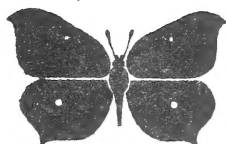


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1977

**THE
BULLETIN OF
THE AMATEUR
ENTOMOLOGISTS'
SOCIETY**

Edited by
BRIAN O. C. GARDINER, F.L.S., F.R.E.S.

Index compiled by
PAUL SOKOLOFF, M.Sc., M.I.Biol., F.R.E.S.

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355 Hounslow Road, Hanworth, Feltham, Middlesex

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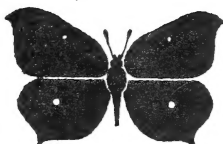
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**EDITOR:
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(Founded in 1935)

President	B. A. COOPER	Entomological Dept., Shardlow Hall, Shardlow Derby.
Hon. General Secretary :	P. A. SOKOLOFF	4, Steep Close, Orpington, Kent. BR6 6DS.
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Hon. Treasurer :	N. H. COOKE	8 Gerard Road, Barnes, London, SW13 9RG.

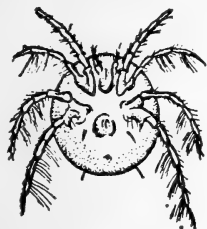
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A.E.S. Exotic Insects Group :	C. J. ESCHBACHER, 38 Frith Road, Bognor Regis, Sussex, PO21 5LL.
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EDITORIAL

While I appreciate the thought that causes members to write me long chatty letters I must reluctantly but firmly state that, quite apart from Editorial duties, I do have masses of other work to attend to and just cannot spare the time to reciprocate in kind. I hope this will assure all past and would be correspondents that their epistles are noted and that they will accept this brief editorial as a joint reply. I do try and acknowledge all matter received, but for various reasons even this sometimes takes a week or two. I would also like to thank all those who send me correctly typed and spaced manuscripts and to point out to others that badly presented material will always be subject to extra delay. All authors please note that tables should always be on a separate sheet of paper and not incorporated in the text. Coloured illustrations are also unacceptable. They can be redone, but this again leads to further delay and probably a sad loss of quality compared to the original.

CHILD AND BEE

CHILD: Go away, go away, naughty Bee,
Leave me, I tell you, instantly,
You want to give me a sting, I know.

BEE: Let me speak, and don't scold me so,
You're always with me so angry and cross,
If I gave no honey, you'd feel the loss

Now, when the child thought the matter o'er,
He scolded the busy bee no more;
But saw how it hover'd the flowers about,
Sucking from each the sweetness out,
And all his fear of the sting lost he,
In praising the insect's industry.

F. Hey

ANNUAL EXHIBITION 1976

Our Exhibition was held on Saturday, 2nd October, 1976 at University College School.

After a run of successful and increasingly popular Exhibitions at Holland Park School, we were faced with the problem of finding a new venue, as our former premises were no longer available. A large number of possibilities were investigated and we were very fortunate in obtaining



Fig. A. General view of exhibition hall. Photo by J. S. Chambers.

permission to use the Halls of the University College School at Hampstead. These offered an impressive setting, fine facilities and good availability.

Our congratulations must go to our Organiser, Mr. Bernard Skinner who, faced with an entirely new set-up, produced a first rate Show with an absence of complications. In general, Dealers occupied the ground floor of the Main Hall, Exhibitors and Demonstrations used the balcony and adjoining rooms and the Refectory was reserved for refreshments and the popular St. Ivo School exhibition. A number of useful suggestions for improvements have been received and these will be considered along with our own ideas, for future occasions.

In his opening speech, our President, Mr. B. A. Cooper, a founder member of the A.E.S. and author of most of our earlier publications, spoke of the trials and tribulations of those years. But the most significant factor for him was that some 50 years ago, as a very junior pupil of University College School, he first became interested in insects. From this inspiration, the A.E.S. emerged and now, half a century later, he was privileged to chair the first A.E.S. Meeting at his old School.

The primary object of our Exhibition is to provide an opportunity for entomologists to show their current work and discuss matters of interest. While it was most encouraging to have a capacity attendance throughout the day, it was disappointing that a Society of some 1,300 members could not produce more personal efforts. Many observers commented that the exhibits were outstandingly good but there was an absence of more average displays. Members may not have the time to prepare anything elaborate but if they would bring a small contribution, this would encourage many others to do likewise.

Surprisingly few persons noticed that Independent Television cameras were present. Our member, Gordon Trebilcock, is arranging a series of natural history programmes which are expected to be shown next year and our Council agreed that our Exhibition might be used as the 'back-cloth' for the final Show. Part of the material for this series, a video film of British butterflies photographed in the field during the marvellous 1976 summer, was shown continuously throughout the afternoon.

Our major attraction of the day was the presence of Dr. Sutton and Mr. Peter Hudson, two entomologists who took part in the Zaire River Expedition in 1975. Dr. Sutton described their objectives and experiences and illustrated his talk with slides, equipment and local material. Typical insects were on show, forming part of an estimated 30,000 specimens brought home for study.

Two of our regular features which are always popular are the prizes for the best Junior exhibits and the practical demonstrations and talks. Three excellent Junior projects were chosen, N. J. Armes—1st prize for his survey of Dung Beetles, N. James—Moths of Worcestershire

and M. Smith—Life history of Bumble Bees. Details of these are included in the subsequent list of exhibits. Probably one of the most difficult operations for lepidopterists is overwintering larvae and three experts in this field, Maitland Emmet, Peter Cribb and Eric Bradford presided over a most interesting discussion on their techniques.

The AES Council wish to thank all the members and friends of the Society whose work ensured the success of our Exhibition, fully appreciating that a new venue posed many problems. They are especially grateful to Joan Hilliard and the team of willing and efficient ladies for providing attractive refreshments all day; Eric Bradford for producing



Fig. B. Our President, Mr. B. A. Cooper (left) talking about bees.

a comprehensive supply of signs and posters; the members who donated surplus material to the Society and Peter Taylor who master-minded the sale; Stephen Cribb filling the difficult Enquiries desk post and David Keen and others who presided over the sale of publications. Not least, an appreciation of the stalwarts who on the previous evening and before and after the Show, shifted furniture, erected and dismantled tables and tidied up.

Reports were received for the following exhibits:—

AES CONSERVATION GROUP. The general theme was site and habitat protection, a main objective of the Group. D. Lonsdale, P. W. Cribb, N. Cooke and E. Bradford showed detailed case studies of two important areas, Ditchling Common and Tenantry Down.

AES EXOTIC INSECTS GROUP. A wide selection of living foreign lepidoptera. An attractive feature, when breeding exotics, is their availability at times of the year when most British species are dormant.

ALLEN, A. A. (5788). Parasitic insects of two groups, *Braconidae*, sub-family *Rogadinae* and *Ichneumonidae*, sub-family *Campopleginae*, with detailed life histories and host preference. A selection of microlepidoptera with notes on behaviour and localities for each species.

ARMES, N. J. British Dung beetles, *Geotrupidae*, in particular, *G. stercorarius* L. whose coprophagous habits are critical as a remover of dung from fields. There is very little literature on this species and this exhibit included large original line drawings illustrating the life history, habits and morphology. An identification chart for the 8 British species of *Geotrupidae*. **AWARDED FIRST PRIZE.**

ASHDOWN, P. D. (2823). Insects and other arthropods from the Central American country of Belize. Two main localities were worked, Stann Creek Valley and Mountain Pine Ridge.

BERNAU, G. W. M. (5882). Realistic models of the imagines and larvae of lepidoptera and odonata. Materials used were balsa wood, paper, wire, pins, cotton and water colour paint.

COLLINS, T. A. (4228). Macrolepidoptera and insects of several orders taken this year in a M.V. Light Trap situated in a suburban garden at Mickleover, Derbyshire.

COOPER, B. A., B.Sc. (19). An impressive display of material outlining the work of the British Isles Bee Breeders Association (BIBBA). Their aim is to improve and restore British native honey-bees such as the 'Village' bees, sub-species *mellifica*.

CRIBB, P. W. (2270). Spring butterflies of the Alps of Provence and Var, S. France including bred examples of Camberwell beauty (*N. antiopa* L.) and Large tortoiseshell (*N. polychloros* L.). Bred butterflies indicating the effects of the 1976 heat and drought such as the dwarf, heavily suffused partial 2nd generation of the Large Copper (*L. dispar*

batavus Obth.). Japanese butterflies caught by Y. Mori in the Prefecture of Gifuken and set by the exhibitor.

CROW, P. N. (393). Local and aberrant butterflies, mainly from N. Wales. *Syrphidae* (Hover flies) from the same area including *C. ranunculi*, Panzer, a new record for N. Wales.

ELSE, G. R. (3881). Rare or local Aculeate Hymenoptera from Southern England including the Sphecid wasps *C. walkeri*, Shuckard, *P. triangulum* F. and the bees *A. proxima* Kirby, *A. congruens* Schmied. *N. argentata* Herrich-Schaef. and *N. conjungens* Schrank. Diptera from the same area collected with D. M. Appleton, *T. atrata* L., *D. celandica* L. and *C. ranunculi* Panzer.

FERRY, R. S. (207). Insects from Sardinia including typical grasshoppers, wasps and bees. Colour plates of several species including the Great peacock moth (*S. pyri* Schiff.)

