied myself from his collection.

N. nigrescens Reitt.—This name figures in our list on the strength of Donisthorpe's record (1913) of two specimens from sedge-stack refuse at

Wicken Fen. It must, however, be deleted, for these specimens are nothing more than rather dark *N. helvolus*, scarcely different from others standing over the labels *sparshalli* and *minutus* in the same collection. Indeed, Reitter's insect is no longer considered a good species, but merely a pitchy-black form of *helvolus* (Machulka, p. 88). Even if the 'ab.' were worth retaining, which is not so since it grades into the ordinary form, Donisthorpe's examples would hardly qualify for it.

Stenichnus harwoodianus Will. and *S. barnevillei* Reitt.—These names must be removed from our list as separate species, Dr Claude Besuchet having established that both are identical with *S. poweri* Fowler. The matter has been fully dealt with in a recent paper by Mr C. MacKechnie Jarvis (1966) so that only a few brief comments need be made here. *S. poweri* (a species I have never met with) seems rather more variable in some of its minor characters than has been realised in the past; and I have long thought that *harwoodianus* at least was somewhat poorly distinguished, notwithstanding the care taken over it by Williams (1927). In the Harwood collection at Oxford will be found further material of this 'species' (topotypical), appearing in no way different from the *poweri* series next to it (same locality). *S. harwoodianus* has for some time been included in the Danish fauna, but I have little doubt that the species is really *poweri*, which seems not to be well known on the Continent. As to *S. barnevillei*, believed synonymous with the latter even by its author (but not by Joy, as Jarvis points out): if there *are* small infraspecific differences from typical *poweri* in the Scillonian race on which the name was introduced into our list—and even that seems doubtful—they may well be a result of the isolated and specialised habitat.

S. stotti Donis.—According to Besuchet this is synonymous with *S. pusillus* M. & K. (see Jarvis, *l.c.*), and he has so labelled the type and paratypes in the British Museum. The error arose from Donisthorpe's having ascribed the characters of *S. scutellaris* M. & K. to *pusillus*, whereby he was left with the true *pusillus* (not previously distinguished in Britain) as a seemingly new species which he described as above (1932). The mistakes did not really originate with Donisthorpe, however, for the *pusillus* of all our collections and literature is obviously *scutellaris*—one has only to consider the male front femoral character—and not '*stotti*'. The *scutellaris* of British authors is, of course, the same species; it is usually found that females are placed as *scutellaris* and males as *pusillus*. The latter species (=*stotti*) is well characterized in the male by having the outer edge of the anterior femora angularly excised (in *scutellaris* straightly truncate), but Müller and Kunze's figure of this (1822, pl. 5, fig. 15a) hardly appears correct, having no excision and so being more like that of *scutellaris*. (It is no wonder therefore that Donisthorpe, who refers to this figure in his article, was led astray—though admittedly all else indicates that his species is the German authors' *pusillus*.) For females, there are other differences from *scutellaris* that will permit separation, notably the slenderer form and longer, darker limbs. The species appears so far to be rare and restricted in its British range, and most of our specimens come from moss on the North Downs about Reigate; other records are for Middlesex, Kent, and Sussex.

S. exilis Er.—This species has in recent years been equated on the Continent with *Scydmaenus bicolor* Denny (1825), which trivial name,

having priority, must be substituted for *exilus* in our list.

(*Euconnus rutilipennis* M. & K.—In 1955 I drew attention to the existence of a specimen of this distinctive species, not otherwise known from Britain, in the National Collection, labelled 'B.M.Coll./Swansea'. I have since come across an early note on the insect by Rye (1869), who says that Crotch had little doubt that it was sent to Leach by his (German) correspondent, Herr G. Kunze, but that no reasons were given for the opinion. Rye tells us also that Dr Leach included the species in his MS. catalogue as a Swansea insect. In favour of this last, and against Crotch's belief, is the surely telling fact that Müller and Kunze (1822) mention the species as from 'England' as well as Germany, clearly (?) in allusion to the Swansea capture and on Leach's authority. I am thus inclined to regard this example as genuine, but as a probable introduction *via* the docks; if such a striking little beetle were really British, others would most likely have been detected by this time.)

Euconnus claviger M. & K.—The species added to our fauna under this name by Donisthorpe (1926)—one of his celebrated Windsor Forest discoveries—still bears it in the 1945 *Check List*, although the above author had in his 'Windsor List' (1939) emended the name to *pragensis* Mach. (1923); a correction of identity and not of name alone, the two species being quite distinct. As no separate note was published (that I am aware of) pointing out the change, it has doubtless been largely overlooked. Its propriety is shown by Dr Machulka's having labelled as his *E. pragensis* the Donisthorpe specimen that represents the species in the National Collection; moreover it is required by the characters of our insect. It is curious that this apparently little-known and mainly east-mid European species should exist here (where it is certainly of ancient origin), rather than *E. claviger* which on the Continent occurs much nearer to us—in Denmark, for instance. Both species live with ants: *pragensis* mostly with *Lasius brunneus*, *claviger* more with *Formica rufa*. The two beetles are much alike, differing in a number of details of which the most obvious, perhaps, is the nature of the long conspicuous lateral hair of the temples and pronotum (the former especially); this in *claviger* is dark, straight, bristly and stiff, but in *pragensis* pale (more or less golden), curled, soft and 'frizzed'. The type of the latter, and a *claviger* with a Machulka label, are in the British Museum. There is a quite good coloured figure of *pragensis* (as *claviger*) in *Ent. mon. Mag.*, **66** (1930), plate D, fig. 3; but it shows the antennal club shorter than the funicle, whereas it should be longer than the latter and of much looser form. This insect has scarcely been met with here since the original find of 9 examples in a large *L. brunneus* nest in the centre of a felled oak (x.26); except once, I believe, by the late E. M. Eustace in the same locality. My specimen, taken by him, bears the date 28.viii.40.

E. murielae Last (1945).—There is little further to note concerning this very distinct, rare, and interesting species, only known at present from Surrey, Kent, and S. Lancs. (see *Ent. mon. Mag.*, **81**: 275; **85**: 101; **88**: 153; **90**: 185; **102**: 4), except that further examples have been taken in recent years in the Higham (Kent) locality by Mr S. A. Williams, the late Dr Massee, and perhaps others; and to emphasise its total distinctness from its nearest ally (at least in Britain), *E. maeklini*. To the very marked differences mentioned by Mr Last, one might add the longer, much more conical pronotum quite lacking the basal furrow and foveae of *maeklini*.

The description of the body-colour as 'reddish-yellow' seems far too light; for all practical purposes the body is blackish or pitchy. From the situations in which the recorded captures have been made I have little doubt that (as suggested in a previous note) the true biotope of *murielae* is subterranean. The species, it seems, is still not known from the continent.

E. maeklini Mann.—Our rarest undoubted Scydmaenid, of which only three British specimens are known to me: Bradfield, Berks. (Joy; see Fowler & Donisthorpe, p. 96); St. Albans, 15.vi.30 (B. S. Williams, *Ent. mon. Mag.*, **66**: 221, and see note on p. 219; now *in coll.* P. Harwood); and near Oxford, 19.vi.16 (Walker, 1916). I have been able to examine these, and it seems that all three are males. At first sight they do not accord very well with a Danish specimen I possess, in which the antennal club appears smaller and much more compact and the whole antennae, like the legs, shorter. I have seen no mention of sexual differences in *maeklini*, yet they must, I think, be held to account for the above discrepancies—the Danish insect being doubtless a female, which sex has not yet been observed in Britain. Walker's specimen, as stated in his note, had been determined as a male by Champion. The Bradfield one, in poor condition, is in the National (Power) Collection. *E. maeklini* is regarded by Continental authors as myrmecophilous, occurring chiefly with *F. rufa*, but also with *L. brunneus*. Hitherto, however, it has not been found with ants in Britain, our few captures having been at large—on the wing or by evening sweeping—except Joy's 'probably' in dead leaves. In our fauna, the species is at once known by the following features in conjunction: small size, short antennae with broad and very abrupt club, pronotum rounded-obcordate (not conical) with basal channel, elytra subdepressed in front and not thickly haired (cf. *E. murielae*).

E. nanus Schaum.—Fowler (p. 79) remarked that this very minute species 'certainly appears to be generically different'; and in fact that view is to-day universally adopted and *nanus* now forms the type of Croissandeau's genus *Microscydmus*—a change that should be followed in our list. It is excessively local with us, being for long only known from the Scarborough district as one of the series of rarities discovered there by Lawson and Wilkinson during the last century; more recent records are Bradfield, Berks. (Joy), Sherwood Forest (Bedwell), and, in Scotland, Ayr Gorge (Crowson). It seems to be found only in rotten wood and under bark. In its localization *M. nanus* closely parallels another of the aforesaid Scarborough discoveries, the Pselaphid *Trimium brevicorne* Rchb.

Acknowledgments

My thanks are due to the following persons: Dr Victor Hansen (Copenhagen) for a Danish example of *E. maeklini;* Prof. G. C. Varley and Mr Ernest Taylor (Oxford) for the loan of material from the Hope Dept., University Museum; Mr Colin Johnson (Manchester) for the loan of *Cephennium pallidum* from Edmonds's collection and for bringing to my notice Machulka's paper on *Neuraphes;* and the authorities of the British Museum (Nat. Hist.) for facilities for study in the Entomological Dept.

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63 Blackheath Park, London, S.E.3. 28.vi.69.

On a new Genus of Dermaptera from India

By G. K. Srivastava, Calcutta

Family	:	LABIOIDEA
Sub-family	:	CARCINOPHORIDAE
Super-family	:	CARCINOPHORINAE

Aborolabis gen. n.

Paralabis Burr (partim), 1915, *J. R. mirc. Soc.*, **1915**, p. 540.

Generic Description. ♂ : Size medium, surface pilose. Head triangular, sutures distinct, caudal margin sinuate mesad. Antennae 16-segmented(?), 1st segment equal to the combined length of 2nd, 3rd and 4th segments; 2nd small; 3rd long; 4th about half as long as 3rd and equal to 5th; rest long and cylindrical. Eyes smaller than genae. Pronotum quadrate, anterior margin and sides straight, gently widened posteriorly with posterior margin truncate or briefly rounded, median suture distinct. Meso-sternum rounded and meta-sternum truncate posteriorly. Tegmina absent or present as narrow lateral, ovate flaps on mesonotum. Wings absent. Legs with femora and tibiae banded with black, 1st tarsal segment almost as long as 2nd and 3rd segments together.

Abdomen gradually dilated from base to 7th tergite, surface punctate, sides of segments 6th to 9th acute, striate and carinate. Ultimate tergite strongly transverse, sparsely punctate, median suture distinct, posterior margin entire, sides rugose with a longitudinal fold. Penultimate sternite triangular, punctate with posterior margin truncate. Forceps with branches remote and dilated at base, trigonal, ridge present in basal one third only, then depressed and tapering towards apex with tip pointed, asymmetrical, right branch more curved than the left, inner margin crenulate. Genitalia with parameres three times longer than broad, gently dilated at about middle and narrowed towards apex, tip rounded, outer margin convex and inner margin at base armed with a triangular tooth almost equal to parameres in length with tip pointed and hooked; preputial sacs with longitudinal rows of chitinous teeth.

♀ : Agrees with male in most characters except that the sides of abdominal segments rounded, almost smooth and devoid of longitudinal carina, ultimate tergite slightly narrowed apically. Penultimate sternite triangular with posterior margin obtuse. Forceps with branches contiguous or subcontiguous, straight, attenuate, apices pointed and crossing each other.

Remarks. The described genus falls under the *'Second Group—Psalides'* of Burr (1915, p. 532) in having the parameres three times longer than broad but differs from all the genera included under that group by the presence of an inner triangular, acute tooth at the base of the parameres. On the basis of this character alone it can be even separated from all the known genera of the sub-family Carcinophorinae.

Type-species. *Anisolabis pervicina* Burr, 1913.

Aborolabis pervicina (Burr) comb. nov.

Anisolabis pervicina Burr, 1913, *Rec. Indian Mus.*, **8** (2), p. 137.

Paralabis pervicina (Burr), 1915, *J. R. micr. Soc.*, **1915**, p. 540, pl. 12, fig. 3.

Material examined. (i) 1♂, 2♀♀, Reg. Nos. 2198/19, 2188/19, 2210/19, Ind. Mus., Rotung, 1400 ft., 26, 28, 23.xii.11, under bark and rotten wood; (ii) 1♀ (nymph), Ind. Mus., Reg. No. 2435/19, Dibrugarh, N.E. Assam, 17-19.xi.11; (iii) 1♀, Ind. Mus., Reg. No. 2315/19, bank of Dhiong river below Pasighat, 16.xii.11; (iv) 1♂, 1♀, Ind. Mus., Reg. Nos. 8598/16, 8599/16, Assam-Bhutan Frontier, Mangaldai dist. N.E., Deshnoi river bed, 31.xii.10; (v) 1♂ (mentioned by Burr as ♂ nymph but it is an adult specimen), Ind. Mus., Reg. No. 2289/19, Puging, 3000 ft., . . . 11-12; (vi) 1♀, Ind. Mus., Reg. No. 2297/19, Sadiya, N.E. Assam, under bark, 26.xi.11; and (vii) 2♀♀ (nymphs), Ind. Mus., Reg. Nos. 2340/19, 2342/19, Kobo, 400 ft., under logs, 7.xii.12; Abor Exped.; all collected by *Kemp* excepting the ♂ with Reg. No. 2289/19, on the label of which is written in hand *J. Coggin Brown* after deleting Kemp's name; determined and quoted by Burr (1913) and deposited in the Zoological Survey of India, Calcutta.

The ♂ specimen with Reg. No. 2198/19 has been designated by Burr as Nomotype. Only in three ♀♀ specimens with Reg. Nos. 2210/19, 2297/19 and 8599/16 the elytra are present as long oval flaps on either side of the mesonotum. The specimen with Reg. No. 2188/19 is a ♀ nymph since the wing rudiments are visible.

Remarks. Burr (1915, pl. 12, fig. 3) has figured the genitalia and the tooth at the base of the parameres has been shown with dotted lines

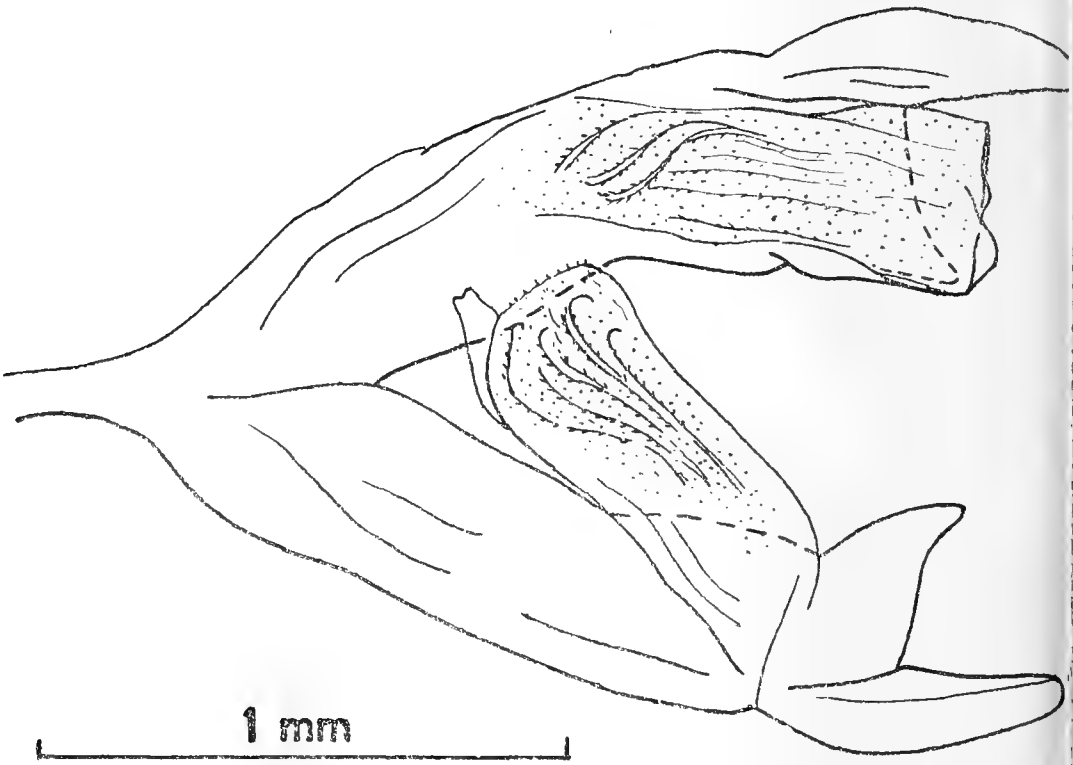

Fig. 1—Male genitalia of a specimen with Reg. No. 8598/16.

but he makes no mention of it while referring this species to the genus *Paralabis* Burr, 1915. The author has examined the genitalia of a ♂ with Reg. No. 8598/16 (Fig. 1). The tooth at the base of parameres is quite distinct.

The author is thankful to the Director, Zoological Survey of India, Calcutta, for providing facilities.

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Notes and Observations

ABERRATION OF DEUTERONOMOS EROSARIA SCHIFF.—On 4th October 1968 at Woking, Surrey, I caught in my mercury vapour light trap a male aberration of *D. erosaria* Schiff. in which the ground colour was normal, but the transverse lines on the forewings were reduced to a small triangular blotch just below the costa. On the hindwings there was no trace of the usual weakly marked transverse lines.—A. G. M. BATTEN Littledale, Cedar Road, Hook Heath, Woking, Surrey.

A New Type of Habitat?—On May 20th I was inspecting a local scrap yard for any parts suitable for my 1952 vintage Alvis saloon and was able to discover the remains of an identical model. No sooner had I opened the rear door than I was startled to find a larva of *Parascotia fuliginaria* L. which proved to be in its last instar. I searched, but could find no other specimen. The car, being still well upholstered (leather seats, woollen blend headlining, etc.), offered in its interior good shelter for those species associated with decaying materials, and was more or less closed up. I was consequently not surprised at discovering a considerable number of *Schiffermulleria grandis* Desv. imagines also resting inside, and signs of considerable infestation. I offer the suggestion, for what it is worth, that even such unlikely sites need not be overlooked! Of course, modern plastic upholstery offers little opportunity for insects—only the older vehicles are worth bothering with!

On the advice of Mr. Brian Baker, of the Reading Museum, I offered the larva suitable material, and it seemed happy with lichened bark from an apple tree in my garden, subsequently pupating in a cocoon suspended inside a rolled piece of that bark.

I understand that *fuliginaria* has been recorded from the Kennet valley west of Reading, as far as Berkshire is concerned, but do not know of any other records in this corner of the county.—J. K. C. Kemp, 57 Courthouse Road, Maidenhead, Berks.

Maritime Lepidoptera Found Away From the Sea.—In the June issue of the "Record", Sir Robert Saundby notes some inland records of species normally restricted to the coast.

Here at Micheldever, which is ten miles nearer to the sea than Burghclere, I have noted the following species at mercury vapour light:—*Hydraecia paludis* Tutt, 1952, 2; 53, 2; 55, 4; 56, 1; 57, 1; 58, 3; 59, 1; 61, 1; 62, 2; 64, 1; the earliest and latest dates being 10.vii.1952 and 5.ix.1962. 1 *Agrotis trux* Hübn., 31.vii.1962, and even more surprising was 1 *Agdistis bennetii* Curtis 3.ix.1964.—C. H. Dixon, Northbrook Farm, Micheldever Station, Hants. 5.vii.1969.

More Old Ladies.—Shortly after having sent Mr. Waddington's article to press for the July/August issue, I was tidying up some boards in a shed after paint spraying operations on my house, and observed on one board, an aggregation of four *Mania maura* L. sitting very close together and overlapping each other, much in the manner of *Scoliopteryx libatrix* L. (the herald) when hibernating. They remained undisturbed while I put the board in its place, and remained there until dusk, but they had departed when I looked again the following morning. They were accompanied by one *Orneodes hexadactyla* L. when found, but this insect did not stay with the others.

To an ultra-enthusiast, one of the *maura* might have been named var. *albomaculata* ab. nov. but it had only been caught by the fallout from the painting operation a couple of days earlier.—S. N. A. Jacobs. 5.viii.1969.

Tetrix subulata (L.) (Orthoptera: Tetrigidae) in Pembrokeshire.—On 18th May 1968 a female of this ground hopper was captured a mile north of Haverfordwest, Pembrokeshire. The habitat was the transition between *Juncus effusus* (L.) marsh and grazing pasture where the ground had been liberally trampled by cattle.

T. subulata is not recorded from Pembrokeshire by Dr. D. R. Ragge in his book *Grasshoppers, Crickets and Cockroaches of the British Isles*, London, 1965.—ALAN E. STUBBS, 91 Clitherow Avenue, Hanwell, London, W.7.

BOARMIA PUNCTINALIS SCOP. IN GLOUCESTERSHIRE.—On May 31st I took in my trap the third Gloucestershire specimen of the pale oak beauty. I took the first in Woodchester Park, three miles from here on June 3rd, 1950, and the second, two nights later in my trap.

The moth, apparently, does not normally come so far west, and these would appear to be migrant specimens.—AUSTIN RICHARDSON, Beaudesert Park, Minchinhampton, Glos. 22.vi.1969.

CAENOTEPHRIA SUBROSEA STEPH.—I should like to put it on record that on April 23rd 1968, I took 10 very small larvae of the rosy marsh moth in the same locality as I took the moth in August 1967. They were so small that identification at the time seemed difficult, except that at that date and on the almost bare bog-myrtle stems they had to be it. Armed only with a hand trowel I dug up a plant next day, but the larvae grew much faster than the tight bog-myrtle buds, and had to be fed on birch, willow and dandelion. They ate all these, with occasional bog-myrtle buds to keep them happy. I kept them in plastic boxes until they began to go down at the end of May. On June 7th I went back to Wales and collected 10 more, this time full fed.

Two of the first batch died very small, three I preserved, and 14 moths emerged between July 11th and August 9th. Had it not been for the fact that my school term started on April 25th, I should probably have postponed my earlier visit for another week, and should thus have lost the thrill of being the first to see the larvae in Britain since 1848, as Messrs Rogers and Sadler arrived the next week-end. The local farmer, who had had an almost continuous procession of visitors from April onwards, told me that my June visit was the last. It seems somewhat surprising that, in spite of the large numbers taken, the moth apparently appeared as plentifully in August as it had the previous year.

Other larvae seen on my two visits were: *Philudoria potatoria* L. (both), *Amathes castanea* Esp. (June), *A. xanthographa* Fabr. (April), and *Apamea crenata* Hufn. (April).—AUSTIN RICHARDSON, Beaudesert Park, Minchinhampton, Glos. 22.vi.1969.

LATINIZED NAMES FOR COLOUR VARIETIES OF ACRIDIDAE.—To me, as a lepidopterist, with a slight knowledge of Acridians, Mr. Hard's suggestion of latinized names (*antea* 143) has one major objection.

If tropical Acridians are any criterion, colour variation does not seem to have any genetic basis, but to depend largely, if not wholly, on the colour of the surroundings. Furthermore, the colour of the individual grasshopper appears to change to match its environment. I can well remember collecting in dry grass country in Uganda, with all the Acridians some shade of buff or pale brown, and returning some two weeks later, after a grass fire had left the ground covered with blackened stems, to find the grasshoppers were all blackish in colour. Earlier, after the rain when the grass was lush and green, the same area would produce mainly green examples.—D. G. SEVASTOPULO, F.R.E.S., Mombasa. 2.viii.1969.

COLLECTING ITHOMIIDAE WITH HELIOTROPE.—When first reading Mr. Master's note under this heading (1968, *Journal Lepidopterists' Society*, 22: 108-110), referred to briefly in his more recent article '*Hypothyris vallina colophonia* D'almeida (Lep., Ithomiidae) Rediscovered in Venezuela' (1969, *Ent. Rec.* **81**: 115-116), I was immediately reminded of the numerous references in the *Proceedings of the Entomological Society of London* some forty years ago (1926, 1: 35, 36, 37. 1931, 6: 77, 78, 79. 1936, 11(a): 94) to the attractiveness of occasional dead and dry twigs of *Tournefortia argentea* (Boraginaceae) to butterflies of the Danaid genus *Euploea* on various Pacific islands. There is, of course, no food-plant relation between *Euploea* and *Tournefortia* and the flowers of *Tournefortia* are said to be unattractive to butterflies.

I decided that this method of collecting might be worth trying in East Africa, the most likely species to be attracted, on the analogy of South America and the Pacific, being *Amauris* and, possibly, *Acraea* and *Bematistes*. Bunches of the plant were collected and dried, and subsequently hung up in the Makadara Forest in the Shimba Hills, when it was found that they were highly attractive to *Amauris niavius dominicanus* Trim. but that the only other resident species *A. ochlea* Bsd. showed no interest whatsoever. No *Acraea* or *Bematistes* species was attracted.

Later, when discussing the matter with Mr. Carcasson, then of the National Museum, Nairobi, he told me that he had been sent a large box of the dried herbs from Trinidad as a bait for day-flying Amatids.

Incidentally, I notice that Mr. Masters described the flowers as being purple, but all the *Heliotropium indicum* that I have seen growing, both in India and East Africa, have been white-flowered, although Nairne in the *Flowering Plants of Western India* (1894) describes the flowers as being white or lilac.—D. G. SEVASTOPULO, Mombasa. 29.vi.1969.

RETURN TO JAMAICA.—Last February my wife and I had the chance to return to the Windsor Hotel, near St. Ann's Bay, for the first time since 1962, when we were there at the same time of the year (*Ent. Rec.* **75**: 73), for the period February 20th to March 1st, and we were very happy to find the hotel, now managed by Mr. Corinaldi, to be run on the same happy lines as it was seven years ago.

Butterflies were again plentiful, though the ground down by the river, described in 1962, had been planted with coconuts, and so lost to butterflies, and some of the bushes had been cleared out of the hotel garden, reducing the shelter available for *Calisto zangis* (Fabr.) But the tropical forest west of the hotel, on land owned by it, was still as productive as ever.

Lepidoptera seemed later this year and the butterflies were fresher. Most of the species caught in 1962 were about, but we did not see *Colobura dirce avinoffi Comstock*. On the other hand, *Metamorpha stelenes* L. and *Anaea troglodyta portia* (Fabr.) were more in evidence. Four species not caught in 1962 were added to our list from this locality: one *Papilio thersites* Fab. ♂, one *Thecla pan* Drury; and some specimens of the skippers *Timochares ruptifasciata* Plötz and *Anastrus sempiternus* Butler and Druce (or ssp. *dilloni* Bell and Comstock). Another interesting capture was a male and a female *Eurema nise* Cramer, identified by Mr. N. D. Riley. I am indebted to him and to Mr. Bernard Heinemann

for help in naming these captures.—J. L. CAMPBELL, Isle of Canna, Hebrides, Scotland.

CORRECTIONS

Referring to Notes on Odonata from the Eastern Cape Province (*antea*: 144-148), p. 144, lines 17 and 39: p. 147 line 45, for *Diplocodes lefeburei* read *Diplocodes lefebvrei.*

p. 145, lines 6 and 13, for *exillis* read *exilis.*
p. 145, line 19, for *Pserdagsion* read *Pseudagrion.*
p. 146, line 3, for *Ardens* read *ardens.*
p. 146, line 46, for *longicanda* read *longicauda.*
p. 147, line 16, for *glancum* read *glaucum.*
p. 147, line 28, for *miniscula* read *minuscula.*
p. 148, for total 49 read 50.

Further, Dr. E. Pinhey kindly pointed out to me in his letter the following name changes: I quote from his letter: "*Misocnemis singularis* is definitely distinct from *Metacnemis valida; Pseudagrion angolense* from the Cape is not this species but *P. hageni; Platycypha* replaces *Chlorocypha* for the South African species; *Phyllomacromia* is sunk now to *Macromia; farinosum* is in genus *Nesciothemis; O. stemmale capense* is now *O. falsum capicola.*"—L. P. HERSALEK, Willowdene, P.O. St. Albans, Port Elizabeth, C.P., South Africa.

Current Literature

A concise Guide in Colour: Butterflies by **Josef Moucha,** illustrated by **Vlastimil Choc**, 264 pp. including 88 plates in colour. Hamlyn Publishing Group. 10/6.

This pocket size book represents yet another instance of the excellent practice of using good coloured illustrations already published in one language, for use with translations of those works into other languages, thus lowering the cost per plate and bringing colour work into the realms of practicability for natural history (and other) subjects.

This welcome book is translated from the Czechoslovak language by **Olga Kuthanova**, and, of course, the text has been skilfully adapted to meet the needs of English-speaking readers. Before the plates there are short chapters on various aspects of the study of butterflies which open up the subject for beginners. These deal with life cycle, feeding habits predators, distribution, migration, variation, collecting, breeding and preservation.

The very beautiful coloured plates follow, occupying the right hand page, while a short account of the species illustrated is given on the left. In all, 135 species are treated, with 153 coloured illustrations. A list of plates, a list of English vernacular names (some apparently manufactured

for the non-British species), and a list of scientific names complete the book.

It seems ideal for the lepidopterist who is taking advantage of the modern expanse of travel facilities to pursue his hobby further afield, but the fine coloured figures must also have an appeal to the more advanced reader.

The printing is good, as also is the paper; the binding is in paper boards, decorated by three reproductions of figures from the plates. The price is such that it should be available to all pockets, and the book will certainly give pleasure wherever it is studied.—S.N.A.J.

Pests of Rice by **D. H. Grist** and **R. J. A. W. Lever,** xi + 520 pp. + 4 coloured and 28 black and white plates. Longmans, Tropical Science Series, 150/-.

With world food problems in mind, the present addition to this important series will be welcomed by all concerned. Both the authors are well known authorities on their particular subjects, and in the list of acknowledgements are many well-known names of people who have assisted the authors with their specialised contributions.

Chapter 1 is headed: The Morphology and Cultivation of Rice, and is subdivided into Classification, Morphology of *Oryza sativa* L. with a full page illustration showing the application of the names of various parts used in the later text of the book, Growth of the Plant, Soils, Methods of Cultivation, Milling and Parboiling, and Definitions. In 16 pages, the subject of the title is set before the student with sufficient clarity to explain terms used in the text proper of the book. Chapter 2 is headed Classification, Ecology and Cultural Control of Rice Pests, and under the sub-heading of Classification, the insect orders concerned are explained, followed by the sub-heading Economics of Rice Insects in Relation to Climate. Another sub-heading is Environment and Life Cycles of Rice Pests, with diagrams illustrating the subject, including a copy of the Madras paddy pests calendar which is a circle divided into twelve segments representing the months; the main pests and their work are illustrated round the outside over the appropriate seasons, and inside are arcs inscribed with the names of the districts in which the pests are active. The prevalence of the main rice pests in Bengal is shown by a square divided along the top into the months, and with a list of the main pests on the left hand side a line to each, with a dense black line across the months of their prevalence. A similar chart for the Philippines has the prevalence lines in different patterns to show the particular activity of the pest at the moment, and the system of the Bengal chart is used to indicate the prevalence of the main rice pests in South India, the months of the year in this case being replaced by the four stages, Nursery, Early Growth, Flowering and Ear Stage. Throughout the book, references are numbered and the titles are shown against the reference number in th long Bibliography.

Chapters 3 to 13 deal with insect field pests, each dealt with very fully under clear headings including such matters as Distribution, Importance, Nature of Damage, Description, Life History, and Control. Chapters 3 to 8 deal with various groups of Lepidoptera; Chapter 9, Hemiptera Heteroptera

10, Hemoptera Homoptera; 11, Coleoptera; 12, Diptera; and 13, Orthoptera and Miscellaneous Insect Pests.

The subject of storage pests is covered in Chapter 14 while 15 deal with protection measures for stored rice and paddy. Capter 16 deals with Non-Insectan Invertibrate Pests from land crabs and snails to eel worms and mites, while 17 deals with vertibrate field pests from rodents to fishes.

Five useful appendices follow, including a list of the principal insect pests showing the species in columns headed by names of the rice-growing continents excluding Europe. The usual application rates of various insecticides are set out in Appendix 2, 3 mentions equipment for field application of insecticides; 4 gives a list of cereal and grass host plants of rice pests ;and 5 gives useful data, conversion factors and abbreviations.

The bibliography previously referred to cites 647 titles duly numbered for reference from the text. An index of rice pests and a very full general index conclude the work.

The text is throughout in clear and concise language, and is most skilfully limited to essentials, relying on the bibliographical references for enlargement of the subject. It is this that has made it possible for so large a subject to be brought so comprehensively under one cover. The excellent drawings illustrating the text are by **Mrs. Isobel Grist.**

The book is well printed on good paper and is well bound in cloth boards, and it will be a necessity in all institutions and universities where the subject is taught, and also to the managements of all undertakings where rice is grown in large quantities. Let us hope that the information contained will help to increase the food supply in parts of the world where rice is regarded as the mainstay of the diet of the majority of the population.—S.N.A.J.

The Macrolepidoptera of Buckinghamshire by **Sir Eric Ansorge, C.S.I., C.I.E., M.A., F.R.E.S.** 140 pp, + 1 map: Bucks Archaelogical Society, 21/-.

In this book we have another example of a first county list since the Victoria County Histories, the Buckinghamshire part of which was published in 1905, and since then 97 species have been added. The Introduction mentions the panel of active field workers who have assisted the author with their records, and many of the new species are mentioned with a few remarks on their special interest. It is possible that some of these will be accounted for by the advent of the mercury vapour light trap, which has brought so much more material before the investigator. The Author has followed I. R. P. Heslop's list for the order of families, species, and the scientific names, with the addition of synonyms used in the V.C.H. and South's British Moths (1961 edition) added. The traditional vernacular names have been retained throughout.

The main text is set out under the scientific names with a short account of the species in the county. The book will be welcomed by the large number of lepidopterists interested in the distribution of species. Although the title mentions Macrolepidoptera, the conventional Microlepidoptera genera, such as Aegeriidae and Hepialidae are included. It is a pity that the whole of the microlepidoptera could not be included with this volume, for it is not a practical proposition to publish a Microlepidoptera supplement later on, as this would not find a large enough public to buy it, quite

apart from the amount of research that would be entailed, but it is really necessary to make the work complete.

The book is well printed on good paper and bound in a stout paper cover. It is well set out, and the inclusion of the map, extending to three pages, is placed at the end of the book, which is a great advantage for reference to it while using the text. The Bucks Archaeological Society and the author are to be congratulated on this project.—S.N.A.J.

Proceedings and Transactions of the British Entomological and Natural History Society, Vol. 1, No. 2. 72 pp.+10 coloured plates, published by the Society: 50/- (£2·50p).

The main feature of this issue is Part VIII of Larvae of the British Lepidoptera not figured by Buckler, compiled and illustrated in colour by G. M. Haggett, which illustrated 28 species with several examples of each, and Mr. Haggett is to be congratulated on his handling of the subject, the greens, which predominate in many species, being most difficult to handle. Various attitudes of the larvae are shown, which should greatly reduce the difficulty of identification in the field. This large instalment is due to the generosity of Mrs. Margaret Mere, who has provided the plates in memory of her late husband, Robin Mere.

There are also book reviews, short notes, including two records of *Nymphalis antiopa* L. from Surrey and Oxfordshire respectively, and Mr. Spreadbury's sighting of *Danaus plexippus* L. at Seaford, Sussex. Dr. de Worms reviews the Macrolepidoptera of the London Area for 1966 and 1967, and the Proceedings of meetings from 14th March 1968 to 23rd May 1968 conclude the part.—S.N.A.J.

Warne's Natural History Atlas of Great Britain by **Arnold Darlington,** illustrated by **Charles King,** 112 pp., Frederick Warne & Co. Ltd., London, 35/- (£1·75 p).

The Author sets before us the various geological areas with their normal plant coverage, and some of the animal life more likely to be met with on the type of area under discussion. He first first explains simply how the different areas have developed geologically, botanically and zoologically.

Areas discussed are Sand Dunes, Sandy Heathlands, Acid Moorlands, Chalklands, Limestone Areas, and Claylands, each with six coloured plates illustrative of plant life, vertibrates, and invertibrates generally associated with the area under discussion. The Map Section follows showing in seven double page maps, the geological formations and botanical areas, to a reasonably large scale.

Next comes a list of books for further study, and some notes on field study methods, Conservation and Collecting. Selected projects are set out in sub-headed sections, and the index concludes the book. Throughout, the text is copiously illustrated with explanatory drawings, both coloured and in black and white. This book is calculated to inspire a general intelligent interest in Nature, which prompts the individual to ask himself Why? and then to proceed to answer the question for himself.—S.N.A.J.

Some Continental European Aberrations of *Abraxas grossulariata* **L. (Lepidoptera)** by **G. H. Hutchinson,** 21 pp.+1 pl. Transactions published by Connecticut Academy of Arts and Sciences. Newhaven.

Conn.; obtainable from Archon Books, Shoestring Press Inc., Hamden, Conn. 06514, $4.00.

In this paper the author has expanded his research into the variation of this species and sets up three new aberrations; *triangulata* from Portugal, *quasivarleyata* from Eberfeld, Germany, and *basicaerulea* from "an unknown, but probably European locality". The various elements of the wing pattern are explained and named for use in the text, illustrated by an enlarged figure based on the Linnaen type. Many forms are mentioned from various European countries and their relationships discussed. The observed variation of the species is reviewed historically and genetic frequencies for certain forms are estimated. The histories of the rarer forms are discussed, and many of the classic specimens traced. Various gene frequencies are summarized, and the author finishes by stating: "A re-investigation of the genetics and ecology of the species, using modern evolutionary concepts, might well reveal phenomena of considerable interest."

In his summary the author estimates that data at our disposal to-day is the result of the examination of one million specimens.

There is a list of biblographical notes and the plate, which illustrates several type specimens including those of the three new forms described. Altogether this is a paper which should be of considerable interest to geneticists.—S.N.A.J.

Current Notes

THE ANNUAL EXHIBITION OF THE AMATEUR ENTOMOLOGISTS' SOCIETY will be held on Saturday, 27th September, from 2 p.m. until 5 p.m., at the Holland Park School, Airlie Gardens, Campden Hill, Kensington, London W8.

Exhibits are invited and may consist of anything of entomological interest. If much space should be required, please notify the Meetings Secretary in advance.

The Hall will be open for the receipt of exhibits from 11.30 a.m. on 27th September.

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.

Wanted.—Specimens of *Pararge aegeria*, and *Pieris napi* from Scotland and Northern England.—*George Thomson*, 98 George Street, Dunblane, Perthshire.

Wanted.—Information *and* data on the distribution and habitats of *Coccinella 11-punctata* (Eleven-spot Ladybird) for an investigation into this species. *All* records welcome.—*J. Muggleton*, Dept. of Botany, Science Laboratories, South Road Durham.

For Sale.—Private collection Ornithopthera, and 500 species from Russia, Japan, Australia, New Guinea, Malaya, Africa, and Solomon Islands. Many Charaxes and Papilios. To be sold as one lot.—Please reply to *R. H. Morgan*, 108 Titirangi Road, New Lynn, Auckland 7, New Zealand.

Wanted.—Male Ornithoptera *Croesus lydius* and ♂ *O. croesus croesus*.—Full details to *Dr. A. D. Morton*, 37 Templeway West, Lydney, Glos.

Wanted.—A Second-hand Robinson M.V. Moth Trap, with or without electrical fittings and in reasonable condition.—*B. F. Coles*, Rose Cottage, Weston-on-the-Green, Bicester, Oxon.

For Sale.—Forty Drawer Cabinet, plain glasses, suit beginner, £15. Twelve Drawer Cabinet, airtight drawers, glass panelled door, £10.—*Redgrave*, 2 Connaught Way, Tunbridge Wells. Tel. 21494.

CHANGES IN ADDRESS

Dr. N. M. Bailey, now of Woodlands, 159 High Street, Pershore, Worcestershire.

O. M. White to 6 Northwood Street, Stapleford, Nottingham. NG9 8GH.

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LEPIDOPTERA OF KENT, VOL. II

This comprehensive work was completed with the instalment in our May issue and a limited number of separates, unbound, with stiff paper cover, is available for sale at 45/- per copy from The Editor, 54 Hayes Lane, Bromley BR2 9EE, Kent. (Postage extra)

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION
(Founded by J. W. TUTT on 15th April 1890)

TO OUR CONTRIBUTORS

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AND JOURNAL OF VARIATION

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

with the assistance of

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Butterflies collected from the Eastern Cape Province

By L. P. Hersalek

From the Eastern Cape the writer has recorded ninety-five species of butterflies. These species have come from varied habitats: pine and indigenous mountain forests of Hogsback, coastal forests of Van Standens Pass; bush (thorn and cacti) of Uitenhage, the slopes of Hogsback, Witteklip hills (shrubs: protea species, Leucospermum sp., heather). Other areas investigated: Port Elizabeth and areas around Grahamstown (bush, Karroo veg.). One can simplify the above into three main habitats: (a) Forest (mainly indigenous); (b) Bush and (c) Mountain-hill. Each has its own characteristic species. Common species are those found in three habitats, rare or local species those found only in one type of habitat. Thus using the three habitats above the writer will describe butterflies collected during the past few years in the Eastern Cape Province.

(a) *Forest* (Coastal and mountain).

Charaxes varanes found commonly in forest clearings at Van Stadens, Hogsback, and even in bush localities (Grahamstown, Uitenhage). *Varanes* tends to fly low and congregates at sucking places (sap oozing from certain trees and shrubs). *C. xiphares* even more forest loving than *varanes*. I found it sparingly at Van Stadens Pass and Hogsback while a single female was seen in small tract of forest near Grahamstown. I found the female commonest of the sexes, and much easier to collect, as she tends to sail casually amongst the trees. Often in her aimless gliding she comes within reach of the net. Not so the male he flies rapidly and businesslike often high amongst the trees. I discovered banana bait was best at V.S.P. by which some beautiful male specimens of this blue and black charaxes were obtained. *C. ethalion* taken so far in forest at Th. Baines Nature Reserve (nr. G'town) found at sucking place (*unlike xiphares*) and being nearly uniform black. *Neptis marpessa* and *Eurytela hiarbas* are two black and white Nymphalids characteristic of this habitat. They delight in forest bushes in filtered sunlight at V.S.P. particularly. Of the four species of Papilio I have taken in the Eastern Cape, three are predominantly forest species. *P. dardanaus cenea, P. nireus lyaeus,* both occur commonly at the coastal forests of V.S.P. and also at Hogsback together at the latter habitat with *P. echerioides* a true inhabitant of the wetter mountain forests. The female of *P. dardanus cenea* is tailless (unlike male) and shows three forms at V.S.P.; normal female *form cenea, f. trophonius* (mimic of *D. chrysippus*) and *f. hippocoonides* which is black and white somewhat like *Hypolimnas misippus. Antantartia hippomene* is a nymphalid, like a tailed English Red Admiral, that occurs in the mountain forests of Hogsback during April. *Belenois zochalia* the forest white and *Netheronia buqueti* with its characteristic green eyes and swift flight are among some of the Pierids taken at V.S.P. I have taken no real forest Lycaenids, but of the Satyrids *Meneris dendrophilus dendrophilus* is a true lover of the Hogsback mountain forests. Two other species I have found in most wooded areas are *Bicyclus safitza, Cassionympha cassius* (Rain forest brown). From the mountain forests of the Hogsback two Hesperids taken during April are: *Calleagris kobela* and *Celaenorrhinus mokeezi* the former occurs in plenty amongst grassy clearings on the forested slopes. Its large black

brown form is quite obvious. *Mokeezi* on the other hand keeps strictly to the damp cool forest interior. It tends to settle flat upon the upper surfaces of stray sunlit leaves and *mokeezis* yellow and brown wings blend in this condition of diffuse sunlight and shade. Another species that I have found which often settles on the undersurfaces of leaves in the forests near Uitenhage is *Tagiades flesus* being broad winged, the outer part of hindwing being grey-blue. *Eagris nottoana* also from the coastal forests is like a smaller version of *kobela*.

(b) *Bush.*

I shall consider this region as consisting of low shrubs and bushes (thorn, cactus, etc.) with few scattered trees (cabbage tree, acacia). This type of country is dry and offers little shade to the collector during the summer months. Most collecting was done around Uitenhage (20 miles from Port Elizabeth) and Grahamstown (70 m. North East of Uitenhage). Here in thorn and prickly pear belts of Uitenhage esp. are found a wealth of whites and skippers with a smattering of lycaenids (Hairstreaks). *Colotis eris* (Banded Gold Tip) is a very erratic Pierid. Weaving its way through the thorn bushes, *eris* defies the collectors net, the latter often suffering a series of rents from the ever present thorns. Three other Tips occur more commonly than *eris* in this area during December; *C. evenina* and *C. evagore antigone* have orange tips and are similar to the English Orange Tip. *C. antevippe* has intense scarlet tips in the male. *Pinacopteryx eriphia* known as the Zebra due to being all brown with white stripes and is a local inhabitant of typical bush country. Throughout the year one can usually find the following pierids: swift *Catops. florella; Belenois creona; B. aurota* and *Eronia cleodora.* Of the Hesperids *Tsitana uitenhaga* is a great lover of some bush areas around Uitenhage during November. In appearance it is dull brown with a white stripe on the underside and its flight similar to some of the satyrids. *Kedestes lepenula* a brown and yellow skipper that I have found widespread but difficult to take in numbers, as only a single specimen will be met with in the course of whole days collecting in the bush. *Eretis djaelaelae* occurs throughout the year and when fresh from the pupa the wings are a beautiful silky black/brown-purple colour, this in the course of active butterfly frolics is lost and fades to a dingy brown. *Gomalia elma* the Marbled elf, with a creamy pool on the hind wing, I have taken throughout the year and *elma* delights in settling on pink flowers in bush areas. *Borbo borbonica* the Olive Haired Swift I have found rare having taken only one specimen from Grahamstown during May.

The Swallow tails *P. demodecus* and *P. nireus lyaeus* occur commonly in bush areas. The latter is often attracted to moist places by rivers. Lycaenids include the bright tailed red and black *Axioceres harpax,* the brilliant lustrous blue hairstreak *Myrina ficedula,* the purple shot *Anthene definita* and golden brown *A. amarah* from Grahamstown. While around Uitenhage I have found the minute fluttering *Oraidium barberae* Africas smallest butterfly. *Leptomyrina hirundo* and *Lachnocnema bibulus* occur near succulents and fig trees respectively. Only one copper appears to be definite of this area, *Poecilmitis chrysaor,* this golden winged species will at once approach burst from a bush in a flash of burnished copper circling at speed and finally settling again

and covering its bright surfaces with the pale brown wing undersurfaces.

(c) *Mountain-hill.*

Most of the species described or listed here were recorded from the hilly grassy country around Rocklands (14 m. from Uitenhage) and the more mountain like Witteklip (25 m. W. of P.E.). True mountain country was investigated at Hogsback (up to 5,000 ft.). At least three Acraeas are found in this region; *A. rahira* the Marsh Acraea found during September along the Brak river at Rocklands. *Pardopsis punctatissima* and *A. anacreon* are more high elevation species. The former occurs on the shrubbed slopes of the south-westerly swept Witteklip range, while *anacreon* I have taken in April as high as 5,000 ft. near streams at Hogsback and at 5,500 ft. have found hundreds of larvae of the common acraea *A. neobule.* With the exception of the above Acraeids I have found no other families more characteristic of this habitat in my collecting than the Satyrids and Lycaenids (esp. coppers and blues). Of the Satyrids I shall mention the large (4 in.) *Aeropetes tulbaghia* the true Mountain Pride which occurs at Witteklip in August, flying swiftly and majesticaly at or near the summits of high ground. This yellow and brown pride of the Satyridae is then difficult to capture on the wing. But apart from the Satyrids the Lycaeinids offer a more characteristic group. Of the blues one finds the beautiful large *Lepidochrysops* inhabiting the hill tops. *L. asteris* is brilliant blue, *L. ortygia* darker blue, and *L. methyma* is all brown. *Cupidopsis cissus* tends to be less common than the above and inhabits less elevated habitats.

What strikes my attention whenever I climb the Witteklip range near my home is the rapid flying copper, (Protea Scarlet) *Capys alphaeus.* This robust bright scarlet and jet black insect warily avoids the net as it swiftly takes to wing at the slightest disturbance but will usually return to its favourite perch; a dead protea twig or leaf. If one takes care one can stalk *alphaeus* with a degree of success. Coppers are like gems in these relatively barren hills, it is with delight when one falls amongst a colony of *Poecilmitis pyroeis* shot with violet blue at the base of the wings. Not far from this colony at Witteklip I have found numbers of *Phasis wallengrenii* during December. Further yet among the same hills in a certain valley occur a local colony of *Poecilmitis palmus* flying nearly throughout the year by a small stream. *Palmus* resembles *chrysaor* on the upper surface but the under surface is quite different. Thus in conclusion I have made a list of all the butterflies recorded by myself in this Province. It by no means represents a total of all Eastern Cape Province butterflies but it does I think reflect a fair majority of them. In this paper I have tried to show the concentration of certain butterfly families in three main habitats occurring in this region, and to briefly present some species characteristic or inhabiting each of these habitats.

ABREVIATIONS:

Van Stadens Pass	V.S.P.
Witteklip	Wit.
Grahamstown	G/town
Port Elizabeth	P.E.
Uitenhage	Uit.

PIERIDAE

Colotis antevippe	Uit. P.E.
C. euippe	Uit.
C. evagore antigone	Uit. G/town P.E.
C. eris	Uit. Wit.
Colias electo	Everywhere
Eurema brigitta	Wit. P.E.
Eronia cleodora	Uit. (Groendal Dam), V.S.P.
Catopsilia florella	Uit. V.S.P.
Netheronia buquetii	V.S.P.
Dixeia doxo charina	Despatch (Uit.), V.S.P.
Belenois creona	Uit.
B. aurota	Uit.
B. gidica	V.S.P. Uit.
B. zochalia	V.S.P. only
Pinacopteryx eriphia	Uit.
Pontia helice	Everywhere
Mylothris chloris agathina	V.S.P. Rocklands

PAPILIONIDAE

Papilio demodecus	Everywhere
P. nireus lyaeus	Uit. V.S.P. G/town
P. dardanus cenea	V.S.P. Uit. G/town Hogsback
P. echerioides	Hogsback only

LYCAENIDAE (blues)

Azanus moriqua	Uit. G./town
A. jesous	Uit. G/town
A. ubaldus	Uit.
Tarucus thespis	G/town Wit.
Cacyreus palemon	Wit.
Cacyreus marshalli	P.E. Uit. G/town
Zizeeria knysna	Everywhere
Eicochrysops mahallokoaena	Rocklands
Actizera lucida	Wit. Rocklands
Oraidium barbarae	Uit. (Despatch)
Brephidium metophis	Middelburg
Anthene amarah	G/town
A. definita	Uit. G/town
A. livida	Uit.
Lepidochrysops methyma	Wit. Rocklands, G/town
L. asteris	Wit. Rocklands, G/town
L. ortygia	Rocklands, Wit.
Cupidopsis cissus	Wit. only
Lampides boeticus	Everywhere
Syntarucus telicanus	Everywhere
(*Coppers*)	
Poecilmitis chrysaor	Uit. G/town
P. palmus	Wit. Rocklands
P. pyroeis	Wit. only
Phasis wallengrenii	Wit. G/town
P. macmasterii?	Wit. G/town
Aloeides thyra	Wit. Uit.

A. pierus	P.E. Uit. Wit.
Capys alphaeus	Wit.
(*Hairstreaks*)	
Myrina ficedula	Uit.
Deudorix antalus	Wit. Uit.
(Others)	
Axioceres harpax	G/town, Despatch, Wit.
Leptomyrina hirundo	G/town only
L. lara	Everywhere
Lachnocnema bibulus	Uit. G/town
NYMPHALIDAE	
Charaxes varanes	Uit., Rocklands, V.S.P., G/town
C. xiphares	V.S.P., G/town, Hogsback
C. ethalion	G/town (Nature Res.)
Precis cebrene	Everywhere
P. archesia	Uit., Hogsback, V.S.P.
P. octavia	Hogsback
Eurytela hiarbas	V.S.P.
Neptis marpess	V.S.P.
Antanartia hippomene	Hogsback
Pyrameis cardui	Everywhere
Catacroptera cloanthe	Wit., Despatch
Hypolimnas misippus	Uit., Wit.
DANAIDAE	
Danaus chrysippus	Everywhere
ACRAEDIAE	
Acraea horta	G/town
A. neobule	Hogsback, V.S.P.
A. rahira	Rocklands
A. anacreon	Hogsback
Pardopsis punctatissima	Wit., G/town
SATYRIDAE	
Aeropotes tulbaghia	Wit., G/town
Meneris dendrophilus dendrophilus	Hogsback only
Dira oxylus	Hogsback
Dira clytus	Everywhere in season
Stygionympha vigilans	Wit., G/town
Pseudonympha magus	Wit., G/town
Bicyclus safitza	V.S.P., Uit.
Cassionympha cassius	V.S.P., Uit., G/town
HESPERIDAE	
Coeliades forestan	Despatch
Celaenorrhinus mokeezi	Hogsback
Tagiades flesus	Uit. (Groendal)
Calleagris kobela	Hogsback
Sarangesa phidyle	Despatch
Eagris nottoana	Uit.
Eretis djaelaelae	Wit., Uit.

Borbo borbonica	G/town
Tsitana uitenhaga	Uit.
Metisella metis	Uit., Hogsback. P.E.
Kedestes lepenula	V.S.P., Despatch, G/town
Gomalia elma	Uit., G/town
Gegenes hottentota	Everywhere
Spialia spio	Rocklands
S. diomus	Everywhere

Total 95 species.

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Some aspects of the fauna of the Ingessana hills, Sudan, with an account of an experiment with light trapping

By J. L. CLOUDSLEY-THOMPSON

The Ingessana hills lie south-west of Roseires between the Blue and White Niles in the *Acacia*-tall grass forest region of the Sudan (Andrews, 1948). Here the rolling grass plains south of Singa with 'heglig' (*Balanites aegyptiaca* Del.), 'aradeb' (*Tamarindus indica* Linn.), '*talh*' (*Acacia* Seyal), 'sidr' (*Zizyphus spinachristi* Willd.), 'tebaldi' or baobab (*Adansonia digitata* Linn.), 'la'ot' (*Acacia orfota* (Forsk.) Schweinf.) and 'kitr' (*A. mellifera* Benth.) give way to rocky hills covered with grass and trees. Among the latter, *Sterculia tomentosa* G. & P., *Bauhinia* spp. and 'dom' palms (*Hyphaene thebaica* Mart.) are common whilst 'taraktarek' (*Boswellia papyrifera* Hochst.) and *Ficus* spp. occur on the rocky outcrops, and bamboo (*Oxytenanthera abyssinica* Munro) along the banks of seasonal water-courses.

During the December vacation, 1968, I decided to visit the Ingessana hills. In addition to investigating a region about which no faunistic information is available, I wanted to test the efficacy in the field of 6v. battery-operated suction mosquito light traps manufactured in U.S.A. and supplied to us by W.H.O.

Two of these traps were attached to the leeward side of the Land Rover at each camping site at a height of 1 m. The fans of each were run concurrently for two hours after sunset, but the light bulb of only one trap was connected, the other trap acting as control. The results obtained, with relevant climatic data, are given in Table I. This indicates clearly that significantly larger numbers of insects were attracted to the lighted trap than were sucked into the control, including *Culex* but not *Anopheles* mosquitoes.

As can be seen from the localities listed in Table 1, we travelled to Galegu in the Dinder National Park (Cloudsley-Thompson, J. L., 1963, *Entomologist's mon. Mag.*, **91**: 65-7) and then returned to Guweisi and Es Suki, before driving down the Blue Nile to Roseires. The reason for this was that the roads had not been cleared beyond Galegu. The long grasses towered above the Land Rover and blanketed the radiator which had constantly to be cleared every time the engine boiled. Progress was

Date	Locality	Catch in lighted trap	Catch in unlighted trap	Temperature (range)	Relative humidity (range)	Wind velocity (range)
20th Dec.	20 miles south of Wad Medani (14°00′N. 33°40′E.)	1 *Grullulus* sp. 6 *Culex* sp. 1 flying ant 12 moths (*Chilo* sp. *Rotruda* sp. Pyralidae: Phycitinae and Microlepidoptera) ∞ Chironomidae and Ceratopgonidae	1 moth, *Chilo zonellus* Swinhoe (a common pest of sorghum) Pyralidae: Crambinae	26-23°C	35-40 per cent	3-0 m/sec.
21st Dec.	Nr. Galegu (12°40′N. 35°05′E.)	1 *Embolorrhinus* sp. Hemiptera: Henicocephalidae 1 Staphylinidae 3 *Culex* sp. 6 Ceratopogonidae 1 *Rotruda* sp. 48 Microlepidoptera	1 *Culex* sp.	29-24°C	30-35 per cent	Nil
22nd Dec.	El Guweisi (13°20′N. 34°05′E.)	Nil	Nil	29·5-27°C	25 per cent	2m/sec.
23rd Dec.	25 miles N of Roseires (12°05′N. 34°20′E)	1 Trichoptera 3 *Hilda* sp. Hemiptera: Tettigometridae 2 flying ants 1 Staphylinidae 1 *Culex* sp. 5 Chironomidae 3 Ceratopogonidae 1 Muscidae* 7 Microlepidoptera	1 *Scaphoideus aegyptiacus* Mats. Hemiptera: Cicadellidae	29-26°C	20-35 per cent	1-1·5 m/sec.
24th Dec.	Ingessana Hills (11°20′N. 34°05′E)	Nil	Nil	25-24°C	25-30 per cent	2-4 m/sec
25th Dec.	Ingessana Hills	Nil	Nil	27-24·5°C	30-35 per cent	1·5-2·5 m/sec.
26th Dec.	30 miles S.E. of Sennar (13°15′N. 33°25′E)	Nil	Nil	23·5-21°C	15-25 per cent	2·5-2 m/sec.

TABLE 1. Catches with a lighted and an unlighted 16v. suction-trap at various localities in December 1968, during periods of two hours after dusk. **Musca (Byomya) sorbens* Wied.

very slow because the track was often blocked by fallen trees and soon it petered out altogether. Both the dynamo and the milometer cable burned out and, after 30 miles, it seemed unwise to press on any further

Owing to unusually heavy rain earlier in the year, there were still water-pools away from the Dinder River and we did not see a great variety of game, apart from innumerable reed-buck, *Redunca redunca bohar* (Ruppell), a few bush buck, *Tragelaphus scriptus decula* (Ruppell), a lion, *Panthera leo leo* (L.) and a herd of over 100 ostrich, *Struthio camelus* L.

Compared with the better known Nuba Mountains, which consist of a vast, elevated plain with inaccessible scattered ranges and *jebels*, the Ingessana hills seem very mountainous because the roads run through them. From Soda we took a road which led us beside the chromite mine, and then followed a steep track which had not been used for at least ten years. This led us into the very centre of the hills, past permanent running streams with fishes in them; the denser vegetation also indicated higher rainfall than occurs in the surrounding countryside. The few people we met were bedecked with beads and little else, the men carrying large, elegantly shaped throwing knives. They were shy but very friendly.

Although the fauna is naturally much richer than on the surrounding plain, it is not plentiful because of the long dry season. Half an hour's collecting in a promising situation, under rocks besides a dry water course, provided a number of woodlice, *Periscyphis albescens* (Budde-Lund). This species has been recorded from Egypt (Cairo), Nubia (Abu el-Quadir) and the Sudan (Khartoum and Jebel Tozi near Singa). This new record therefore extends its known distribution almost to the frontiers of Ethiopia. I also found two large geophilid centipedes, three scorpions (two *Buthotus minax* Koch and a huge pregnant female *Pandinus exitialis* Pocock), some ticks, *Hyalomma* spp., and a few spiders of the families Salticidae, Pisauridae and Agelenidae. Ground-living insects included the termites *Macrotermes bellicosus* (Smeath), *Odontotermes nilensis* Emerson and *Trinervitermes togoensis* (Sjöst.), ants *Camponotus* (*Tanaemyrex*) *maculatus* (Fabr.), *Pheidole* sp., *Monomorium* sp. and *Dorylinae* (*Aenictus*) sp., beetles, and the Pyrrhocoridae *Odontopus sexpunctatus* Lap. and *Dysdercus fasciatus* Sign. I also found some skinks, *Mabuya quinquetaeniatus* (Lichtenstein). We returned to Khartoum via Jebel Kukur, J. Buk, J. Guli, J. Mazmum, J. Bizi, J. Dali, J. Sureig, Sennar and Wad Medani.

My thanks are due to Dr. Paul Freeman and his colleagues at the British Museum (Natural History) for their assistance in identification of my specimen as follows:—P. S. Broomfield and J. Quinlan (Hemiptera) and Paul E. S. Whalley (Lepidoptera). Dr. W. V. Harris (Commonwealth Institute of Entomology) kindly identified the Isoptera, Prof. M. Vachon (Université de Toulouse) the Isopoda, and Prof. P. L. Benoit (Musée National de l'Afrique centrale) confirmed my identifications of Arachnida. Specimens have been deposited in the respective institutions.

Department of Zoology, University of Khartoum, Sudan.
February 20, 1969.

Approach to the Ingessana hills.
The centre of the Ingessana hills.
(*Photos*: *J. L. Cloudsley-Thompson*. 22nd Dec. 1968.

M.V. Records for Industrial Warwickshire

By M. Vice

It was interesting to note the M.V. records for Charlecote in Warwickshire I also ran a M.V. moth trap in that county in Coventry. At the back of the house there is a large factory and at the front a main road; so therefore I think I am justified in calling the area industrial.

Naturally the number of moths taken are less than at Charlecote both in variety and quantity. However some interesting species arrive in the trap from time to time. The trap, which is situated in the garden at the rear of the house, is in operation from dusk to dawn on most nights between the months of March and October.

Of the Sphingidae I can boast four different species:—3 *Mimas tiliae* L. (Lime Hawk), 10 *Laothoe populi* L. (Poplar Hawk), 1 *Smerinthus ocellata* L. (Eyed Hawk), 2 *Deilephila elpenor* L. (Large Elephant Hawk).

As for the commonest moths, they are very similar to the records for Charlecote but in smaller numbers. *Triphaena pronuba* L. (Yellow Underwing) heads the list with 656, with *Apamea monoglypha* Hufn. (Dark Arches) second and *Agrotis exclamationis* (Heart and Dart) a close third with 500.

The next seven in the quantity stakes are:—268 *Caradrina morpheus* Hufn. (Mottled Rustic), 198 *Apamea secalis* L. (Common Rustic), 140 *Apamea sordens* Hufn. (Rustic Shoulder Knot), 110 *Plusia gamma* L. (Silver Y), 64 *Triphaena comes* Hübn. (Lesser Yellow-underwing), 51 *Melanchra presicariae* L. (Dot), 49 *Mamestra brassicae* L. (Cabbage Moth).

Out of the ten foremost moths mentioned in Mr Brown's article five figure in my top ten. Four out of the other five were common except for *Diarsia brunnea* Schiff. (Purple Clay) which was non existent.

I have never approached anything like 4000 moths in a night, the highest number I have ever recorded being 316 on June 30th. Although it is an industrial district the occasional woodland species occurs such as *Thyatira batis* L. (Peach Blossom) and *Amphipyra pyramidea* L. (Copper Underwing). Even a moth that has a preference for marshy places. *Plusia festucae* L. (Gold Spot), has been taken. Another moth of interest is *Abraxas sylvata* Scop. (Clouded Magpie). a scarce species for the area, as is *Apatele Leporina* L. (Miller). These both appeared in the moth trap in June on the 10th and 15th respectively. *Polychrisia moneta* Fab. (Golden Plusia) generally pays us a visit although only one was captured in 1968.

Many of the moths tend towards melanism such as *Biston betulaira* L. (Peppered Moth) being predominantly ab. *carbonaria.* Other moths with this tendency are *A. monoglypha* Hufn. ab. *infuscata, Meganephria oxyacanthae* L. (Green Brindled Crescent) ab. *capucina,* and *Dysstroma truncata* Hufn. (Common Marbled Carpet) (which is predominantly ab. *perfuscata.*

As a final footnote *Orgyia antiqua* L. (Vapourer) occurs fairly regularly each year at the trap and so does *Chiasmia clathrata* L. (Latticed Heath).

The above records are all for 1968 except for the mention of *T. batis* and *A. pyramidea* which were captured in a previous year.

196 Burnaby Road, Coventry. CVN 4AY.

The Genus *Spilosoma* at Dungeness, Kent

By R. E. Scott

All three species of the genus *Spilosoma* occur quite numerously at Dungeness, Kent, and are readily attracted to light. During the six years 1962-64 and 1966-68 I have operated light traps at two sites on Dungeness. In the first period I ran a Robinson 80 watt m.v. trap at Dungeness Bird Observatory (site A), grid reference 085172; and for the second period a trap based on a standard 200 watt bulb at Boulderwall Farm (site B), grid

Spilosoma lubricipeda L. (White Ermine)

Site	Year	First Record	Last Record	Span of Emergence (days)	Total Trapped	Peak
A	1962	Jun. 11	Jul. 4	24	9	3 on June 11th
A	1963	Jun. 7	Jul. 23	47	13	2 on three dates
A	1964	May 26	Jun. 16	22	28	4 on June 5th
B	1966	Jun. 7	Jun. 28	22	26	5 on June 12th and 15th
B	1967	Jun. 1	Jul. 14	44	32	5 on July 6th
B	1968	May 18	Jul. 6	50	19	6 on June 16th
Average:						
	1962-64	Jun. 4	Jul. 4	31	17	
	1966-68	May 29	Jul. 6	39	26	
	1962-68	Jun. 1	Jul. 5	35	21	June 16th

S. urticae Esp. (Water Ermine)

Site	Year	First Record	Last Record	Span of Emergence (days)	Total Trapped	Peak
A	1962	Jun. 14	Jul. 30	47	7	All singles
A	1963	Jul. 3	Jul. 9	7	2	Singles
A	1964	Jun. 11	Jun. 29	19	6	All singles
B	1966	Jun. 6	Jul. 7	32	26	5 on June 12th
B	1967	Jun. 25	Jul. 16	22	31	9 on July 6th
B	1968	Jun. 17	Jul. 24	38	37	9 on July 8th
Average:						
	1962-64	Jun. 22	Jul. 13	24	5	
	1966-68	Jun. 16	Jul. 15	31	31	June 29th
	1962-68	Jun. 18	Jul. 14	27	18	

S. lutea Hufn. (Buff Ermine)

Site	Year	First Record	Last Record	Span of Emergence (days)	Total Trapped	Peak
A	1962	Jul. 8		1	1	
A	1963	Jun. 6	Jul. 23	48	8	All singles
A	1964	Jun. 5	Jul. 15	41	12	4 on June 10th
B	1966	Jun. 15	Jul. 26	42	46	5 on July 2nd
B	1967	Jun. 21	Jul. 29	39	65	14 on July 11th
B	1968	Jun. 19	Aug. 2	45	65	11 on July 4th
Average:						
	1963-68	Jun. 13	Jul. 25	43	1962-64 7 1966-68 55 1962-68 33	June 29th (1964-68)

refence 063196. These two periods are not therefore strictly comparable, over the course of twelve months the m.v. trap providing a considerably greater variety and number of insects.

Full details of the capture of all three species are shown in the tables.

One of the most interesting facts to emerge from an examination of these tables is that although the two sites are only two miles apart, all three species are obviously much more numerous at site B where a less efficient trap was being operated. The main differences between the vegetation of the two sites is the much drier habitat at site A, site B being very close to water filled ditches with many damp and wet area plants. Of the three species, *lubricipeda* is the most equally abundant at the two sites, well exceeding the other two species at site A.

The following list summarises the points made apparent by an examination of the tables:—

1. All three species are more numerous at site B.
2. *S. lubricipeda* is the commonest at site A, followed by *lutea* and then *urticae.*
3. *S. lutea* is the commonest at site B, followed by *urticae* and then *lubricipeda.*
4. *S. lubricipeda* shows the most similarity between the two sites.
5. It appears possible that *lutea* has an earlier emergence at site A than at site B.
6. *S. lubricipeda* has an earlier emergence than the other two species, being nearly two weeks in advance.
7. On average *lutea* shows the longer emergence period, followed by *lubricipeda.*

It is perhaps worth mentioning that up to the time of my trapping Chalmers-Hunt (1962-68) was only able to record 13 imagoes of *S. urticae* at Dungeness, the first being recorded in 1932 and the dates covering the period 31st May to 28th July.

REFERENCE

Chalmers-Hunt, J. M. (1962-1968). *The Butterflies and Moths of Kent*, Vol. II.

Dungeness Bird Observatory, Romney Marsh, Kent. 8.vii.1969.

The Future for the Amateur Entomologist

By R. M. Payne

We are constantly hearing and reading in the entomological journals of two kinds of reactions to the impact of progress on our hobby. On the one hand there is the plea for conservation of the dwindling areas of certain types of natural habitat in the face of modern demands on land, coupled with the ominous portent of permits to collect insects; and on the other hand there is the protest from those who remember better days that things are not what they were, that the Blues are no longer in such profusion on the Downs, that our favourite wood has been clear-felled and replaced by obnoxious conifers, and that motor-cars are emitting too much poisonous waste.

These are of course two aspects of the same phenomenon, and as amateur naturalists or just plain collectors we cannot help deploring such

recent developments in our civilisation as the enormously increased use of chemicals in agriculture, the cutting of roadside verges in rural areas, the pleas to build ever more houses and roads for a growing population, and other manifestations of the increasing pressure to maximise the economic return from the land. Nor can there be any doubt that we are on the losing side.

Without wishing in any way to denigrate the efforts of the conservationists (to which indeed we ought all to contribute vigorously), I feel nevertheless that both these attitudes are negative ones, in the sense that they do not directly add to our enjoyment of our hobby. I should like to put in a plea for an approach which takes some of the sting out of this feeling of protest and of helplessness in the face of odds. It is, briefly, an attitude of concentrating on the positive side of things.

There are hundreds of species of insects which are not adversely affected by the march of progress, or which can at least still be found in numbers and widespread. These are available for collection without any risk of an outcry that their continued survival is thereby imperilled, and for the elucidation of a wide range of unknown aspects of their existence —distribution, environment preferences, feeding habits, behaviour, etc. There is thus endless scope both for the collector and for the man with an ecological bias.

I am impressed, for example, by the numbers of insect species that can be seen—and therefore either collected or studied, according to one's bent—in an ordinary garden, given a long enough period. Certainly in the Diptera and Hymenoptera there is evidence that a quite unexpected proportion of species, including many regarded as rare, will turn up in a garden where an experienced entomologist is keeping his eyes open, and I imagine that with the use of m.v. traps the same remarks would apply to the nocturnal Lepidoptera, if not to most winged Orders.