GARDINER, B. O. C. (225). Larvae and adults of Rhinoceros beetle,

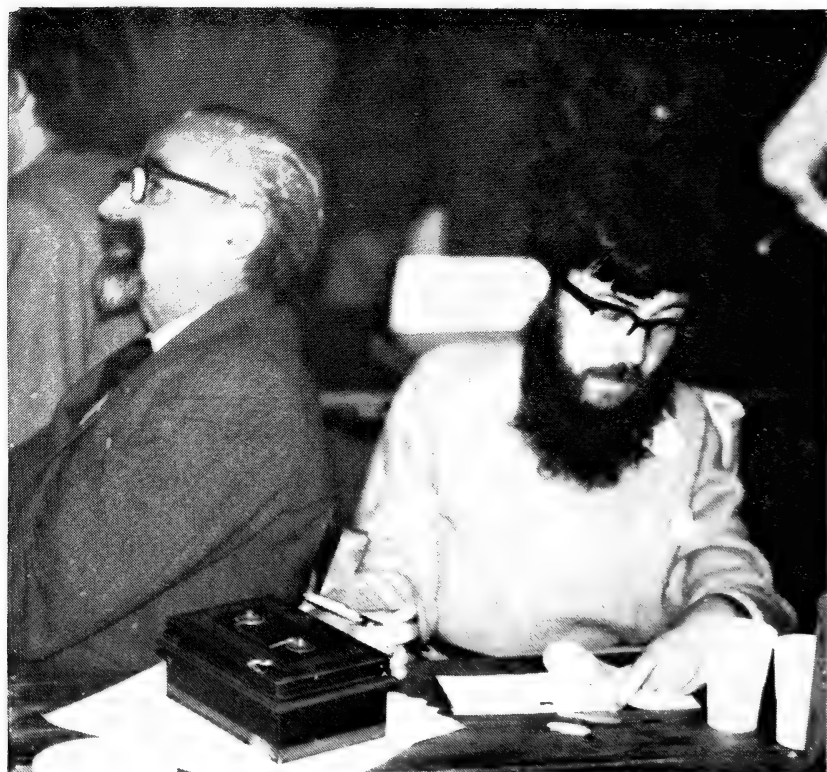


Fig. C. Stephen Cribb manning the enquiry desk and enrolling a new member. Council member Mr. G. Prior on the left.

(*O. rhinoceros* L.) reared on a mixture of dried cowpat and rotten wood. Some originals of the photographic illustrations from our Bulletin.

GARDINER, C. J. (5429). Lepidoptera caught in Switzerland during 1975. Series of Ladybirds (*Coccinellidae*) illustrating their abundance in 1976. Variation in colour and pattern which may make identification difficult.

GRAY, M. Series of moths bred from larvae collected in 1976. A specimen of the Convolvulus hawk-moth (*H. Convolvuli* L.), found at the Lizard.

GREY, P. R. (3820). From Cape Town (S. Africa), butterflies which endure the hot dry summer and from the Table Mountain, A large Satyrid, The Mountain beauty (*A. tulbaghia*) and the strong flying copper *P. thyra*. From the Kenya coast, the attractive *Colotis* (Desert Orange Tips) and other Pierids which fly in arid conditions on the windy coast in the dry season.

HARMAN, T. W. Lepidoptera bred and taken during 1976 including a good series of the variable Orange moth (*A. prunaria* L.).

HEATH, G. L. (4409). 11 species of living Praying mantises (sub-order *Mantodea*) raised from egg-pods sent from various parts of the world. The empty egg-pods were shown.

HIGGS, C. E. (3608). 3 water colour paintings of hazel, alder and willow catkins with attendant moths. Similarly, a branch of pine with associated species of lepidoptera.

HILLIARD, R. D. (99). Typical species of each major family of British moths, all with preserved larvae. It was intended to illustrate the diversity of larval form and the characteristic style for each family.

HOPPER, R. (4848). Cockroaches (sub-order *Blattoidea*) from several countries and tropical *Arachnids* (spiders).

JAMES, R. (5005 J). An exhibit showing the distribution of the less frequently found moths of Worcestershire with special reference to those found in the Vale of Evesham. This is a hitherto unrecorded part of Worcestershire and a brief outline of recording in the county was included. **SECOND PRIZE.**

KEEN, D. H. R. (3309). A selection of insects reared during the year with their larval and/or pupal skins. Of special interest were the Downy emerald dragonfly (*C. aenea* Drury), a Hover-fly (*S. luniger* Mg.) and the Parent bug (*E. grisea* L.).

KING, G. (5654 J). Larvae of Eri silkmoth (*P. cynthia* Drury) feeding on sumach and *P. forbesi* Benj. on privet. Also a cocoon of *P. ricini* Bois., a domesticated species, containing 2 pupae.

McCORMICK, R. F. (3375) and PENNEY, C. C. (3880). Selected moths from specialized localities, Sychant Pass, N. Wales, Ham St., Kent, Clitheroe, Lancashire and Church Orp Cove, Dorset.



Fig. D. Mr. E. W. Classey the well-known bookseller and staunch supporter of our Society since its founding.

McLEAN, I. F. G. (3848). Leg modifications in Diptera, including enlargement for predation, *O mantis* Degeer, ornamentation in males for courtship display, *D plumipes*, Scopoli and bristles for cleaning *C. flavicanda*, Ringdahl. Specimens together with drawings of the legs and entire insect.

MORRIS, A. (5486 J.). Butterflies of Val de Cantobre, Aveyron, France. Type specimens, maps of district and sketches of the various habitats. PAYNE, J. H. (5923). Aberrations of British butterflies taken in 1976 and a specimen of the Long-tailed blue, (*L. boeticus* L.) seen at Wellingborough, Northants, in July, this year.

REVELS, R. (3942). A wide selection of butterfly aberrations reflecting the population explosion of some of our native species in 1976. with photographs of the more extreme varieties.

A drawer setting out the F1 and F2 generations of a cross between two varieties of the Chalkhill blue butterfly, (*L. coridon* Hem.), *abs. semisyngropha* and *ultrafowleri*.

ROCHE, J. (3096). Examples of the smaller British lepidoptera (microlepidoptera), mainly from Kent and Inverness.

ST. IVO SCHOOL NATURAL HISTORY SOCIETY. This flourishing School Society set up once again their own mini exhibition with the emphasis on *Arthropods*. This large animal phylum embraces insects, crabs, centipedes and millipedes, spiders and scorpions.

SKINNER, B. F. (2470). Showed species bred and captured in 1976 of many local races and aberrations of British lepidoptera. Included was the Grey (*H. caesia* subsp. *mananii* Gregson) from Doolin Co. Clare, Sandhill rusic, (*L. nickerlii* subsp. *Gueneei* Doubl.) from N. Wales,

Fen square spot, (*D. florida* Schmidt), Chippenham fen and Barretts marbled coronet (*H. luteago barrettii* Doubl.), S. Devon.

SMITH, M. (5866 J). 11 species of British bumble bees, 5 species of Cuckoo Bees (*Bombus* and *Psithyrus*). Photographs, species list, general description and preliminary distribution maps for Britain. Larvae (3rd and 4th instar) of the Convolvulus Hawkmoth (*H. convolvulii* L.).
THIRD PRIZE.

SOKOLOFF, P. A. (4456). The huge Goliath beetle (*G. giganteus*), the Colorado beetle (*L. decemlineata* Say.), British *Lucanidae* and *Cicindelidae*. Moths from mid Wales including the Silver hook *E. uncula* Clerck.). Leaf mines, larval workings and imagines of micro-lepidoptera covering the genera, *Stigmella*, *Mompha*, *Leucoptera*, *Endothenia* and *Bucculatrix*. Bred lepidoptera including Plume moths (*Pterophoridae*).

THEOCHARIDES, K. (5769) and NUSSLE, P. General display of *Insecta* and *Arachnida* covering beetles, scorpions, centipedes and spiders. Relevant notes on structure and habits with a special study of aggression.

UFFEN, R. W. J. (1660). Cibachrome colour prints from transparencies of insects and other subjects. A reproduction of a hand-coloured line plate from an old book showed the fine detail reproducible on these fade-resistant prints.

TREBILCOCK, G. D. (2976). Varieties of butterflies from Cornwall and Wiltshire, notably the rare yellow tipped form of the Orange tip butterfly (*E. cardamines* Hubn. ab. *aureoflavescens*). A collection of lepidoptera from the Eastbourne, Sussex district.

UNIVERSITY COLLEGE SCHOOL. Mr. R. J. Jenks, the biology master, arranged an impressive stand with the theme 'Insects in school biology'. Projects included a comparison of insects living in lawns and uncut grass, a survey of aphids and ladybirds on rose bushes, behaviour experiments with locusts and blow-flies, reproduction and growth of locusts and genetic experiments with fruit flies.

WARING, P. (4220). Display and slides showing the life cycle and habitat of the Oak egg moth (*L. quercus* L.), the southern form from the New Forest.

WARREN-SMITH, C. (3908). A sample of butterflies and moths collected in June, 1976 from a wood in the Loire Valley, France. Included was the Great emperor (*S. pyri* Schiff.) and 3 hawkmoths (*Sphinxidae*). A parallel collection from Andorra, of special interest were the swallowtail (*I. podalirius* L.) and 2 species of Apollo butterflies (*Parnassius*).

WATSON COLLECTION OF BRITISH LEPIDOPTERA. (Exhibited by Amanda Watson (5091). Bred aberrations of the Garden tiger moth (*A. caja* L.), the Black arches (*L. monacha* L.) from Boldre, New Forest and the red strain of the Cinnabar moth (*C. jacobaeae* L.) discovered



Fig. E. A happy group from St. Ivo School.

in 1965 and still healthy and free from virus. Aberrations of British lepidoptera bred and taken in 1976 including low temperature forms of the Small tortoiseshell butterfly (*A. urticae* L.) and a somatic mosaic of the Poplar hawk-moth (*L. populi* L.).

WHITEHOUSE, I. (5889). A large heated cage built for rearing broods of exotic silkmths. Refinements included a peat tray to maintain humidity and a home-made hygrometer.

WILLIAMS, P. (4965 J). Drawings of the large Chinese hornet (*Vespa mandarinia* Smith) and a colony of the British hornet (*V. crabro* var. *gribodoi* Bequaert). A collection of insects taken in Scotland, August 1976, mainly hymenoptera, with brief notes.

WILLMOTT, K. J. (3822). Specimens and colour prints of some unusual butterflies taken this summer: good examples of vars. *suffusa* and *cuprenus* of the Small copper butterfly (*L. phleas* L.).

ZOOLOGICAL GARDENS (LONDON). The curator, Mr. Leftwich, presented a selection of living invertebrates from the Insect House at the Zoo. An unusual species was the deadly Great water bug (*Belastoma*) from West Africa.