I was also struck recently by a statement—at first sight an extraordinary one—made by the Rev. C. E. Tottenham in his identification *Handbook* on Coleoptera: Staphylinidae, where he says "No collecting has been done in the greater part of the country". This stark truth applies, I am sure, to very many groups of insects, perhaps indeed to the great bulk of our insect fauna, for is it not a general habit for collectors to go the round of the well-known localities to obtain their series of the rare species?

But perhaps our interest has always lain in some group which is seriously affected by modern developments, and not in Staphylinid beetles or fruit-flies. Butterflies, dragonflies and some families of beetles and grasshoppers certainly fall into this category. Then what about the refreshing experience of breaking new ground? Are we too old to recapture the thrills of our youth by embarking on a new Order?

If we are, then I suggest that there are still plenty of interesting matters we can direct our daily attention to, without feeling oppressed by the long-term outlook. We know of species that were here yesterday, but are gone to-day: others are here to-day but we suspect may be gone to-morrow. Lists for the same place at different times offer scope for continuing interest. Why are some closely allied species more obviously affected by environmental changes than others? As a botanist, I am aware that while some rare plants are in danger of extinction, many others are spreading year by year to areas where they were hitherto unknown.

These changes must affect insects of many Orders, but my impression is that the entomology of it all is much less adequately recorded than the botany.

So let us not sit back and bemoan the afforestation of the Breck and the commercialisation of the Cairngorms. Britain is still teeming with insects, and we as amateur entomologists have opportunities that were not available to our predecessors in more stable times.

But I suppose I am prejudiced towards contentment, since I am not a Lepidopterist!

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Notes on some British Serricorn Coleoptera, with Adjustments to the List. 2 - The Malacoderm Families

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

(No. I of this series of three appeared in *The Entomologist's Monthly Magazine* for July-Sept. 1968, vol. 104, pp. 208-216.)

HELODIDAE

Microcara bohemani Mann. (*bohemanni* auct.).—Kloet & Hincks (1945: 183), following several Continental authors, give this as a good species; with us, it has more often been regarded as a variety of the common *M. testacea* L. (as by Fowler, 1890: 121) or else ignored (as by Joy, 1932). Its true status may well be still in doubt. Thus, Horion (1951: 255) includes it only with reserve, as from north and middle Europe, and marks it 'spec. propria?'. Reitter (1911: 244) gives it as a species without question, but his diagnosis is rather poorly contrasted with that of *testacea*. Fowler's (*l.c.*) is broadly similar but adds that the pronotal disc is dark. He records the insect as having occurred near Birmingham and Dumfries, and in other localities unspecified; Spalding (Lincs.) and several Irish counties are added in the Supplement (1913: 276). Whatever its taxonomic rank, the form seems very poorly known. In Britain, dark aberrations of *testacea* have evidently been mistaken for it; a series of what I take to be such a form stands over the name *bohemani* in G. C. Champion's collection, all from Aviemore. I have examined two specimens purporting to be the latter in D. Sharp's collection, one of which has a label 'Bohemanni/Scotia/à retourner s.v.p.' and thus appears to have been checked by a French authority (name not indicated). I cannot make them anything but, at most, slight variants of *testacea*—in any series of which they would in no way stand out. Whether or not, therefore, *M. bohemani* is a genuine species—a problem I do not pretend to have solved—it seems almost safe to say that we possess but one species of *Microcara* in this country, as far as known at present.

Cyphon Payk.—Since the 1945 *Check List* appeared, the British species of this genus have been very ably revised by the late D. K. Kevan (1962), with the addition of three to our list and figures of the often remarkable genitalia in both sexes.

EUCINETIDAE

Eucinetus meridionalis Lap.—A very recent addition to the British list

and the most interesting and surprising to have been made for half a century or more, the family being new to our fauna and the species a southern one not known from mid-Europe. It was discovered last autumn by Mr. A. E. Gardner near Lymington, South Hants., and—though only a few hibernating specimens had been found up to the time of writing—there is evidently a breeding colony in the vicinity (Gardner, 1969). (Such discoveries as this, *Stenelmis*, and certain others of the past decade or so surely confute those pessimists who have long inisisted that no further startling additions to our seemingly native Coleoptera can be expected!).

CANTHARIDAE

Cantharis darwiniana Sharp.—This is placed in the *Check List* (p. 179) between *C. pallida* Goeze and *C. fulvicollis* F. (the former of which, of course, includes the later split-off species *C. cryptica* Ashe, 1947). It frequently happens in this work that nearly or very nearly allied species are separated by others with which they have relatively little in common; and the present case is a pronounced one, tending to obscure the extremely close affinity always recognized as existing between *C. darwiniana* and *C. rufa* L. (=*liturata* Fall.).

But the question here is whether *darwiniana* can really be maintained as a species, or whether it is not rather—as often suggested, e.g. by Fowler as long ago as 1890 (p. 139)—a 'biological form' or modification of *rufa* produced under the influence of its peculiar environment, viz. under seaweed on the coast. In fact it seems now to be generally considered as such; for instance, by Horion (p. 222) who, however, makes it a simple variety—which can scarcely be correct—and records it from the North German coast.

Examination of Sharp's type series (General Collection, British Museum, Nat. Hist.) and other material convinces me that this insect is indeed only a form of *C. rufa* and cannot be upheld as a valid species. Extreme specimens particularly of the female sex do have a distinctive aspect because of their small size and short limbs, but there seems to be no real dividing-line. The alleged structural characters are, when examined on the actual insects, purely comparative and, moreover, hardly stable. Joy's diagnosis on colour alone (p. 436) is useless, for the fact is that *both* forms vary widely in that respect and the coloration attributed specifically to *darwiniana* can be found in *rufa*, which, as every collector must know, is by far the most variable of our larger species of the genus. Joy, however, cannot have seen *rufa* with dark elytra, as he places it in the section of his key with 'el. yellow' (p. 435). Even the characteristic biotope of *darwiniana* seems not to be constant, for in the Power collection there are four examples (which certainly have the facies of the coastal insect) placed over that name from Woking, Surrey (Champion). In short, everything points to there being only one species involved.

Metacantharis haemorrhoidalis F. (=*clypeata* Ill.).—It has for some time been known on the Continent that the beetle which had up to then been passing under one or other of these names (mostly the first) is in reality a different species, *Cantharis decipiens* Baudi (1871), since found to be much commoner in Europe than the true *M. haemorrhoidalis*. It seems to be the only one of the two occurring in Britain (as also in Scandinavia), and consequently *C. decipiens* must replace *M. haemorrhoidalis* in our list. The latter, a more southern and alpine species in Europe,

has a differently-shaped dark blotch on the pronotum and is further distinguished, among other details, by the generic characters of the tarsal claws. (Incidentally, since *Ancistronycha*—which includes our *C. abdominalis* F.—appears to have been dropped as a genus, it seems doubtful whether Bourgeois's *Metacantharis* is any more worthy of retention.) *C. decipiens* was originally described from Sweden as a variety of *C. figurata* Mann. Fowler's description of *Telephorus haemorrhoidalis* (p. 140) applies, of course, to our insect—i.e. *C. decipiens*—and not to the other species.

Malthinus fasciatus Ol.—Here too the British list must be altered. Several years ago I noticed that the species known in this country from early times as *M. fasciatus* Ol. seemed to agree far better with the diagnosis of *M. seriepunctatus* Kies. (1951) in Reitter (p. 263) than with that of *fasciatus*. Ensuing correspondence with my friend Dr. Strand in Oslo much increased the suspicion that our species had been misdetermined. Finally the matter was put beyond all doubt when Dr. Walter Wittmer, the Swiss Cantharid specialist, kindly indentified as definite *seriepunctatus* a dissected male sent to him—having informed me that for certain separation of these two species the male genitalia are required. *M. fasciatus* is generally darker, thus somewhat more resembling *M. balteatus* Suffr.; the possibility of its being mixed with either that species or *seriepunctatus* in a few collections should not be overlooked, though more probably we do not possess it. The two in question are not very different in their distribution abroad, neither occurring as far north as Fennoscandia.

It may be as well to draw attention to Newbery's amendment (1896) of Fowler's statement of the secondary male characters of '*fasciatus*' (i.e. *seriepunctatus*) and *balteatus* (p. 146; also in the key, p. 145)—since such a note can easily be passed over, and errors of determination result. Moreover, Joy (p. 432) more or less copies Fowler. Newbery gives the characters fully and correctly. Champion (1918) remarks that the male of *balteatus* is 'extremely rare'; in my experience however, like Newbery's, that is by no means the case.

MELYRIDAE

Malachius elegans Ol.—Introduced as British by Donisthorpe (1931[1]) on a pair taken by him at Slapton Ley, S. Devon. However, in attempting to check the determination, I was forced to the conclusion that the beetles had been incorrectly named and could not be specifically separated from *M. marginellus* Ol., which, in its coastal form *pseudosardous* Recl. & v.d. Wiel (=*angustimarginalis* Donis.), abounds at the spot where the alleged *M. elegans* occurred. On comparing these last with *marginellus*, no appreciable difference of structure was revealed, but only one of coloration, viz. that in the supposed *elegans* there is no orange at the sides of the pronotum (in 'var.' *pseudosardous* this colour is reduced from a very broad to a narrow border). The British so-called *elegans* are thus, in my view, extreme aberrations of the above variety—or rather, local form—of *marginellus*; and as such, the present species must, I think, be dropped from the list. Donisthorpe gives a description, with figures of the male antenna and eytral apex; to judge from this, the true *M. elegans* (unknown to me, and ignored by Reitter (1911) though Horion (p. 229) gives it a wide range in central Europe) must be structurally very near *marginellus*—in any case sufficiently so to require comparison, yet Donisthorpe does not once mention it.

M. lusitanicus Er. (v. *australis* Rey).—Another *Malachius* added to our fauna by the same author (1931[2]) on a single female from Windsor Forest, and included in Joy's book (p. 621-2). I have always suspected that most likely some mistake had been made over its identity, and after a careful examination am quite satisfied that it is merely an example of the small form (*v. immaculicollis* M. & R.) of *M. bipustulatus* L., with the third antennal segment perhaps a trifle longer than usual relative to the fourth; but there is no real difference. When the specimen is put beside v. *immaculicollis* in the same collection, their identity is evident, and it is curious that the comparison did not seem to occur to Donisthorpe—particularly as he had this form in his collection from the same locality. *M. lusitanicus* must therefore be expunged from the British list.

CLERIDAE

Trichodes apiarius L. and *T. alvearius* F.—I have already discussed fully the question of the status of these species in our fauna (Allen, 1967), and reached the decided conclusion that they must have been indigenous, dying out probably towards the middle of last century or perhaps somewhat later. Here therefore I need only call attention to the matter, and recommend that both be restored to our list as extinct natives.

Thaneroclerus buquetii Lefebvre.—Kloet & Hincks (p. 180) include this Indian Clerid as British with the symbol for 'introduced but established'. The correctness of this seems open to doubt. The only British record of the beetle I have ever seen is of its having been found breeding in Bombay ginger at the British Museum, where it was predacious on *Lasioderma serricorne* F., by C. O. Waterhouse (Fowler & Donisthorpe, p. 280); and it seems most unlikely that the species would be able to naturalize itself here outside warehouses and the like. In that case it is in the same class as a great multitude of introductions which may breed for a short time in artificial conditions but really have nothing to do with the British fauna properly speaking; and it is better that our list should not be cluttered up with them (see Allen, 1964). On the other hand the Australian *Paratillus carus* Newm., for instance (in the same family), is rightly included and marked as established, as it has been repeatedly taken in the open under conditions that fairly show it to have accommodated itself to our species of *Lyctus* as a permanent resident. Unless a stronger case can be made out for *T. buquetii* than the above, I think it would be best omitted.

Necrobia rufipes Deg.—Some years ago I noticed that my short series of this species comprised two well-marked forms, one having distinct rows of larger punctures and longer, blacker, upstanding hairs on the elytra besides the shorter less erect pubescence, while the other was almost uniformly puncto-pubescent. The differences were very obvious on comparison, rather suggesting the presence of two distinct species. British works threw no light on the problem, but foreign ones plainly identified the first form above as v. *pilifera* Reitt.—the other being regarded as the the typical state. The two forms were found to be present in equal proportions in the British Museum material, and the late Mr. D. K. Kevan (to whom I had mentioned the matter) reported the same for his own and that of the Royal Scottish Museum. This suggested that we might here have to do with an unusual kind of sexual dimorphism—characters of sculpture and vestiture being, as a rule, specific rather than sexual—an idea proved correct by dissection of a number of specimens of both forms. Later (from

Dr. A. Strand, I believe) I learnt that the problem had been solved as long ago as 1926 by Stolz, who demonstrated that the so-called var. *pilifera* was actually the female of *N. rufipes*—agreeing, of course, with the conclusion arrived at by Kevan and myself. But Stolz's finding not having been noticed in our literature, as far as I am aware, other coleopterists in this country may well have been puzzled as I was.

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Collecting in Spain, 1969

By Dr. R. G. Ainley.

From May 23rd to June 2nd, 1969, I stayed in Madrid, and was able to collect Lepidoptera in several localities in the district. The season was a late one, due to cold weather in the weeks preceding my arrival. During my stay the weather was consistently fine and sunny, though not really hot unitl May 30th. Furthermore, when the weather was hot in Madrid, there was often a gentle but cool breeze in the foothills of the mountains where I did most collecting. This certainly reduced the numbers of insects on the wing, as shown by their increase on occasions when the breeze abated.

On the morning of May 23rd I was pleased to see a few fresh specimens of *Iphiclides podalirius* L. (spp. *feisthameli* Dup.) and *Pararge aegeria* L. (form *aegeria*) flying in suburban gardens in Madrid. In the afternoon I drove to the foothills of the Sierra de Guadarrama northwest of the city. The sky was overcast much of the time, but on scrubland with many flowers we found a fair number of butterflies. *Zerynthia rumina* L. was common, but most specimens were worn. Fritillaries were much in evidence, especially *Mëlitaea phoebe* Schiff., and also *M. cinxia* L., *Mellicta athalia* Rott. and a few *Euphydryas aurinia* Rott. (the rust-

coloured form *iberica*). Other species found were *Dira megera* L., *Coenonympha pamphilus* L. (typical form, not *lyllus*), *Vanessa cardui* L., *Aricia cramera* Esch., *Colias croceus* Fourc. and *Colias hyale* L.

On the morning of May 26th I returned to the same locality but a cool breeze was blowing and very few butterflies were seen, so early in the afternoon I drove on along a narrow mountain road towards the tiny village of Mataelpino (1071 m.) on the southern foothills of La Maliciosa. The weather became hotter and more Lepidoptera were seen, especially in the mountain pastures where short grass and many flowers were growing. Species not found on May 23rd were *Dira maera* L., *Agapetes ines* Hffsgg, *Issoria lathonia* L., *Papilio machaon* L. (resembling the British subspecies in appearance, rather than the specimens I have taken in the south of France), *Euchloe tagis* Hbn. and *Anthocaris euphenoides* Stdgr, this last flying in small numbers, and far from easy to take with the net, especially on a boulder-strewn hillside.

On May 27th I drove to the Sierra de Gredos, a wild and beautiful range of mountains about 200 Km. west of Madrid, where I stayed for two nights at the Parador de Gredos, a comfortable State-run hostel and an ideal centre for mountain walking. The next morning, climbing in the range south of the Paradour, the weather was fine and sunny, but cool, and the only species seen was the moth *Euclidimera mi* Clerk., flying in hundreds around the yellow broom bushes. In the early afternoon a solitary *Aglais urticae* L. was seen flying over the snow near the the summit. Not until 4 p.m., when I had returned to a lower level and the breeze had dropped, were butterflies seen in appreciable numbers. In marshy meadows beside a small river I saw about ten *Anthocaris euphenoides* Stdgr, and took four, becoming spattered with wet mud in the process. Flying with *euphenoides* were a few *Euchloe tagis* Hbn. and *Pieris napi* L.

Driving from Gredos back to Madrid on the 29th the weather was mostly dull, but on the roadside near Toledo, during a sunny interval, there were a few *Pontia daplidice* L., *Agapetes ines* Hffsg. and early *Maniola jurtina* L. One notable capture here was a perfect male *Pandorina pandora* D & S. (=*Argynnis pandora* Schiff., =*Argynnis major* Cr. etc. Any number can play).

On May 30th I returned to Mataelpino. The same species were found as on the 26th, but in greater numbers. In addition I took my first Spanish "blue", solitary specimen of *Philotes baton* Bergstr., and a few *Iphiclides podalirius* L. and *Pontia daplidice* L.

June 1st was extremely hot. I spent the afternoon collecting in olive groves near Chinchón, south-east of Madrid. Large numbers were on the wing, one of the commonest species in this locality being *Lysandra bellargus* Rott., which I had not seen elsewhere. Also very common were *Agaptes ines* Hffsgg., the ubiquitous *Melitaea phoebe* Schiff., and *Anthocaris euphenoides* Stdgr. Worn specimens of *Zerynthia rumina* L. were flying in moderate numbers, along with *Euchloe tagis* Hbn., *Polyommatus icarus* Rott. and *Pontia daplidice* L.

That evening in Madrid I was sitting in the garden, net in one hand, brandy in the other, waiting for *podalirius*, when my host pointed out some larvae crawling up the side of the house. These were obviously a large Nymphalid, though I did not recognise the species. An exhaustive search of the outside of the house produced about ten larvae and a

pupa. Subsequently, after a minor publicity campaign and a hint of bribery, the neighbours' children brought half a dozen of the same larvae, most of which suspended themselves for pupation in the next few days. Unfortunately the majority harboured parasites, and only four live pupae survived. On June 17th the first emerged. It was, of course, *Nymphalis polychloros* L., a species I had never before seen alive at any stage of its life-history.

The following list of species seen or taken omits *Hesperidae* and moths. The numbers refer to the localities given in the Key. I wish to record my thanks to Mr. H. G. Allcard, of Sale, for helping to identify some of the species.

PAPILIONIDAE

Papilio machaon L. (3)
Iphiclides podalirius L. (spp. *feisthameli* Dup.) (2)
Zerynthia rumina L. (3, 6)

PIERIDAE

Pieris brassicae L. (1)
P. rapae L. (1)
P. napi L. (1)
Aporia crataegi L. (6)
Pontia daplidice L. (3, 5, 6)
Euchloe tagis Hbn. (3, 4, 5, 6)
Anthocaris cardamines L. (1)
A. euphenoides Stdgr. (3, 4, 6)
Colias hyale L. (1)
C. croceus Fourc. (1)

NYMPHALIDAE

Vanessa atalanta L. (1)
V. cardui L. (1)
Aglais urticae L. (1)
Nymphalis polychloros L. (2)
Euphydryas aurinia Rott. (3)
Mellicta athalia Rott. (3, 6)
Melitaea cinxia L. (3, 6)
M. phoebe Schiff. (3, 5, 6)
Pandoriana pandora D & S (5)
Issoria lathonia L. (3, 5, 6)

SATYRIDAE

Parage aegeria (form *aegeria*) (2)
Dira megera L. (1)
Agaptes ines Hffsgg. (3, 5, 6)
Maniola jurtina L. (5)
Coenonympha pamphilus L. (1)

LYCAENIDAE

Heodes tityrus Poda. (=*Lycaena dorilis* Hufn.) (3)
Lycaena phlaeas L. (3, 4, 6)
Philotes baton Bergstr. (3)
Aricia cramera Esch. (3)
Polyommatus icarus Rott. (2, 3, 6)
Lysandra bellargus Rott. (6)

KEY

1. Found in all localities visited.
2. Madrid.
3. Sierra de Guadarrama.
4. Sierra de Gredos.
5. Toledo.
6. Chinchón.

PARASITISM AND DISEASE IN CAENOPHILA SUBROSEA STEPHENS (ROSY MARSH MOTH).—In my note on this species (antea 179) I much regret that I wrote by mistake that the larvae were taken in Carnarvonshire. The locality is in fact in Cardiganshire. — J. M. CHALMERS-HUNT, St. Teresa, Hardcourts Close, West Wickham, Kent.

Butterflies and Insecticides

By F. Moriarty

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Many people believe that some indigenous species of British butterflies have become less common in recent years, although unfortunately, precise estimates of numbers are hard to come by. One of the most popular explanations for this alleged decline is the increased use of insecticides. I want, in this article, to examine the evidence for this explanation.

There are, of course, many possible reasons for any declines in the numbers of butterflies, but the idea that insecticides are responsible has several merits. The increase in the use of insecticides coincides roughly with the period during which the butterfly numbers are believed to have declined. There is also a considerable amount of circumstantial evidence that insecticides have decreased the numbers of some predatory birds in Great Britain. Furthermore, although it would be very difficult to make direct field tests, the credibility of the idea can be checked by toxicological tests on individual butterflies.

All of the most heavily used insecticides found in agriculture today belong to either the organochlorine or organophosphorus groups of compounds. These are all synthetic substances, and all of them have been developed during or since the Second World War. In general, the organochlorine insecticides are by far the more persistent group, both in the environment and within organisms, and so presumably they are the greater hazard to living animals. The half-life of organochlorines in soil can exceed ten years in extreme circumstances, but an average figure is three to five years.

I have tested the effects of two commonly used organochlorine insecticides, DDT and dieldrin, on *Aglais urticae*, the small tortoiseshell butterfly (Moriarty, 1968). Small drops of insecticide dissolved in a volatile solvent were placed on the surface of caterpillars during their last, fifth, instar. Some of the insecticide is absorbed through the cuticle, and most of this absorption occurs within 24 hours of dosing. The first step was to determine how much insecticide is needed to kill the caterpillars, and I found that dieldrin, for example, kills half of the caterpillars when the body concentration reaches from 0·5-5·0 parts of dieldrin per million parts of caterpillar. The higher concentrations occur in the heavier caterpillars.

However, death of individuals from insecticidal poisoning is not the only way in which populations of butterflies might be affected. Doses which are too small to kill could, in theory, affect populations in any of three ways. A sub-lethal amount of insecticide might alter the genetic constitution of future generations, or, within the individual, it might influence survival or reproductive ability.

In fact, there is no evidence for genetic effects on individual insects. The only way in which a population's gene pool can be affected is by selective kill of a proportion of the population. Death of a high proportion of individuals in successive generations from the use of insecticides has often produced a population which has a much greater resistance, and other linked characteristics may also change. But there is evidence for effects on survival and reproduction.

One of the more striking results with *A. urticae* is the effect of dieldrin on reproductive potential. In one experiment, a drop of solvent containing 1·25, 5 or 20 micrograms of dieldrin was put on the cuticle of a fifth instar larvae. Control larvae were dosed with solvent alone. Five male and five female adult survivors from each treatment were kept in a flight chamber until they died, and the number and fertility of all eggs laid were recorded (table 1). Only the controls laid many

TABLE 1.—The effect of dieldrin on the fertility and fecundity of *Aglais urticae* (figures from Moriarty (1968)).

Dose of dieldrin applied to larvae (micrograms)	*Number of egg clumps laid*	*Total number of eggs laid*	*Fertile eggs (%)*
0	12	1,344	84
1·25	2	146	84
5·0	2	18	0
20·0	0	0	—

eggs, and the largest dose, which killed about half of the larvae, caused complete sterility of the surviving adults. Egg fecundity is affected by smaller doses than egg fertility. If effects such as this were to occur in the field, natural populations might well be devastated.

We need two items of information before we can decide how real such risks are. The first is, how much insecticide must be absorbed before any effects occur? It is generally supposed that any effect is the result of insecticide acting during some period of time after it has been absorbed on a specific 'site of action' within the insect's body. We know, for a given dose of dieldrin, how much is absorbed and remains within the body afterwards, but we cannot say how little is needed to cause sterility, because we do not know where or when the insecticide acts. However, dieldrin has a simpler effect on adult behaviour. Larvae dosed with 5 micrograms or more of dieldrin may produce adults which are markedly hyperactive, as though they were showing the initial symptoms of dieldrin poisoning. This response is presumably caused by the dieldrin present at that time, which is about 1-3 parts per million. This is the only absolute measure I know for insects of the minimum amount required for a sub-lethal effect.

The second item is, how much insecticide are insects likely to acquire? The amount present in a butterfly depends on the relative rates of several processes. First, of course, is the amount of insecticide absorbed by the insect, and the period of time during which it is absorbed. The degree of persistence depends then on how rapidly insecticide can be either excreted from the body or converted within the body to other compounds. Both dieldrin and DDT (in a modified form) are relatively persistent in *A. urticae*, and minute amounts of these compounds can be detected by recently developed methods of analysis. But a sample of twenty-two newly emerged first-brood adults taken in Huntingdonshire had no detectable organochlorine insecticides, although the limit of detection was less than 0·01 parts per million

So we find that, as far as our knowledge extends, insecticide can produce sub-lethal effects in laboratory cultures of *A. urticae* after a single dose if the concentration within the body reaches about 1 part per million. But individuals in the field appear to contain less than

0·01 parts per million. If a straight comparison of these two figures is legitimate, there appears to be a safety factor of more than a hundredfold. Of course, there are many possible criticisms of this conclusion. Individuals in the field may receive many small doses, which may be more deleterious than the same total quantity in one large dose. The harsher existence in the field may expose effects which do not appear in the laboratory. Other species may be more sensitive. But the available evidence, although scanty, does not suggest that insecticides have caused the alleged decline in the numbers of butterflies.

More information is needed. In particular, we need background information on the distribution and densities of various species, and their changes with time, so that any declines in numbers which may develop can be more quickly and surely detected. This knowledge would also make it much easier to find explanations and possible safeguards.

REFERENCE

Moriarty, F. (1968). The toxicity and sublethal effects of *p,p'*-DDT and dieldrin to *Aglais urticae* (L.) (Lepidoptera : Nymphalidae) and *Chorthippus brunneus* (Thunberg) (Saltatoria : Acrididae). *Ann. appl. Biol.*, **62**, 371-393.

Portrait of Robert Dick

By I. R. P. Heslop

At *Ent. Record*, **80**: 102, I contributed a note on the Robert Dick centenary Exhibition of 16th July, 1966, together with the complete text of my inaugural speech. In the note I mentioned the photograph of Robert Dick. This, as well as other relics, was discovered as a direct result of the interest aroused by the prodigious labours of Mr. Neil Campbell, Mr. Jack Saxon and Mr. John Bramman (whose names I gratefully record here in an entomological journal) in preparing the Exhibition.

This unique photograph, which dates from 1858, was turned up in Wick. With expert attention an excellent fresh negative was produced. It appears, however, that only two prints were made therefrom, and the picture has not been published. It is my anxiety lest this precious item should once again lapse into oblivion that has prompted me to have further prints prepared and to seek publication, for the very first time and after 111 years, of the one exact likeness of this great naturalist.

"Belfield," Burnham on Sea, Somerset. 20.viii.1969.

Letter to the Editor

August 19th, 1969.

Dear Mr. Editor,

I have wondered for some time whether you would consider making available a page or two of "The Record" for the increasing number of lepidopterists (in particular) who have added colour photography as an ancilliary, or indeed an absorbing primary pursuit in their study of insects. There is no question of turning The Record into a photographic journal, but a page given to a forum for the exchange of ideas on *modus operandi* would be of particular interest to many readers. Journals devoted to photography in general can afford only an occasional reference to such a specialized branch of camera work, such as this is. You must have among your readers, many who long to know more of how others achieve their results.

ROBERT DICK

Nor do I refer to the essential monochrome accompaniment to descriptive text. To-day, the colour transparency has brought a new world of beauty and satisfaction to many who wish to preserve the colour and freshness of the live insect. We have moved very rapidly from the days when colour photography was possible only with heavy apparatus like the Thornton-Pickard camera (good as it still is) and hours of patient stalking for the quarry. Yet we photographers must be pursuing different ways to the same end. The following notes list some of the varying techniques which could well be subjects for most rewarding exchanges of views.

(1) Successful stalking of an insect must be to a large extent dependent upon time of day, weather and intensity of the insect population. For many photographers, the "studio" set-ups with knowledgeable backgrounds are the most likely way to success. It is in the "preparation" of the model that experience and technique play a large part. In my own work on butterflies I find I get most success by feeding the insect well in the morning, then shading the cage in the late afternoon and offering a flower for the butterfly in evening light—most butterflies will bask in the late sunshine for a few seconds!

(2) Suitable Camera and Film. My camera is the Pentax Spotmatic and for available light photography, the "through the lens" metering is a great boon. This type of camera is light and convenient and one sees the picture up to the moment of "shooting". Parallax in no problem. I find Kodachrome II a good film for colour rendering and its speed is adequate with flash photography on small apertures. It would be valuable to hear of other people's experience with this and with other films and emulsion speeds.

(3) Size of insect to format. I have decided against a standard magnification for all butterflies and moths. I find that while a 10 mm. extension tube and a No. 1 dioptre are suitable for insects the size of *G. rhamni* or *V. atalanta*, the magnification is not enough reasonably to fill the frame with, say *P. icarus*. All the smaller butterflies get two or even three dioptres. At the same time I think it is wise to leave space on the picture for a recognizeable flower or leaf, so that relative sizes can be compared.

(4) I find that ringflash is almost essential for the photography of insects, and the flat lighting is no real disadvantage. Other workers may have discovered that other electronic flash units, mounted on the top or side of the camera, give them great satisfaction in wing texture and body contour, and it would be very useful to hear other views on this matter. I use the Minicam Ring Flash with one layer of diffuser (cut from a handkerchief) to halve the factor to 6 at from 4″ to 6″ distant from the insect. I have this way a little latitude on the small stops according to the intensity of the daylight. The Pentax is a focal-plane camera but the flash at 1/300th sec. is usually adequate to stop movement and there is no "ghosting" at *f*16 or *f*11.

(5) I would like to know more about the use of telephoto lenses in this work. I understand that with a suitable extension tube or bellows, there are sizes of telephoto lenses which allow perfect focussing at distances 2′ to 2′ 6″ from an insect, but I still wonder about depth of field and shutter speed with such combinations. Presumably a fast film is essential. Do any of our photographers use the telephoto for insect

photograhphy in the field? What size of image to format do they aim at?

These then are a few of the items in the making of colour transparencies of the lepidoptera which admit of varying techniques by the macrophotographer. Am I correct in assuming that other readers would enjoy exchanging ideas on such matters.

T. W. JEFFERSON, 20 Mill Lane, Redworth, Darlington.

[I would appreciate the views of readers on this proposal. Ed.].

Notes and Observations

COINCIDENCE.—I fully agree with L. G. F. Waddington that it is a queer world! (antea 220). On my return from the Lake District on the 20th August after an exciting week during which I had netted my first *Erebia aethiops* Esp. I read his article on the evasiveness of *Mania maura* L., I likened my thoughts to his and my longing and ambition, after early reading, to catch the damsel, as he termed it. I too had searched bridges, barns, porches, summer houses, sugared and run a mercury vapour light trap, and I mused as to whether I also would have a lifetime without success.

I put the Record down and walked into the garden where I had sugared an apple tree. After an unhopeful glance, imagine my intense surprise and pleasure to find an old lady on the bark. I lost little time in boxing it and returned indoors to sympathise even more with Mr. Waddington.—D. C. G. BROWN, 25 Charlecote, Nr. Warwick. 23.viii.1969.

THORNE WASTE near Doncaster in South East Yorkshire, has long been known amongst northern entomologists as a haunt of many rare insects. Over the years much of the Waste has been drained and peat has been dug out commercially, but there still remains a large area which supports a rich insect fauna. Unfortunately, Thorne Waste is now threatened by proposals to dump fuel ash there from a power station, and the Entomological Survey Committee of the Yorkshire Naturalists' Union is gathering together evidence of the site's value as a matter of urgency.

In this connection I shall be pleased to receive details of recent records, if these have not yet been passed to the appropriate Y.N.U. recorders, so that our lists may be as complete as possible.—ROY CROSSLEY, 2 Mill Rise, Swanland, North Ferriby, East Yorkshire. 24.vii.1969.

BUTTERFLIES IN THE BIRMINGHAM DISTRICT.—On Sunday, 2nd August, I was very surprised to see on the Buddleia in my garden, four of the five vanessids found in this area—*Inachis io* L., *Aglais urticae* L., *Vanessa atalanta* L. and *V. cardui* L.—something I have never seen before since living here. For five or six years now *io* has been conspicuous by its absence, and I had despaired of seeing it again in any numbers. Since that day they have become frequent visitors, usually seven or eight at the bush at a time along with the others mentioned and *Pieris brassicae* L., *P. rapae* L. and *Pararge megera* L.—L. J. EVANS, 73 Warren Hill Road, Birmingham 22c. 30.viii.1969.

MANIOLA JURTINA (L.)—AN APPEAL.—Since the publication of my paper on *jurtina* (antea 7-14, 51-58, 83-90) I have received many letters of appreciation. This is very gratifying and my sincere thanks go to those who took the trouble to write to me. My work on this butterfly is continuing along three different lines and the help of anyone who can spend a few minutes looking over his specimens would be greatly appreciated.

The first problem is that of combination forms in *jurtina*, the interesting feature in which two or more forms are found in the one specimen. I would be interested to know of specimens in which any of the following are combined, together with the data for the butterfly:

nana Stephen	*anommata* Vty.	*rectoformis* Thomson
major Leeds	*antiparvipuncta* Leeds	*costa-cava* Cabean
brigitta Ljunch	*erymanthoides* Strand	*brevipennis* Lempke
cinerea Cosm.	♂ *bioculata* Rebel	*pallens* Th.-Meig.
addenda Mousley	*feminea* Graves	*fracta* Zweigelt

and Gynandromorphs.

The second problem concerns island populations, both in the British Isles and elsewhere. Unfortunately, this is a more complicated problem and requires a statistical analysis of various characters of the species. However, if anyone would be prepared to help with this I would send him the necessary tables on request. I do not require information from the Isle of Wight—Mr. Fearnhaugh has already generously helped with this region.

Finally, I require specimens from the region indicated on my map (loc. cit. 86) as the range of s.sp. *phormia* Fruh.

Help with this and the other problems would be most welcome, and anyone who has the time to do so can be sure of my fullest appreciation.—GEORGE THOMSON, 98 George Street, Dunblane, Perthshire.

NYMPHALIS ANTIOPA L. (THE CAMBERWELL BEAUTY) IN SCOTLAND. — I give an extract from a letter which I have received from Mrs. Ralston, of Kilmarnock, Ayrshire: "My husband and I were walking on the lower slopes of Ben Lomond, the eastern side, among the trees in Rowardennan, when about 4 o'clock this afternoon (August 21) suddenly in front of me there rose up a most unusual butterfly. We followed it as best we could, for a while, and then lost it. On returning home I identified it in your book, "The Complete British Butterflies in Colour," and it could only have been a Camberwell Beauty. We got a great deal of pleasure from watching it, and we are hoping that it will be of some interest to yourself, as it seems to rarely appear on the west coast of Scotland."—L. HUGH NEWMAN, "Betsoms", Westerham, Kent. 24.viii.1969.

EREMOBIA OCHROLEUCA SCHIFF. AT WOKING.—I was surprised to find this species in my trap on the night of August 13, 1969, as it is a species so closely associated with downland. Only a few days earlier Mr. G. Woollatt, who lives a mile from here in the direction of Chobham, also had one in his trap, which seems to indicate that this insect is increasing its range. In his list of the lepidoptera of north-west Surrey (1957), Mr. R. F. Bretherton enumerates only three specimens from New Haw, Oatlands and Pirbright.—C. G. M. DE WORMS, Three Oaks, Woking. 24.viii. 1969.

SPHINX LIGUSTRI L. (THE PRIVET HAWK MOTH) IN NORTHUMBERLAND.— A fully grown larva of *Sphinx ligustri* L. was brought into the Hancock Museum on August 15, 1969. It had been found by Mrs. Lightley of Rothbury Terrace, Heaton, Newcastle-upon-Tyne, on a pathway near to her home. To-day it has successfully pupated.

I know of only two previous reliable records of *ligustri* in Northumberland. The first was by Dr. R. Embleton at Beadnell on the coast in 1846: "Several caterpillars of the Privet Moth have been captured" (Hist. Berwickshire Nat. Club **2**: 171). The second was by George Bolam for 1899 at Fowberry Tower (*ibid*, 25; 545). A third, less certain record was also mentioned by Bolam—"A caterpillar believed to be of this species was taken at Berwick in or about 1886, but I did not see it." I would be interested to learn whether any other records for Northumberland are known. — ALBERT G. LONG, Deputy Curator, The Hancock Museum, Newcastle-upon-Tyne, NE2, 4PT. 25.viii.1969.

PLUSIA CONFUSA STEPHENS (GUTTA GUEN.) IN THE ORKNEY ISLANDS. — While staying with Mr. Ian Lorimer at his house Scorradale at Ophir on the mainland of Orkney overlooking Scapa Flow, I was present at a remarkable apparent immigration of moths on the night of August 2nd/3rd, 1969. He informed me at an early hour that there seemed to be a lot of *Plusia gamma* L. in his mercury vapour trap, but when we examined it, we estimated at least 400 of this species had suddenly appeared after midnight when a sea mist had pervaded the still atmosphere and an easterly breeze was in force. To our astonishment in a carton almost at the bottom of the trap was a *Plusia confusa* slightly past its best, but nevertheless a most unexpected visitor to such a northerly part of the British Isles. Since Mr. A. J. Dewick recorded the first specimen for Britain in Essex in October, 1951, according to South (1962) five other examples have been taken in 1954 and 1955 in Kent, Surrey, Essex and Cumberland. I believe there has been one other during the present decade. Two *Notarcha ruralis* Scop. were also in the trap, a newcomer to Orkney. It will be of interest to try to trace the origin of this invasion so far north.—C. G. M. DE WORMS, Three Oaks, Woking. 24.viii.1969.

PYRAMEIS CARDUI L. AND OTHER BUTTERFLIES IN ORKNEY. — Butterflies were particularly interesting and numerous during my visit to the Orkney Islands starting July 30, 1969. My host, Mr. R. I. Lorimer and I were surprised to see painted ladies flying all over the mainland of that archipeligo. Dr. Guthrie of Aberdeen told us he counted no less than 30 in one day on the island of Ronsay. *P. atalanta* L. too was seen on several occasions. But it was *Polyommatus icarus* Rott. which was in far the greatest abundance, being seen everywhere where the yellow trefoil was growing luxuriantly. Both sexes were of the very large and bright single-brooded race. No less attractive was the very suffused form of *Argynnis aglaia* L.; this grand insect was quite numerous on sandhills and some moorlands which also harboured some late, fresh *Coenonympha tullia* Müll. There was also a small race of *Maniola jurtina* L. not previously recorded from Orkney, while towards the end of my stay which concluded on August 11, some striking *Pieris napi* L. appeared with many somewhat smoky *Pieris brassicae* L.—C. G. M. DE WORMS, Three Oaks, Woking. 24.viii.1969.

Devon Butterflies in 1969.—My grandson, Walter de la Hoyde, was staying with me last month and spent most of his time bug hunting. He reported having seen from the main road near a wood, a number of white admirals (*Limenitis camilla* L.). This was in the Bovey-Heathfield area; he stopped the car in an endeavour to catch one, and eventually he was successful in taking a rather worn male, which proved he was not mistaken. *Argynnis paphia* L. and *Polygonia C-album* L. were particularly plentiful, and this also goes for *Satyrus semele* L. (mostly males). He found a spot near here where he was sure he had seen *Strymonidia w-album Knoch.* I visited the site with him in not too favourable weather, but saw no signs of the butterfly. Last week I had an opportunity of again visiting the spot and this time found *w-album* plentiful but very worn. I kept a couple with reasonable undersides for my cabinet and hope to see more of the insect next year. This locality also produces a nice partial albino *Maniola jurtina* L. male. *Thecla betulae* L. are also about in the lanes around here and can be beaten as larvae in small numbers only. I collected about 30 fully grown peacock (*Nymphalis io* L.) larvae from a colony feeding on nettles by the roadside and all duly pupated and emerged by the end of the month, without one being parasitised—they are still flying about my garden where they were released.—J. L. Atkinson, Gatcombe House, Totnes, Devon. 28.viii.1969.

Migrant Red Admirals in Thanet—With the appearance of so many red admirals in my garden this autumn, I feel I should put on record the actual start of a migration of these butterflies which I watched on 10th June in Thanet. I had gone down to live by the sea at Broadstairs during the worst of the hayfever season to avoid the pollen inland. The day being fine I made my way down to the beach and found a sheltered cove, just under the high chalk cliffs, out of the strong east wind which was blowing that day. It was brilliantly sunny but cold. About mid-day the first butterfly arrived across the sea—a large female—which pitched down near my feet and sat with wings extended, resting for several minutes before it took off to settle on wild flowers growing out of the chalk. Within a couple of minutes another arrived—a small male—which behaved quite differently; it fluttered its wings and restlessly walked about among the flints and sand. After a few minutes it joined the other one high up on the cliffs. If the tide had not been coming in strongly, I would have walked along the beach to Ramsgate, a matter of a mile or so, to see if there were more arrivals, but as it was approaching lunch time I had to make my way back to my hotel.

I hope this rather sketchy note will be of interest, but I think it is worth recording as one so seldom sees the start of a migration, which this undoubtedly was.—L. Hugh Newman, Betsoms, Westerham, Kent. 5.ix.1969.

Lysandra coridon (poda) (Lep. Lycaenidae) Visiting Fox Excreta.—On July 31, on the downs near Shaftsbury, Dorset, I noticed a little cloud of the males of *coridon* flying round an object on the ground. On inspection I found that the attraction was fox excreta. There were nine on the portion and others were on the grass nearby trying to obtain a foothold.—S. C. S. Brown, 158 Harewood Avenue, Bournemouth. 5.ix.1969.

CALLIMORPHA DOMINULA (LINN.) (LEP., ARCTIIDAE) IN PERTHSHIRE.— In June 1968, Squadron Leader J. L. C. Banks of Bournemouth was botanising along the shores of Loch Tay in Perthshire, when he came across a small colony of *Callimorpha dominula*. He took a coloured photograph of a specimen feeding on agrimony, which I have seen. I am indebted to Squadron Leader Banks for his permission to publish this note.—S. C. S. BROWN, 158 Harewood Avenue, Bournemouth. 5.ix.1969.

SPECKLED WOOD COLONY ON THE BLACK ISLE, ROSS-SHIRE.—On 27th July 1969, my son, Kyle, was recording lepidoptera for me while I was leading a party of young ornithologists on a remote part of the Black Isle—a profitable locality visited every other week throughout the spring and early summer of six seasons. It was here on 4th July 1966 that we found a single ♀ *Celastrina argiolus* L. We hoped to find further specimens as previous Scottish records appear to be doubtful. On a steep broom, grass- and bracken-covered slope, amongst stands of mature beech, 200 to 300 feet above the Inner Moray Firth, Kyle noted about twenty *Pieris brassicae* L., ten *Maniola jurtina* L., one *Coenonympha pamphilus* L., one *Aglais urticae* L. and five brown butterflies of an undetermined species. These last proved difficult to approach and he failed to obtain a specimen by stalking with his net. After a half-hour chase he succeeded in catching one by the desperate measure of throwing his pullover a few yards! He showed me his capture, which he had transferred to a glass-topped tin without damage, and I was extremely pleased to see that he had taken a *Pararge aegeria* L. The specimen—the first Speckled Wood we had seen since leaving Derbyshire—was released after being shown to my family. I have a possible Scottish record of one in flight, but *not* captured, at Clunes, Westerness, on 23rd July 1948. *South* 1941 edition gives this species' distribution as "local in Scotland, and rare north of the Caledonian Canal" while Ford in 1945 states "it reappears in a few places on the west coast of Scotland—in Islay, Argyll, Inverness and Skye." For the record the colony is in the 10km. square NH65, on the coast between Kilmuir and Munlochy Bay in East Ross-shire. — D. C. HULME, Kyle & Glen, Muir of Ord, Ross-shire.

BLUE BUTTERFLIES IN GLOUCESTERSHIRE.—The Gloucestershire Trust for Nature Conservation is now undertaking a survey of the breeding sites of certain Blue butterflies in Gloucestershire. The butterflies involved are:— Large Blue (*Maculinea arion* Linn.), Chalk Hill Blue (*Lysandra coridon* Poda), Adonis Blue (*Lysandra bellargus* Rottemburg) and Small Blue (*Cupido minimus* Fuessly). It is hoped that it will be possible to classify the breeding sites according to their breeding potential, so that a sound programme of conservation can be planned.

These butterflies are a characteristic feature of the Cotswold grasslands and the Trust considers them to be an ideal group for conservation. The Trust would therefore be grateful to receive any information on the locality and status of past or present breeding sites of these butterflies in Gloucestershire. All information received will be treated as confidential. Information should be sent to, JOHN MUGGLETON, Department of Botany, The University, Bristol, BS8 1UG. 2.x.1969.

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.

Wanted.—Information *and* data on the distribution and habitats of *Coccinella 11-punctata* (Eleven-spot Ladybird) for an investigation into this species. *All* records welcome.—*J. Muggleton*, Dept. of Botany, Science Laboratories, South Road Durham.

For Sale.—Private collection Ornithopthera, and 500 species from Russia, Japan, Australia, New Guinea, Malaya, Africa, and Solomon Islands. Many Charaxes and Papilios. To be sold as one lot.—Please reply to *R. H. Morgan*, 108 Titirangi Road, New Lynn, Auckland 7, New Zealand.

Wanted.—Male Ornithoptera *Croesus lydius* and ♂ *O. croesus croesus.*—Full details to *Dr. A. D. Morton*, 37 Templeway West, Lydney, Glos.

Wanted.—A Second-hand Robinson M.V. Moth Trap, with or without electrical fittings and in reasonable condition.—*B. F. Coles*, Rose Cottage, Weston-on-the-Green, Bicester, Oxon.

For Sale.—40 drawer cabinet, plain glasses, suit beginner, £15; 12 drawer cabinet, airtight drawers, glass panelled door, £10.—*Redgrave*, 2 Connaught Way, Tunbridge Wells. Tel. 21494.

CHANGES OF ADDRESSES

E. P. Wiltshire, 23 Ave Foch, 76 Le Havre, France.

D. O'Keeffe, 51 Parkhill Road, Bexley, Kent.

C. P. Sturgess-Lief, Gyminge Brook Cottage, Sellindge, Ashford, Kent.

CONTENTS: Vol. 81, Part 10

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.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION
(Founded by J. W. TUTT on 15th April 1890)

TO OUR CONTRIBUTORS

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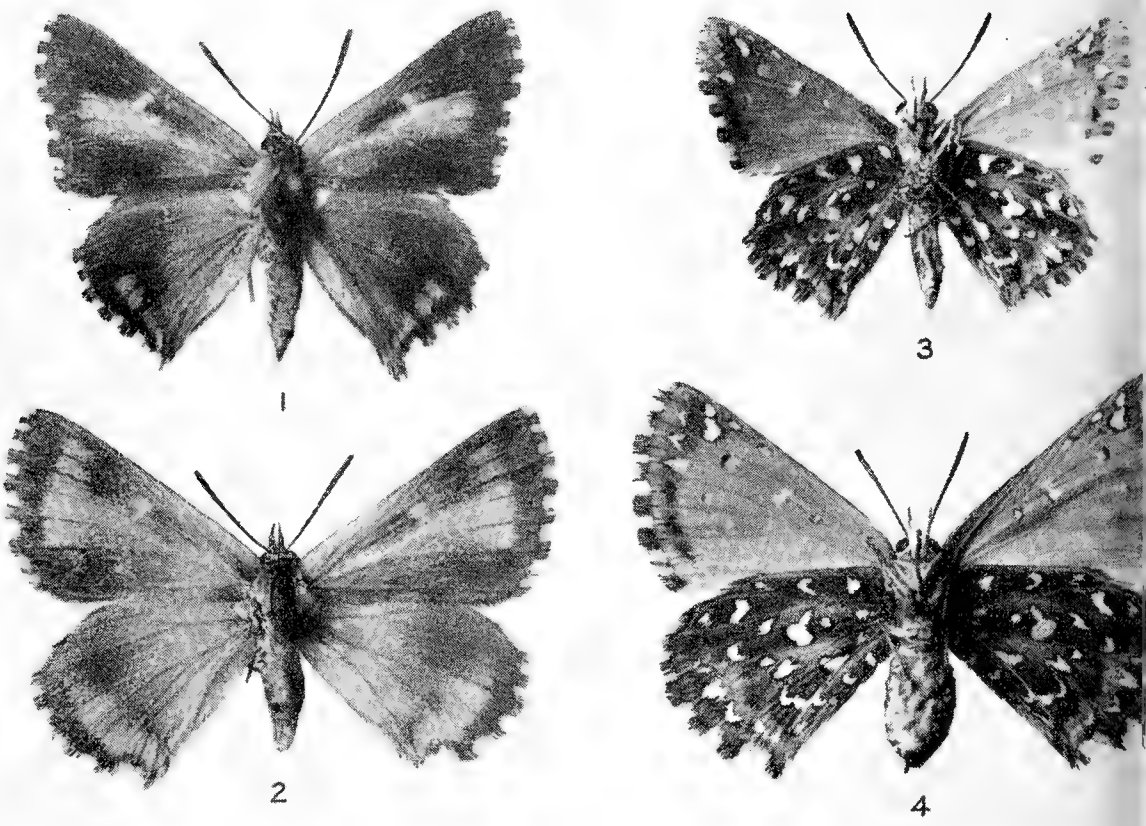

Photo: H. N. Wykeham

Phasis argyroplaga wykehami subsp. nov.

Fig. 1. ♂ Holotype (upperside).

Fig. 2. ♀ Allotype (upperside).

Fig. 3. ♂ Paratype (underside). Verlaten Kloof, 20.xii.1957.

Fig. 4. ♀ Paratype (underside). Data as holotype.

Figures 1-5 times natural size.

An Additional New Member of the *Phasis wallengrenii* (Trimen) Group (Lepidoptera : Lycaenidae)

By C. G. C. Dickson

It has been found, when studying a good series of specimens, that the insect concerned differs from both *Phasis argyroplaga* (described by the present writer in *Entomologist's Record*, **79**: pp. 267-270, Pl. XI, 15th Nov., 1967) and from *Ph. macmasteri* (*Idem*, **80**: pp. 89-92, Pl. V, 15th April, 1968); and the butterfly is being treated hereunder as another easily, recognised, race of *argyroplaga*. Apart from other features, the form of the silvery-white markings of the underside of the hindwing indicates the affinity to this insect rather than to *macmasteri*.

Phasis argyroplaga wykehami subsp. nov.

Male.

Forewing with the distal margin from below vein 4 less concave (in some cases practically straight) and angle formed by distal—and inner-margins of hindwing a little wider than in nominate race of *argyroplaga*—the wing-shape thus having some resemblance to that of *macmasteri*.

Upperside.

Forewing. The orange area as a whole narrower than in *argyroplaga*.

Hindwing. In distinct contrast to the nominate race, the only clear orange marking of the wing is in the form of a wedge from vein 4 to the anal-angle (crossed, but not in all specimens distinctly so, by dark veining), the main area of the wing being dark, but with very dull orange scaling over a good deal of the inner half.

Underside.

Forewing. The larger silvery-white markings towards the apex a little smaller on an average than in the nominate race; the submarginal black streak broken into separate spots. Inner-marginal whitish area rather wider than in the nominate race.

Hindwing. Ground-colour of a less uniform dark tone than in nominate race of *argyroplaga* and partially streaked with brownish-ochreous. The silvery-white markings not infrequently smaller (in some specimens appreciably reduced) than in examples of the nominate race in which they have reached their full development—but, when this occurs, any reduction in size not in the direction of the largely thin, attenuated type of marking found in *wallengrenii*.

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

Female.

As would be expected, the females differ less from one another than do the males of the two races.

Upperside.

Inner half of wings of a duller coloration than in most examples of the nominate race—more generally so with respect to the hindwings.

Underside.

Forewing. Subapical brownish area always reduced, and less extensive than in the majority of specimens of the nominate race. The sub-marginal black streak relatively narrow in all specimens and broken up into separate spots as in the male.

Hindwing. More streaked with brownish-ochreous than in nominate females.

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

♂ Holotype, WESTERN CAPE PROVINCE: Summit of Nieuwveld Mtns. (6,000′), nr. Beaufort West, 16.xii.1958 (C. W. Wykeham); British Museum Reg. No. Rh. H.T. 17143.

♀ Allotype, data as holotype; British Museum Reg. No. Rh. H.T. 17144.

Paratypes in the author's collection, W. CAPE PROVINCE: Head of Verlaten Kloof (5,020′), S. of Sutherland, 20.xii.1957, 1 ♂ (C.G.C.D.); as holotype, 1 ♀ (C.W.W.).

Paratypes in Coll. C. W. Wykeham, as holotype, 3 ♂♂, 6 ♀♀; Head of Verlaten Kloof, 20.xii.1957, 1 ♀ (C.W.W.).

This butterfly was encountered in numbers on an open, stony slope just short of one of the summits of the Nieuwveld Mountains, when the locality was being searched, in company with my nephew, on a warm mid-summer's day in 1958. When disturbed specimens rose from the ground and flew fast and irregularly for short distances before settling, abruptly, usually close to where they were first seen. With their wings closed in characteristic manner, they were inconspicuous against the background of soil and small stones. The pair from Verlaten Kloof were met with a year earlier in country of similar type. These two specimens, from 110 miles W. of the 1958 locality, clearly belong to the same race as the main series, and there is a continuous stretch of high ground between the respective localities.

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

Berberia abdelkader Pierret and other Butterflies in Morocco, May 1969

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

I spent the last few days of my first trip to Morocco, in early May 1965, in the Ifran-Azrou region of the Middle Atlas, in company with Gen. Sir George and Lady Ida Johnson (*Ent. Rec.*, **77**: 177). This area seemed so attractive and so rich in lepidoptera, that I decided to return possibly later in the season, to obtain some of the species which appeared after those already observed there. The opportunity presented itself this spring (1969) for a return visit to this delightful country.

Accordingly I set out on the afternoon of May 15th from London Airport, reaching Gibraltar that evening. Here, I spent the night at the very well-known and comfortable Rock Hotel, and was greeted the following morning by a cloudless sky and glorious day. After arranging to hire a Ford Escort, I had a walk in the Almeda Gardens, in the hope of seeing the Gibraltar Burnet (*Zygaena gibraltaica*) but none were forthcoming. However, the road behind the Rock Hotel provided a number of butterflies, including *Gonepteryx cleopatra* L., *Euchloë ausonia* Hübn., *Pararge aegeria* L., *Colias croceus* Fourc. and *Lampides baeticus* L. That evening, I crossed in the ferry to Tangier where I joined Mr and Mrs H. G. Allcard at the very sumptuous El Minzah Hotel. They had just returned from Meknes, and had done two excursions from there to Ifran where, I learnt, the season was a very late one as in most parts of Europe, and that the early spring species were

still on the wing. They flew back to England on the morning of May 17th, when I set out by car heading south along the Atlantic coast. I halted for a short time near Larache, where I found *Euchloë belemia* Esp. flying with *Pyronia bathseba* F. (*pasiphaë* Esp.). Near El Kassim, I took *Maniola jurtina hispulla* Esp. by the side of the main road with *Heodes phlaeas* L. Carrying on through the city of Meknes, I gradually ascended to the plateau of the Middle Atlas. From El Hajeb, I continued through the remarkable Forêt de Jaba which has some similarities in appearance to parts of our New Forest, and then ascended steeply up a winding valley to Ifran at 5,500 feet, where I was pleased to see that the ground we had collected to such good advantage in 1965, has not been impaired. I then descended the ten miles to Azrou, completing the 240 miles from Tangier, making my headquarters for the next fortnight at the Hotel du Panorama, which had also been my haven for a few days in 1965. By the time I arrived, the sun had taken on a very watery appearance and the fine spell which had just preceded me, came to an abrupt end on the following morning of the 18th. The clouds descended low on the mountains, bringing a heavy deluge which lasted all day so that no collecting was possible, a great initial disappointment. The 19th opened with grey skies and a persistent drizzle, but improved as the day went on. In the afternoon I set out on the road south, towards Midelt. After passing through Timhadite, the route over the high plateau ascends steadily to the Col du Zad at 7,300 feet, just 45 miles from Azrou. The summit provided a grand panorama of the surrounding country, with fine winding valleys on the southern side flanked by some huge cedars. But the sun did not oblige and no lepidoptera were seen. On the way back, I surveyed the very attractive nearby lake of Aguelmane.

However, on May 20th, the elements relented and a fine morning greeted me when I revisited Ifran and halted in the small hollow just outside the town on the Boulmane road which had proved so productive in 1965. It was not any less so on this occasion, and I was soon able to appreciate how late the season was, as many of the species we had seen four years earlier, were still on the wing. Among these, that grand fritillary *Euphydryas desfontanii* Godart was flying in quantity with the large females sailing lazily over the herbage, but when I came to scrutinise them closely, I was surprised to find that some *E. aurinia* Rott. were flying in their company, though only apparently just starting to emerge. As I was having lunch, a small Blue fluttered in front of me and I was pleased to see that it was *Philotes bavius* Eversman, very attractive with its row of orange lunules on the upperside of the hindwings. Later that day, I moved to some of the grassy slopes just outside the main cedar forest. This area was alive with lepidopterous life which did not seem to have suffered from the two days deluge. Among the Pierids was that grand species *Zegris eupheme* Esp. careering round its foodplant *Sinapis incana*. *Colias croceus* was very numerous with a high proportion of *f. helice*. Both *Pararge megera* L. and *P. maera* L. were flying together with the latter, a small race, not easly distinguishable from its near relative. In the late afternoon, the long grass seemed to be the chief habitat of *Melitaea aetherie* Hübn. which was settling in dozens on the many flowers. The brilliant red coloration of the males was in striking contrast to the much more

sombre hue of closely related species *M. phoebe* Schiff., which was comparatively scarce. The female *M. aetherie* were also about in numbers and very variable. Among the Blues the very handsome *Lysandra punctifera* Oberthür. looking like an outsize *L. bellargus* Rott. were just starting to appear, while *Lysandra thersites* Chapn. seemed much commoner than *Polyommatus icarus* Rott. The smaller Lycaenids were represented by *Aricia cramera* Esch. with larger orange spots than our Brown Argus. The smallest Blue was the ever present *Cupido lorquinii* H.-S. which replaces *C. mimimus* Fuessl. in this region. In the late afternoon I found quite a number of both sexes of *P. bavius* at rest on grass heads, mostly in very good order.

A very warm day with cloudless sky broke on the 21st when I was once again at Ifran at an early hour. Many more insects seemed to be on the wing, including both late *Zerynthia rumina* L. and *Anthocharis eupheno* Esp. Both Brimstones, *Gonepteryx rhamni* L. and *G. cleopatra* L. were to be seen round the bushes of *chênes verts*. *Callophrys rubi* L. was still in fairly fresh condition. Many *Macroglossa stellatarum* were on the move with the day-flying noctuid *Heliothis dipsacea* L. I returned to Azrou over the Tizi-n-Tretten Pass at 6,000 feet, where I saw *Melitae cinxia* L. and *Issoria lathonia* L. Another dull and wet day supervened on May 22nd with very little collecting but the last two days of the week, the 23rd and 24th were much better when I replenished my various series in the Ifran region. *L. punctifera* was now getting much more numerous in both sexes, flying near its apparent foodplant which looked like our *Hippocrepis comosa*. Two species of small Foresters were now flying in fair plenty.

Gen. Sir Gerald Lathbury joined me at Azrou on the evening of May 24th and the following morning in ideal weather, we set out for Ifran, first visiting the hollow near the Hotel Ballima. It was alive with butterflies with *E. desfontainii* predominating. Suddenly Sir Gerald spotted a small Pierid which I took and at once recognised it as *Euchloë tagis* Hübn. of which authentic examples have very seldom been obtained in Morocco, though it has been seen more frequently in Algeria. All the usual species were on the wing in quantity, in particular *L. punctifera* and *M. aetherie*. We also saw the first Swallow-tail, *Iphiclides feithsamele* Dup. Whit Monday, the 26th, also proved another superb day, again spent in the Ifran region with an *al fresco* lunch taken under the famous cedars. *Z. eupheme* was much in evidence with a few *P. bavius*. We also saw the first Marbled Whites which are generally recognised as *f. lucasi* of *Agapetes galatea* L. We revisited this area on the morning of the 27th, another very warm day when on the edge of the forest I saw one of the large Fritillaries dash past me, most probably *Argynnis auresiana* which some authors consider to be the large North African race of *Argynnis adippe* Rott. That afternoon, we motored down the steep and winding valley from Ifran to the Forêt de Jaba which was somewhat disappointing, as we had hoped to see the big Argynnids there, but none were forthcoming. *Aporia crataegi* L. was well out there with a few *M. phoebe* and *M. aetherie*. We also took a single specimen of *Melitaea didyma* Esp.

After a further morning's collecting near Ifran on May 28th, Sir Gerald went off on a bird observation expedition, while I set out on a voyage of discovery to the Imouzzer region, en route to Fez. Madam

Duffal, who ran the Panorama Hotel, had put me in touch with M. Jean Gallet who lived quite close by in Azrou. When I went to see him, I realised he was a leading authority on Moroccan lepindoptera and knew the best locations of all the butterflies and a great many moths. When I enquired the whereabouts of that grand Satyrid *Berberia abdelkader* Pierret, he advised me to try the Imouzzer chain of lakes and marked my map for some of the most likely spots. On the afternoon in question, I followed the route he recommended, eventually ascending a steep, very rough road to an escarpment covered with the small *chênes verts* bushes, interspersed with tufts of long grass on very rocky and stony ground which I surveyed thoroughly, seeing only the occasional *Lysandra punctifera* and *Philotes abencerragus* Pierret. A strong wind was blowing in this bleak and high spot and I was about to return to my car, when suddenly a huge black butterfly sailed past me and settled a little way off. I realised at once it was the much coveted quarry. But, in spite of close stalking, it eluded me. I saw two others soon afterwards, equally elusive and then the sky clouded over. When I told Sir Gerald of my discovery, we decided to revisit the area early on the 29th. We were on the ground by 10 a.m. and as soon as we alighted from the cars, we espied three of the most handsome insects flitting among the long grass which is their foodplant. We spent the day in this remote and somewhat inhospitable region, seeing many *B. abdelkader* mostly in the glades between the thick undergrowth. By stealthy stalking, we managed to secure four specimens in prime condition. Another most interesting small butterfly inhabiting this rather inhospitable region was *Coenonympha vaucheri* Blachier which flitted about the stony knolls and was very hard to see or indeed, to catch. After a further scanning of the Ifran area on the morning of the 30th, Sir Gerald left for Tangier and I paid a further visit to the *abdelkader* locality, seeing several more of this grand insect. Among new discoveries there was *Cigaritis zohra* Donz. a small Copper-like species which hugged the ground and was very difficult to follow. I also took single specimens of *Philotes abencerragus* Pierret on the sage.

The very fine morning of May 31st, M. Gallet called for me early with his son and we picked up a friend. also a collector, in Ifran and proceeded to the rocky region once more, but to a spot some little way from mine, where we saw a fair number of *C. vaucheri,* but very few *B. abdelkader.* So we all repaired about 11 a.m. to my original locality, where we found the big black butterfly flying in even larger numbers than before. We were able to net some very fresh specimens including several females. A great delight for M. Gallet was the capture of a *Euchloë tagis* which he had never come by before and of which his colleague had only taken three in thirty years. The first *Hipparchia aristaeus* Bonelli (*algirica* Oberthür) was taken as well as fresh *Pyronia bathseba* F. (*pasiphaë* Esp.) at this altitude. Several Burnets were now starting to appear and the most notable in this area was *Zygaena orana.*

The very hot morning of June 1st I made a final survey of the ground at Ifran which was as usual alive with butterflies, but a very thorough search failed to reveal any further *Agapetes pherusa* Bdv. of which I had taken a single specimen flying among a host of *A. galatea.* I went on to the Forêt de Jaba for a picnic lunch during which one of the

larger Fritillaries flew over my head. All the smaller species seemed to be there including *M. aetherie*, but worn at these lower levels. I then motored on the further 200 miles to Tangier in great heat, staying at the very comfortable Villa de France Hotel. The following morning, I crossed by the early ferry back to Gibraltar, where I spent the afternoon in the Almeda Gardens which I was pleased to find alive with the local Burnet, *Zygaena gibraltaica* flying mainly round the bushes of *Coronilla,* its chief foodplant. I took the evening plane which landed me in London at a fairly late hour, thus ending what had been a most enjoyable, and on the whole, very successful visit to the Middle Atlas.

I have thought it of interest to append a full list of butterflies seen though a good many of the species are similar to those which were enumerated for my 1965 visit.

Iphiclides feisthameli Dup. Only one seen at Ifran.

Zerynthia rumina L. Still fairly fresh and numerous round Ifran and Azro.

Anthocharis eupheno Esp. A few fresh specimens were flying mainly in the cedar forest at Ifran.

Euchloë tagis Hübn. A single fresh male taken at Ifran on May 25th and another worn specimen at Imouzzer on the 31st. This small form seems to extremely rare in the Middle Atlas region.

Euchloë ausonia Hübn. Generally common in woods and fields.

Zegris eupheme Esp. Very numerous and mainly fresh around Ifran. A very large race.

Pieris brassicae L. Fairly numerous in the vicinity of Ifran and Azrou.

Pieris rapae L. Plentiful in most areas.

Aporia crataegi L. First seen in the Forêt de Jaba on May 27th, then increasingly common in most regions.

Colias croceus Fourc. Very numerous in most parts with a large proportion of f. *helice.*

Gonepteryx rhamni L. Fairly common round Ifran.

Gonepteryx cleopatra L. Commoner than the last species in the Ifran area.

Euphydryas aurinia Rott. Emerging with the next species, though slightly later and in a very large and bright form.

Euphydryas desfontainii Godart Abundant round Ifran and Azrou, though getting worn by end of May. Large and small forms flying together.

Melitaea didyma Esp. One fresh example taken in the Forêt de Jaba on May 27th.

Melitaea cinxia L. A few fresh specimens seen mainly at high elevations.

Melitaea phoebe Schiff. Fairly common, but not so widespread as the next species with which it was flying.

Melitaea aetherie Hübn. Very plentiful, mainly among long grass near Ifran. Both dark and light forms of female seen. Also in Forêt de Jaba.

Issoria lathonia L. Sporadic round Ifran and Azrou.

Argynnis auresiana Fruhst. A few seen near Ifran and in Forêt de Jaba.

Argynnis pandora Schiff. One seen in garden at Azrou by M. Gallet.

Pyrameis atalanta L. Two seen near Ifran on May 25th.

Aglais urticae L. Seen near Meknes on May 17th.

Agapetes galatea L. Becoming increasingly common round Ifran from May 26th.

Agopetas pherusa Bdv. One taken flying among the preceding species near Ifran on May 30th.

Pararge aegeria L. A very orange form numerous round Ifran.

Pararge megera L. A very bright form fairly common in the cedar forest.

Hipparchia aristaeus Bonelli (*algirica* Oberthür) One taken near Imouzzer on May 31st.

Berberia abdelkader Pierret Fairly common along *chênes verts* scrub in the Imouzzer region. first seen on May 28th.

Maniola jurtina L. The large *hispulla* form taken near Meknes and a few at Ifran.

Pyronia bathseba F. (*pasiphaë* Esp.) Taken worn near Larache and fresh at Imouzzer on May 30th.

Coenonympha pamphilus L. The *lyllus* form numerous round Ifran.

Coenonympha vaucheri Blackie. Fairly common in the *chênes verts* scrub in the Imouzzer area.

Callophrys rubi L. Large bright form still fresh round Ifran.

Cigaritis zohra Donz. Few seen in the Imouzzer area end of May.

Heodes phlaeas L. A few noted fresh near Ifran and Azrou.

Lampides baeticus L. One taken at Ifran on May 26th.

Cupido lorquinii H.-S. Plentiful and still fresh in the Ifran region.

Philotes bavius Eversman Sporadic and fairly fresh near Ifran.

Aricia cramera Esch. Fairly common in the Ifran and Azrou regions.

Cyaniris semiargus Rott. Only two seen near Ifran.

Polyommatus icarus Rott. Fairly numerous, but not so common as the next species.

Lysandra thersites Chapman. Quite common in the Ifran area also at Azro.

Lysandra punctifera Oberth. This splendid Blue was abundant among *Hippocrepis comosa* in the Ifran region.

Pyrgus onopordi Rambur Fairly common, but sporadic near Ifran and Azrou.

Spialia ali Oberth. Numerous near Ifran.

Adopaea lineola Ochs. Common in the Forêt de Jaba on June 1st.

Apart from a *Celerio livornica* Esp. taken at a window in the hotel at Azrou moths were mainly of the day-flying species. The most notable among these were *Hemaris tityus* L. and *Minucia lunaris* Schiff. both seen at Ifran where Burnets were just beginning to appear. The species noted there were the very small *Zygaena orana* Dup. and *Z. alluardi* Oberthür, while this species was also taken at Imouzzer. Two kinds of Procris (foresters) were very numerous in the long grass there. They seem referable to *P. cirtana* Luc. and *P. orana* Aust. The chief noctuids by day comprised *Heliothis dipsacea* L. in a large form *H. peltigera* Schiff. and *Acontia luctuosa* Schiff. I also had the good fortune to take a specimen of the small *Omia oberthüri* Allard considered a great prize among French collectors. The chief geometers were the very prevalent *Bichroma famula* Esp. and the Orange *Amygdalaptera testaria* Fab. *Scopula ornata* Scop. was fairly numerous and the tiny black and white Pyrale, *Titanio pollinalis* Shiff. Among grasses at Ifran were numerous companies of dark larvae resembling those of *Malacosoma castrensis* L.

Among other orders of insects seen were the striking green Ascalaphids, *Ascalaphus icterius* Chap. and the huge ground beetle *Meloë majalis* L.

Joint Committee for the Conservation of British Insects

The Royal Entomological Society called a meeting on 21st June 1968 to set up an independent, broadly based committee for the conservation of insects, following the dissolution of both its own Conservation (Insect Protection) Committee and the Entomological Liaison Committtee of the Nature Conservancy. At its first meeting, on 1st November 1968, the scope and representation of the new committee was widened so that it now consists of representatives of the Royal Entomological Society, British Trust for Entomology, British Entomological and Natural History Society, Amateur Entomologists' Society, British Butterfly Conservation Society, a representative of the Keeper of Entomology [British Museum (Natural History)] and regional representatives. The Forestry Commission sends an observer, and the Nature Conservancy and Society for the Promotion of Nature Reserves are also represented. Mr N. D. Riley, C.B.E., has accepted the chairmanship of the Committee.