R. D. Hilliard (99)

BETLES ARE TOPS WITH SCHOOLBOY

Dung beetles might not be the most attractive members of the insect community, but a 16-year-old St. Ives schoolboy is glad they captured his interest. For Nigel Armes, of the St. Ivo School, has won a top national award for his work studying them. Nigel won the junior section of a competition run by the Entomological Society.

Nigel is a member of the school insect and wildlife club, and along with 45 boys and girls took his work to the society's annual exhibition in London.

"Nigel's work, a study on dung beetles, was really excellent, and he won first prize in the junior section", said the school's biology teacher, Mr. Henry Berman.

The exhibition had a further surprise, because one of Nigel's former schoolmates, Mathew Smith, aged 15 took the third prize.

"Mathew left St. Ives to live in Reading about two years ago. It came as a big surprise when they read his name out as one of the prize winners and we realised he used to go to the St. Ivo," said Mr. Berman.

[The above extract appeared in "The Cambridge Evening News" the week following our exhibition. Mr. Berman really is to be congratulated on the way he drums up and sustains the enthusiasm of his pupils for their subject and for all the work he puts in, not only in bringing his St. Ivo group so regularly to our exhibition, but also to all the other functions I know they attend and put on such a good show.—Editor]

Geotrupes stercorarius (L.) pupa



x10



Fig. F. Part of Mr. N. J. Armes' prize-winning exhibit.
(Photos B to F by Brian Gardiner. Prints by J. Overton)

THE HIDDEN WONDERLAND OF CRETE

My first impression of Crete was that it was a sub-tropical place, hitherto unknown to all but the inhabitants. But one of the first places we drove through on our way to our villa was Agios Nikolias—the setting for the BBC TV series, 'The Lotus Eaters'.

Our destination was Elounda and two hours after arriving I discovered my first Scarab—a male *Catharsius molossus* L. Flying round nearby lamps were the Cantharid *Rhagonycha fulva* Scop. as well as the moths *Erannis defolaria* and *Lymantria monacha*.

Next day I wandered along the shallows by the beach, watching Egrets feeding and wading, and discovered *Staphylinus caesareus* and the Carabid *Carabus glabratus* and the Tenebrionids *Crypticus quisquilius* L., *Melanimon tibiale* Fab. as well as a strange bug I cannot identify.

The Ant *Camponotus gigas* was everywhere, carrying all sorts of things in its jaws, but mainly wheat and grass seeds.

I rounded off my first day with a swordfish steak and aubergine salad in the village restaurant.

The following day I spent sightseeing and window shopping but for a couple of hours in the early evening I managed to photograph some insects. But it was not easy as there was quite a wind blowing, sending dust in all directions and there were plenty of mosquitoes about as well.

Next morning I struck out in the opposite direction, walking to the other side of the bay at the far end of the village.

During my walk I noticed that some flowers—I believe it was wild parsley—had attracted a host of insects. Among them I found the Buprestid *Anthaxia candens* the Chrysomelid *Chrysomela anea*, the Cockchafer *Epicometus hirta*, *Trichodes alvearius* *Trichodes apiarius*, *Anthrenus scrophulariae* and *Mordella pumilla*. Further along the road I found the Carabid *Scarites euparius* and on more wild parsley I discovered the bug *Graphosoma lineatum*, *Cercopis vulnenata* Illinger, the red bug *Lygaeus kalmi* and what I believe was a *Megalonotus* bug. Flying around everywhere was the huge bee, *Xylocopa violaceus* which not only frightened the insects. I later on saw one land on a woman's hair which almost frightened her out of her wits.

I noticed also the strange insect *Palpares solidus*, not to mention a large creature, like a dragon fly which was greatly attracted by lights at night. Later on I visited the museums in Iraklion which contained the treasures excavated from the Palace of Knossos.

Later, at the palace site I discovered, crawling over the dusty ground, the weevil *Cleonus piper* and on a tree by the souvenir shops I found the Alleculid *Ctenopus flavius*.

After Knossos we went to the less well known Minoan palace of Mahlia where I found the dung beetles *Onthophagus vacca* and *Aphodius luridus*. Our guide, when asked, said the soil on Crete was 'argillic' soil.

It is brick red and the guide said the land was very fertile, so fertile in fact that anything could grow there, including oranges, palms and olives. That day's sightseeing over, I returned to one of my favourite haunts in the hinterland of the wild parsley. There I caught and as yet, a still unidentified *Bupestid*, orange and green in colour.

That evening I dined on fried squid, with chips of course, washed down with beer. The temperature during the holiday averaged between 70 and 80° F. and on one day it even reached 100°.

The locals call the Cockchafer "muscari" and the big *Hoplia philanthus* flies around the buildings and among the olive trees. But down by the beach again I found the beetle *Necydalis major* L. among the ever present parsley. In fact, wherever I went, whether along the beach, in the fields or even along the streets of the villages, I found insects, bugs and beetles.

Certainly, as I sat in the bar on my last night I realised that discovering the hidden wonderland of Crete had been very fulfilling.

Taking colour photos of the insect life had been challenging and in fact the whole holiday had been an adventure.

I feel sure that anyone else who goes to Crete will enjoy it as much as I did.

M. JOHNSON (3464 J)

NOTES ON SOME OF THE PARASITES ARISING FROM MATERIAL COLLECTED IN SOUTH FRANCE—MAY 1976

I sent this material to Dr. Mark Shaw at Manchester who has kindly made the following comments:—

1. Host—the pupa of *Euphydryas aurinia provincialis* Bois. The pupa was found near Digne and failed to hatch but on our return to England it produced a mass of small wasps. They are of the genus *Pteromalus*, similar to *P. puparum* L., but differing in some characteristics in the males. Possibly an undescribed species—Dr. Shaw has had previous examples from other Nymphalidae from S. France.

2. Host—the larvae of *E. aurinia provincialis*. Larval skin and cocoons found near Fayence. The emerging wasps proved to be *Apanteles melitaeorum* Wilkinson, a parasite of *E. aurinia* in Britain. Emerged in post to Dr. Shaw.

3. Host—young larvae of *Nymphalis polychloros* L. At St. Paul-en-Foret. Single parasite to each larva which spins a small cocoon after emerging from the larval skin. *Apanteles ?plutellae* Kurdjumor, a solitary parasite known to attack *Aglais urticae* L. and *Plutella xylostella* L. an unusual combination.

4. Host—young larvae of *Aporia crataegi* L. A mass of cocoons appearing outside the dead larval skin, similar in appearance to those occurring with the Large White, *Pieris brassicae* L., but the cocoons not the bright

yellow of *Apanteles glomeratus* L. These proved to be *Apanteles pieridis* Bouché, only known from *A. crataegi*.

All the above are Hymenoptera. *A. crataegi* also produced dipterous pupae but these were unfortunately lost.

5. Host—half grown larvae of *Anthocaris belia euphenoides* Staud. gathered near St. Paul-en-Foret. A single small cocoon formed on the stem of the foodplant beside the shriveled larva. The parasite is a Braconid, *Microplitis* sp., but the species is undertermined. Dr. Shaw had previously recorded this wasp from both *Euchloe ausonia* Hbn. and *E. tagis* Hbn. feeding on *Biscutella* sp., the same foodplant as *euphenoides*, so that the parasite may be plant rather than host specific.

6. Host—ovum of scarce Swallowtail collected on Sloe at St. Paul. The egg failed to hatch but from a hole in the shell emerged six minute wasps, distinguishable only by means of a lens. These were *Trichogrammitids* (Chalcidoidea) of an undetermined genus.

(The above material is in the collection of Dr. Shaw).

P. W. Cribb (2270)

CONCERNING BRITISH BUTTERFLIES

In an extensive review of *South's British Butterflies* by T. G. Howarth, Dr. J. R. G. Turner, (Turner 1973) provocatively raised, in an American Journal, a number of interesting factors which are, I feel, of general interest to all British Entomologists, but perhaps only of passing interest to American ones. Many of the points and queries raised in his review deserve an answer, or, in some instances, further research and comment.

One of the first queries raised concerns the earliest recognisable picture of a butterfly species and asks for any advance on 1503 where the Meadow brown (*Maniola jurtina* L.) and Small tortoiseshell (*Aglais urticae* L.) can be recognised in a painting "The garden of delights" by Hieronimus Bosch. We can certainly go back a long way past this. I can recognise a *Colias* in "The Romance of Alexander" of 1338 (Ms. Bodley 264). I also have a copy of another Ms., of about the same date but whose provenance is unfortunately lost, clearly depicting a very familiar enemy, the Small white, *Pieris rapae* L. Both these Mss. show a number of other (and highly improbable) species and the former clearly shows nets (possibly converted from certain hats of the period) being used by children chasing the butterflies. I feel sure that a study of illuminated mediaeval Mss. would reveal many recognisable pictures of butterflies and moths. Has any Entomologist ever done a study of Roman mosaics, Pompeiian wall paintings and Egyptian tomb painting? After all the Scarab beetle is well represented in Dynastic Egypt. Butterflies did not play a part in Egyptian religion as did the Scarabs, but it would be worth a look. Incidentally, the earliest fairly easily recognisable description (as opposed to picture) appears to be of a

Clothes moth or rather its larva (*Tinea* sp.) and is found in various places in the Bible (e.g. Isaiah 51.8).

Dr Turner believes that the literature is extensively misleading on some species and asks if it is true that the Ringlet (*Aphantopus hyperantus* L.) is a shade butterfly. I think that the question as to whether a particular species is a shade butterfly (or a woodland, or open field butterfly etc.) would be better phrased by asking the corollary "Is it foodplant a shade plant, etc?" Does the larva of the Ringlet in fact prefer the coarser stronger growth formed by grasses growing partially shaded? In my experience the Ringlet is a shade loving butterfly. I also think that it deserves to be pointed out that when making studies of the sex ratio of feral populations one has to make certain that one is not producing a ratio of foodplant abundance as appears to have happened in some records I have seen, of, for instance, *Pieris*.