The Committee's terms of reference are:

1. To prepare a register of species requiring conservation and to investigate their status.
2. To consider what form of conservation (if any) would be the most suitable in any given case.
3. To act as a forum for the consideration of any matters relevant to items 1 and 2 above.
4. To initiate and promote any action that appears necessary for the purpose of securing the conservation of threatened species or habitats, including the promotion of legislation.
5. To act in liaison with the Nature Conservancy, the Conservation Committee of the Society for the Promotion of Nature Reserves and other appropriate bodies in all matters concerning the conservation of British insects and their habitats.

Populations of insects are threatened by many factors in our modern, industrialised society. These threats may be summarised as:

1. *Destruction of habitat.* This is an important factor which is under the control of man. It has been estimated that between 1951 and 1971 750,000 acres of agricultural land will have been taken for building in England and Wales.

2. *Changes in land use.* Forestry, when it concentrates on the production of conifers, is particularly harmful to insect populations, and so are many aspects of agricultural improvement, such as the destruction of hedgerows, ploughing-up of old pasture and the draining of fens and marshes. Neglect or abandonment of former management practices, such as the coppicing of woodland and grazing of chalk grassland has an adverse effect on populations of some species. Public pressure on the countryside for recreation also affects populations of insects, and this is likely to increase considerably in the future.

It is particularly important to manage wisely those areas of countryside which have not been changed greatly for the conservation of insects and other forms of wild life, so that they can be properly enjoyed by all.

3. *Toxic chemicals and pollution.* Pesticides (including herbicides) undoubtedly affect many insects adversely. The threats to wild life posed

by the use of pesticides are sufficiently serious for a government committee to be considering the restriction of use of certain especially persistent substances which can contaminate the environment well away from the point of application.

The chemical pollution and heating of rivers, streams, lakes and ponds frequently kill acquatic insects on a large scale. Atmospheric pollution from industrial sources may destroy the food or habitat of insect species unable to adapt quickly to change.

It is the task of the new Joint Committee to advise and co-operate with the conservation movement as a whole in finding solutions to these problems. Particular attention will be given to species of national rarity and those in special need of conservation.

The problem of overcollecting is also one which causes the Committee serious concern. Entomologists of all lands are being brought into disrepute by the actions of a number of collectors, mainly lepidopterists, who are plundering rare and local insects without regard to the need to conserve our insect fauna. Both Trusts for Nature Conservation and members of natural history societies who wish to protect colonies of rare and local species have expressed their disapproval of such activities in strong terms. Certain species inhabiting well-known areas, which attract both local entomologists and those from other regions, either on holiday or on a special trip, are subject to a disproportionate amount of collecting which cannot be tolerated if the colonies are to survive. There is little doubt that if the activities of these entomologists continue in this way the goodwill of the County Trusts for Nature Conservation, other organisations in the countryside, and those interested in other branches of natural history, will be alienated, and such goodwill as at present exists will not be extended to entomologists in general.

The committee urges all entomologists, of whatever depth of interest, to:

(a) give serious thought to their collecting requirements and the need to conserve our more local species,

(b) encourage fellow entomologists to do likewise,

(c) and, in the case of butterflies, to pursue their interests in all stages of the insects with the aid of photography whenever possible.

All entomologists are invited to bring matters of conservation interest to the attention of the Committee.

For further information contact: Dr. M. G. Morris (Hon. Sec. Joint Committee for the Conservation of British Insects), 41 Queen's Gate, South Kensington, London, S.W.7.

NYMPHALIS ANTIOPA L. (CAMBERWELL BEAUTY) IN NORTHERN IRELAND.—On 4th August 1969, a specimen of *Nymphalis antiopa* L. was seen flying in my garden here (Irish grid ref. J 397748). It appeared to be in good condition, and visited several flowers and also entered a neighbour's greenhouse before flying off to the west. The day was bright and sunny with a light wind from the south. The time of the sighting was 12.30 G.M.T. The last recorded example of this butterfly in Ireland was in 1960.—ANTHONY IRWIN, Glen Eyre Hall, Glen Eyre Road, Southampton SO9 2QN.

The Correct Names for the African Blue Pansy (*Junonia oenone* L.) and the African and the Oriental Yellow Pansy (*Junonia hierta* Fabricius) Butterflies (Lepidoptera : Nymphalidae)

By T. G. Howarth

(Department of Entomology, British Museum [Natural History])

There has been considerable confusion over the scientific names of the two African butterflies, commonly known as the Blue and Yellow Pansies, the specific name *oenone* Linnaeus of the blue and black species being transferred indiscriminately to the other.

The original description of *Papilio oenone* Linnaeus (1758, *Systema Naturae* Xth ed. Vol. **1**. p. 473) reads 'alis denticulatis: primoribus albido-maculatis subbiocellatis; posticis basi cyaneis ocellis duobus.' and there is no doubt that this refers to the African Blue Pansy though Linnaeus cited figures of the yellow species. As Corbet pointed out in 1941 (*Proc. R. ent. Soc. Lond.* (B) **10** (2): 19 footnote) and again in 1945 (*Proc. R. ent. Soc. Lond.* (B) **14** (7 & 8): 94) 'It is evident that Linnaeus confused the two but the name must be reserved for the African species.' formerly known as *clelia* (Cramer). Corbet was dealing with *Junonia hierta hierta* (Fabricius, 1798) under *Papilio lintingensis* Osbeck (1765), which name has since been suppressed (see *Bull. zool. Nomen.* 1968, **25** (1): 6 Opinion 842).

Linnaeus (1764, *Museum Ludovicae Ulricae Reginae* p. 274) re-described *oenone* in detail and placed the African and Oriental species *hierta* (Fabricius) as 'Varietas oenones'.

Cramer (1775, *Pap. Exot.* **1**, p. 33) re-named the Blue Pansy as *Papilio clelia* and wrongly associated the Yellow Pansy with the name *oenone* (Linnaeus).

Trimen (1870, *Trans. ent. Soc. Lond.* p. 353) in a footnote when dealing with his *Junonia cebrene*, correctly summed up the situation but was incorrect when he stated in the last part of his last sentence, "I suppose, therefore, that, in strictness, the name *Oenone* should attach to Cramer's *Clelia;* but in that case *Oenone*, auct., would require a new nomination; and it will perhaps be better to let the recognised *Oenone* stand as "*Oenone* Fabr.," the latter author's description in *Systema Entomologiae* (1775) being unmistakeably that of the butterfly generally known by that name."

Kirby (1871, *Synonymic Catalogue Diurnal Lepidoptera*) on p. 187 deals with the Blue Pansy under the name *clelia* (Cramer) and then later, on p. 648 of the appendix, corrects this so that *clelia* (Cramer) is placed as a synonym of *oenone* (Linnaeus) and *oenone* sensu Cramer as a synonym of *hierta* (Fabricius).

Aurivillius (1882, *K. svenska Vetensk-Akad. Handl.* **19** (5): 80) when dealing with the Lepidoptera described by Linnaeus in the Musei Ludovicae Ulricae, under the name *oenone* Linnaeus, was of the opinion that the specimen mentioned in the Xth edition which Linnaeus probably had in his collection was referable to a variety, as the word 'black' had been omitted from the description and goes on to say that he thought it

inadviseable to change the name from *clelia* because Clerck and other authors were of the same opinion.

It is extremely unfortunate that Aurivillius still persisted in using the name *oenone* (Linnaeus) for the wrong species when writing the African section of Seitz (1913, *Macrolepidoptera of the World,* **13**: 225, 226), as a number of authors have followed this standard and very often, to them, the only available comprehensive work on the African butterfly fauna.

However, it is fortunate that this section of the Brit. Mus. (Nat. Hist.) collection was correctly arranged many years ago, probably according to the appendix of Kirby's *Catalogue,* by Sir Guy Marshall, so that authors such as Peters (1952, *Provisional Check-list of the Butterflies of the Ethiopian Region*) who used this collection, were correct in the allocation of names, though the latter author should have given the date for *oenone* (Linnaeus) as 1758 rather than 1764 and included *var. oenones* (Linnaeus, 1764) as a synonym of *hierta* (Fabricius) with *cebrene* Trimen as a subspecies of *hierta,* not as a synonym of that species.

The following is a list of the aberrational, formal and subspecific names associated with the two species, which, for the most part, were described under the genus *Precis.*

Junonia oenone (Linnaeus)

oenone oenone (Linneaus 1758)
=*clelia* (Cramer 1775)
ab. *bipupillata* (Strand 1912)
ab. *caeruleffugiens* (Heslop 1962)
ab. *posterior* (Strand 1912)
ab. *subbipupillata* (Strand 1912)
ab. *subvirilis* (Strand 1912)
ab. *subepiclelia* (Strand 1911)
ab. *subtriocellata* (Strand 1912)
ab. *triocellata* (Strand 1911)
ab. *viridata* (Strand 1911)
ab. *virilis* (Strand 1912)
ab. *vosseleriana* (Strand 1911)
oenone epiclelia (Boisduval 1833)

Junonia hierta (Fabricius)

hierta hierta (Fabricius 1798)
=*oenone* auct.
hierta magna (Evans 1926)
hierta cebrene (Trimen 1870)
ab. *aeolus* (Stoneham 1965)
ab. *conjuncta* (Stoneham 1965)
ab. *demaculata* (Neustetter 1916)
♀ f. *sudanica* (Schultze 1920)
hierta paris (Trimen 1887)

The author is extremely grateful to Mr H. Barlow for some translations and to Mr N. D. Riley, Mr W. H. T. Tams and to Mr R. I. Vane-Wright for many helpful suggestions regarding this note.

An Interesting Immigrant.—I am pleased to report the occurrence of a female specimen of the rare immigrant butterfly *Argynnis lathonia* L. (Queen of Spain Fritillary) at Tal-y-Wern, Machynlleth, Montgomeryshire on the 3rd September 1969. The time in question was 2 p.m. in bright sunshine, when the insect was fluttering over brambles in an open valley near coniferous woodlands. Mr Peter Crow informs me that he believes this to be the first record of this species from Montgomeryshire. —D. Leatherdale, Eastfield Lodge, Whitchurch, Oxon. 23.ix.1969.

Notes on Butterflies (Rhopalocera) in Crete in June, 1969

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

The island of Crete, 160 miles long but only 36 miles from north to south at its widest point, consists mainly of a chain of limestone mountains, several of whose summits exceed 2,000 metres; the highest, Ida (otherwise called Psiloritis) reaches 2,456 metres. On the north there is a narrow coastal strip; on the south the mountains generally fall almost sheer into the sea except in the centre, where the substantial Messara plain is connected with the north coast by relatively low saddles in the mountain range. Rain hardly falls between the middle of May and October and, though the winter's snow lies long on the mountains and provides plenty of water, this disappears into the limestone and can only be recovered for cultivation purposes by pumps and windmills or from occasional springs. Most of the island is therefore very arid in summer. Vegetation on the hillsides is limited to a maquis of spiny, drought-resisting plants; rivers and water courses are almost dry by early June; and, except in a few favoured spots, there are few trees larger than the ubiquitous olive and carob. The geologists tell us that Crete has been an island for a very long time, and it is doubtless this combination of early isolation with a difficult climate which explains both the poverty of the lepidoptera and the presence of a number of endemic species and sub-species.

A basic work on the lepidoptera of Crete was published by the Austrian entomologist Professor H. Rebel in 1916. This brought together the results of his own collecting in eastern Crete from May to July 1904, records by half-a-dozen earlier writers (some of them British), and an account of much unpublished material in Austrian and Hungarian museums. It includes a critical comparison of the Cretan fauna with those of the Balkans and of Asia Minor, and a discussion of its probable origins. Other Continental writers, notably Hans Reisser and Edvard Troničck, have made further contributions since then; but, apart from passing references, there have been no recent accounts by British collectors.

My wife and I with two friends, spent the first fortnight of June 1969 in Crete, staying for a week in Iraklion, in the centre of the north coast, and later in Aghios Nicolaos, a small port and holiday resort some 60 kilometres further east. We did not explore the western half of the island, and our expeditions south of the watershed were limited to a visit to the archæological sites at Phaistos and Aghia Triada in the centre and a few hours in and around Ieraptera in the east. I concentrated upon the butterflies and did not attempt any serious night collecting. The other members of the party were not entomologists, so we used our hired Volkswagen for the mixed purposes of finding suitable collecting grounds visiting the many archæological sites, and taking us to bathe in the sea—an activity which proved irresistible in temperatures which exceeded 90°F. every day, often with a hot south wind blowing from Africa.

We found the main roads, and some of the secondary ones, much better than those we had used in previous years in mainland Greece. But there are still few of them, so that most of the mountainous inland and much of the south coast are still difficult or impossible of access by

car. The available maps are unreliable, and are embarrassingly silent about the altitude of any places except the highest mountain tops. Each nome (county) does, it is true, post large maps of its road system at points of entry to it; but we were amused to note that the road classifications used differed greatly in the three adjacent nomes which we visited.

Our attempt to visit the higher slopes of Mount Ida in search of the endemic Blue, *Aricia psylorita* Freyer, was frustrated by these uncertainties. The recently published official map of Crete which was handed to us on arrival shows a motorable road from the village of Anogia, 34 kms. from Iraklion and about 750m. above sea-level, on for a further 16 kms. to the high plain of the Nidha and the Idaean Cave, where a "tourist pavilion" is marked, at about 1,400m. The 1968 Blue Guide also stated that this point could now be reached by car. From it we thought that it would be no great climb to the reputed haunts of *A. psylorita* below the remaining snow-drifts. But when we drove up to Anogia we found that this road beyond it was a plan for the future, not a present reality. It might be possible to get a Land Rover up the existing first-class mule-track; but after a short distance we had proved it quite impassable for our Volkswagen. I did myself walk on for perhaps three miles up the zig-zagging track to a bare plateau at the top of the steep escarpment, catching on the way a fresh male of *Pseudochazara amalthea* Friv., which is essentialy a mountain species in Crete. Besides striking black and white markings, it has a very distinctive wing shape; and I was able confidently to ascribe to it the butterfly represented on a Minoan brooch, dating from about 1400 B.C., which we saw later in the museum at Iraklion. On the plateau itself I explored a shallow gully where the vegetation looked thicker and less parched than elsewhere. though there was no actual water. This yielded plenty of *Polyommatus icarus* Rott. and a few *Aricia agestis* Schiff.; they seemed to be worn survivors of the first broods, which had disappeared altogether lower down, where both species were fresh and presumably showing their second broods. A fine Crambus, *C. cassentiellus* Zell., which looks very like our own *C. chrysonuchellus* Scop. was also common in this gully. But I could find no trace of *A. psylorita*, and the snow slopes were still so far away that I decided to abandon further attempts to find it and to rejoin the rest of the party, who had stayed around the foot of the escarpment. It was only after my return to England that my attention was drawn to E. Troničeк's account of his experiences with *A. psylorita* in 1936. I then realised that, if I had persevered for a further couple of miles along the Nidha track, I should probably have found it commonly, without much further climbing, around some springs well short of the Nidha high plain itself, though that is its headquarters. In retrospect, this is a failure which rather rankles.

In the afternoon and on another visit two days later, I consoled myself with some useful collecting in the ravine beside the road just before Anogia village. Besides many *Gonepteryx cleopatra* L., a fine *Lampides boeticus* L., and many common species, it yielded a fresh male *Pieris ergane* Geyer-Hubner, of which Rebel records only one specimen from Crete. It is clearly a rare species; I could find no more, either at Anogia or elsewhere.

The high plain of Lasithi, further to the east, is much more accessible

than the Nidha, as there is now a good road all the way up from the Iraklion side and another, not yet completely improved, but passable, from Aghios Nicolaos. This circular plain, about six miles across at a height of perhaps 1,200m., is completely surrounded by a ring of bare limestone peaks, the drainage from which accumulates below the surface of the plain. The water is pumped up for irrigation by some thousands of small windmills, whose sails, turning in the mountain breeze, give a fantastic touch to the landscape. From the village of Psychro in the plain, we climbed several hundred metres to the Dicte cave, which is one of several claimants for the honour of being the birthplace of Zeus. We thought it a singularly repulsive cavern, and the steep slopes around it were too arid for most butterflies, though I did miss, in the very mouth of the cave, a fine *Polygonia egea* Cramer, which we saw elsewhere only rarely and at lower levels. But when we descended again to the outskirts of Psychro I found, flying beside a damp path, a few specimens of the lovely *Zerynthia cerisyi cretica* Rebel, which was one of my principal objectives in Crete. They were still in good condition there, though at lower levels the flight begins in March and must have been long over. Unfortunately *A. psylorita* probably does not exist in the Lasithi mountains, which are rather lower than Mount Ida and were no longer holding snow when we were there. Rebel records that he could find no trace of it, and neither did I.

Below the Lasithi plain the higher reaches of the road from Aghios Nicolaos climb through several relatively well-watered and well-timbered villages, among which we spent a good day on 14th June. The highest of them all, Potami, provided some especially good collecting. It was the only place where we saw *Lycaenopsis argiolus* L., in a large and brilliant race with the females very heavily marked with black. *Lampides boeticus* L. was commoner here than elsewhere, and I saw but missed a *Z. cerisyi* which may have strayed down from the high plain. Between the villages the road was being reconstructed, and the newly rolled surface attracted dozens of *Hipparchia semele cretica* Rebel of both sexes. So intent were they that some allowed themselves to be crushed by the slow-moving roller. I thought at first that the water used to consolidate the surface might be the attraction, but we noticed on our second visit that they were still frequenting stretches of the road which had been rolled four days earlier and seemed completely dry. Possibly the butterflies were sampling some mineral deposit. There were a few *Pararge megera L.* and *Carcharodus alceae* Esp. among them, but other species which were flying nearby, such as *G. cleopatra, Maniola jurtina, Polyommatus icarus,* seemed not to be attracted. Whatever may have been the case with the butterflies, we ourselves certainly felt the need for moisture. Each of the villages contained a hospitable "kafeneion"—the Cretan equivalent of the village pub; and my companions spent much of the time improving their knowledge of the Greek langauge in these while I was studying the fauna.

Though the best ground was certainly in the mountains, butterflies were abundant in the foot-hills wherever there was shade or the remnants of water. As in mainland Greece, uncultivated and ungrazed ground around the archæological sites was often productive; a watercourse just beyond the palace at Knossos, for instance, was tenanted by large numbers of *Pararge egeria* L., *Maniola jurtina hispulla* Esp., *Iphic-*

lides podalirius L., *Carcharodus alceae* Esp., *Thymelicus actaeon* Rott. The excavated site at Vathypetro, which is delightfully surrounded by vineyards and flowery hillsides, was also very rich in common species, *Vanessa cardui* L. and *Pontia daplidice* L. being especially prominent. Even the dessicated maquis had its large quota of the endemic *Coenonympha thyrsis* Freyer, whose total population in Crete must be astronomical, *P. icarus*, and less commonly, *H. semele cretica*. The least productive area seemed to be the sea-coast, where butterflies were nowhere common; I did, however, find my only specimen of *Hyponephele lupinus* Costa on a bare slope above the sea near Mallia, and rather similar ground west of Iraklion was tenanted by a large colony of an attractive Burnet, *Zygaena punctum dystrepa* F. de W. A promising area of dried-up salt-marsh which we explored near Ierapetra contained no butterflies at all, apart from a few of the ubiquitous *C. thyrsis*.

Despite the abundance of individuals, the range of species of butterflies in Crete is very limited. Rebel listed in 1916 40 species, but these included three—*Chilades trochilus* Freyer, *Parnara zelleri* Lederer and *Pyrgus malvae* L.—of which the very early single records have never been repeated and were probably erroneous. In 1928 Warnecke added five species (*Melanargia larissa* H-S., *Brintesia circe* F., *Chazara briseis* L., *Strymon acaciae abdominalis* Gebh., *Cupido minimus* Fuessly) from a collection which had been made in the Aegean area; but there is doubt whether the specimens concerned were really caught in Crete, and these records have never been confirmed. Troniček (1949) recorded as reliably determined, a male of *Pyrgus armoricanus* Oberthur, taken by himself near Anogia on 7th June 1936. Beuret (1955) discussed two specimens of the little Blue, *Zizeeria karsandra* Moore, taken in 1909 in not clearly identifiable localities in Crete. Reisser (1958) gave records of *Charaxes jasius* L. from Vukolies and Chania and, doubtfully, of *Limenitis rivularis* Stichel (*reducta* Stdgr.) from East Crete; he also points out that Rebel overlooked Lederer's very early record of *Spialia phlomidis* in Crete, though no one has since seen it there. Finally, Mr John Coutsis of Athens tells me (*in lit.*) that he took an undoubted male of *Pieris mannii* Mayer in Crete recently in September. It seems, therefore, that the number of species of Rhopalocera reliably recorded from Crete within the present century is still only about 40, though more than 80 have been added to the moths since 1916. These now number about 370 species. But large parts of the island, particularly the high Leukos Ori mountains in the west and much of the south coast, have hardly been worked at all; there may well be discoveries still to make.

We ourselves saw 27 species, which was not bad for a single fortnight by no means wholly directed to entomology. It may be compared with 31 species found by Troniček and Stepanek from 22nd May to 21st June 1936, and the same number by Rebel over a rather longer period in 1904. Of those which we saw, *Coenonympha thyrsis* Freyer can claim to be a purely Cretan species, though some authorities attach it to *C. pamphilus* L., which does not itself occur in Crete, despite the enormous differences between them in both appearance and habits. Three others, *Zerynthia cerisyi cretica* Rebel, *Gonepteryx cleopatra insularis* Verity, *Hipparchia semele cretica* Rebel, can certainly be accepted as endemic sub-species. *Thymelicus actaeon* Rott. (our Lulworth Skipper) which is locally common in Crete, is larger and more brightly marked than its cousins

from both mainland Greece and Cyprus; its status may repay further investigation, as may also the fine race of *Lycaenopsis argiolus* L. Of *Pseudochazara amalthea* Friv., *Hyponephele lupinus* Costa and *Pieris ergane* G-H. I only obtained single specimens, but these all differ slightly from the usual forms in mainland Greece. The Cretan *Maniola jurtina* L. are magnificent creatures, especially the females; they clearly belong broadly to the *hispulla* Hb. group of sub-species, but differ somewhat both in colour and markings from typical *hispulla.* Detailed notes and localities for these and other species which we saw are attached.

The Heterocera noticed were mostly diurnal. *Macroglossa stellatarum* L. was seen high up on the Anogia plateau, and the same locality produced *Plusia gamma* L., *Crambus cassentiellus* Zell., and a very large *Procris* whose identity is still to be determined. We found colonies of an attractive little Burnet, *Zygaena punctum dystrepa* F. de W. by the sea near Gazi, in the Anogia gorge, and above Psychro; this is an altitude range of about 1,300m., yet all were about equally fresh. A striking Syntomid, *Dysauxes punctata* F. was caught at Phaistos, along with the migratory Noctuid *Tarache lucida* Hufn. A minute example of *Rhodometra sacraria* L. was taken in a salt marsh at Ierapetra, and worn examples of *Heliothis pelvigera* Schiff were seen in several places. Most of the very small attendance at the lights round our hotel at Aghios Nicolaos also consisted of migratory species, *Laphygma exigua* Hb. and *Nomophila noctuella* Schiff. A brilliant form of our British *Scopula imitaria* Hb. was common both by day and by night. But the yield of such casual moth collecting as we did was disappointingly small. Probably it was too late in the season for most of the indigenous Heterocera, at least at sea-level.

RHOPALOCERA SEEN IN CRETE, 2nd/15th JUNE 1969

Carcharodus alceae Esp. Widespread, but only singly. Knossos, Anogia, Vathypetro, Psychro.

Thymelicus actaeon Rott. Locally common in flowery places. Larger and more brightly coloured on both surfaces than specimens from the Greek mainland, Sicily or Cyprus; perhaps an endemic sub-species.

Papilio machaon L. Not common; always close to plants of fennel, and mostly worn.

Iphiclides podalirius L. Widespread, especially near villages where there were fruit trees; in some places very common, feeding at flowers of scabious. Mostly fresh, presumably of 2nd generation.

Zerynthia cerisyi cretica Rebel. Psychro, c. 1,200m., 10th June, one male, three females, all in fair condition, taken and another missed; flying along a wet ditch among fruit trees. Potami, c. 900m., 14th June, one fresh specimen seen.

Pieris brassicae L. Few seen, mostly high up and worn. Probably between broods.

P. rapae L. Abundant, especially at low levels; females mostly worn, males fresh, Search was made for *P. mannii* Mayer, but none were seen.

P. ergane G-H. Anogia gorge, c. 800m., 7th June, one fresh male, no more seen, despite considerable search. This appears to be only the second record for Crete; Rebel records a single worn male in

the Lasithi mountains, 4th July 1904.

Pontia daplidice L. Widespread and generally fairly common; all apparently of the 2nd generation.

Euchloe ausonia Hb. Several seen on the Anogia plateau, c. 1,000m., 5th June.

Colias crocea Fourc. Generally abundant, but only one *f. helice* Hb. seen, at Knossos.

Gonepteryx cleopatra insularis Verity. Scarce at first, males then becoming common generally, females still few on 15th June; most numerous at moderate altitudes. My specimens are uniformly smaller than those from mainland Greece, and the males less heavily marked with orange, though more so than in ssp. *taurica* Stdgr. from Cyprus.

Vanessa cardui L. Generally abundant up to 900m., especially in central Crete; less common in the east.

V. atalanta L. Only three seen, at Phaistos, Knossos, Gournia.

Polygonia egea Cramer. Iraklion, Archarnes, Potami, Dicte cave above Psychro, singly.

Pararge aegeria L. Locally common among trees. The difference in size between the sexes seems to be more pronounced than in the mainland form.

P. megera lyssa Hb. Widespread, but usually singly; mostly worn.

Hipparchia semele cretica Rebel. Widespread up to 900m., becoming very common. Apart from the attraction to a newly-rolled road, already discussed, we noted its habit of settling on the shady side of tree trunks. Each insect selected its own trunk, which it defended vigorously against intruders, whether of its own or human kind, as we discovered when we settled for lunch beneath an occupied tree. It is a brilliant and large race (up to 72mm in both sexes), outwardly rather resembling *H. aristaeus siciliana* Obth.; but there seems no doubt that structurally it belongs to *H. semele* L.

Pseudochazara amalthea Friv. Anogia escarpment, c. 1,000m., 5th June, one fresh male. This resembles the Greek mainland ssp. *amalthea*, but the white markings are slightly more extensive, and there is a clear white spot outside the apical ring on the forewings.

Maniola jurtina L. The race seems to be closer to *hispulla* Esp. than to *fortunata* Alpheraky, but is distinguishable from either. In the female, the usual colour of the underside hindwings is dove-grey, with a violet tinge, but in some examples the marginal band is bright biscuit colour. Generally abundant up to 900m.

Hyponephele lupinus Costa Above the beach west of Mallia, 15th June, one female, fresh but damaged by a lizard. Found on extremely dessicated ground, accompanied only by a few *C. thyrsis* and *M. jurtina*.

Coenonympha thyrsis Freyer. Found at all levels, generally abundant on dry, stony ground; not a colony insect like *C. pamphilus*. It flies jerkily in the partial shade of tall plants, but seems little attracted to flowers. It is probably short lived, as we saw hardly any worn examples among hundreds of fresh ones. There is some variation in the amount of spotting in the hindwings upperside. otherwise constant in markings but rather variable in size (30mm in small males to 38mm in large females).

Lycaena phloeas eleus L. Widespread at moderate altitudes, but usually singly. A brilliant race, with well-developed tails to the hindwings.

Lampides boeticus L. Anogia gorge; Acharnes; Potami. About a dozen seen, mostly worn, flying round broom bushes and settling on flowers of scabious.

Acriia agestis calida Bell. Anogia plateau, 5th June, Psychro, 10th June, a few worn; Potami; 14th June, fresh males.

Polyommatus icarus Rott. Generally abundant; worn at high levels, fresh lower down. All small or very small; a few females have traces of bluish suffusion upperside.

Lycaenopsis argiolus L. Potami, c. 900m., 14th June, males worn, some females still fresh. A fine form; females measure up to 40 mm., and have heavy black borders on the forewings and a marginal row of pale blue spots on the hindwings. On the underside, the spots are greatly reduced in number and size. This race needs more investigation: I have seen nothing quite like it elsewhere.

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Folly Hill, Birtley Green, Bramley, Surrey. September 1969.

Wessex Notes, 1969

By H. Symes

During the past few years, so much has been said (and rightly) about the scarcity of butterflies that it is a welcome change to record that 1969 has been a good year for them. In 1968 I did not see one hibernated Vanessid in my garden, but during the fine weather at Easter this year, I saw a Peacock (*Nymphalis io* L.) on 6th and 7th April, and ten days later, a Small Tortoiseshell (*Aglais urticae* L.) on Grape hyacinth (Muscari). May was a cold month, but the appearance of a Painted Lady (*Vanessa cardui* L.) on 28th suggested that it was going to be a good year for this immigrant. Meantime, on 27th, an extreme form of *Biston betularia* L. var. *carbonaria* had emerged from pupa. I had found the larva on sycamore (Ent. Rec. 81 : 60).

On 5th June, Mr S. C. S. Brown and I met Brigadier Warry at his favourite locality near Wootton Glanville. *Euphydryas aurinia* Rott. (Marsh Fritillary) and *Argynnis selene* Schiff. (Small Pearl Bordered) were scarce, but fresh and only just beginning to emerge; the most

plentiful species seen was *Coenonympha pamphilus* L. (Small Heath). Everywhere around us nightingales were singing, and I caught sight of one of the shy little birds slipping from branch to branch in an old sallow tree. I had not heard so many singing since the old days in Hell Coppice some forty years ago. I also saw the largest grass snake that I have ever seen, and without moving my position, an adder very close to it. On 17th June Mr. Brown and I returned to this locality, but the day was too cold and windy for butterflies. I was pleased to find a newly emerged *Deilephila porcellus* L. (Small Elephant Hawk), a beautiful sight low down on a grass stem, and a few eggs of *Hamearis lucina* L. (Duke of Bergundy). During June I bred a nice series of *Hadena serena* Schiff. (Broad Barred White): the larvae. which I had never seen before, had been given to me by Mr. F. C. Stanley. A contributor to Tutt's "Practical Hints" (II: 111) says that he found them difficult to rear: many died when nearly full fed, others in the pupal stage, and from more than 100 larvae only 18 imagines were bred. (Perhaps there had been overcrowding) My experience was happily the reverse of this as no larvae died and from 15 pupae 14 good moths emerged.

On 15th July Mr. M. T. Horwood, Assistant Regional Officer (Dorset) of the Nature Conservancy, arranged a visit to Morden Bog in which Brigadier Warry, Mr Brown and I took part, to try to find out whether *Coscinia cribraria* L. (Speckled Footman) still existed in this locality. It was an optimum date for this species, and with St Swithin in a benign mood, it was a very sunny day, actually the hottest of the year at Bournemouth. But we did not see *cribraria*. Twenty years ago it was quite common at Morden Bog. where I found three distinct colonies, separated from each other by about a quarter of a mile. In the last ten years it has become increasingly scarce, and I have not seen one since 21st July, 1964. It may well be more than a coincidence that three other local species, none of them as plentiful at Morden as *cribraria* used to be, have also, as far as I know, not been seen there for five years. They are *Lasiocampa trifolii* Schiff. (Grass Eggar), whose larvae were found by Dr. H. King and me in 1950 and 1951, *Heliothis maritima* Grasl. (Marbled Clover) taken by Dr. King in 1951 and 1953 and by Brigadier Warry and me in 1956, '58, and '59, and *Dasychira fascelina* L. (Dark Tussock) taken by me as larva or imago in 1949, '50, '51, '60, and for the last time on 21st July 1964. There may be some ecological reason for all this, due to the draining of part of the area to make it better for planting conifers (see Proc. Brit. Ent. Nat. Hist. Soc. Vol. II, Part 2, pp. 31, 32).

On 22nd July, Mr. Stanley took me to the marshes at Lymington, where we found ourselves paddling in warm but muddy water among bulrushes and other reeds. Some of these contained larvae of *Nonagria sparganii* Esp. and *N. typhae* Thunb., and from my share I bred two *sparganii* (two other larvae had been "stung") and one *typhae*. On 27th July I visited an entirely different type of locality with a large party of members of the Dorset Naturalists' Trust. The place was Green Hill Down, a reserve on the chalk overlooking Milton Abbey. An impressive list of butterflies including the White Admiral (*Limentitis camilla* L.) has been recorded there, and I was interested to see three Small Coppers (*Lycaena phlaeas* L.), a species of which I had seen very little this year. I was rather surprised not to see a Chalk Hill Blue (*Lysandra coridon* Poda), a Painted Lady, or a Comma (*Polygonia c-album* L.) which I had

seen in my garden on 25th July.

August is the great month for butterflies in the garden, when the buddleias and the Vanessids are out, and on 1st *V. atalanta* L., *A. urticae* L., *N. io* L. and *V. cardui* L. appeared; they were joined by *P. c-album* on 4th. That evening I received a 'phone call from Mr. Fielding, of Manchester, who was staying at Ringwood, and asked if I could tell him anything about Hod Hill Our conversation ended by his inviting me to come with him and his friend Mr. Carter to Hod Hill on the next day. The weather was ideal and butterflies were plentiful on the lower slopes as well as at the top of the hill. The protection of the food plants has clearly had excellent results and *L. coridon* Poda especially was abundant. I did not see any varieties. It was quite like old times on "the Hill", and at its foot there was a glorious mass of thistles, nettles and hemp agrimony, on which a *P. c-album* was taken. As we sat on the ramparts eating our lunch, there was a delightful view of the surrounding country with its golden cornfields and green pastures, but I missed the little train that used to run along the railway line beside the Stour. Mr. Fielding took an enormous female *Tettigonia viridissima* L. (Great Green Grasshopper). I have never seen one approaching it in size. Two days later we went to look for larvae of *Cucullia lychnitis* Ramb. (the Striped Shark) in its Dorset locality. but although there was plenty of black mullein we did not find any larvae. During the last week of August, the weather deteriorated and became windy and rather cold. *P. c-album* and *V. cardui* were not seen at all and only *A. urticae* was really plentiful. During the whole month *atalanta* was seen on 18 days, *urticae* on 17, *cardui* on 13, and most interesting of all, *c-album* on 10, both light and dark forms occurring. Highest numbers on any day were *atalanta* 8 (Aug. 16th), *urticae* 11 (17th), *io* 5 (16th, 17th and 24th), *cardui*, 3 (6th), *c-album* 2 (6th).

Other butterflies seen in the garden were *Pararge aegeria* L., *P. megaera* L., *Maniola jurtina* L., *Polyommatus icarus* Rott., *Gonepteryx rhamni* L. and of course, *Pieris brassicae* L. and *P. rapae* L. on every suitable occasion. The dipteron *Volucella zonaria* Poda appeared on August 7th and 16th, and like its relative *V. pellucens* L., preferred the flowers of *Eupatorium cannabium* (hemp agrimony) to any other attraction, not even excepting buddleia.

September was a disappointing month in the garden. The buddleias were over and the Michaelmas daisies were not fully out. After two good days. on 3rd, when 4 *urticae*, 1 *atalanta* and 1 *Coenonympha pamphilus* L. were seen, and on 4th, when 3 *urticae*, 1 *cardui*, 1 *io*, 1 *rhamni* appeared, there was an unsettled spell, and apart from one or two *urticae*, the only vanessid I saw was a *cardui* on 24th. Two nymphs ♂ and ♀ of *T. viridissima* were seen on roses on 5th, and the female appeared at intervals until 24th. Finally, on 2nd October, I saw an *atalanta*, and watched a hornet (*Vespa crabro* L.) flying to and fro along my privet hedge. It was only the second time I had seen this insect in Bournemouth

Notes and Observations

COLIAS CROCEUS GEOFFROY (CLOUDED YELLOW) IN LANCASHIRE.—On 17th August 1969, my brother, Mr S. G. Kirby, took a male specimen of this species at Fulwood, Preston. It was a male in very fresh condition, still exhibiting the evanescent yellow scales on the nervures in the black margins of the forewings. This seems to indicate that this specimen is from a locally bred generation.—M. A. KIRBY, 71 Loveday Road, Ealing, London, W.13.