It is on the subject of *Pieris*, however, that I really wish to take Dr Turner to task. I would like to know the books he has consulted and which state that the Green-veined White (*Pieris napi* L.) does not occur in cultivated land. I have consulted twenty books from my library and not a single one of them makes such a statement. Mostly they are ambivalent (making vague statements such as "generally common": "Widely distributed", or they are specific in making the following statements which are in direct contradiction to that of the books consulted by Dr. Turner: "... also fields of different kinds of Cruciferae ..." (Frohawk, 1934); "In our gardens we may find both eggs and larvae ..." (Furieux, 1905); "... may frequently be found in gardens and cultivated ground also" (Stokoe, 1944) "Frequents gardens ..." (Lang, 1884); "Both in woods and cultivated grounds ..." (Coleman, 1880).

However, I am perfectly prepared to qualify these statements to a certain extent. I believe the Greenveined White does occur, often commonly, on cultivated land, as an adult but not as a larva, and it does not often penetrate far from the boundaries of large fields, unlike the Small white which does. It is also exceedingly rare to actually find its larvae on cabbage as such, *P. napi* prefers Rape, Mustard, Watercress and various wild weed Cruciferae, whereas *P. rapae* has a marked preference for cultivated hearted cabbage plants. It also prefers moister and shadier situations than *rapae* although it is of course always possible that these two conditions go together in many cases.

The surprising statement is made about "The impossibility of separating British *Pieris* on the wing ..." I totally disagree about this alleged impossibility of separating British *Pieris* on the wing. When I was a boy I could do it with a better than eighty per cent probability at 50 yards and, out of practice and no longer so keen sighted, reckoned I could still, and put this to the test recently in a walk along the Cromford canal in Derbyshire. My score was 4 out of 4 for *Pieris brassicae* L. 28 out of 29 for *P. napi* and 5 out of 5 for *P. rapae*. Rather a better

result in fact, than when I was younger! Only those specimens whose identity could be positively confirmed by capture or subsequent settling close by on a flower head were counted. Scores were made only on flying insects and the distance varied from about three to thirty yards. It is I feel a matter of experience; watch and then catch, every white in sight, after making a guess as to what it is first. After a time one recognises certain nuances in the behaviour of the different species and also where they are flying. As mentioned above, for instance, a white in the middle of a large field is far more liable to be *P. rapae*, perhaps nine out of ten, whereas at the edges it can be a straight fifty/fifty and in a moist shady lane one to twenty in favour of *P. napi*. The Large white is too big to be confused with either the other two.

Another rather surprising series of statements by Dr Turner require quoting in full; he states "my only qualm about this lovely new book is for the plight of the beginner and the schoolboy, who need a little more help with identifications which are childplay to Graham Howarth; how does one distinguish the various female Blues and Hairstreaks at a glance, and for the beginner or general naturalist, what distinguishes the Grizzled and Dingy Skippers? Confusion of these last resulted in several incorrect records, now expunged, in the *Provisional Atlas*". I do not share Dr Turner's qualm about the plight of the beginner and schoolboy needing a little more help with identification. From its size it is quite clear that Howarth's "South" is not a field pocket book and its price puts it well beyond the range of all but the well-heeled. Only after having passed the beginner stage and becoming dedicated to the hobby will the average young amateur entomologist save up for the book. Most beginners and schoolboys in England start with one of the numerous and cheap junior insect pocket books on the market or a 2nd hand old South, Furneaux, Coleman or Frohawk, and I quite agree with Dr. Turner that this is the best way to start.

I have consulted my son Christopher; he has now passed the beginner stage, and just, that of schoolboy. He agrees with me that there is little difficulty in distinguishing British Hairstreaks and most of the Blues (*Aricia* spp. and *L. bellargus* and *corydon* females are the difficult ones). I also believe that the confusion between Grizzled and Dingy Skippers must be a *lapsus calumni* of pen or typesetter! They are totally dissimilar, but Essex and Small Skippers are alike as two peas in a pod. Actually, in my opinion, many identification confusions arise with dead specimens back at home. In the field it is often possible to separate species by habitat and time. In England for instance, one of our Hairstreaks (*Strymonidia pruni* L.) is so rare that the beginner just does not get the chance to confuse it with the common *S. W-album* Koch. Not only do they have different foodplants (Blackthorn and Elm respectively), but the one flies high, the other low. Similarly I believe that more studies of behaviour in the field and of the spatial and tem-

poral distributions of species could lead to a better understanding of the differences between similar species. The pity of it is that we in Britain, only wish we had far more material to work on, for as Dr. Turner rightly points out, ours is already the most intensively studied butterfly fauna in the world.

After allowing for extinct and rare local species there are after all less than fifty species to study and at least ten of these are only sustained in England due to regular migration from the warmer climates of Europe and are not to be seen every year, which doubtless explains why very few English Lepidopterists indeed confine themselves to Butterflies. Most have broken with their insular traditions and now go and study the European continental fauna as well, but it has always been the habit of the English to study moths, of which we have some two thousand, as well as butterflies, in spite of the fact that only the English language basically differentiates the two!

Brian O. C. Gardiner (225)

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FORTHCOMING EVENTS

AES ANNUAL GENERAL MEETING:—Saturday March 26th at Caxton Hall, Westminster. See enclosed leaflet for further details.

INTERNATIONAL INSECT FAIR:—The second International Insect Fair of Paris will be held on April 23 and 24 at the Palais des Congrès, Porte Maillot, Paris, France, when both professional and amateur entomologists from all over Europe will have the opportunity to meet; to exchange; to purchase and to sell the insects of their choice. The price per table for dealers and others is 200 FF. (£25) for two days. So far as we can tell this is likely to be similar to, but much larger than, our own AES exhibition. Further details obtainable from 'Association pour la promotion de la science entomologique, 27 Villa Chaptal, 92300 Levallois-Perret, France'.

GUIDED NATURAL HISTORY TOURS:—Cox & Kings Ltd. are running a series of guided holiday tours to places of natural history interest such as Turkey, Czechoslovakia, Afghanistan, Russian Caucasus. Although labelled as botanical, ornithological and photographic, it would seem to us that some of them could prove very interesting entomologically, such as Wengen of which we have personal experience. Further details from Mrs. Joy Randerson, Cox & Kings Ltd., 46 Marshall Street, London W.1.

AN ENTOMOLOGICAL WEEK ON RAASAY:—Geoffrey Gill, Department of Adult Education & Extra-Mural Studies, 23A High Street, Inverness is proposing to run a course of "The Entomology of an Island" from August 27th to September 3rd with between 14 to 20 Entomologists, amateur or professional, in order that as complete a survey as possible may be made of the Island of Raasay. The evenings would be taken up with lectures and discussions. Accommodation would be in Churchton House (full board), but some country cottages may be rented for those preferring to cater for themselves. Cost details are not yet available and those interested should get in touch with Mr. Gill, address above, as soon as possible.

FIELD AND OTHER COURSES FOR ENTOMOLOGISTS:—The Field Studies Council organise many one week courses during the year. The following may be of interest to members: 15-22 July, 1977 'Field Studies in Insect Behaviour' (Juniper Hall, Surrey); 20-27 July 'Butterflies and Moths' (Slapton Ley, Devon); 20-27 July 'Natural History Photography' (Orierton, Dyfed); 6-13 August 'Bugs, Beetles and Butterflies' (Drapers, Gwynedd); 31 August-September 1st 'Flies, Midges and Gnats' (Malham Tarn, Yorks.). Fees for these courses, including board, are in the region £30-£45. Further particulars are obtainable from the Hon. Secretary.

NEW FRENCH SOCIETY & JOURNAL:—The former "Reunion des Lepidopteristes Parisiens" has moulted into the "Societe des Lepidopteristes Francais" which intends to publish a regular bulletin to be illustrated with numerous drawings and photographs and in order that it shall be a tie between all entomologists every paper will have an English summary. Obviously of use to all those who collect in Europe and further particulars may be had of Mons. Jean Richebourg-Peyrache, Olympiades 75, Rue du Javelot, 75645 Paris Cedex 13, France.

MARRIAGE BUREAUX FOR SPHINGIDAE & SATURNIIDAE:
—Andrew Sykes is proposing to start a scheme known as "TELEOPTERA" whereby breeders of moths who have an emergent specimen but no mate for him/her may ring up and be put in touch with someone who has. All being well the scheme will commence next month. Phoning hours are very strictly limited to between 7.00 to 8.00 a.m., Monday to Friday only, and the number is 01-446-1775.

AN INTRODUCTION TO THE SALTATORIA OF CENTRAL AND SOUTHERN FRANCE

The insects of this particular order, the Saltatoria, include the Grasshoppers, Bush crickets and Katydid. It is an order that is frequently neglected by the entomological fraternity. They are easily studied by their relatively large size, and also by their conspicuous markings. In ecological terms they occupy a dominant part of the terrestrial fauna being the prey of large reptiles, birds and small mammals especially insectivores. To the unaccustomed traveller abroad, these insects were by far the most interesting and the most numerous.

This account is not, however intended to be a long winded account of all the species but a general introduction based on the experience I have gleaned during my three expeditions to Central and Southern France.

COLLECTING, AND FIELD PRESERVATION

Where can I find them, and when? The most favourable months for collecting Saltatoria are July and August. If you go there in May or June they are likely to be in early instars, and if you go later in October or November they will be dying off before the winter comes. Saltatoria can be collected in meadows, fields and on hillsides by using the normal type entomological net and pill boxes. Most Bush crickets can be beaten from hedgerows and low bushes that are in the shade but must be "boxed" quickly as they are excellent fliers as well as having the ability to jump to safety. If you intend to rear them you will require a netting cylinder and a deep tray of sand over which it fits. The insects are introduced to the cage in the shade and the female will start depositing ova immediately. Female bush crickets have a large sword like ovipositor which they use to deposit their ova under the hard soil. Grasshoppers on the other hand insert the whole abdomen into the soil and lay a pod of ova.

The ova are best laid in sand 3-4 inches deep and the whole container can be brought back providing you frequently moisten the sand.

If you go to the trouble of going out at night with a torch and a few pillboxes you will most likely get yourself some of the more elusive Bush crickets, the name is misleading as they are correctly referred to as "Long-horned Grasshoppers" even though they are more closely related to the crickets. If you intend to bring specimens back home you must decide whether you intend to set them while on holiday or at home. I personally prefer to paper mine for two good reasons. Firstly specimens are much less likely to get damaged if in an envelope, in a tin, than if a box of pinned insects is brought back, I also prefer to set them during the bleak winter months when they cannot be collected. The second reason is that if you are setting insects in the field you have less time to sample the local "cuisine"!

All Orthoptera (The order containing Saltatoria) can be killed either

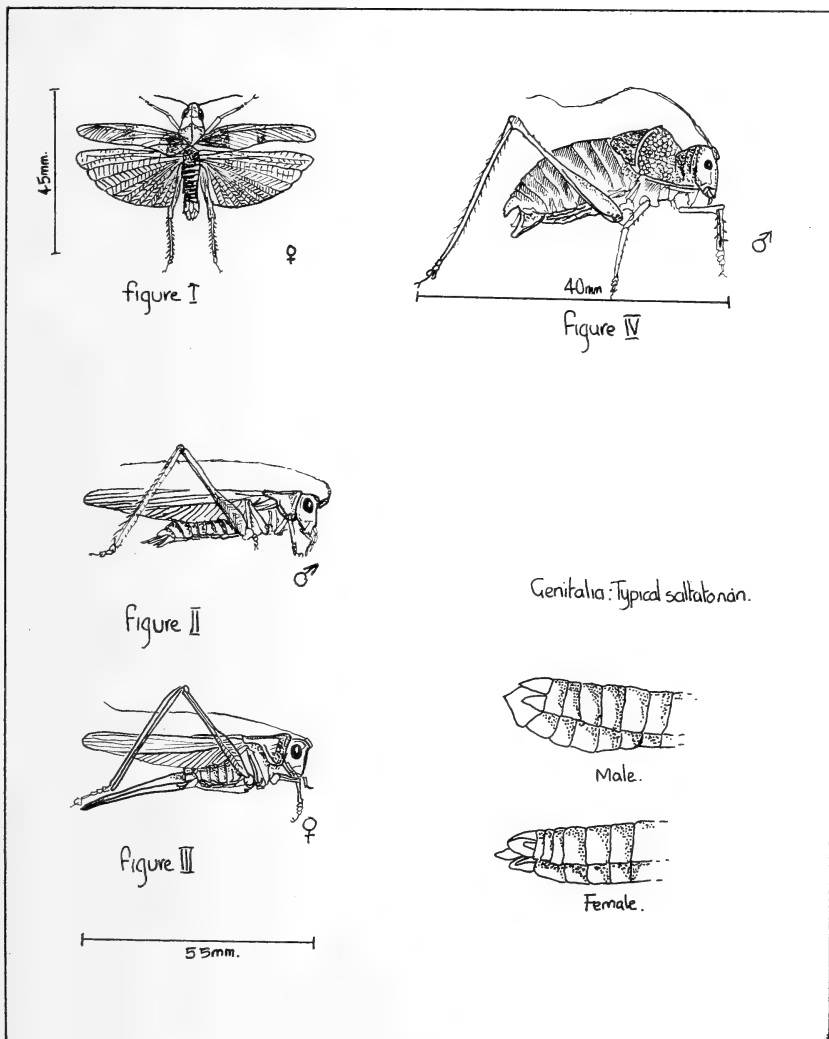


Figure I. *Oedipoda germanica* (Latreille)
 Holotype: Female. Lou Paradou. Brignole. Toulon. France.
 8. VIII. 73. Hadley collection.
 Figure II. *Tettigonia viridissima* (Linn)
 Holotype: Male. Lou paradou. Brignole. Toulon. France.
 8. VIII. 73. Hadley collection.
 Figure III. *Tettigonia viridissima*. (Linn)
 Holotype: Female. Lou paradou. Toulon. France.
 1. VIII. 74. Hadley collection.
 Figure IV. *Ephippiger ephippiger* (Fiebig)
 Holotype: Male. Lou paradou. Brignole. Toulon. France.
 4. VIII. 74. Hadley collection.

with the normal killing fluids, Ethyl acetate, Carbon tetrachloride, or Chloroform. Or alternatively they may be dropped into nearly boiling water for 30 seconds then removed. One word of warning, I think, is necessary, NEVER leave them in the open to dry, the reason being that the ubiquitous ants will cut them up piecemeal as a supplement to their diet. For this reason as well it is perhaps best if all papered insects are placed in airtight (Ant-tight) plastic, or metal boxes.

You may perhaps ask where are the most suitable localities for collecting orthoptera. If you want the large or the unusual you must go South of Lyons. Areas which will repay further detailed examination are: Provence, Dauphine, Drôme and general areas including the Central massif and the Maritime Alps.

CLASSIFICATION

This is not difficult for any beginner just embarking upon the study of this group, but classification beyond genus is more complicated since there is a general lack of texts on this order, especially in the areas outlined previously. The references at the end of this article give some general guides suitable for preliminary examination. I will attempt to briefly outline the main families.

<i>Family name</i>	<i>Common Name</i>	<i>Diagnostic characteristics</i>
Gryllidae	True Crickets	Tarsi 3 segmented, Dorso-ventrally flattened
Tettigoniidae	Long Horned Grasshoppers/ or Bush crickets	Tarsi four segmented. The antennae are much longer than the body
Gryllotalpidae	Mole Crickets	Enlarged fore limbs. Subterranean
Acrididae	Field Grasshoppers	Antennae not longer than body. 3 segmented tarsi
Rhaphidophoridae	Cave/Camel crickets	Nocturnal inhabits caves
Tetrigidae	Ground hoppers	Elongated pronotum
Tridactylidae	Pigmy mole cricket	Elongated hind femora

Of the seven major families four are mostly rare insects seldom seen, or almost totally obscure. This leaves us with three remaining families one of which we can dismiss as we are not interested in them—the Gryllidae. This leaves us with the Tettigoniidae and the Acrididae. A neat division as the Tettigoniidae represent the Long-horned or Bush crickets. They have a four segmented tarsi which separates them from their relatives the Acrididae which have three segmented tarsi. If you go really South you might encompass the breeding range of a true locust *Locusta migratoria*, L. The common red winged grasshoppers, also members of the Acrididae, can easily be captured on any sunny day. There seems to be a slight seasonal variation in the colouration of the forewings which are matched to the substratum.

Where the colour of the substratum is light, e.g. roadsides and hillsides, the forewings are also light, with slightly darker bands. Alternatively, where the substratum is dark the forewings tend to be

darker and with more clearly defined bands.

A near relative of *Oedipoda germanica* is *O. coerulscens*, L. This is a much more widespread species than the former which tends to be restricted to the more southerly portions of France, and a few warm places in Central France such as Die and Gap. *O. coerulscens* has a more northerly distribution and the author has taken this species just south of Paris on several occasions, as well as its normal haunts around Grenoble in Central France and in the Loire valley in the west.

A closely allied genera to the Oedipodinae is the genera *Psophus* of which there is a single representative, *P. stridulus*. This is a mountain insect found throughout France generally at altitudes of greater than a 1000 m. The hindwings are brilliant scarlet and the body integument is almost black, a most distinctive species. When disturbed the grasshopper takes flight revealing the bright hindwings, an example of 'Flash colouration', the objective being to confuse and startle a would-be pursuer.

Lastly, a species it would be well to include in this consideration of the more interesting Saltatoria is the Italian Grasshopper *Caloptenus italicus* L., an unusual insect that is, in the authors opinion, a scarce insect in the French countryside. The hindwings are very much reduced in size and are almost transparent with a feint crimson suffusion.

In an article of this brevity it would be impossible to consider a representative of all the most interesting genera and so the author has attempted to cover only those species which are immediately apparent to the traveller.

Ephippiger ephippiger, Fiebig. is sometimes very common on wasteland at quite high altitudes; the adults sit around on vegetation and are very active! they have atrophied wings which are hidden under remarkably distorted elytra.

Tettigonia viridissima L. is very common throughout the country, much more than in England where it is seldom found except in the South. The females are easily secured either by beating them from low growing bushes or by looking under the flysheets of tents, a very lucrative method. Also found very commonly in the Southern France is the Dark Bush Cricket *Pholidoptera griseoptera* Degeer, which is obtained by employing methods similar to those outlined earlier. It is a handsome insect about 40 mm long and there is a noticeable sexual dimorphism, the male is black with a dark rust coloured stripe running down the pronotum, the female is a more usual tan colour with a straw coloured pronotal stripe. In this species the wings are also absent, totally in the female with the remnants of the wings left on the male.

This is by most standards a modest discourse on the Saltatoria, it will have achieved its purpose if it sheds but a little more light on a fascinating group.

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NOTES AND OBSERVATIONS

GOLF-COURSE BUTTERFLIES:—I am the head greenkeeper at Stowmarket golf club situated at Finborough Park, Stowmarket. This has been uncultivated parkland for about 200 years with fine Oak trees and Elms. The park also has a river running through it with overgrown Osier beds on one side and small woods with more Oaks, Poplars, Limes, Chestnuts and Elms, bordering the golf course itself.

With hope and luck this will continue for the next 200 years. In fact this is a Lepidopterist's haven as I have large areas of grassland bordering the hedges etc. which I refuse to cut short, much to the discontent of the golfers. The golf course itself has been in existence for about 15 years and during this time a large number and variety of trees have been planted between the fairways.

Stinging nettles are everywhere with meadowsweet and other moisture loving plants.

We pump the water for the greens out of the river, and during the drought of Summer 1976 I have witnessed the following butterflies sitting on the wet greens:

Small White	<i>Pieris rapae</i> L.
Meadow Brown	<i>Maniola jurtina</i> L.
Small Tortoiseshell	<i>Aglais urticae</i> L.
White Letter Hairstreak	<i>Stymonidia w-album</i> Koch.

I have not seen *S. w-album* in this locality for six years, but on 14th July, 1976 I saw several sitting on one of the greens.

I did not witness Large Whites, Ringlets, Gatekeepers, Small Heaths, Common blues, Peacocks, Commas or Red Admirals, feeding on the greens in the same manner.