LYCAENA? DISPAR BATAVUS L. (LARGE COPPER) IN IRELAND.—It may be of interest that on Sunday, September 7, about lunch time, we stopped by the roadside near Allentown in the Bog of Allen. There were very large numbers of *Nymphalis io* L. (Peacock) and other butterflies, but what caught my eye was a perfect female specimen of a large copper. No doubt it has been introduced recently, as in the Fens, but it is the only one I have seen in the British Isles. I watched it settling on flowers from a distance of a few feet, so there was no mistaking its identity.—J. E. LYNE, M.A., F.R.G.S., Oakwood, Chichester, Sussex.

NOTES FROM EAST ANGLIA.—In my mercury vapour light trap on July 16, a specimen of *Nycterosea obstipata* Fab. (*fluviata* Hübn.) (Gem) was found, and I had two more later in the month. From a female I have bred a nice series. I believe, at any rate in the 1937 edition of the Suffolk Naturalists' Trust, it has only been recorded twice before. *Laphygma exigua* Hübn. (small mottled willow) came to my trap on 2nd and 17th August, and another on the night of 11th September, surely not recorded so far east before: I took a few many years ago when resident on the Isle of Portland, Dorset. On August 14, a very dark specimen of *Nonagria dissoluta* Treits. (brown-veined wainscot) came to the trap. This species is not previosuly recorded from West Suffolk. I could not at first decide what this insect was, and thought that it was perhaps a freak "mouse" moth. In the very warm weather of August, I have had bigger captures than ever before, but apart from the foregoing, nothing of particular note.

In August I took a specimen of *Galleria mellonella* L., and I am told that this species is now considered rare.

I have bred and caught many specimens of *Nonagria typhae* Thunb. in the past, but this year I bred a most striking example of var. *fraterna*—it is nearly coal black on the forewings, with white markings and deep red patches at the base. I took at mercury vapour light on September 11 what I consider a normal specimen of this variety in which the forewings are of a uniform dark brown colour.

The large thorn, *Ennomos autumnaria* Wernb. seems to be becoming almost common here; I saw several specimens on the nights of 12th, 16th, 17th and 18th September. Another *exigua* came in on the night of September 18, and my biggest surprise, a huge example of *Catocala fraxini* L. on September 16. Again referring to the 1937 edition, the last Suffolk record was in 1905.

On the lighter side, I recollect some semi-humerous experiences while collecting. Last year, for example, while on holiday in Scotland, the police (led by a woman sergeant drat it!) tracked me down about eight

miles to the hotel where I was staying in order to accuse me of stealing grouse chicks, having previously seen me in a field with a net. Is it not about time serious moth hunters could produce a good conduct pass of some sort? Again, I shall not forget when taking the only *Epione vespertaria* Fabr. I possess, in Yorkshire, being surrounded by a posse of police. I told them that whatever they wanted must wait until I had boxed my captive. They were most friendly and said they only wanted to know what I was doing with a lamp near the roadside. I should be interested to read an article on the hazards of moth hunting, and incidentally, how to cope with them.

Finally, several collectors have said to me how rare to-day are some of the common moths as for example the cream spot tiger and old lady moths. I have only six of the latter in my collection after many years; I took two at Horning Ferry in the Broads on a gate in August 1958 and one this year at light at exactly the same place; it even perched on the same gate. Can you beat it? — GUY A. FORD, The Rookery Farmhouse, Norton, Bury St. Edmunds, Suffolk.

PLUSIA GAMMA L. AND NOMOPHILA NOCTUELLA SCHIFF. IN SOUTH DEVON.— Main migration peaks as recorded in my mercury vapour light trap during the period 1st May to 24th September 1969 are as under: In May, there were 52 on 13th, 21 on 25th, 24 on 29th and 16 on 31st. No other date in May produced double figures: the total for May was 159. There were no peaks in June; numbers varied from 2 to 21 with a total of 159. July showed 34 on 23rd, 155 on 24th, 98 on 25th, 385 on 26th, 73 on 27th, 268 on 28th, 68 on 29th, and 86 on 31st with a total of 1373. On August 1st the trap was not in use, but on 2nd there were an estimated 6000 specimens, 57 on 3rd, 1150 on 8th, 560 on 9th, 700 on 10th, 174 on 12th, 107 on 15th, 347 on 16th, 184 on 17th and 180 on 18th, with a total for the month of 10,237. On September 1st there were 107, with nothing over 55 for the remaining period. I was away on 13th, 14th and 15th, making 21 days of trapping only, and the total for that period was 576.

Nomophila noctuella Schiff. Between 5th August and 24th September peak migration numbers are as follows: 11 on 6th August, 9 on 7th, 10 on 8th, 39 on 10th, 9 on 11th, 19 on 12th. The total for August (27 days) was 181. In September there were 17 on 1st, 10 on 4th, 18 on 5th, 23 on 7th, 20 on 8th, 51 on 9th, 27 on 10th, 24 on 11th, 50 on 12th, 119 on 16th, 27 on 17th, 51 on 18th, 44 on 19th, 91 on 23rd, 26 on 24th. The total for the month (21 days) was 624. The total for the period was 805. — H. L. O'HEFFERNAN, Thurlstone, Devon. 28.ix.1969.

RHYACIA SIMULANS IN IRELAND.—During a recent trip to Ireland with Mr and Mrs Demuth, I was interested to take four specimens of *Rhyacia simulans* Hufn. ab. *suffusa* Tutt. This species does not seem to have been taken in Ireland since last century when some specimens were seen in Co. Sligo by Russ. Interestingly, they seem referable to ab. *suffusa*. Last year I took two ab. *suffusa* in Orkney, with two of the very black form, ab. *latens* Staud. Four specimens taken in 1967 in S. Harris and one in S. Uist in 1966 all appear to be of this latter form. My Irish specimens were taken at Kerrykeel, Co. Donegal 10-16 viii.1969. — AUSTIN RICHARDSON, Beaudesert Park, Minichinhampton, Glos. 30.ix.1969.

Two Uncommon Flies in West Kent. — *Discomyza incurva* Fall. (Ephydridae): of this curiously squat, dumpy, rounded, short-winged little black fly I caught four examples (and missed one or two others) while sweeping on one of the chalky slopes of Otford Downs, near Sevenoaks, on 16th July 1965. The species appeared to occur only in certain spots within a limited area, and I was inclined at the time, having no idea what it was, to associate it tentatively with harebell (*Campanula rotundifolia* L.) which was always most in evidence where the fly was met with. However, any such connection was seen to be excluded when Mr E. A. Fonseca kindly named it for me as above, pointing out that it is believed to be a snail parasite mainly attached to *Helix pomatia* L., and appears scarce and little-known in Britain. This feeding-habit certainly accounts for its presence on Otford Downs, where in the past—if memory serves—I have noticed occasionally the large bleached empty shells of the Roman snail, and where such snail-feeding beetles as *Drilus flavescens* Rossi and *Lampyris noctiluca* L. (the glow-worm) are, or were, not uncommon. In life *D. incurva* almost more resembles a small beetle or bug than a fly, at least when walking up the side of the net, from its trick of holding the wings curved against the body instead of projecting straightly behind in the normal way; which, presumably, suggested to Fallén the name he gave the species. I observed a similar habit in the allied but smaller *Clanoneurum cimiciforme* Hal. (det. E. A. Fonseca) at Faversham Creek, north Kent, in August 1968.

Xanthocnemia pseudomaculipes Strobl. (Anthomyiidae): when collecting in Farningham Wood on 17th August 1966 I swept from bracken, etc., an unfamiliar Muscoid fly, black with yellow legs and yellowish wings. Mr Fonseca tells me that it is the above rare species, which used to be in the genus *Pegohylemyia* and is not in the 1945 Check List; he has a note on it in *Ent. Rec.*, **69** (1957): 18, having taken specimens in Woolwich Wood near Deal, and further informs me that the late Mr L. Parmenter took it in the Blean Woods—also in East Kent. Mine may perhaps be the first West Kent capture, but I cannot be positive as to this. Otherwise the species, which develops in the flowers of *Solidago virgaurea* L., has only (or chiefly) been taken in East Anglia and the north by the late Mr J. E. Collin. — A. A. Allen, 63 Blackheath Park, S.E.3. 24.ix.69.

Plusia orichalcea Fab. (Lep.) in Hampshire. — On 9th October 1969, Miss Kim Noble telephoned me to say that she had taken *Plusia orichalcea* Fabr. in her mercury vapour light trap at New Milton, Hants. This morning, I found a specimen of this moth in my mercury vapour trap here. Both are in mint condition. So far as I know, these are the first records for Hampshire.—L. W. Siggs, Sungate, Football Green, Minstead, Lyndhurst, Hants. 10.x.1969.

Plusia aurifera Hübn. (orichalcea Fabr.) in West Sussex.—A very fresh specimen of this species came to my static light trap during the night of 18th-19th August. Conditions were about this time of the summer very poor for collecting at light, and although I made great efforts to try and get others, which, judging by the condition of my specimen, might well be about, I failed to get another. — A. J. Wightman, Pulborough, Sussex. 30.ix.1969.

PLUSIA ORICHALCEA FABR., URESIPHITA POLYGONALIS SCHIFF, AND PALPITA UNIONALIS HÜBN. IN S. CORNWALL.—On the night of September 13, I took my fifth specimen of *Plusia orichalcea* Fabr., along with the two Pyrales on the Lizard peninsula.—AUSTIN RICHARDSON, Beaudesert Park, Minchinhampton, Glos. 30.ix.1969.

PLUSIA ORICHALCEA FABR.—On the night of 13th-14th August this year, I had the good fortune to take a specimen of *Plusia orichalcea* Fabr. at mercury vapour light near Chulmleigh, in Devon. The specimen is a male in very fine condition, and was identified with the kind help of Dr Jeaffreson Harris, from Seitz.

It may be useful to note here the features by which the specimen was identified, as it closely resembles *P. intermixta*. *P. orichalcea*: reniform stigma constricted, orbicular more nearly circular than in *P. intermixta*, brassy wedge pointed at inner end and reaching to inner line. *P. intermixta*: orbicular stigma more elongated in shape, brassy wedge does not reach the inner line, and is blunt-ended.—C. W. D. GIBSON, Lyon House, Sherborne, Dorset. 24.ix.1969.

ORGYIA ANTIQUA AT LIGHT.—Baron de Worms and others have mentioned the occasional capture of *Orgyia antiqua* L. at light in their traps. I have had two or three such arrivals in the past and this year on 20th September there was one vapourer moth in my trap in the garden here. I report this particularly because in fifteen years in this area I have never seen the moth flying in or near my garden, but some eight years ago, several males came to a bred female. However, perhaps they had to travel a long distance, because none appeared until the third day after the female had emerged. — J. A. C. GREENWOOD, The Thatches, Forest Road, Pyrford, Woking, Surrey. 6.x.1969.

CORRECTIONS

On a new Genus of Dermaptera from India by G. K. Shrivastava, *antea* p. 246. For Famliy read Super-family; for Sub-family read Family, and for Super-family read Sub-family.

Current Literature

Catalogus de Nederlandse Macrolepidoptera (Fifteenth Supplement). By **B. J. Lempke.** 1969, Tijdscrift voor Entomologie, Vol. 112, pp. 15-80, with 8 photographic plates of 112 historic specimens, 14 maps and illustrations in the text.

Serial publication of this great work on the Macrolepidoptera of the Netherlands, has progressed steadily since the first part appeared in 1936. In this, the latest issue, the treatment of the family Geometridae is continued by the conclusion of the subfamily Lerentiinae. With each species the following particulars are presented: time of appearance, biotope(s), new localities and variation. The nomenclature of the two species so far known as *Eupithecia pini* Retzius and *E. bilunulata* Zetterstedt is amply discussed and corrected; and the subspecific status in the Netherlands of

E. icterata Villers, *E. nanata* Hübn., *E. dodoneata* Guenee. *E. tantillaria* Boisduval, *Chesias rufata* F. and *Minoa murinata* Scopoli is definitely settled by comparing these subspecies with the nominate forms. Two new subspecies are described: *Eupithecia analoga europaea* and *Minoa murinata limburgia,* besides a number of new forms. Lectotypes are designated for *Eupithecia abietaria debrunneata* Staudinger and *E. dodoneata* Guenee and the subspecific status of the Danish populations of the latter is discussed.

For convenience, the author has added English translations of the descriptions of the new subspecies and forms, as well as notes in English on some other aspects. As in the preceding Supplement, the nomenclature and classification adopted, is that of D. S. Fletcher, in the Lepidoptera portion of Kloet and Hincks, *New Check List of British Insects* (due for publication early in the new year).

The excellent black and white plates contain figures of historic specimens reproduced from photographs by J. Huisenger, and with each specimen the essential data are conveniently printed below. Finally, the histograms and distribution maps add appreciably to the interest of the work, which is well printed on good quality paper.—J.M.C.-H.

British Shells by Nora F. McMillan, xii+196 pp.+80 pl. (32 in colour); F. Warne, 50/-.

Shell Life by Edward Step was published in 1901 and reprinted in 1927 and 1947, but it was found necessary to bring the old book up to date, and as it had been in existence for more than sixty years without revision, the task had become too cumbersome, and a new book was put in hand. In her preface, the author points out that in the British Isles and the shallow seas surrounding them, we have 780-800 species of Mollusca, of which about 600 are marine and 180 terrestrial or fresh water species. With the exception of 15 species of minute freshwater bivalves of the genus *Pisidium,* all these are mentioned in the book and 231 are illustrated in black and white drawings and 124 in colour. The black and white drawings are by **Bridget Finlow,** and the coloured photographs by **G. D. Hyslop.**

The Introduction gives a short history of the study of shells and a rough idea of the Mollusca. A short note on where to find mollusca, and another on their economic uses are followed by notes on their classification and structure, with a glossary of the terms used in the body of the book.

The species are then described in systematic order, marine species being treated first and then freshwater and terrestrial species. The descriptions are followed by systematic lists of our species, treating the marine species first again. An index completes the book.

Although this book has no connection with entomology beyond the fact that certain beetles prey on snails, it is certain to be of great interest to all nature lovers, being one of those books to which one likes to be able to turn for information on and identification of material seen on outings. Of course, to an amateur conchologist, the book is a must. It is well printed on good paper and strongly bound as one would expect of work from this publisher—S.N.A.J.

Birds of the British Isles and their Eggs, edited by **J. A. G. Barnes, M.A.,** from the three volumes of the Wayside and Woodland series, by **T. A. Coward, M.Sc., F.Z.S., F.R.E.S., M.B.O.U.** xvi+359 pp.+160 pl. (80 in colour). F. Warne, £2·75 (55/-).

The present work takes the place of the three volumes mentioned. The coloured illustrations by Thomas Thorburn of the old books have been retained and their number is augmented by figures of newly added species, by **Robert Gillmor.** The black and white figures have been replaced by a series of exceedingly fine photographs by various photographers.

The Introduction, headed Classification and the British List gives a line drawing illustrating the terms for various parts of a bird's plumage and body used in the text of the book. A list of protected birds is given, and there is also a list of birds recorded from the British Isles less than five times.

The main text goes systematically through the British list, giving a good account of the bird, its feeding and nesting habits and distribution; a description of plumage follows and finally a reference to the appropriate illustrations. The order of these details is the same throughout the book. An index completes the work.

Here again we have a book which, though not entomological, is one certain to be of interest to all naturalists, and particularly to the very large numbers of amateurs who "watch" and study birds. It is assured of an honoured place in the collection of identification books kept by most naturalists, whatever their particular interest may be. It is well printed in clear type on good paper and is well bound in boards. One can recommend it as a handsome present to a young (or not so young) enthusiast in the knowledge that it will last him throughout his active lifetime.—S.N.A.J.

Two interesting separates have been received from Dr. H. B. D. Kettlewell: **Gene Flow in a Cline:** *Amathes glareosa* **Esp. and its Melanic F.** *edda* **Staud. (Lep.) in Shetland,** by **H. B. D. Kettlewell** and **R. J. Berry:** (Heredity, **24:** 1-14), and **Differences in Behaviour, Dominance and Survival within a Cline:** *Amathes glareosa* **Esp. (Lep.) and its melanic F.** *edda* **Staud. in Shetland** by **H. B. D. Kettlewell, R. J. Berry, C. J. Cadbury** and **G. C. Phillips:** (Heredity, **24:** 15-25).

The authors of these papers have made several expeditions to Shetland to investigate the phenomenon of decline in frequency of the melanic form *edda* from 97 per cent. in the north to 1 per cent. in the south of the group, during which many experiments have been carried out and a considerable number of records made. These have consisted of light trapping, the release of marked specimens and their recapture, which have provided a multitude of figures. These figures have now been analysed and provide many interesting conclusions and indications which are set out in these two papers, illustrated by charts and tables, with two maps. The interpretation of the data raises many points and when compared with data gathered about other melanic communities, some general rules for the subject may be forthcoming. These papers are exceedingly interesting to those outside the subject, but must be extremely valuable to those working on genetics.—S.N.A.J.

Proceedings and Transactions of the British Entomological and Natural History Society. Vol. 2, Pt. 2, 40 pp.+8 pl. (2 coloured). Published by the Society, 16/6.

The Society's meetings from 25th July 1968 until the Annual General Meeting on 23rd January 1969 form the subject of the first portion of this issue. These include the Annual Exhibition and the account is illustrated by two coloured plates of aberrations of *Callimorpha jacobaeae* Linn. and two half tone plates illustrating fourteen varieties and insects of special interest. The exhibit of fungi is illustrated by a plate of four photographs by Mr. W. H. Spreadbury.

As customary, the report of the A.G.M. contains the President's Address. the scientific portion of which is a monograph of the variation of *Agrotis exclamatis* Linnaeus; Mr. Goater has dealt with his subject very fully and the paper is illustrated by three half tone plates showing 36 forms of the species from many parts of its range at home and abroad.

Field meetings between 21st September 1968 and 25th April 1969 are reported.—S.N.A.J.

The Insects. Structure and Function. By **Dr. R. F. Chapman.** xii+819 pp. The English Universities Press, 85/-.

In this large work the author has set out to bring together morphology and physiology in one text book and to relate these to the behaviour of the insect in its natural surroundings. The first problem, before commencing such a large task must have been its organisation, and the author has managed to solve this by collecting several studies under six sections. which he has sub-divided into 36 chapters, in each of which from two to nine titles are dealt with. In Section A for instance, Chapter 1 covers Orientation, in which the various positioning of the heads of different insects and stages is mentioned. Then the grooves on the head are shown to represent the suture between two segments in some cases, and in others are for strengthening purposes and to afford attachments for muscles. The typical grooves are illustrated by anterior and lateral views of a grasshopper's head, and the appropriate names of these are given. The heading Areas of the Head is illustrated by a vertical longitudinal section of the head. The ventral region of the head, modifications of the head, and the tentorium are explained, with large text figures. The Neck forms the subject of the second part, antennae the third giving structural growth. variation of form, and functions, and the fourth part deals with the wide subject of mouth parts, again well illustrated. Chapter II on Feeding, beside the opening remarks deals with the subject under nine heads. Naturally, Chapter III follows with The Alimentary Canal in which the digestive tract is described and well illustrated. Maintaining the sequence. Digestion and Absorption is the title of Chapter IV. Chapter V is headed Nutrition, the Fat Body and General Metabolism deals with the fat body. luminescence, respiratory metabolism, end products of catabolism. metabolic rate and the control of metabolism. Colour is treated in Chapter VII under the heads of the nature of colour, physical colours, pigmentary colours, the colour of insects, colour changes, and the significance of colour.

Section B is entitled The Thorax and Movement. Section C, The Abdomen, Reproduction and Development, D. The Cuticle, Respiration and Excretion, E. The Nervous System and Sensory Systems, and Section

F. The Blood, Hormones and Pheromones. Each section is treated similarly to the method used in Section A. There follow some forty pages of references with about 1000 entries, a Taxonomic Index and a Subject Index.

The superb organisation of the subject and the clarity of expression are, of course, what one would expect from a man of Dr. Chapman's standing, but this is no reason for withholding the well deserved praise which they command. In all, this superb book brings together the subjects which, to use the author's own expression, enable the student to understand what makes the insect tick.

The book is bound in strong boards and is printed in very clear type on good paper. It should be a very welcome addition to the student's library, and should find a place in the libraries of all museums and universities.—S.N.A.J.

Obituary

DUDLEY GRAHAM MARSH (1891-1969)

Dudley Graham Marsh died on the 22nd day of March, 1969, after a long illness patiently borne. In his earlier days, he was a very keen collector of butterflies, spending much of his time on the Downs collecting varieties of blues. His patience, and that of his wife Norah, in searching the grass stems, was rewarded with some fine varieties.

Two remarkable varieties of *Lysandra coridon* Poda, one of *Aricia agestis* Schiff. and one of *Maniola jurtina* Linn are plated by the late F. W. Frohawk (with whom he frequently collected) in his book, "Varieties of British Butterflies."

Later in life, he transferred his affection to the moths of the British Isles, and became a keen collector and after amassing a very representative collection of the macro-lepidoptera, turned his attention to the micros, but too late, alas, to make a comprehensive collection. His ability to set an insect in perfect symmetry and casting aside anything but undamaged specimens, makes his collection a showpiece of precision and perfection.

This is perhaps because of his profession, a Chartered Architect. Unfortunately, his career as such was interrupted by the two World Wars, in both of which he served as an officer. In the Great War in the Royal West Kent Regiment and in the Second World War on the General Staff.

In spite of the hard work involved in starting in private practice again after the war, he found time to relax in the pursuit of his hobby, spending a number of his annual holidays in the most favoured haunts.

He had a great fund of stories from the past, which he enjoyed relating. He was a good companion, and will be sadly missed by all who knew him.

Our sympathy goes out to his widow and a united family, who showed an interest in his entomological activities.

G.H.Y.

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).

Cabinet Wanted.—Forty drawer, side runners. Will collect from reasonable distance.—Offers to *Richard Dickson*, 'Flagstones', Catisfield, Fareham, Hampshire.

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CHANGES OF ADDRESS

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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.

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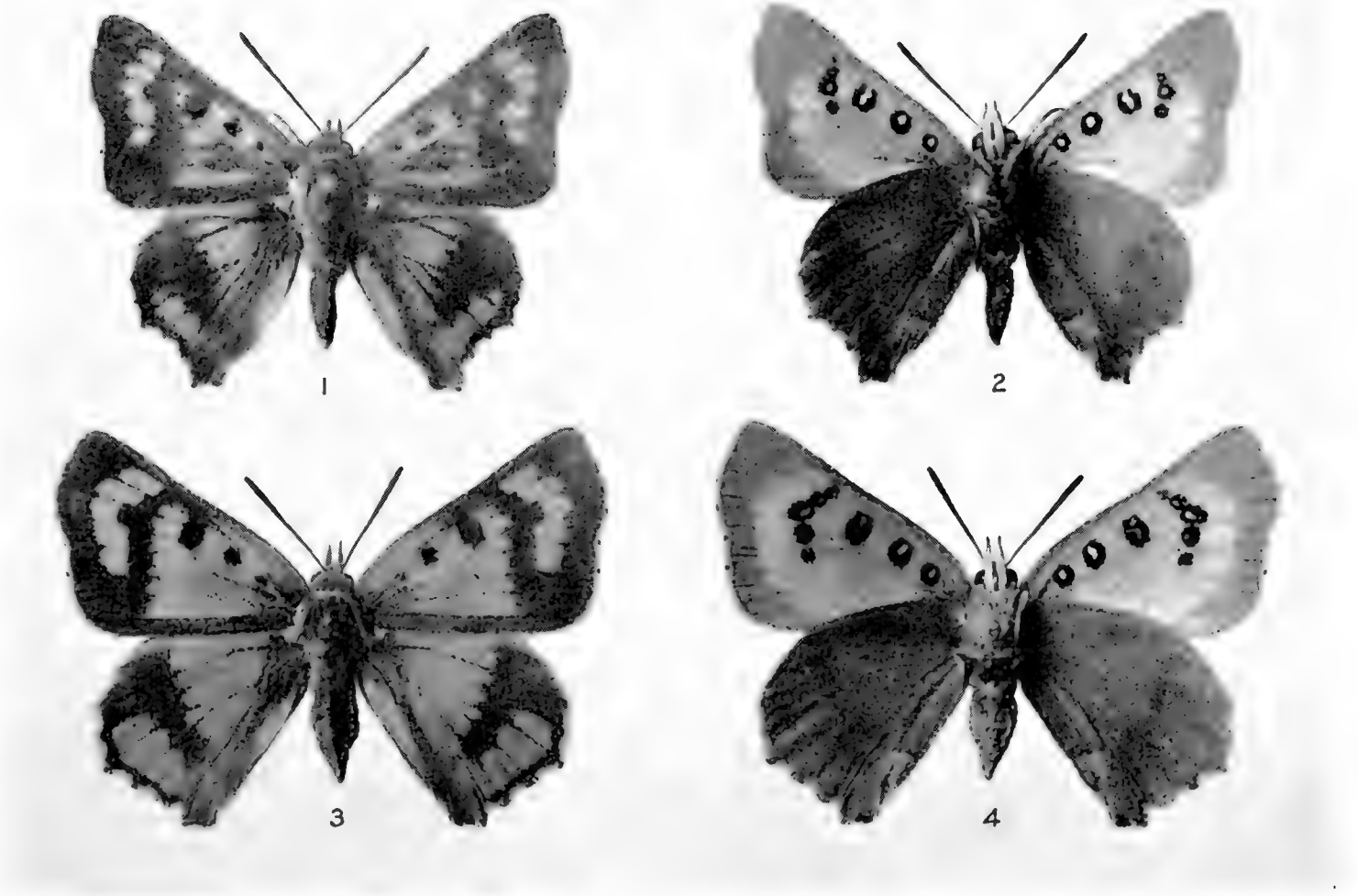

Photo: H. N. Wykeham.

Phasis sardonyx peringueyi Aurivillius

Fig. 1 ♂ (upperside) (Het Kruis, 24.viii.1969); Fig. 2 ♂ (underside) (Het

No. 20.

On the Status of *Phasis sardonyx* ab. *peringueyi* Aurivillius* (Lepidoptera: Lycaenidae), and the Selection of a Neallotype Female

By C. G. C. Dickson

**Phasis sardonyx* ab. *peringueyi* Aurivillius, 1925. Seitz's "Macrolepidoptera of the World," Vol. 13, p. 430.

Described originally as an aberration of *Phasis sardonyx* (Trimen)—owing presumably to insufficient material for comparative study—this butterfly has since been found to have such a wide distribution in its own general area and to differ in some respects so consistently from nominate *sardonyx* that one can only conclude that it represents at least a separate race. There is also a noticeable disparity in the flight periods of the two insects, that of nominate *sardonyx* being more spread out and continuing long after *peringueyi* would, from prolonged observations, appear to be right off the wing.

The status of *peringueyi* is being formally raised to subspecific rank and the female described for the first time, in this paper.

Phasis sardonyx peringueyi Aurivillius stat. nov.

Average size less than that of nominate *sardonyx* (with individual specimens of the males, anyway, of each insect, not infrequently of the same size); projection at the end of vein 1b of the hindwing less acute; underside of hindwing of an almost uniform coloration, as against the prominenty streaked hindwing of nominate *sardonyx*.

Male. Upperside.

Forewing. Veining in the majority of specimens with more dark scaling than in nominate *sardonyx;* inner edge of distal band more crenulate in specimens in which the veining is well darkened. Inner-marginal area below vein 1 always more or less dusted with dark scaling, and to such an extent in some specimens as to obscure practically all the tawny-orange background in area 1.

Hindwing. The veining, as a rule, noticeably dark-scaled.

Underside.

Forewing. The postmedian spots often reduced to four spots (sometimes virtually three) and with their black rings obliterating or reducing the size of the silvery-white centres. (A fifth spot of the series below costa, in area 7, very much reduced in size, if present; and generally without any light centre.)

Hindwing. Wing-surface (like apical and distal-marginal areas of forewing), in fresh specimens, usually of a beautiful purplish-lake colour (in some, of a less rich tone) and devoid of the silvery-white lines (two short, below costa, and one long, postmedian) which are so characteristic of nominate *sardonyx.* In some specimens the darker bordering of the postmedian line may be indicated to some extent, while the lighter, rather triangular patch adjoining the inner margin towards the apex is always at least partially apparent.

Length of forewing (of specimens under examinaion): 15·75-19 mm.

Description of the neallotype female.

Upperside.

Dark markings well developed but these, as well as the partly dark veining, less heavily so than in some paratypes.

Forewing. Postmedian black band continues broadly down to a large black patch in lower angle of wing—the band thus not broken or partially broken, or reduced in width, at its lower end as is often if not always the case in nominate *sardonyx*. Inner edge of distal band fairly crenulate—in some parataypes, hardly so. Area below vein 1 dusted with black scaling as in the male of *peringueyi*.

Hindwing. Postmedian band, with very jagged edges, continues broadly (though tapering somewhat) down to vein 2 and then narrows abruptly and ends as a small patch of diffuse dark scaling—in contrast to the band in nominate *sardonyx* which is normally very narrow below vein 4, or may be fragmentary or even absent below this vein. The slight projections at ends of veins 2-4 (in addition to the main projection at the end of vein 1b) less apparent than in nominate *sardonyx*.

Underside.

Differs from nominate female, as regards all wings, in same respects as does the male of *peringueyi* (as indicated above) from that of nominate *sardonyx*.

Length of forewing: 21 mm., in neallotype; 20·5-21·5 mm., in paratypes.

In both sexes of *peringueyi* the underside of the thorax and the abdomen as a whole are of a more purplish-lake coloration than in nominate *sardonyx*, this also applying to the antennae and palpi, at least above, the frontal scales and hairs and the legs, mainly above.

♀ Neallotype, Western Cape Province: Het Kruis, Piquetberg Division, 24.viii.1969 (C.G.C.D.); British Museum Reg. No. Rh. 17142.

Paratypes presented to British Museum (N.H.), data as neallotype, 2 ♀♀.

Paratype in Naturhistoriska Riks-Museum, Stockholm, data as neallotype, 1♀.

Paratype in Coll. Transvaal Museum, data as neallotype, 1 ♀.

Paratypes in Coll. Mrs. J. Sipser, data as neallotype, 4 ♀♀.

Paratype in Coll. W. H. Henning, data as neallotype, 1 ♀.

Paratype in Coll. V. Pringle, data as neallotype, 1 ♀.

The male type of *peringueyi* is in a rather rubbed condition and has clearly suffered from fading due to its age, but all the characters are clearly apparent. The dark markings of the upperside are moderately well developed, and those of the forewing underside are quite characteristic of this race. The veining of the upperside is not noticeably dark-scaled in this specimen. Length of forewing: 19·5 mm. The locality label is inscribed "Clanwilliam Leipoldt 1898," another label "Phasis sardonyx var. or new sp." and a third label "var. Peringueyi Auriv." A red label bears the numbers 307 and 69, with the second below the first. The collector of this specimen can be assumed to have been the late Dr. C. L. Leipoldt.

The male specimen which is figured is particularly darkly marked on the upperside, but it is not unusual for specimens to have the black markings of the upperside as a whole, though not necessarily the marginal bands, more heavily developed than those of nominate *sardonyx*.

It should be mentioned that Het Kruis is situated within a few miles of the Clanwilliam Division and is in the same type of country.

The two butterflies might well, in the writer's view, prove ultimately to be separate species. The male genitalia are very similar to one another. From a limited number of preparations which have been made, some small differences have been apparent, but not all of them constant. The male genitalia of *Phasis sardonyx* have been figured and referred to by the late Rev. D. P. Murray in Anns. S. Afr. Museum, Vol. XLIV (Nov. 1958).

Phasis sardonyx peringueyi is widely distributed in the North Western Cape—commencing, from available records, as far to the south as the northern end of Piquetberg Mountain, and extending up to the more northern portion of Namaqualand. It is partial to hillsides and small valleys or kloofs, as at Het Kruis and near Clanwilliam, and both sexes can be decidedly plentiful in such places. It has also been found at a considerable height on a mountain S. of Doorn River (well S. of Van Rhyn's Dorp). The males especially have a quick and rather irregular flight, but generally settle frequently, on the ground, as a rule, while the females often alight also on shrubs—and more frequently than do the males. This insect is attracted to a wide variety of flowers. The butterfly emerges at least as early as the middle of August and, from the writer's observations, specimens are usually in poor condition by the end of September. This butterfly has been taken by a good many others within the past 20 years—including the late R. Badham, N. A. Brauer, D. Brown, Dr. P. R. D. Dryburgh, Dr. J. Kaplan, Dr. D. Kroon, K. M. Pennington, Mrs. R. J. Southey, R. D. Stephen, D. A. Swanepoel, W. Teare and C. W. Wykeham.

Emergence seemed to be practically at its height when Het Kruis was visited by the writer and Mrs. June Sipser and the present material obtained, on the date recorded.

Nominate *Phasis sardonyx* has been caught in good condition near Montagu in about the middle of November—as well as in late September (Duke)—and, from the data on other specimens in the writer's collection, it has been taken at Oudtshoorn in December (Duke), near Beaufort West in December, January and late February, near Cradock in December, at Carlton in December (Clark), at Steynsburg in November (Mrs. Southey) and near Colesberg in December; and it has been observed between Philippolis and Trompsburg, in the Orange Free State, in January.

While no details of the life-history are known, *peringueyi* was once observed ovipositing on a species of *Aspalathus* (Leguminosae), by Dr. Dryburgh, at Clanwilliam (*vide* J. ent. Soc. Sth. Afr. 28: 17 (1965)).

When corresponding with him in connection with *peringueyi* and its higher status, Mr. G. E. Tite suggested that the writer might himself accord the butterfly the treatment it has been given in this paper.

Very sincere thanks are due to Dr. Inge Persson of the Naturhistoriska Riks-Museum, Stockholm, for his courtesy in sending on loan to the writer the male type of this insect.

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

Butterflies in Scandinavia, 1969

By Major General Sir George Johnson, K.C.V.O., C.B., C.B.E., D.S.O.

Short visits to Abisko in Swedish Lapland in 1960 and 1964 produced a number of the interesting Arctic butterflies and inspired in me a desire to penetrate further into the wilderness to obtain the rarer species which live still further north.

I therefore planned a trip to Finnish Lapland with Kilpisjarvi and Karigasniemi as the main destinations. Both these hamlets lie on the Finnish-Norwegian frontier on the roads out of Finland which terminate respectively at Tromsö and Hammerfest.

My wife and I left England in a Dormobile Land Rover by the Immingham-Göteborg ferry, landing in Sweden on 16th June after a very good 26 hour crossing of the North Sea.

We planned to motor up Sweden to Rovaniemi, the capital of Finnish Lapland hoping to get a few butterflies en route. In particular we heard that *Coenonympha hero* L., *Lycaena helle* Schiff. and *Carterocephalus silvicola* Meigen. were to be obtained near Lake Siljan in Central Sweden.

On 17th June en route for Örebro we stopped for lunch at a small forest clearing recently replanted. Here were a few common butterflies, *Mellicta athalia* Rott., *Clossiana euphrosyne* L., and *Pararge petropolitana* Fabr. My wife produced a small butterfly in a box and said "Is this any use?" It was a very fresh *Coenonympha hero* L. which she had caught round a small clump of birch and sallow! Further search of the clump produced one more. Next day between Örebro and Leksand on Lake Siljan we stopped in an open area of the forest by a small stream bordered with birch and sallow. Almost immediately we came again on *hero* and found quite a number, again in very fresh condition. After arrival at our hotel at Leksand we went out again and about two miles north on the Rättvik road found a bushy and flowery clearing where *hero* was really numerous. We also took here a single rather worn female *helle*, but failed to find *sylvicola*. *C. hero* seems to be quite widespread in this part of Sweden as on our only three casual stops we found it.

A short stop by a moss between Sundsvall and Umeå on 20th June produced an example of *Coenonympha tullia* Müll. much like the Scots form. Otherwise we saw little else of interest until we had crossed into Finland at Haparanda. The weather was perfect, roads were mostly good, but the journey was rather monotonous. There were endless vistas of pine and spruce enlivened occasionally by animal warning signs depicting a large elk. Needless to say no elk were seen.

On 22nd June we stopped 44 miles south of Rovaniemi to investigate a small moss bordered by a strip of birch and small spruce. No sooner had we entered the strip than a large black butterfly got up—*Erebia embla* Thunbg. The moss was rough going with many holes, and *embla* was by no means easy to catch, but we got a few, including two females before the disappearance of the sun put and end to sport. The butterflies were in fair, but not absolutely fresh condition.

We were due to stay at Rovaniemi for three nights and had been told of a locality for both *embla* and *Oeneis jutta* Hübn. on the outskirts of the town. This we failed to find, so returned to our locality of 22nd June where we got a few more *embla*. A few miles nearer Rovaniemi we found a large moss with a strip of small trees and bushes, and here again *embla*

was flying. We finally made up a reasonable series after discarding a number of worn specimens.

June 24 was overcast. We found a small bog on the outskirts of Rovaniemi corresponding to the locality of which we had been told, but on visiting it in sunshine next morning, there were no butterflies and only a duck wigeon with a family. We went to Kilpisjarvi where we arrived at the comfortable Tourist hotel on the lake (jarvi=lake in Finnish). It is a few miles from the Norwegian frontier on the road to Tromsö. It is dominated by a 3000 ft. hill, Saana, just east of the road. This hill is the best butterfly ground with *Clossiana chariclea* Scheven, as the main prize. The foot of Saana is a birch zone, mosquito infested, which has to be got through before reaching the butterfly ground. A path goes up from just beyond the petrol station about one mile north west of the hotel, elsewhere the going is distinctly rough.

Our stay 26th June-6th July was rather handicapped by lack of sun. On two days it was so overcast that it was not worth while going up the hill and on several other occasions the day had a distressing tendency to cloud over just as we had struggled up through the birches. The birch zone contained no butterflies except an occasional *Erebia pandrose* Borkh. in the more open spaces. The north west slopes of Saana, to which the path leads, were crossed by occasional *Colias nastes* Bdv. and we secured a very fresh male and female which stopped to investigate a flower on 2nd July. A few fresh *Oeneis norna* Thunbg. were found in various places not very far above the birch line. Round the top of Saana on the south west side runs a low escarpment of rock. Below this on very steep ground we saw one or two foxy red small fritillaries, probably *Clossiana chariclea* but we failed to catch one. Here also we saw a single *Pyrgus andromedae* Wallgrn. We several times worked another area just above the birch, going up through it close to the hotel. Here on the edge of the birch we saw a few fritillaries, but only got three, one *Clossiana thore* Hübn. and two *Boloria napea* Hffmsg. *O. norna* was fairly common on the same ground, and we found one colony of *Vacciniina optilete* Knoch. fresh on 4th July.

Of birds, a pair of rough-legged buzzards was nesting near the top of Saana, we saw one snowy owl and a pair of bluethroats had eggs close to the hotel. We twice saw a cock Ryper close to the hotel, and a splendid collection of house martins were occupying a double row of nests low down just above the hotel door. They were very busy with the mosquitoes!

We left Kilpisjarvi on 6th July for Ivalo on the Rovaniemi-Karigasniemi road, arriving there on 8th July. The hotel was comfortable, but 84 miles from the hill Ailigas at Karigasniemi which we wanted to work for *Oeneis bore* Hübn. and *Clossiana polaris* Bdv. It was, however, the nearest place in which we could book accommodation from England. Luckily all but twelve miles of the road was very good. Ailigas is a rather isolated 2000 ft. hill with a wireless station on the top overlooking the Tana river and the Norwegian frontier. It is fairly easy of access by a path through the birch zone, the summit being about two miles from the road. The hill has a stony flattish top with fairly steep slopes crossed by many large stones in screes (or cairns as they would be called in Scotland). This is the main collecting ground for both *C. polaris* and *C. chariclea*. Luckily the stones are not too large, not slippery, and firmly anchored, so the cairns can be crosed with ease.

O. bore for the most part patronises the hilltop where I saw a dozen or more at once flying round one of the summit cairns.

We stayed at Ivalo until 14th July but on only two days was the weather good enough to justify starting on the long drive to the hill. Even on these two days the sun was only intermittent once we had got above the birch.

The first day, 10th July, we started ascending the cairns to the south east of the summit. Halfway up I saw a small foxy red fritillary flit past and settle on a patch of grass. I got my net over it and boxed it, and had the pleasure of seeing a completely new insect to me, with conspicuous large silver-white spots near the base of the underside hindwing — *C. chariclea*. Shortly afterwards we took *C. polaris*, also with a most distinctive underside. I made my way on to the top where *O. bore* was not uncommon but alert and not too easy to stalk. Frequently we had to suspend operations when clouds crossed the sun, but secured 9 *bore*, 2 *chariclea* and 3 *polaris* before descending.

On 12th July, a brilliant day at Ivalo we found the sun on Ailigas even more intermittent and after a good deal of work secured 5 *bore*, 1 *chariclea* and 3 *polaris*. One or two of the polaris were past their best. We had hoped to find *Erebia medusa polaris* Stdgr. in the birch zone where it had apparently been common in previous years, even along the roadside. We saw none; perhaps we were too late for it. On this day I saw a bird new to me in the birch, a Siberian jay.

What with unreliable sunshine, steep ground and difficulty of access, these rare Lapland butterflies take a great deal of work if a good series is to be secured, and probably several seasons are required. They go over quickly and their date of emergence is very dependent on weather. The mosquitoes are a curse, and an effective repellent must be used. The country is magnificent and a true wilderness. The road should not be left light-heartedly by those with no great experience of keeping direction in trackless wastes. Butterflies are not usually thick on the ground, but they make up for this by their interest and rarity compared with most European species. Only localities with easy access have been much collected. There must be many better ones which could only be reached by a proper expedition equipped with pack ponies and camping equipment. It is not an old man's country!

24.ix.1969.

LEUCANIA L-ALBUM L. IN THE WEST END OF LONDON.—On 28th October 1969, soon after mid-day, I was walking from Bond Street Station to Claridges. In Davies Street, a few yards from the hotel, I noticed a moth tucked into the angle of a window frame; I was able to capture it and can, therefore, confirm with certainty that it is *l-album* and is in excellent condition.

I do not know any record of this species being reported from near London. The moth is an active migrant, and perhaps the recent exceptional weather encouraged it to move northwards. Alternatively, it may have travelled from the south coast by Rolls Royce. However it reached Claridges, it was a pleasant appetiser to lunch. — J. A. C. GREENWOOD, The Thatches, Forest Road, Pyrford, Woking, Surrey. 29.x.1969.

Ireland 1969

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

As customary I spent the summer in Ireland at Dingle, arriving on June 11th and leaving on September 10th. For the first fortnight I was accompanied by my niece, Mrs Esmé Burn, but this rather assisted collecting than otherwise because, as she had never visited Ireland before, I often went out when I might otherwise have taken things easy.

Unlike the weather in England, we had quite a lot of rain and mountain mist which made collecting on the higher ground rather difficult.

I came over on the new car-ferry from Swansea to Cork, named "Innisfallen" after my old favourite, and was pleased to find many of the crew had transferred to the vessel with her name.

When we reached Tralee station on the 11th there was a white butterfly fluttering on the station window. It turned out to be a perfect female *Euchloë cardamines* L. As I had no boxes, I tipped my matches into my pocket and succeeded in boxing it without any damage. It was quite fresh and had the hindwings suffused with light saffron. This is by no means constant, I have taken females with white hindwings, whilst the best I have ever seen was one from Tyrone given me by my late friend Greer, in which the tint was almost golden. It is also said that the male is often suffused with yellow on the underside of the forewings; I recently checked my series from Glenagarriff and the Burren and found not one of these possessed this feature although one of my three Kentish ones did. I therefore netted over a dozen at Dingle, and again, not one was suffused.

I found Dingle in a state of some excitement; Faraway Productions were making a big film called "Ryan's Daughter" and almost every spare room in the town was occupied. In one scene butterflies were to appear and the only pupae obtainable at the time were those of *Gonepteryx rhamni* L. I was asked how to keep them and feed the butterflies, and am glad to say they emerged and lived some time. I am also glad that they all died before they were done with, as I did not want English *rhamni rhamni* L. to be loose in a country devoted to *rhamni gravesi* Huggins, though as there was no buckthorn for twenty miles at least they could probably not have done much harm. I well remember poor Philip Graves's rage in 1952 when an English enthusiast wrote suggesting that English *rhamni* should be released in parts of Ireland where buckthorn grew but there were no brimstones. As in England, it was a tremendous year for butterflies, particularly non-migrants. This could not be due to the weather, which was a good deal worse than in 1967, let alone the *annus mirabilis* 1958. The outstanding insect was *Nymphalis io* L., which occurred literally in thousands. When I first arrived the nettle beds were almost eaten up by the larvae, and towards the end of July the butterflies were everywhere. In early August I got a lift to the Connor in a car going to Tralee, so was up in the Brandon range about 2600 feet when it was still a bit cold and misty. To my astonishment I put up an *io* which flapped away feebly, I caught it with my hands and let it go. An hour later, when the sun was up, I saw at least a score flying happily about: what they were doing goodness knows, for flowers at that height are few and we were nearly 2000 feet above the nearest nettle bed. As my nice little girl student (long since qualified

and vanished, alas!) would have said "They were Irish peacocks."

Immigrants in 1969 were generally scarce and late. It was not until July 13th that I saw the first, a *Plusia gamma* L. The next night this moth occurred again together with a *Nomophila noctuella* Schiff. and thenceforward these two occurred fairly regularly, *gamma* every night but never commonly; *noctuella* usually at intervals of a day or so. On June 23rd there was a large rather pale female *Colias croceus* Fourcr. laying eggs on white clover on a bank by the side of the Dingle-Tralee road about a mile from the town. I could easily have caught her but left her to carry on the good work. On the 25th there were three males at Ballydavid and on August 2nd one in the middle of the town where the four main roads cross. There was only one worn *Laphygma exigua* Hübn. and a few *Hapilia martialis* Guen. towards the end of my stay. I also saw two or three *Vanessa cardui* L. and several *V. atalanta* L.

I was very surprised in August to take an *io* in my mercury vapour light trap. I never set this until very late dusk and cut it off at dawn, yet last year (1968) took both *Aglais urticae* L. and *Parage aegeria* L. in it at Dingle. I have also in the past taken two *Macroglossum stellatarum* L. at Tresco, and several *V. atalanta* in my garden here at Westcliff, where also *Orgyia antiqua* L. occurs annually in small numbers if I set the trap at the right time of year, and I twice took *Thecla quercus* L. at a pressure vapour lamp at Ranworth over thirty years ago.

Mr Alan Wheeler paid me two fleeting visits during my stay; during the first it blew a hurricane so collecting was impossible except for *Silene* heads. On the second he found three eggs of *cardamines* on rocket (which grows locally as a garden escape) near Ventry. He kindly gave me these and I reared the larvae in a jam pot on my dressing table; one succeeded in penetrating the collar to the water and drowned itself when full fed, but the other two pupated successfully and I am hoping for a lemon-tipped male and a halved gynandromorph next spring.

As I have written on Dingle so much before I shall only mention those insects that seem worthy of note:

Notodonta ziczac L. I took specimens of both broods and the beautiful silvery form appeared in both in about equal numbers to the typical form. I have never seen this form except at Dingle.

Spilosoma lubricipeda L. (white ermine). A light chocolate coloured male, the darkest I have seen from Ireland, in colour equalling my Aberdeen ones.

Apatele euphorbiae Fabr. I took a newly emerged male at my mercury vapour light on July 15th. There are two broods in Western Ireland, at the end of May and beginning of June, and the end of August, but I cannot account for this July one. The August ones are undoubtedly second brood, and not a deferred first one, as both Donovan and Mr Baynes have reared them from July larvae. I was with Mr Baynes when he found one of these at Slea Head. The Kerry form is quite unlike the Burren one; it is almost uniform dark grey like the Highland ones whilst the Burren form is much paler grey with distinct darker markings.

Graphiphora augur Fabr. I took a couple. Mr Baynes (p. 25) has no Kerry record. The one I kept is much darker than my Kentish ones, but these may have faded.

Amathes xanthographa Fabr. comes out as early as mid June at Dingle. A few are plain reddish with no markings.

Diarsia rubi View. Amongst the melanics I usually find in Western Ireland, I took one that may fairly be called black.

Cerapteryx graminis L. On August 12th when the sun was out at midday this moth was flying in hundreds at between 2500 and 2600 feet on the Brandon range. I netted about a dozen with some difficulty but they were exactly the same as those in the garden trap.

Luperina nickerlii s.sp. *knilli* Boursin. On August 5th I took a rather worn specimen at mercury vapour; I consider it had been on the wing at least a week, which brings it to the end of July. There is no doubt it has a prolonged emergence period and is often looked for too late. In mid August I took two more quite fresh ones in the trap. These Dingle insects when fresh (I have now taken six, five fresh) are as black as *cespitis*, much darker than Inch or Anascaul ones, even when they are bred.

Eustrotia bankiana Fabr. In early July Lieut. Col. and Mrs Adler took me for a day's run in Kerry. It was not much of a day but I took a rather worn specimen of this moth between Caragh and Windygap, which seemed to be an extension of its range.

Plusia festucae L. Common throughout my stay; still no *gracilis* Lempke.

Dyscia fagaria Thunb. Three in the trap; these Dingle peninsula ones (I took three last year at Inch) are smaller and much whiter than my New Forest ones.

Cryphia muralis Forst. During my usual wall inspection I took a large grey insect nearer to *impar* Warren than any Cork ones I have seen.

I saw most of the usual birds; I am a sort of a conductor to those who want to see choughs, rock-doves and fulmars. This year, however, I was greatly pleased to watch an Irish dipper for several minutes, feeding and playing just above the water-splash on the Slea Head road. Although I have more than once seen the bird near Dunquin, I have never had so good a view before.

I also saw two turtledoves. Mr King tells me the bird seems to be extending its summer range in Ireland, and a collared dove was feeding tamely on the road near Ballydavid.

Subscriptions for 1970

The Hon. Treasurer is pleased to let subscribers know that the subscription for 1970 is being maintained as at present, 35/- for Great Britain and Commonwealth and £2 for other countries, in spite of greatly increased costs in producing the Magazine.

As subscriptions are now due it would be appreciated if members who pay their subscriptions other than by Banker's Order would please do so as soon as possible, without waiting for a reminder, so as to keep expenses as low as possible.

Assembling *Pachythelia villosella* Ochs.

By E. A. Sadler

While crossing a New Forest heath near Ringwood, a favourite collecting ground of mine, in company with Mr P. Rogers, on the evening of June 11th, 1969, I chanced upon a large female case of *P. villosella* attached to some short heather. As I stooped to pick it, a male flew direct and briskly to me; I netted this, and after boxing it I again picked up the hastily dropped case, and two males arrived together to be promptly netted and boxed, during which time two more males arrived together and were chased by my companion but he failed to catch them. After this hectic confusion, which took place at 8.45 on a sunny evening, we spent some minutes trying to locate the dropped case, which we eventually gave up as lost, only to find it in my net when we made to leave the area.

As no more males had arrived we assumed that their flight had ceased and the case was taken home by me that night.

It was noted the next day that the case had one end open in a tubular fashion where the night before it had been closed, and closer inspection revealed the brown shiny head of the legless and wingless female just visible within. The same evening I returned to the heath unaccompanied this time, and with the female in a perforated zinc sided assembly cage which I placed on the spot where she had been found, the time being 8 p.m. and again sunny. A male immediately arrived and was netted, but as no more were seen during the next quarter of an hour, I spent the following thirty minutes walking up other lepidoptera on the surrounding heath, during which time the cage was kept in sight, and to which nothing had assembled. The previous night's time of 8.45 having now been reached, I opened the cage for closer examination of the female, which I feared was not "calling"—though how one may know this when she remains within the pupa case as well as the cocoon I have still to discover—and directly I touched the female case, a male arrived, to be followed during the next twenty minutes by fifteen more, but only by my handling the case each time, for while left on the ground whilst handling the lively incoming male and struggling to box him (at the same time being eaten alive by mosquitoes) nothing would assemble until I again handled the cocoon, when, as if by magic, another male would arrive.

All males first appeared at about ten yards down-wind, and circled rapidly up to and around the female, the latter being a feat usually beyond *Saturnia pavonia* L. males, which I have assembled on this same heath. If they happen accidentally to pass the female (up-wind), they lose her scent and go careering off after another conquest, whereas *villosella* continues to circle the scent source repeatedly, gradually reducing the circuit.

At 9.5 p.m., with enough males for my purpose, I packed up the "forced" assembly and instead searched the heath for more cases, finding two female ones. On June 21st one of these was seen to have an open end, and contacting another friend, Mr P. Meredith, arranged a meeting with him for another try at assembly that evening. We met at 8.45 on the heath just after the sun sank behind heavy cloud. I commenced handling the case, and two males arrived to be netted by my companion, but no

more could be persuaded, despite my continued handling, for a considerable time, and this unfortunately led to the bursting of the female. I had hoped on this occasion to allow a male to have access to the female to see just how pairing can take place in such peculiar circumstances, but I will now have to restrain my curiosity for another year and another female.

Something else about this species I have never understood, is where the males are when not assembling, as I had never previously seen them apart from the above-mentioned examples, in spite of a number of visits to this, and other *villosella* localities over the years at all times of the day and night. Dare I suggest that perhaps they spend most of their time wandering around female cases trying to find a way of pairing?

Another curious thing, considering the sedentary nature of the female, is how the species appears suddenly to move perhaps a mile from the last known place where cases were seen, in the space of one season. One wonders if perhaps newly hatched larvae spin silk and allow themselves to become wind-borne as do young spiders. A strong wind at the correct time of year causing the colony to take a long leap away from its usual breeding ground. 21.x.1969.

Isle of Canna Report for 1969

By J. L. Campbell

On the 18th of June 1969 thirteen months of almost continuous good weather, unprecedented in the Hebrides, came to an end. Thereafter there was a good deal of rain and wind, interspersed with a few fine spells in which lepidoptera, built up in numbers during the fine summer of 1968 and spring of 1969, were more numerous than at any time since the famous summer of 1947. There were also several prolonged spells of fog in July, which did not interfere with catches in the moth trap, though they were useless for anything else. It was not until early September that the island streams recovered their normal flow of water.

All species of butterflies were markedly more numerous, particularly *Pieris napi* L., of which hundreds could be seen flying over arable ground, in gardens and around plantations on any fine day during the emergence of the second brood. *Pieris brassicae* L. was also very common, its larvae destroying our cabbages. *Aglais urticae* L. and *Argynnis aglaia* L. were again in evidence at the east end of the island, where a batch of about 200 larvae of the former were found on a favoured patch of nettles, and where *Brenthis selene* Schiff. was seen for the first time—hitherto it had been confined to a small area on the south-facing cliffs of Sanday.

A single specimen of *Pararge aegeria* L. was seen on the 1st of August in the identical spot where one appeared in 1968. But searching of the plantations failed to discover any others. This butterfly was also observed by Dr. H. MacLean on the Island of Eigg, where a colony may very well exist, in addition to that on the island of Rum, as there are large and well-established woods on Eigg.

Of the migrants, *Vanessa atalanta* L. was not observed until 15th July, and thereafter was noted occasionally until August 8th. On September 8th full-grown larvae were found on the same sheltered batch of nettles

on which the *urticae* larvae already mentioned had been found two months earlier. These pupated about a week later. *Vanessa cardui* L. was only seen on August 9th and 13th and no larvae were found. *Plusia gamma* L. was not observed until July 25th. Thereafter it turned up in ones and twos in the trap fairly regularly. An unusual feature was that pale forms, usually associated with the early summer immigration, kept turning up until the beginning of September. One *Nomophila noctuella* Schiff. was observed on July 15th and two were taken in the trap the next night.

On September 19th a rather worn *Herse convolvuli* was taken in the trap, a year and a week after the last one. Thereafter the weather changed into winter almost instantaneously. There was a half gale on September 20th and a full storm on the 21st and again on the 28th, and in between a week of wind and rain except for the 27th which was a 'pet day.' The completeness of the change can be demonstrated by the fact that on the morning of September 19th there were 266 moths, of 27 species, in the trap; on that of the 28th, when the trap had to be brought in at 12.15 a.m. because of the return of rain and wind, there were 5 moths of four species.

The season as a whole produced more moths in the trap than ever before, 12,272 moths on 82 nights, up to October 22nd. As usual, a number of common species provided a substantial part of the catch. *Triphaena pronuba* L., 2,175; *Cerapteryx graminis* L., 1,274; *Xylophasia monoglypha* Hufn., 1,224; *Apamea secalis* L. 617; *Triphaena ianthina* Schiff., 523, together provided 5,813 or nearly half the total. Others were: *Orthosia stabilis* Schiff., 364; *Diataraxia oleracea* L., 292; *Orthosia gothica* L., 287; *Orthosia incerta* Hufn., 255; *Agrotis exclamationis* L., 242; *Hydraecia micacea Esp.*, 224; *Plusia chrysitis* L., 196; *Dysstroma citrata* L., 188; *Hada nana* Hufn. (*dentina* Esp.), 183; including some fine dark forms; *Luperina testacea* Schiff., 157; *Cerastis rubricosa* Schiff., 148; *Amathes xanthographa* Schiff., 146; *Omphaloscelis lunosa* Haw., 145; *Dysstroma truncata* Hufn., 135.

New species continue to turn up here, and this season *Harpyia furcula* Clerck, *Trichiura crataegi* L., *Leucania lithargyria* Esp., *Nothopteryx polycommata* Schiff. and *Lomaspilis marginata* L. were taken for the first time.

The dreadful weather at the end of September and beginning of October appeared to have killed the season, and certainly must have done much damage to the autumnal species as well as to the locally bred *V. atalanta* which were (in captivity and presumably outside) emerging at that time. But in the middle of October the warm weather which had been affecting most of the rest of the country reached us at last and brought some surprising effects with it.

Saturday, October 18th was fine and warm and numerous specimens of *P. gamma* were observed in various places in the day time, and at night on veronica blossoms. On October 19th there were 27 *gamma* in the trap and 3 *noctuella*, as well as ten other kinds of macros. On the 20th there were 37 *gamma*, 40 *noctuella*, 13 *Udea martialis* Hübn., and a male and female *Nycterosea obstipata* Fabr. in the trap. In 1966, the great *gamma* year here, the largest number taken in a single night was only 33, on 18th September; *noctuella* has never turned up in such

numbers before, and *N. obstipata* has only been taken once before here, on 8th October 1966. On the 21st October the migration had moved on; there were only 8 *gamma* and 2 *martialis;* on the 22nd, 11 *gamma*, 3 *noctuella* and one *martialis*. All the *gamma* were very fresh. As I then had to leave Canna for a month, further investigations were impossible, but such numbers indicate a probable large influx in the country generally.

Some Butterflies in the Massif Central, 1969

By M. R. Shaw

Although two papers dealing with the butterflies of the Massif Central have recently appeared in the Entomologist's Record, it seems appropriate to supplement these with the rather different experiences that I have had in this exceptionally late summer. By and large I covered the same ground as did Mr. R. F. Bretherton in 1966, and at roughly the same time of year.

Accompanied by my parents, who are fortunately resourceful enough to appreciate the remote and beautiful countryside that goes with collecting butterflies without themselves being collectors, I left England on June 25th, making straight for the deciduous woodland of the Loire valley. Here I hoped to find *Araschnia levana* L., and eventually I found a nest of young larvae together with some more nomadic final instar larvae near the Forêt de Loches, which produced a fine series of f. *prorsa* L. with one of the females approaching f. *porima* Ochs. I was also pleased to take *Mellicta athalia athalia* Rott. and some *Glaucopsyche alexis* Poda. An unexpected capture was *Brenthis ino* Rott., seen in one place only and flying very much faster than I have noted in previous experiences in the Alpes-Maritimes and the Basses-Alpes. I spent a lot of time looking on sallow for the early stages of *Apatura* species without success, and neither could I find *Hemearis lucina* L. on primrose. I was also hoping to take *Carterocephalus palaemon* Pall., but all I could find was one worn male. A few *Limenitis camilla* L., one worn *L. anonyma* Lewin and a pair of *Maculinea arion* L. completed the interesting species I found in the area.

We then pushed on to Chambon in the Monts-Dore, arriving late in the afternoon of June 28th. Almost immediately I found a colony of *Parnassius mnemosyne* L. in the woods stretching above the village towards the Col de la Croix Morand. The males were very fresh, with the females only just starting to emerge, and I easily collected a short series by looking among the grass heads for specimens at rest with their wings extended as this habit makes them very conspicuous. The next day we went up to the Vallée de Chaudefour where I took several *Lycaena helle* Schiff. among *Polygonum bistorta* on very wet ground; the condition of both sexes ranged from very fresh to incredibly tatty. The females seemed easiest to find by watching the *Polygonum* heads but the males apparently prefer to rest on green foliage. Here I also found several very fresh *C. palaemon*, the imagines feeding exclusively on *Geranium*. A short search among the same plant soon produced two only of *Eumedonia chiron* Rott., both very fresh. I have always found

this species to be exceedingly local, and often on small sparse patches of *Geranium* in preference to more lush and extensive growth a few yards away. A single final instar larva of *B. ino* was found on *Spiraea*, and other buterflies seen in large numbers included *Erebia oeme* Hübn., *E. epiphron* Knoch., *E. meolans* de Pr., *Clossiana selene* Schiff., *C. euphrosyne* L. and *Anthocaris cardamines* L. which was still fresh. A single very worn *Nymphalis antiopa* L. was struggling around some sallow scrub, which prompted an unsuccessful search for young larvae. Lower down I was pleased to see some fresh *P. mnemosyne* in a very localised patch which I had missed on the way up. A species which was seemingly absent early in the day was *Erynnis tages* L.; despite a full day's sunshine I saw none until about 3.00 p.m. when plenty appeared.

On June 30th we worked the ground up to the Col de la Croix Morand from Chambon, keeping to the wooded area since higher up it was cold and windy and in spite of full sunshine nothing much was on the wing. In the woods I found a few rather worn *H. lucina* flying with fresh *E. oeme, E. epiphron, E. meolans, P. mnemosyne, Cyaniris semiargus* Rott., *E. chiron, Melitaea diamina* Lang, *Mellicta parthenoides* Kef., very variable *Euphydryas aurinia* Rott. and worn singles of *Callophrys rubi* L. and *C. palaemon.* In the afternoon we again visited the Vallée de Chaudefour, where I confirmed my suspicions of the previous day that both *C. palaemon* and *L. helle* prefer to fly in the fresh morning sunshine rather than in the more oppressive heat later on. I saw only one of the former and two of the latter. The next day, July 1st, was our last day in this area, and we worked some of the ground between Le Mont Dore and the Puy de Sancy. In the town itself I saw what was probably *Apatura ilia* Schiff. flying quite low in a garden, but it kept well out of reach. Then at the Grande Cascade just outside and above the town I was pleased to find a single worn example of *L. helle.* The ground from here to the Vallée de Chaudefour, about two miles away, is mostly high and frequently marshy, and it seems probable that *L. helle* has a good solid stronghold over this rather inaccessible terrain. At the Grande Cascade I also took a single fresh male of *Palaeochrysophanus hippothë* L., but by now the fine weather was breaking and when we moved higher on to the Puy de Sancy all we saw was *E. epiphron,* though in considerable numbers.

July 2nd saw us driving southwards to Le Lioran in the Mts. de Cantal, where we arrived an hour before a thunderstorm. The meadow where Mr. Bretherton found *Erebia sudetica* Stdgr. in 1966 has since taken a terrible hammering from the winter sports industry, and little likely-looking ground remains unspoiled. Whether or not *E. sudetica* still exists on that particular patch of ground is difficult to say; I found no trace, but I was probably too early and the weather was not helpful. The promised storm duly broke and we left, heading south-east for Meyrueis in the gorge of the Jonte. The weather steadily improved and in the afternoon I saw the first *Aporia crataegi* L. of the holiday.

We spent the night on the way and arrived in Meyrueis on July 3rd, having spent most of the day collecting in the Causse de Sauveterre where I caught a single fresh female *Agapetes russiae* Esp., and *Melitaea cinxia* L., *M. phoebe* Schiff., *Mellicta athalia celadussa* Frhst., *M. dejone* G.-H. and *M. parthenoides* in varying numbers. Here I also saw a single

worn *Pararge aegeria aegeria* L. flying among some stunted juniper bushes, which hardly provided the shady habitat one normally associates with this species. (I later saw it again in similar surroundings on the summit slopes of Mt. Aigoual; this time there were at least three). A few Lycaenids were also flying, mainly *C. semiargus* and *Cupido minimus* Fuessl., with a few worn *Lysandra escheri* Hübn. and *Polyommatus icarus* Rott.

On July 4th we collected from Meyrueis towards Lanuéjols, stopping first at the top edge of the Forêt de Roquedols. On the grassy slopes I took several *M. arion* together with a few of the more common "blues," as well as larger numbers of all the *Mellicta and Melitaea* species I had seen earlier in the Causse de Sauveterre. *A.crataegi* was also very abundant, and a little further on there was a small and very localised colony of *Maculinea rebeli* Hirschke. Here there was far less *Gentiana lutea* than in many of the places both nearby and elsewhere where I had failed to find this species. Then further on into the Causse Noir, south of Lanuéjols, we found a small fairly bare shallow valley at 850 m., with occasional stunted blackthorn scrub among the sparse grass, and here *A. russiae* was in profusion. Every specimen I saw was in perfect condition and a brief count of a sample of 25 showed males and females to be in roughly equal numbers. Previously, on the Mt. de Lure at 1600 m. on 26.vii.1968, I had found the species equally abundant, but in much more varied condition and with males apparently outnumbering females by at least ten to one. Also on the Mt. de Lure I had the impression that the species flies much faster and settles less frequently. From a short distance the sparsely grassy areas, which it seems to inhabit in preference to more genuinely bare ground in both localities, looked to be fairly thickly covered, but this illusion is a result of the height of the grass rather than its density. In the Lanuéjols locality there were also some streaks of rather greener grass, and I was delighted to find *Brenthis hecate* Schiff. quite common in, but local to, such areas. All the specimens I saw were very fresh males. Little else was flying here though I saw odd specimens of *L. escheri, Aricia montensis* Vty., *Strymon ilicis* Esp., *A. crataegi, M. athalia celadusa, Coenonympha pamphilus* L., *C. arcania* L., and *Adopoea flava* Brunnich.

The next day, July 5th, we went westwards across the Causse on the south side of the Jonte to Peyreleau. In the wooded area just above the village I caught quite an interesting selection, among them *Pyronia bathseba* Fabr. (fresh and plentiful), *Hipparchia alcyone* D. & S. (3 only, very fresh), *C. pamphilus, C. arcania, C. dorus* Esp., *Brenthis daphne* Schiff. (about 6 seen), *Argynnis paphia* L. (one fresh male only), *Heodes alciphron gordius* Sulzer (2 only, both worn), *Strymon spini* Schiff. (at least one among hundreds of *S. ilicis*) and large numbers of the commoner species. Here I also saw three specimens of *Agaptes galathea* L. (2 males and 1 female f. *leucomelas* Esp.), the first I had seen since leaving the Loire valley on June 28th. It was especially surprising to find *A. galathea* so late at only about 700 m. when *A. russiae* looked to be about on time; most collectors seem to have to work hard to pick out odd examples of *A. russiae* from swarms of *A. galathea*, as indeed had been my own previous experience on the Mt. de Lure, but this time I was able to look for it without such complications. I saw no more of *A. galathea* until

we were in much more parched and lower areas towards Avignon on July 15th, where it was well past its best. On the way back to Meyrueis we found a couple of rather localised but abundant colonies of *Coenonympha iphis* Schiff. flying with or very near *C. pamphilus, C. arcania* and *C. dorus.* At the same time I picked up the only two specimens of *Lysandra dorylas* Schiff. that I saw on the holiday, and several of the commoner species were again plentiful.

A thunderstorm on July 16th delayed our planned trip to Mt. Aigoual until after lunch, but even then the weather was mostly overcast and not warm. The summit was almost completely profitless, but lower down a few butterflies were around, notably *E. epiphron* and *E. meolans,* but obviously I had not seen the locality at its best, and there was no chance to make another visit.

We then moved north-eastward to La Bastide, which was to be our base for the remainder of our stay, where I was especially keen to take *Boloria sifanica* Gr.-Gr. and *Erebia ottomana* H.-S. The weather was unspeakably vile for six days, with strong and very cold north-east winds often bringing mist and driving drizzle, and there was little to do except explore as much ground as possible in case the weather improved. I spent a couple of days under six layers of clothing on the wild, high granite moorland around Les Salesses and to the north-east, looking for *Oxycoccus palustris* among the many bogs. Though I found several small areas in which *Oxycoccus* was growing, none looked to be extensive enough to support a colony of *B. sifanica* except the one just above Les Salesses mentioned by Mr. Bretherton. I also spent a bit of time hopefully sweeping the vegetation on the few sheltered corners of the Col de Meyrand, but needless to say I saw nothing of *E. ottomana.* I could not even find larvae of *N. antiopa* on the willow trees around La Bastide itself, and apart from a single female *Heodes tityrus* Poda the only bright event in this disappointing weather was a chance meeting with M. Puech, a local collector who promised to show us some of the good areas on the Col de Meyrand when and if the weather improved. At last, on July 13th, we had a calm and sunny day and were able to set out. M. Puech was as good as his word and on the northern slopes of the Col at 1100-1200 m. we took several interesting species, among them *P. mnemosyne* (some still quite fresh), *A. crataegi, A. cardamines* (mostly still fresh), one each of *E. chiron, G. alexis* and *Lycaena phloeas* L., *P. hippothoë* L. (males much smaller, darker and less shot with purple than the single male taken in the Monts-Dore, but the females were more or less typical showing no superficial tendency towards ssp. *eurybia* Ochs.), *Issoria lathonia* L., *M. diamina* Lang, *Clossiana titania* Hübn., *B. ino, Erebia euryale* Esp. (quite common and very fresh), *E. meolans* and *E. ottomana* (males very fresh and plentiful, only one female taken. This species apparently had not yet emerged at levels above about 1200 m., for we could find none at the top or for some way down on the north side of the pass). Surprising absences from the Col de Meyrand apparently included *E. epiphron* and *Maniola jurtina* L.