I have introduced the Speckled wood *Pararge aegeria* L. to this locality (1972) and it thrives, but is never common.

The Purple Emperor *Apatura iris* L. has never been seen here to my knowledge, although Sallows abound everywhere with Oaks next door, perhaps they could be introduced by some kind soul as they would be protected 365 days of the year!—T. M. Shipp (5079)

CONVOLVULUS HAWKMOTH IN YORKSHIRE:—I should like to record that on October 19th, 1976 I captured a perfect male specimen of *Herse convolvuli* L. at Acomb, Yorks. The specimen was found

during the day at rest on a neighbour's drive. It would be of interest to know whether this was a late migrant or had bred locally, the offspring of an earlier summer migrant:—A. J. Gillery (3653)

CONVOLVULUS HAWKMOTH IN HERTFORDSHIRE:—In October of last year a dead specimen of *H. convolvuli* was brought to me by Miss P. Hutchison, who had found it in her pantry at Barley, Herts. Rigor mortis had set in but otherwise it was a good specimen:—Brian O. C. Gardiner (225)

PINK POPLAR HAWKMOTH:—On the 18 of June, 1976 I had a very pink female Poplar hawk (*Laothoe pupuli* L.) hatch, from a pupa I dug up in the winter from under an Aspen tree. Unfortunately she was crippled, but nevertheless succeeded in mating with a perfect male. She laid me 84 ova, of which 62 made it to the pupa stage (I would have had more if I hadn't overcrowded them).

This year, on the 17th of June I had the first one hatch. A perfect female, and fairly pink. I managed to pair her with a wild male, and so far she has laid me 70 eggs.

From that date I have had another 24 hatch, including a very pink female, the colour of a pale boiled lobster; also a couple of males not so pink as the females.

I would like to see if I could breed a complete pink or red form and would be more than grateful for any suggestions that members can give. If ever I do, I'll let you know all about it.—Ken Williams (5396)

EARWIG FORCEPS:—When one mentions the earwig it is the thought of the forceps or callipers which springs to the minds of most people. These formidable pincers are usually what put people off the earwig, apart from the fact that they are 'creepy-crawlies', and supposed to enter one's ear and bite their way through to the brain. But to the entomologist or anyone who studies the order Dermaptera they are a very useful facet in classification and determination of the sexes, as well as being a recognition feature of the order. But what of the use of these modified cerci to the earwig itself? In the common species, *Forficula auricularia* (L.), I have observed them being used for injuring caterpillars before moving in to kill with their mandibles, and as organs of offence—any disturbed or alarmed earwig will raise its abdomen in scorpion-fashion; even the young nymphs who have not fully developed callipers, I have also heard of them being used for catching prey, levering themselves out of awkward situations and to help fold away their wings.

I would be very interested to hear any further reports of the use of forceps in the Dermaptera, particularly of our few other species.—J. Good (5398 J)

ITS JUST "DESSERT":—On my return home from a hot and sunny

field trip, at 4 p.m., on August 11th, 1976, I was immediately greeted by the most unusual spectacle of a Common wasp, (*Vespula vulgaris*, L.), demolishing the entire body of a Nutmeg moth (*Hadena trifolii*, Hufn.) laid out at the bottom of an upright-standing setting-board, fully exposed upon a shelf in my study ever since its capture here four nights earlier.

Briefly, scientific objectivity swayed the balance against personal indignation, as I watched this wasp shamelessly and completely consume an entire dead moth body as big as itself, with a ferociously enthusiastic and noisy determination, and with a masterly skill at circumnavigating the forest of pins. Replete with chewed-up moth, (this doubtless destined for its waiting hungry larval dependants), and leaving scarcely any debris at all, it then made a "bee"(?)-line for the open window. But, just two minutes later, back it came, making a very positive and characteristically pendulous aerial approach towards the next *trifolii* up from the bottom of the board.

Now, *trifolii* is always a common enough Noctuid here in N.E. London in August, and in this particular month of relentless desiccating heat, it had become an absolute plague, both as adults attracted to light and Buddleia, and as mature caterpillars swarming locally beneath our abundant waste-ground growths of parched Orache (*Atriplex*) and Knotgrass (*Polygonum*). However, this additional hymenopterous assault upon a setting-board, adorned as always with the fruits of painstaking lepidopterous labours, was sufficient to evaporate any further possible scientific curiosity. Therefore, I am sure that fellow moth enthusiasts will now forgive that sudden and well-aimed right-arm movement which uncompromisingly removed any possibility of such a protein feast being extended to a second course. Our late hero's just "dessert" proved less than sweet.—Brian Wurzell (3718)

DISLIKE OF DARK GREEN FRITILLARY:—I am fortunate in having adjacent to my back garden, a strip of land which provides a breeding area for several species of butterfly. Backing onto the land, in a neighbour's garden, there is a very overgrown Buddleia, which has been host to most of the usual Nymphalids, as well as Lycaenidae, Hesperiiidae, Pieridae and Satyridae.

Whilst all these had fed quite contentedly with just the occasional squabble over a flowerhead, the peace was one day shattered by the arrival of a Dark Green Fritillary (*Argynnis aglaja* L.), a species new to the area. Almost as one, practically everything that could fly, left the Buddleia to chase the 'intruder' away. This was repeated several times, with the Fritillary being chased for up to 50 yards. As a result, I had a grandstand view of a marvellous display of flying and gliding. It did eventually manage to settle, but only briefly, and then the chase was on again. Unfortunately, the insect then gave up the unequal struggle and was not seen again. However, my disappointment has been tempered somewhat by the arrival of a colony of the Chalkhill blue

Lysandra coridon Poda), another species new to the area.

I should be interested to know if other members have noticed this rather unusual behaviour towards the Dark green fritillary. The dislike of the insect was not confined to any particular group, and such unlikely flying companions as Peacocks, Meadow Browns and Skippers, all joined in the 'hunt'.—Colin Simmonds (5050)

ERRATA AND APOLOGY:—The editor regrets that due to a *Lapsus* in his proofreading, on page 123 of the August last issue, an author's name was mis-spelt. It should be Paul Selden (4115).

WHITE POINT IN HAMPSHIRE:—On the night of 23rd August last year two specimens of *Mythimna albipuncta* D. & S. were caught by an MV light trap situated at Hayling Park, Hayling Island. One was released and the other sent to the Natural History Museum for verification and has been incorporated into the National collection.—John Walters. (5904 J)

MORE CAMBS CAMBERWELLS:—Since the migrant records published in our last issue three further reports have reached us. Indeed *Nymphalis antiopa* L. seems to have been rather common in Cambridge this year, although avoiding our garden. August 5th Trumpington (Michael Boddy); September 6th Girton (Mr Boot); September 8th in Sedley Taylor Road (Mr Parker-Rhodes):—Brian O. C. Gardiner. (225).

BREEDING OF DEATHSHEAD:—On 20th July last year I received half a dozen ova of *Manduca atropos* L. from Ray Adams, Canary Islands. Only two hatched and one died at the second moult. The singleton fed up rapidly and pupated on 18th August. I left it in my breeding cage, as thought, for the winter. On 24th September I heard a fluttering noise at 9.00 o'clock in the morning; looked into my breeding cage and found a perfect female Deathshead had emerged, having been only 37 days from pupating to emergence:—C. F. Wilding (4938).

[*M. atropos* is continuously brooded and this is why it cannot survive an English winter. Breeders should note this with foreign stock and always keep them warm. Do not put out for the winter! The related *M. sexta* Johan. at 28° C takes 35 days from egg to adult.—Editor]

LIGHT TRAPS AND WASPS:—I have made myself a light trap for moth catching with a black light unit in it. Some mornings when I went out to see what I had caught I found a few wasps in it. Later the numbers got larger. I removed the wasps and wondered what they were doing. One afternoon leaving the top off my trap to allow the contents to escape I saw a wasp catching a moth, killing it, and flying out to a nearby wall and apparently eating it. A few minutes later another would come and so on. I think that the local nest must be relaying the information for free food:—S. Ellis (5659)

SPECULATORS BEWARE:—Early in 1976 the Daily Telegraph's business column was urging stock marketeers to buy rare butterflies as a hedge against inflation. In particular it appears they had in mind the large colourful Birdwings currently advertised at up to £200 per pair. I can think of nothing more likely to suffer a market collapse than livestock. The precedent has already taken place and there has been a complete collapse in prices of many species due entirely to their powers of reproduction. For instance the price of a Clifden nonpareil in 1939 was £5, which let us face it, was equivalent to £50 at least in today's money. In the 1960's I offered them free and could not find a taker. Today's price appears to be about 50p to £1.00. Some investment! To take another example, in 1926 a blue coloured Large cabbage white sold for £26 at auction (£260 in 1976 terms). Present price a pound or two. Studying a recent dealers list of varieties, I note that in real monetary terms the prices asked are far below what similar material was fetching at auction between the wars. Butterflies are for Entomologists and should be collected for their intrinsic interest. If speculators wish to burn their fingers however, perhaps we should encourage them, for it is after all the demand that encourages dealers and hobbyists to go in for breeding, as already happened with the South American *Morphos* and a number of Taiwanese species. This will make them easier and cheaper to obtain:—Editor.

AN UNUSUAL FIND:—After an unsuccessful search in Newball Wood, which is a small wood just outside Lincoln, for Pearl-bordered fritillaries, I came across a male Silver spotted skipper (*Hesperia comma* L.) resting on a blade of grass on the very edge of the wood. I feel that this species is now of sufficient rarity to make its sighting worth recording:—A. Crook (5481)

UNUSUAL FOOD PLANT OF ELEPHANT HAWK MOTH:—On the 7th August, 1976 I visited the Wonderful World of Nature exhibition at the Old Mill, Kirkby Fleetham, N. Yorkshire and was shown 14 larvae, in various stages both brown and green, which were feeding on a plant of *Menyanthes trifoliata* L., the Bog Bean, which was growing in the pond. I identified the larvae as those of *Deilephila elphenor* L. and the foodplant was identified for me by Mr. P. W. Cribb. The larvae were not part of the exhibition, the ova having been deposited on the plant naturally. Although *Epilobium hirsutum* L., Great hairy willow Herb, was growing in several places around the pond, there were no larvae present on these. As the larvae would obviously not be able to reach land as the plant was surrounded by water, I and the wife of the owner of the place transferred them to the plants of the same species close to the bank. This is the first time I have found this species on any plant other than species of the Willow herbs.—A Northern Correspondent.

The Elephant hawk has quite a range of pabula and the following are recorded by P. B. M. Allan (1949) his *Larval Foodplants* (published by Watkins and Doncaster, London).

Epilobium hirsutum, *E. palustre* L., *Galium verum* L., *G. palustre* L., *G. mollugo* L., *G. saxatile* L., *G. uliginosum* L., *Circaea lutetiana* L., *Men anthes trifoliata*, *Rosa* sp., *Godetia*, *Vitis* sp., *Fuchsia*, *Ampelopsis* sp., *Calystegia sepium*, *Impatiens noli-me-tangere* L., and *Polygonum* sp. I have also found larvae on *Impatiens capensis* Meerb. and in Middlesex its usual Foodplant is *Chamaenerion angustifolium* L.—P. W. Cribb.

THE FUTURE OF THE WHITE-LETTER HAIRSTREAK:—In Britain the White-letter hairstreak (*Strymonidia w-album* Koch) feeds on species of Elm, *Ulmus* spp., but chiefly on solitary specimens of the Wych Elm, *Ulmus montana* With. (= *glabra* Huds.) It has a preference for large solitary trees though I have found colonies centred on several trees growing in a row and also one or two colonies associated with groups of the Common Elm, *Ulmus campestris* Mill. (= *procera* Salis.) and the Cornish Elm, *Ulmus stricta* Lindl. During the present outbreak of Dutch Elm disease it was hoped that the Wych Elms might be more resistant to the disease and perhaps survive but this year, 1976, I have observed the death of the only large specimen in my part of Middlesex and of several large trees in Buckinghamshire and Oxfordshire which I know to carry colonies of the butterfly. In Gloucestershire, Dorset and other counties in the west of England I also observed that Wych Elms were dying amongst an almost total devastation of the Common Elm. It certainly appears that, in the South at least, the Elm, of whatever species, is doomed and with this loss there must follow the disappearance of yet another of our native butterflies.

There are of course other insects dependent upon the Elm, in addition to the Elm bark beetles who are the cause of the trouble, so we may see several insects disappear from our countryside. Two moths which I have always found on the Wych Elm are the Clouded Magpie, *Abraxa sylvata* Scop., and the Brick, *Agrochola circumcellaris* Hufn.—P. W. Cribb (2270)

CLIFDEN NON-PAREILS IN NORFOLK:—No less than seven *Catocala fraxini* L. migrated to Norfolk last September. One of them was shown live on the BBC programme "Look East"—Editor.

BEWARE THE SHARKS:—We have received an unsolicited catalogue from a firm calling themselves "The Armado Aquarium" based in Singapore and offering some 500 Malaysian butterfly and other insect species for sale, to be paid for in advance. The prices appear to be a curious mixture of Malaysian and United States Dollars. Most of the butterflies are named trinomially and there has been a great increase in sub-species "*Malayana*"! Apart from butterflies it is a little difficult to understand exactly what they might be selling. What for instance is

Attacus atlas Malayensis? It is sold by size, from 6 cm to 12 cm at a price of 54p to £1.80. All my bred *A. atlas* L. seem to be greater than 12 cm wingspan and I do wonder how such minute specimens are produced! Next we come to that very interesting group of moths, the *Argema mittrei Malayensis* complex consisting of Hawkmoth *Deilephila elpenor Malayensis* and Gypsy moth *Porthetria dispar*, both of these being priced at £1.20, with Tiger moth *Arctidae* at 85p to complete the trio. Under *Lunar Moth, Saturniidae*, we have but one species, sold again by size, from 10 cm to 18 cm at a price of from £4.20 to £7.20. This, lo and behold, is none other than that familiar old nocturnal friend of ours, omitted from all copies of the Silkmother Rearing Handbook with obvious intent, "The Shark", *Cucullia Aneemisiae* (sic!) *Malayensis*.—Editor.

PONDS:—In the editorial of our last issue I drew attention to the fate that is overtaking ponds. There is indeed moves afoot to save them. The passage *sequiter* is reprinted from *Habitat* Vol. 12 No. 9. (Sept. 1976). "The Director of the Save the Village Pond Campaign has said that the drought which has been drying out ponds in Britain could also increase their conservation by focusing attention on the need for ponds as small but local supplies of water." He cites such examples as emergency watering of farm stock, fighting small grass fires and watering allotments. The drought also provides an opportunity to clear out the ponds, as their level is low enough to remove rubbish more easily and cheaply than usual. Normally people would not be encouraged to remove rubbish at this time of year as pond life is still active. A number of projects such as restocking of ponds once the water returns, replanting of pond plants and removing some of the silt layer, were suggested by the Village Pond Campaign."

MIGRANT DEATHSHEADS:—On 11th August, 1976 I found a fully grown larva of *Manduca atropos* L. in a potato field near Haverfordwest, Wales. The caterpillar pupated within three days and the moth, a female, hatched on 20th September, but unfortunately failed to fully expand its wings.—Nicholas Platt (5433 J)

PLANT-INSECT RELATIONSHIPS MEETING:—The Linnean Society of London and the Botanical Society of the British Isles are organising a joint conference from Thursday, 14 April - Sunday, 17 April, 1977 on the subject of Plant-Insect Relationships with Special reference to Pollination. Speakers have been invited from USA, Canada, South Africa, Israel and a number of European countries, and papers will be given on subjects as diverse as the detection of flowers by moths, pollination on the sea-shore and flower mimicry. Venue is the University of Newcastle-upon Tyne and further details can be obtained from Mrs Mullin, 43 Woodstock Avenue, West Ealing, London, W13 9UQ if a 9" x 4" sae is sent. The programmes and application forms will be sent out in January 1977.

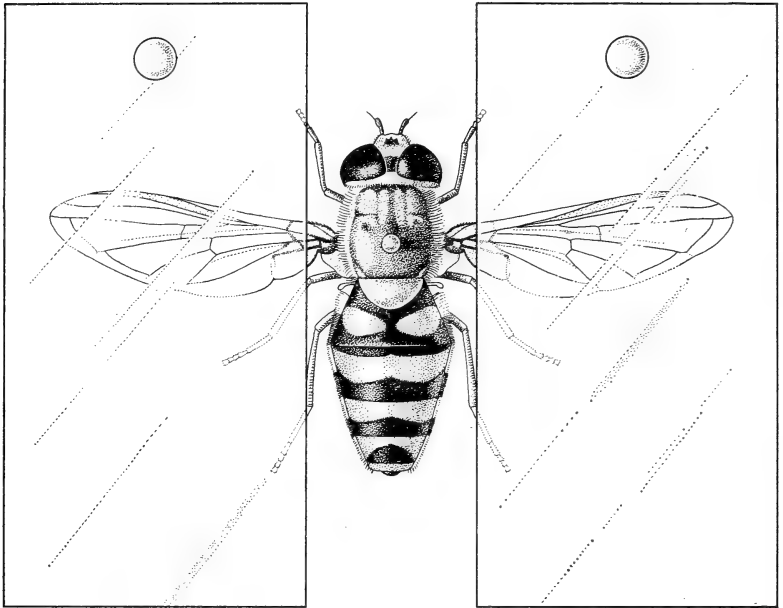
A SIMPLE METHOD FOR SETTING FLIES

As anyone who has tried will know, the setting of flies poses some very different problems to those encountered in setting Lepidoptera. One of the major difficulties encountered is that of securing the legs efficiently, while at the same time leaving space to manipulate the wings into the desired position. It will also be found that if any type of conventional setting board is used, the legs cannot be spread into natural positions due to the narrowness of the groove required for setting the wings, and if a wide groove is chosen the wings are difficult to secure. With these problems in mind I set out to find an easier method of setting those flies that are large enough to be pinned.

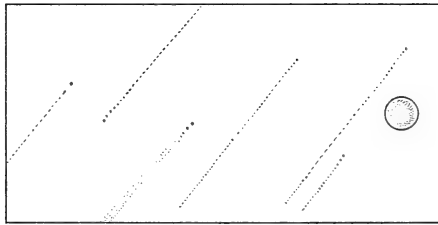
After a period of experimentation I developed the following method with which I have set many specimens with complete success.

The fly having been pinned, the first requirement is a block of expanded polystyrene. The specimen is then placed in the centre of the block and the legs manipulated into the desired positions with a setting needle. It will be found that in most cases the natural gripping nature of the feet will hold them firmly to the polystyrene and a securing pin is only rarely necessary. Before adjusting the wings, it is often helpful to place a pin each side of the body in order to prevent it from twisting when the wings are brought forward. A stage for holding the wings is easily made using clear plastic strip. That from the collars of new shirts is ideal. Two pieces of strip about 1" x $\frac{1}{2}$ " are placed together and a pin pushed through them both as shown in the illustration. Two of these stages are made, one for each wing. To set the wings, one of the stages is pinned in front of the insect with the clear strip pointing backwards. The two pieces of strip are held slightly apart with a needle while the wing is positioned between them. Provided that the part of the strip that the pin passes through is near enough to the front edge of the wing, the sandwich action of the strip is strong enough to hold the wing securely in place. Because the wing can be seen through the plastic, the folding over of any parts of the wing is easy to see and to remedy. The other wing is set in the same way, and any final adjustments are easy to make by simply parting the pieces of strip and moving the wings with a setting needle.