The next day, July 14th, was again perfect and we set out for Les Salesses, again with M. Puech, where we soon found *B. sifanica* on the bog, though not very commonly. All the specimens I saw were males and in very fresh condition, and they were all flying low over the bog

or at rest on the marsh foliage. I presume they must leave the bog (where there were very few flowers) to feed, but I saw no sign of this. I also caught the following species in or around the marsh: *E. meolans*, *E. ottomana* (one only), *C. pamphilus* (very common), *C. titania* (common, but I saw no females though several males were worn), *C selene*, *C. euphrosyne*, *E. aurinia* (abundant but very worn), *M. diamina* (rather few, very fresh), *M. athalia celadussa* (one only), *M. parthenoides* (few), *Mesoacidalia charlotta* Haw. (one only), *C. semiargus*, *M. arion* (few) and the odd *Pieris rapae* L. Later in the day, M. Puech showed me several places where he had taken *Parnassius apollo* L., but as we expected, it was not yet around and all we caught was a single fresh *Papilio machaon* L., the only one I saw this year. Back at La Bastide, I took a single very fresh *Heodes virgaureae* L., also the only example I saw.

The following day was our deadline for getting to Avignon where we were to put the car on an overnight train for Boulogne, and the only collecting I did was in a sweltering sun-trap in the low baked-up limestone hills just on the Uzès side of Alès, where we made a brief stop for lunch. Here I took a worn female *B. hecate*, a worn female *P. bathseba*, a fresh male *Thecla quercus* L. and some of the large Satyrids which were fully out. I also saw plenty of *Colias crocea* Fourc. and *C. hyale* L. (or perhaps *australis* Vty.) and large numbers of *A. galathea*, almost half the females of which seemed to be f. *leucomelas*. From here it was all too short a drive in the brilliant sunshine to Avignon, and the end of the holiday.

In all I had seen about 90 species, but in conclusion it seems worth mentioning that during the whole stay in the Massif Central I was struck by the extreme paucity of the Lycaenids. Though I saw six out of the seven "coppers" native to France, among the commoner members of sub-family Plebejinae things were different. I saw only one specimen each of *Plebejus argus* L. and *Lysandra bellargus* Rott., two of *L. dorylas* Schiff., none of *L. coridon* Poda and few of *L. escheri* Hübn., *Polymmatus icarus* Rott. and *Cupido minimus* Fuessl. All the above I regard as more or less common species over most of the south of France at that time of a normal year, and perhaps the comparative lack of this group expresses the lateness of the year as well as anything.

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Northamptonshire Migrants.—On 4th September 1969 I was pleased to find a specimen of *Herse convolvuli* L. at my mercury vapour light at Maidwell, and on 14th October 1969, two pupae, of *Acherontia atropos* L. were turned up in a potato field at Finedon and brought to me. One was damaged and died, the other has not yet emerged. Both these localities are in Northamptonshire.—P. J. Gent, 3 Irthlingborough Road, Wellingborough, Northants.

The Conservation of Black and Brown Hairstreaks

By J. A. Thomas

The Black Hairstreak (*Strymonidia pruni*) and the Brown Hairstreak (*Thecla betulae*) are both very local woodland butterflies, although their foodplant, blackthorn, is widespread and common. *S. pruni* is known only in a few Midlands woods whilst *T. betulae* is found very locally over a large area of the southern half of Britain and Ireland.

The widespread destruction of woodland habitats throughout Great Britain endangers both species with extinction, and their most hopeful prospect of survival in our fauna is probably on Nature Reserves. There are three supporting *S. pruni* already and several with *T. betulae*. Most reserves require careful management to maintain suitable conditions for such species of special interest on them, and many of us are concerned at our lack of knowledge about the factors regulating the distribution and numbers of these butterflies. Once this problem has been solved it should be possible to maintain some sites under optimum conditions to ensure the survival of large and healthy populations of *S. pruni* and *T. betulae* on a few Reserves although they are disappearing from many former localities. To this end I have been awarded a three year National Environment Research Council grant to investigate the problem at Monks Wood Experimental Station.

Blackie briefly examined the case of *S. pruni* in 1952. He considered its range to be delimited by the need for ancient forests on boulder clay of altitude below 400 ft. These must contain large quantities of blackthorn, have an annual rainfall of around 26 inches to 30 inches, and an average mean temperature of about 48°F. My preliminary investigations largely concur with his conclusions, although any clays, not necessarily boulder clay, will suffice. In addition cold dry winters and warm sunny summers seem more important than the average annual temperature, and the blackthorn must be mature and relatively sheltered from gales. The range of *T. betulae* suggests the need for a long warm summer for its lengthy period of growth and maturation. As yet there is insufficient data to explain why both insects are so scarce and restricted within their overall ranges; *S. pruni* for example, occurs only in limited areas within the few woods it inhabits.

The success of this research project requires the help of fellow entomologists, and already many have been extremely co-operative. I would greatly appreciate it if entomologists familiar with either insect in Great Britain or abroad, would contact me. Not only is it important to establish where the butterflies occur and where they do not, but also to discover any fluctuations in their status over the years, and all aspects of their Natural History that have been recorded. Disclosures of new localities would be treated with strict confidence should that be requested. In addition experiments to test theories require specimens of all stages of both insects, and should anyone have live British specimens of either species I would be extremely grateful to receive any surplus stock he could spare.

Finally, this programme requires the intensive study of populations of both species in Monks Wood Reserve, which includes population counts using marked individuals. Such studies need completely undisturbed colonies and the collecting of *S. pruni* and *T. betulae* is not being per-

mitted in this wood over this period. It is hoped that disappointed collectors will appreciate the need for such an action until more is known about both species, and until a conservation programme is planned ensuring large populations of both butterflies in the Reserves they inhabit.

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The Earwigs (Dermaptera) of the Galapagos Islands

By A. Brindle

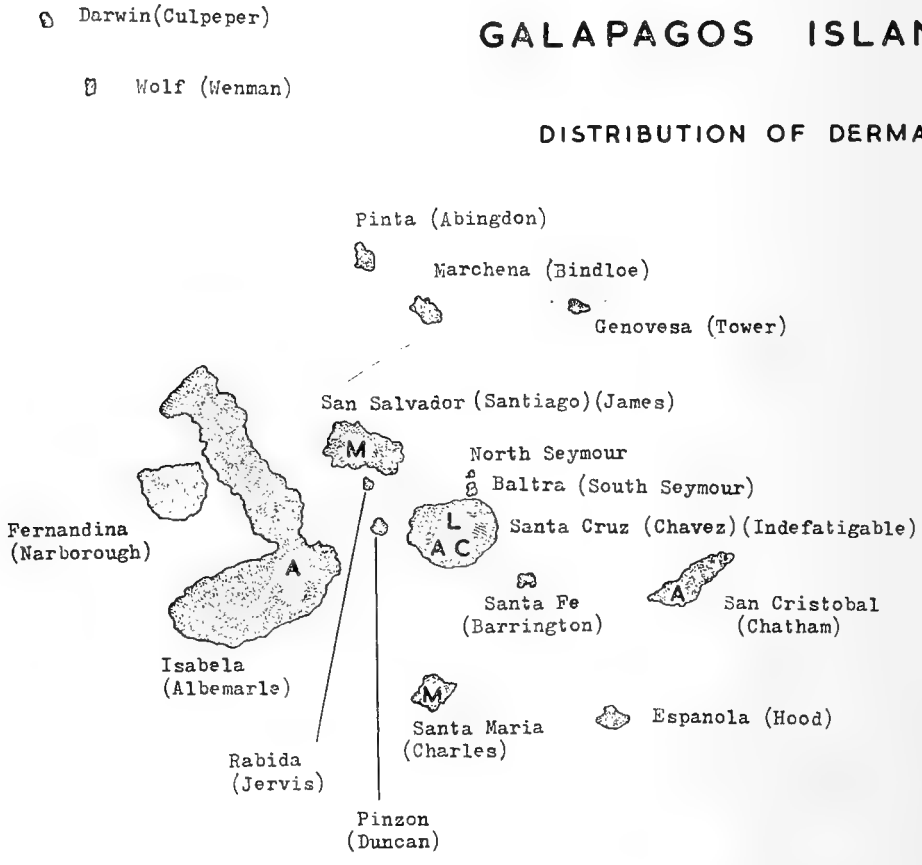
The order Dermaptera is relatively small, and the species are mainly tropical in distribution, being most abundant in the humid tropical forests of the world. Comparatively few species appear to be able to tolerate very dry or cold climates, and the majority of the species have a relatively restricted distribution. They are continental insects in general, and islands, particularly isolated oceanic islands, tend to have a very poor fauna of earwigs. There are, however, a few species of earwigs which have a comparatively wide tolerance of environmental conditions, and some of these have become cosmopolitan in distribution. These cosmopolitan species have sometimes such a wide distribution that it is difficult to trace their original centre, and they appear to owe their present wide distribution mainly to accidental importation into various countries by commerce. The habit of earwigs in hiding by day in crevices easily leads to such accidental introductions if control measures at ports are not strictly enforced. There are numerous records of living specimens of earwigs from tropical countries being found in ports in temperate countries, usually being intercepted on arrival. If control measures are not taken, these introductions can lead to the establishment of the particular species if the environment is suitable.

Countries in the North Temperate Zone are usually unsuitable for such introductions and establishment, owing to climatic conditions, but tropical or subtropical countries are usually favourable.

Such introductions may account for some of these cosmopolitan species occurring on oceanic islands; apart from the suitability of such islands as habitats, the chances of such species being introduced is correlated with the degree of isolation of the island, the more contacts with continental areas there are, and the more chances of introduction exist. The isolated Juan Fernandez and Easter Island, for example, each have only one known species of earwig: this is *Euborellia annulipes* (Lucas), a cosmopolitan species, which is the most widely distributed species of earwig, and which is evidently a most successful coloniser, originally being described from one specimen introduced into the Jardin des Plantes in Paris.

St Helena, in the Atlantic, although isolated, has a history of contact with continental areas, and three cosmopolitan species of earwigs occur on the island, one of which is *Eurobellia annulipes*.

It sometimes happens that an oceanic island has one or more endemic species of earwig, but this seems to be a rather rare occurrence, and any influx of cosmopolitan species may result in the extermination of such endemic species. Sometimes it is found that the more isolated islands are, and the less chance there is of endemic species being found. The Canary Islands, which lie from 80 to 200 miles from the African coast, have eight endemic species and four cosmopolitan species, whilst the Azores, which lie about 800 miles from the African coast, and about the same from the coast of Portugal, have no endemic species but five cosmopolitan species. No endemic species are known from Juan Fernandez or from Easter Island, but there is one on St Helena, and also one on Ascension Island in the Atlantic.



The Galapagos Islands form a group of volcanic islands about 500 miles west of Ecuador, to which the islands belong politically, having been annexed in 1832. Volcanic activity is not entirely quiescent, as the recent eruption has demonstrated. The islands are isolated in that they lie off the usual trade routes, but since the latter part of the eighteenth century the islands have been subjected to numerous visits by various ships, largely to obtain fresh food supplies; domestic animals have been

released during these visits, so that there has been considerable interference with the fauna. Although the majority of the islands have been declared nature reserves by the Ecuadorean authorities, there has been some difficulty in ensuring that these reserves were respected, and it was the realisation of the potential loss of the unique Galapagos fauna which led to the establishment of the Charles Darwin Research Station on Santa Cruz.

Previous to the establishment of the Research Station, only one species of earwig had been recorded from the islands: this was *Euborellia annulipes,* which is recorded from Albemarle and Chatham islands by Hebard (1920). Another three species are now known to occur on the islands, two of which are included in the present paper as new records for the islands. A further record of *Euborellia annulipes* from another island in the Galapagos group is also given. These new records are from specimens belonging to the California Academy of Sciences, which have recently been examined, and the author is indebted to Dr Paul H. Arnaud for the opportunity to examine these insects.

The increased scientific activity in the Galapagos islands will result in a better knowledge of the fauna, so that it may be difficult to judge whether new records indicate new adventive species, or whether such records are simply the result of more intensive study and consequent recognition of well established species. Although there have been numerous scientific expeditions to the islands previous to the formation of the Research Station, many appear to have been of short duration, but that organised by the Californian Academy of Sciences in 1905-1906 was much more thorough. It may be significant that this expedition did not obtain any earwigs; the Orthoptera obtained were studied by Hebard (1920) but his records of *E. annulipes* were apparently from earlier records, the source of which has not been located.

The recent Belgian Zoological expedition to Ecuador and the Galapagos islands, in 1964-1965, however. brought to notice the single endemic species of earwig which is known from the islands. This is *Anophthalmolabis leleupi,* described in Brindle (1968), which is a small yellowish blind earwig which is partly subterranean in habit, living in rock crevices, on the island of Santa Cruz. Its nearest know relative is *Anisolabis caeca* Borelli. the only other blind earwing known, and which is recorded from two specimens collected by Dr Silvestri whilst digging for termites at Sunchales, in the province of Santa Fe, Argentine, previous to 1902. The association of the earwigs with the termites is thought to be coincidental, and *A. caeca* is likely to be at least partly subterranean in habit as *A. leleupi.*

The specimens from the California Academy of Sciences consist of the following:—

Euborellia annulipes (Lucas): 3♂, and 5♀, from Table Mountain, 440 metres, Santa Cruz, 16.iv.1964 (D. Q. Cavagnaro).

Anisolabis maritima (Bonelli): 1♀, James Island, and 1 immature ♂, from Charles Island. These apterous earwigs are determined on the structure of the male genitalia, so that these specimens are referred to this species provisionally.

Labia arcuata Scudder: 3♂, 1♀, 7 large and 7 small nymphs; from near the Darwin Station, Academy Bay, Santa Cruz, 28.i.1964 R. O., Schuster).

E. annulipes is found throughout the World in tropical and subtropical countries; it appears to occur on many isolated oceanic islands if the species has always been correctly recognised. *A. maritima* is also cosmopolitan, but is less widely distributed than *annulipes*, and is typically maritime, being found mostly along sandy coasts. *L. arcuata* is a species of South and Central America, having been recorded from Brazil, Peru, Surinam, Panama, Guatemala, Mexico, and also Trinidad and Honduras.

The first two species can be regarded as originally adventive, but *E. annulipes* at least is likely to have become established. *L. arcuata* is probably a casual; its occurrence near the Research Station indicates a possible recent introduction from America.

The Dermaptera of the Galapagos islands, therefore, are typical of oceanic islands, as far as present records are concerned. There are few species; the single endemic species is closely related to a species on the nearest mainland; and two cosmopolitan species occur. The occurrence of *Labia arcuata* may not be significant in the future development of the fauna since this species may only be a casual, but further studies on the islands are likely to be very interesting and may well bring to notice further species.

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Hebard, M., 1920. Expedition of the California Academy of Sciences to the Galapagos Islands, 1905-1906. Part 17, Dermaptera & Orthoptera. *Proc. Calif. Acad. Sci.*, **11** : 311-346.

Comments on "Collecting in Spain, 1969" by Dr. R. G. Ainley

By Lieut. Col. W. B. L. Manley, F.R.E.S.

I have read Dr. R. G. Ainley's account of his collecting in Spain (1969, *Ent. Rec. J. Var.*, **81**: 273-275) with great interest.

In order that the record is kept correctly, I believe that the following entries should be carefully checked:—

Euchloe tagis Hübner. Four localities are given for this species from which it has not previously been recorded although *E. ausonia* Hübner is generally distributed in these areas. The dates given are extremely late for this species, which usually flies in April.

Colias hyale Linné. This is said to have been found in all localities visited but I have been able to trace only very few authentic records of this species from the Iberian Peninsula although *C. australis* Verity is found throughout most of Spain.

I will not discuss the finer points of nomenclature, as the author writes, "Any number can play", except to mention that the abbreviation "Schiff." to whom *M. phoebe* is attributed and "D & S" to whom *P. pandora* is attributed are the same authors, i.e., Denis and Schiffermüller.—

Greenways, Shoreham Road, Otford, Sevenoaks, Kent.

A new Subspecies of *Zygaena loti* Denis and Schiffermüller (Lep., Zygaenidae) from Catalonia, Spain

By W. G. Tremewan and W. B. L. Manley

Whilst collecting in Catalonia during late June and July 1969, one of us (W.B.L.M.) and his wife collected a long series of *Zygaena loti* Denis & Schiffermüller from Villadrau, in the province of Gerona, and from Moya, Taradell and Collsuspina in the province of Barcelona. These specimens represent a new subspecies, which we describe below, and which differs from the four known races of this species in Spain, viz., ssp. *arragonensis* Staudinger (Albarracin, Teruel), ssp. *avilensis* Koch (Hoyos del Espino, Sierra de Gredos, Avila), ssp. *pardoi* Agenjo (Pesués, Santander) and ssp. *soriacola* Tremewan and Manley (Abejar, Soria).

Z. loti erythristica ssp. nov.

♂, 26-31 mm. Forewing ground colour blue-black; forewing spots and hindwings deep scarlet; forewing spots large, spot 1 extending along costa beyond spot 3, spot 2 often confluent with spot 4 and forming a bar; in extreme examples all spots confluent. Hindwing border narrow, present only at apex and before tornus, or entirely absent.

♀, 27-31 mm. As in the male but red coloration warmer; forewing ground colour dusted with yellowish scaling in the spot area.

Holotype ♂, Villadrau, Gerona, 2500 ft., 24.vi.1969, W. & M. Manley, in W. G. & S. M. Tremewan collection.

Allotype ♀, with the same data, in W. & M. Manley collection.

Paratypes: 2♂♂5, 1♀, Villadrau, Gerona, 2500 ft., 17-24.vi.1969, 21 ♂♂, 9♀♀, Moya, Barcelona, 2100 ft., 25-27.vi.1969; 7♂♂, 2♀♀, Taradell, Barcelona, 2400 ft., 14.vi.-5.vii.1969; 2♂♂, 2♀♀, Collsuspina, Barcelona, 3000 ft., 25-30.vi.1969; all leg. W. & M. Manley, in W. G. & S. M. Tremewan collection and W. & M. Manley collection.

This subspecies is nearest to ssp. *arragonensis* Staudinger from Albarracin but differs in the stronger and brighter red coloration and the greater tendency to confluence in the forewing spots. These characters also separate it from the nominate subspecies described from the Vienna district of Austria.

Notes and Observations

Heliothis scutosa Schiff. in North Surrey.—On the afternon of 24th August 1969, I took a moth which I found sitting on heather bloom on a common in North Surrey, which I did not immediately recognise. I subsequently identified it, and have had it confirmed by Mr. B. F. Skinner, as a specimen of *Heliothis scutosa* Schiff. (the spotted clover moth).—P. J. Renshaw, 53 Links Road, West Wickham, Kent. 15.x.1969.

Cosymbia puppillaria Hübn. in the New Forest.—On 12th October 1969 I found a specimen of this species in my light trap. — L. W. Siggs, Sungate, Football Green, Minstead, Lyndhurst, Hants, SO4 7FQ.

ACHERONTIA ATROPOS L. IN NORTH WEST KENT.—I have just recently had passed to me a reasonably good specimen of *Acherontia atropos* L. (the death's head hawk moth). This had been found dead in a garden in West Wickham on 7th October 1969.—P. J. RENSHAW, 53 Links Road, West Wickham, Kent. 15.x.1969.

HYPENA OBESALIS TREITS. AND A VARIETY OF PLUSIA GAMMA L. IN SURREY. —On the night of 14th September this year, I caught in the mercury light trap a good specimen of *Hypena obesalis* Treits. Dr. C. G. M. de Worms kindly undertook to confirm this rare capture and accordingly visited the British Museum (Natural History), where comparison with the only other recorded British specimen showed the determination to be correct. I see that according to South, the last specimen taken was on October 5th 1908 at Paignton by Milman.

A second very welcome capture on October 3rd was a fine aberration of *Plusia gamma* L. This specimen is without the characteristic silver Y; in its place is a long, rather smudgy white mark running lengthwise along the centre of the forewing, rather similar to the marking of *Plusia confusa* Steph.

Both specimens were exhibited at the exhibition of the British Entomological and Natural History Society on November 1st.—G. S. WOOLLATT, Highfield, Chobham, Woking, Surrey. 16.x.1969.

SALCEY FOREST.—In the article by P. M. Payne entitled "The Future of the Amateur Entomologist" (*antea* 267) mention is made of "the onerous portent of permits to collect insects."

For many years in the past it was possible to collect freely in Salcey Forest until two years ago, when I was stopped by a warden during one of my rare visits to the area, who asked whether I had a permit. Mentioning the fact that I, with many others, had previously had free access to the Forest, I was informed that a permit had to be obtained from the Forestry Commission at Cambridge. However, the warden, realising that I was ignorant of the new regulation, permitted me to carry on, on my promising to apply in due course for the necessary permit. I did the needful and in due course received a permit for one year without any demand for payment.

Wishing to renew the permit this year, I duly applied, and after some delay was informed by an official that on payment of £2 per year for each permit, my request would be granted.

By what right or regulation this demand for payment is legal, I am unable to find out, but needless to say, I did not renew my permit. Right through the Forest are several good motor roads, indicating that the property constitutes a public right of way. Do the Forestry Commission exact payment from motorists for travelling along these roads?.—F. W. BYERS, 59 Gurney Court Road, St Albans, Herts. 28.x.1969.

AN EARLY RECORD OF ORTHOSIA GOTHICA (L.).—I took an example of this common spring species at Bovey Tracey, S.E. Devon, on 28th October 1969. It was feeding on ivy blossom and looked extremely out of place amongst the *Agrochola macilenta* (Hübn.), *Allophyes oxyacanthae* (L.), and other autumnal species that were sharing its table. — BERNARD SKINNER, 85 Elder Road, London, S.E.27.

HERSE CONVOLVULI (L.) IN SURREY.—As the regular hawk-moths appear a bit thin on the ground this year, I would like to put on record the capture of a specimen of this moth taken on a window in Camberly, Surrey, on 18th October 1969. It was a male in perfect condition and was rather smaller and darker than average.—BERNARD SKINNER, 85 Elder Road, London, S.E.27.

Current Literature

Animal Partnerships by **Dr. Maurice Burton.** 107 pp.+8 pl. Frederick Warne, 20/-.

This is a remarkably interesting book mentioning many examples of partnerships amongst the large and small mammals, birds, reptiles, fishes and insects. The opening chapter explains the various kinds of partnership, stressing that the main reason usually comes down to food. Many examples of birds and fishes associating with other animals in order to feed on their parasites to the benefit of both parties are quoted. A chapter is given to Ants and their Guests, and another to Termite nests, which seem to provide shelter for widely separated animal species. The final chapter, "Summing up" is perhaps of the greatest interest to man, for it deals with many of the creatures associated with our dwellings, other than parasites, which, the author explains, have been excluded from this book, or brought to a minimum.

The text throughout is enriched by drawings by **R. B. Davis.**

The book is bound in boards with stout paper imitation buckram covering and should be a useful addition to the "interest" side of all naturalists' libraries.—S.N.A.J.

Kleinschmetterlinge aus Bulgarien (Lep.) by **Joseph Soffner.** Mitteilungen der Münchner Entomologischer Gesellschaft (e.V.) **57** (1957): 102-122+2 pl.

Opening with a short description of the country visited, the author states that about 30 per cent. of the species mentioned are of western Asiatic origin and the remainder Mediterranean species. There follows a list of the species found, with short notes on those requiring them. In this a new *Euzophera* species, so far unnamed, is described as also is *Epiblema infidana* Hübn. ssp. *bulgarica*, ssp. nov. There is a short description of *Scrobipalpa soffneri* Povolny with reference to the original description in *Acta Soc. ent. Czechoslov*, **61** No. 4: 357 (20.x.1964).

In all 412 species are mentioned, and the numbers in the various families are tabulated at the end. The paper is illustrated by two black and white plates, showing photographs of 15 interesting species including the new *Euzophera*.—S.N.A.J.

Sisal by **G. W. Lock, O.B.E., N.D.A., C.D.A., A.I.C.T.A.** xix+365 pp.+32 pl. Longmans, 60/-.

In his preface to this second edition, the author explains that while the first edition was more or less confined to the growing of this crop in East Africa, subsequent travels have enabled him to enlarge on sisal-growing

in other parts of the world, and the object of this edition is that it should be of interest to all sisal-growers. The preface to the first edition is also printed after the preface to the second edition, and there follows a two-page spread map of the sisal-growing areas of Kenya and Tanzania.

Chapter 1 gives an account of the history and development of sisal-growing from the use of wild agaves as a supply of fibre for various local and home uses, and its later use for making binder twine, which inspired the first crop planting of henequen in the Yucatan peninsula in Mexico, to the present day growing of specialised agaves in many parts of the world. There is a survey of sisal-growing countries, giving a short account of each. The chapter finishes with an account of the ecological factors affecting sisal-growing. Chapter 2, headed "The Sisal Plant and other Fibre Agaves" gives details from many angles, from nomenclature and taxonomy to the origin of the agaves. A very full description of the sisal plant, including its root system, rhizomes, the stem or bole, the meristem or growing point, Phyllotaxis or leaf arrangement, the sisal leaf, the inflorescence or "pole", the flower, the seed and the function of bulbils follows. Many of these details are also illustrated by photographic plates. Other fibre agaves are mentioned and a table of yield and other details compares *Agave sisalana, A. fourcroydes, A. cantala* and *A. amaniensis.*

Planting details and nursery techniques follow with many tables. This chapter goes into the raising of young plants and their fertiliser requirements; the establishment of field sisal naturally follows in Chapter 4, with details of the clearance of land, its preparation, and measuring out for planting. Various methods are discussed and the results tabulated. A whole chapter is given to the matter of spacing plants, illustrated by various tables. Cultivation systems are discussed and compared and the results are tabulated, while Chapter 7 goes into cutting, going into considerable detail Plant Nutrition and Deficiency Diseases gives details of nutritional requirements and specifies certain diseases and their progressive symptoms, some of which are illustrated photographically.

Chapter 9 deals with soil of the Sisal-growing Areas and specifies seven main classes of soil in the Tanzania sisal areas. The occurrence of these soils in Kenya, with notes of any differences between the two countries are mentioned where they occur, with analytical tables of each. Certain other soils are also mentioned. Inorganic and Organic Manuring of Sisal is the subject of chapter 10, and while the matter is dealt with in close detail, it is explained that the subject of manuring has only been taken up fairly recently as signs of soil exhaustion have started to become apparent. The various fertilisers, including sisal waste, both liquid and solid, are closely examined both from manurial and financial aspects.

Pests and diseases discussed in Chapter 11 shows that sisal is not subject to damage from many insects; the sisal weevil, *Scyphophorus interstitialis* Gylh. (*acupunctatus* Gylh.) seems to be the main pest, and its history, damage and control, including biological control by a Hysterid predator, *Placodes ebeninus* Lewis, are discussed at length. Some scale insects, a leaf-eating beetle, and mealy bugs are mentioned. Fungoid diseases and certain mechanical leaf damage are also taken into account. Certain wild animals can cause severe damage, and these range from elephants and giraffes to mole rats and porcupines.

Chapter 12 deals with the breeding of long fibre agaves while 13 deals with the characteristics of sisal fibre illustrated by microphotographs. Chapter 14 deals with decortication and preparation of the fibre and 15 covers estate planning and economic aspects. These are followed by five appendices, the last of which is a table for the conversion of Kg. per hectare to pounds per acre, and metric tons per hectare to long tons per acre, and a full index completes the work. The author has followed the very convenient practice of giving his list of bibliographical references at the end of each chapter instead of a long list at the end of the book.

The book is bound in cloth boards, and it is well printed on good paper. It may be described as a must for the grower, and anyone concerned with the sisal trade, and it should also have a place in the libraries of all agricultural colleges concerned with tropical crops.—S.N.A.J.

Letter to the Editor

Dear Mr Editor,

I read with great interest the letter addressed to you by Mr T. W. Jefferson on the subject of colour photography of insects (antea: 278). I, also, belong to "the increasing number . . . who have added colour photography . . . as an absorbing primary pursuit in their study of insects". Studio preparation has not attracted me very much, except when I want to see as much detail as possible, against a plain background.

On the other hand, I find immense pleasure in stalking insects out of doors, without interfering with them in any way, and trying to get near enough for a flash picture. This is much more interesting, entomologically, than sweeping, or even snapping up the insect with a net as soon as I see it. You have to follow it until it settles, and you learn much more about its movements, and what it is likely to do next. Just looking at the insect through the pentaprism gives a close-up view far better than the naked eye, and the picture, when you have got it, shows fascinating details of how it holds on to a leaf or petal, and how it uses its proboscis.

As Mr Jefferson says, there must be many people who would like to exchange ideas about this field of entomology, which has only lately become practical, with the development of cameras with extension tubes and interchangeable lenses, and small, easily portable flash units.

The first thing I discovered was that colour is much easier than black-and-white. I think many people, like me, must hesitate to start with colour, thinking it is going to be very expensive. Yet black-and-white films are quite costly these days, and by the time you have added development and printing there is little difference in the final price. A black-and-white picture of an insect on a flower, among grasses, or even on stony ground, becomes a confusing mosaic of greys, and it is very hard to get a clear, simple picture. Colour contrasts bring the whole picture to life, and even if one is used to looking at insects, a close-up flash picture can be a revelation. Insects are so clean!

I use either an Exakta or an Exa. The latter, besides being much cheaper, is very handy to carry and use. A small electronic flash is carried on top of the pentaprism, and I use 1/60 second at apertures varying from *f*8 to *f*16 according to the number of extension tubes. I have never suffered from ghost images. The lens is a 90 mm. Schacht Travenar.

which gives a longer working distance than the standard 50 or 55 mm. lens. Besides disturbing the insect less, this does not take my face so far into the brambles and nettles among which the insect usually settles! I have a coupling rod to work the lens diaphragm and the shutter knob together, but I found that this caught in the vegetation and fired prematurely. So I operate the lens with one hand, followed immediately by the shutter with the other; except for butterflies, which often take flight at the click of the lens diaphragm, and one gets a fine close-up picture of an empty leaf. So for these I close down the lens before approaching, and try to get into focus at the small aperture. Focussing is done, of course, simply by moving carefully nearer until the insect comes sharp on the screen.

The photography is absolutely standard, and so I can concentrate all my attention on the insects. Stalking living insects in this way means a lot of failures, as photographs, though none of them is wasted entomologically. The equipment is equally suitable for taking pictures of flowers, buds, fruits, fungi, or anything else that is spotted while searching for insects.

I hope that it will be possible to adopt Mr Jefferson's suggestion, and open your columns to discussion of insect photography. I know that many people are becoming interested in it.

HAROLD OLDROYD.

SPECIAL NOTICE

The Editor would like to buy in a few clean complete unbound copies of Vols. 61, 62, 63, 77, 78 and 79, at 17/6 per volume.

Please write to The Editor, 54 Hayes Lane, Bromley BR2 9EE Kent, before sending.

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.

CHANGES OF ADDRESS

R. G. Ainley, Earlsway, 98 Birkenhead Road, Meols, Hoylake, Wirral, Cheshire.

Major A. E. Collier, M.C., Stubbs Spinney, New Park Road, Cranleigh, Surrey.

Rev. Peter C. Hawker, St Botolph's Vicarage, South Park, Lincoln.

M. G. Myall, 23 Ketton Close, Luton, Beds.

L. M. Wigg, 47 Wood Ride, Petts Wood, Orpington, Kent.

Thomas Witt, 8 München 13, Tengstratze 33, West Germany.

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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.

THE ENTOMOLOGIST'S RECORD
AND JOURNAL OF VARIATION
(Founded by J. W. TUTT on 15th April 1890)

TO OUR CONTRIBUTORS

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ILLUSTRATIONS are inserted on condition that the AUTHOR DEFRAYS THE COST.

Contributors are requested not to send us Notes or Articles which they are sending to other magazines.

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The Entomologist's Record and Journal of Variation

SPECIAL INDEX

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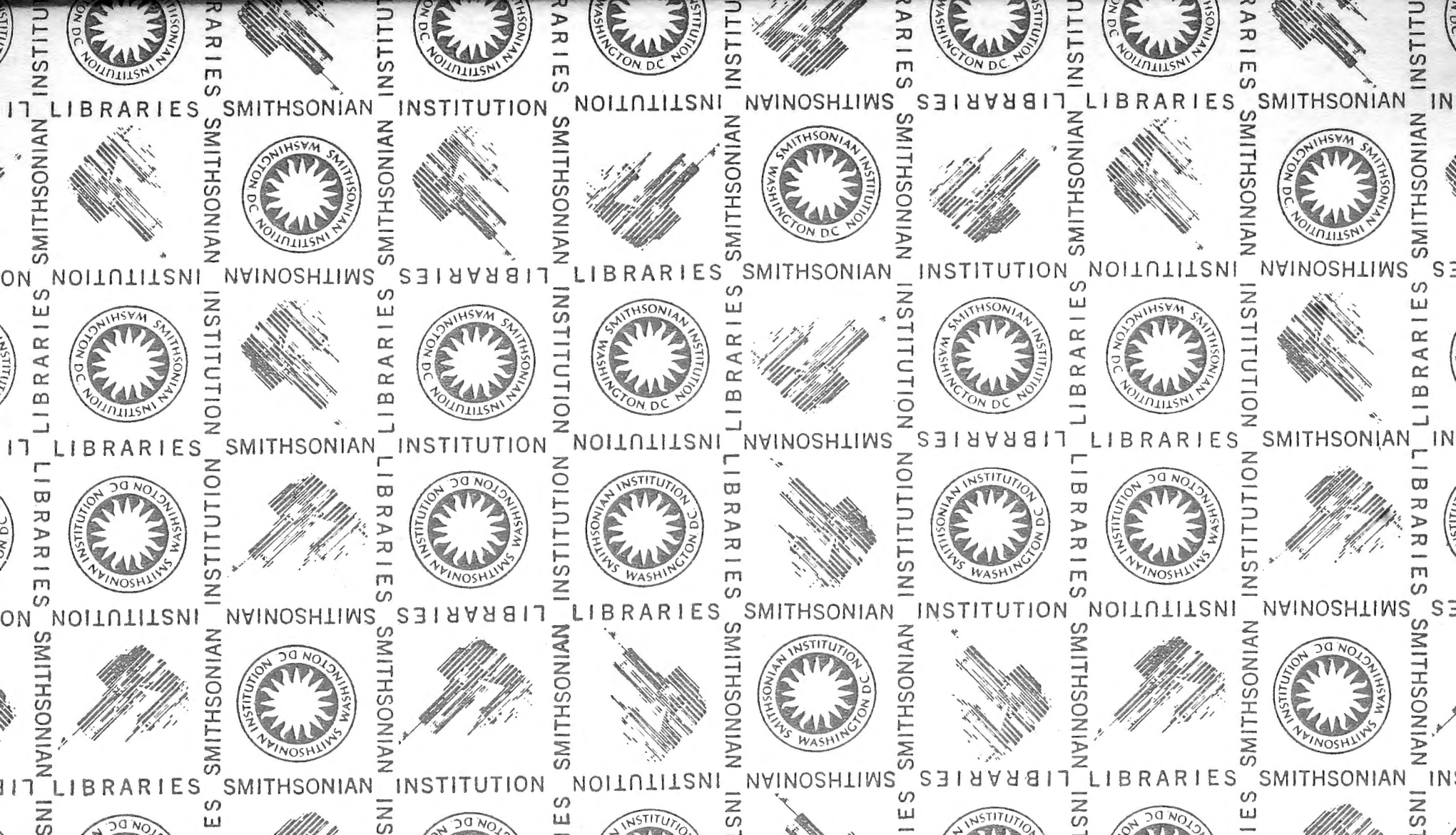
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