Having left the specimen to dry for a suitable period, removal from the polystyrene block poses no problems. The stages for the wings are removed by twisting them sideways until the wing slips out, parting them slightly if necessary. The insect is then carefully pulled away from the block, having removed any securing pins of course, and will come away easily, the gripping power of the feet not acting so strongly to this upward force. No problems have yet been encountered in the way of 'drooping' on the setting board or difficulties in removal, and the specimens set in this manner have a nice 'natural' look. With a little practice

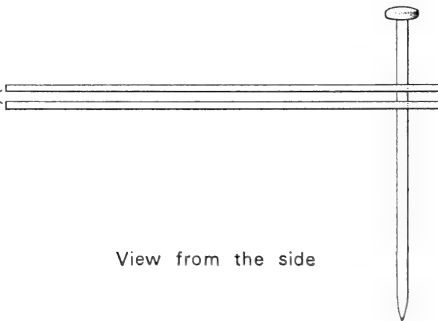


A set specimen of *Syrphus ribesii*



View from above

Cellophane
strip



View from the side

this method is very quick and a large fly can easily be set in 5 minutes or so.

I have not tried out this method on any other orders than Diptera yet, but feel that it may be suitable for many other orders such as Hymenoptera or Orthoptera, and members might find it interesting to try it out on such specimens. I hope this article proves useful to members, and that possibly the simplicity of this very cheap means of setting might possibly encourage interest in the more unusual orders of the insect world. I would be very happy to help anyone who encounters any problems while using this method.

L. H. T. LARGE (4424)

(The editor thanks Mr. Richard Lewington for the illustration)

CROATIA AND SLOVENIA—JUNE 1975

(Continued from Vol. 35 page 164)

We started early on the Sunday, 22nd June, and drove via Karlo Vac and Novo Mesto towards Ljubljana. Unfortunately we missed our road and found ourselves on a secondary road heading for Zagreb. However we decided to stay on it and strike the Autoceste from Zagreb to Ljubljana. On the way we saw Storks nesting on the top of telegraph poles and several soaring over the plain. The autoceste is a straight road of a two vehicle width no cross roads so that a good speed can be maintained. Near Otocec we stopped where a huge forest flanked the roadway on each side. Of mixed deciduous trees it seemed dense but we found a glade which led away from an animal culvert which passed under the roadway. The sun kindly came out and it was hot and very humid. The glade was alive with Heath fritillaries, *M. athalia*, large and well coloured. Among them were a few *Melitaea diamina* Lang and *N. ilicis*. Suddenly a butterfly like a White admiral circled down from the Hazel bushes and into my net. It turned out to be *Neptis sappho* Pallas an eastern species which has the same food-plant as *L. morsei*, the Vetchling *Lathyrus verna*. I had taken *N. rivularis* Scop. which is very similar in N. Italy some years ago and this was my first, and only, specimen of its cousin. The pathway had many big puddles ringed with deer slot marks and in them were dozens of Yellow-bellied toads in various stages of growth. I walked back towards the tunnel under the road and disturbed a large butterfly which raced off across the road and then returned to circle round me. I saw the flash of royal purple and netted a freshly emerged male of *Apatura ilia* L. We would have liked to have stayed longer here but we still had a long and unknown journey ahead of us so reluctantly drove on through the forest lined road to Ljubljana and out to the north where we could see the outline of the mountains in the distance. Heavy rain started to fall and did not stop until we reached the industrial town of Jesenice which stands at the end of the valley leading up between the Julian Alps and the Kara-

wanken Alps, the latter forming the frontier with Austria. At the end of a winding road we drove into the village of Kranjska Gora where we had booked rooms at the Hotel Prisank. In the evening sunshine the Julian Alps to the south of the village filled the landscape with the sun sparkling from the snowfields round the peaks. The Karawanken Alps are much lower and well wooded, while the peaks of the Julian Alps rise to 2,600 metres with Triglav the highest.

We were still having to push start the car as the battery did not appear to hold the charge and with the friendly help of fellow guests we started next morning up the Vrsic pass which leads up into the Trente valley before passing at about 5,000 ft. over the col towards Trieste. This is the home of two *Erebia* species, *E. calcaria* Lork. and *E. stirius* Gdt. but we guessed we would be too early for both in this late season. On the way up we encountered three large coaches and these had to take three bites at each of the hair-pin bends of which there are twenty-three on the way up. The road passes through flowery meadows above the river, by a lake and then up towards the snowy slopes. The metalled road peters out well before the col and the rest is a stony dirt track. We stopped and explored the slopes from which the snow had only recently departed and found dozens of *Pieris napi bryoniae* Hubn. flying up and down. The Spring butterflies of England were just on the wing, the Grizzled skipper, *Pyrgus malvae* L., and *Erynnis tages* L., the Dingy skipper, and several Orange tips, *Anthocaris cardamines* L. and some male *L. sinapis*. It seems obvious that we were too early for much else and drove down towards the village. This was nearly my last drive. With the battery being flat I inserted the ignition key but did not turn it. Taking off the hand brake the car rolled forward and as I turned the steering wheel the wheels locked (a device on the WG to prevent theft) and we went straight across the narrow road and over the edge. I slammed on the brakes and by a miracle there was a thin strand of wire along the edge. This caught under the mudguards as we went over and there we were with the car teetering over the edge. We managed to crawl out onto the road and eventually a car came up the pass with a Swedish driver who had a tow rope in his boot. This we tied to the back bumper and with the help of two farmers who had climbed up the slope we managed to get the car back onto the road, none the worse for wear though we both found the experience traumatic. Somewhat subdued we spent the rest of the morning collecting in the meadows above the village where we found carpets of Columbine, *Aquilegia* sp., and Orchids of several species. The Pearl bordered fritillary, *Clossiana euphrosyne* L., and *P. hippothoe* were common and with them lots of *L. sinapis*. In the afternoon we tried the other side of the valley, driving up the Wurzen Pass which leads over into Austria. We found the slopes here almost devoid of butterflies though rich in Orchids—white and mauve forms of the Fragrant, pink Pyramid mixed with red and the Early purple.

On the following day we decided to drive back down the valley and try the woods and meadows, hoping that more might be on the wing there. The battery trouble had been resolved as the night before I had rung the car hire firm at Ljubljana and a new Beetle had been driven out to us. The valley all the way down is quite beautiful with flowery meadows and woodlands. During the next three days we explored them thoroughly down through the village of Gozd and right beyond Jesenice. We disturbed several roe deer and some large hares during our wanderings and took several new species of butterfly. Amongst these were an interesting aberration of the Adonis Blue—it was a female, half of which was typical and the other ab. *ceronus* Esp. Along a deserted railway line we took *H. alciphron* Rott. and *Aricia allous montensis* Verity., and several specimens of the Chequered skipper, *Carterocephalus palaemon* Pall. These last were in a little woodland glade beside the railway and were flying with the Duke of Burgundy fritillary. *Melitaea cinxia* L., *Brenthis ino* Rott. and *B. hecate* were the commonest small fritillaries and the only large one seen was *Fabriciana niobe eris* Meig. flying fast over the meadows. The meadows could not be said to be rich in butterflies, the reason almost certainly being the shearing which was already taking place—scythe and small power mowers cut them very close and the grass is hung on wooden frames to hay. The weather continued to be unsettled with storms most evenings and wet grass next morning but there was sufficient sunshine to bring insects on the wing so that we were able to assess quite fairly the insect population. Below Jesenice I took a short series of *Coenonympha iphis* (= *glycerion* Bork.) Schiff. flying with *C. arcania*. and on a grassy bank there were hundreds of *M. galathea* and Coleridge caught one which had the forewings almost totally black. The beautiful blue, *Plebicula dorylas* Schiff., was just emerging and I took one male *C. dia* L., several *Q. quercus* and some Narrow-bordered bee hawks, *Hemearis tityus* L. These last were buzzing about the flowers and were hard to pick out from the Bumble bees. Searching for larvae, I found those of *M. athalia* feeding on Yellow rattle, *Rhinanthus* sp., and several larvae of *L. coridon* on clumps of *H. comosa* on which *Colias australis* females were depositing ova. There were a few *E. medusa* and *G. rhamnii* in the woodland clearings and in a swampy area we found a lot of Purple-edged coppers flying. I collected several stems of Dock, *Rumex* sp., on which eggs had been laid but these subsequently produced *Heodes tityrus subalpinus* Speyer so must have been laid some time earlier as we did not see it on the wing. The railway line gave us a nice feast of wild strawberries but the wild raspberries were still in flower. On the 26th I decided to drive up to the top of the Vrsic pass despite some misgivings after our previous experience. Right on top of the pass the view is striking—fields of snow with clearings of grass, heather and Alpenrose above, and below the winding hairpins of the road. People were still skiing as I climbed up a grassy gully above the road. *P. bry-*

oniae was everywhere and then I saw an *Erebia*. After a breathless chase I netted a male *E. pandrose* Berkh. and higher I found them very commonly. The race is very large and handsomely marked. Large flocks of Alpine Chough floated above my head, their raucous cries and sharp whistles breaking the silence. In the sunshine it was quite warm but as soon as cloud covered the sun the temperature dropped suddenly and a cold wind blew off the snows. Half way down the pass is a wooden Chapel built during the 1914-18 War by Russian prisoners of war in memory of 400 of their number who died while building this pass. There were flowers on the altar above which was a group of icons. In the afternoon we drove out to Podkoren on the Italian frontier and up a stony track below some impressive ski jumps. We saw a large black snake cross the roadway towards a lake, probably a large dark form of the Grass snake. There were now dozens of *L. sinapis* on the wing but little else.

On the 27th we woke to clear skies and the promise of a really hot day so decided to venture further than before, driving down through Jesenice. Beyond the town we turned off back into the Julian Alps to the town of Bled. Just outside the town there were large areas of pine woodland with grassy clearings. *M. athalia* was again very common and a lot of Ascalaphids buzzed about over the grasses catching flies. As I walked along a glade a large brown butterfly flapped across in front of me and I managed to net it. It was a new species to me, the Woodland brown, *Lopinga achine* Scop., very like the Speckled wood, *Pararge aegeria* L., in its habits. I also took one female *Strymonidia spini* Schiff. and Coleridge saw *A. ilia*. We drove into Bled and stopped by the vast lake in which there is an island with a church. In the deep water beside the bank we saw four huge Tench playing amongst the weeds; they must have been about 7 lbs. apiece. The road beyond the town winds through flowery valleys to another large upland lake, Bohinjsko Jezero, about 13 km. further on. Here we stopped above the lake where a wide river flows out of the lake below a bridge. There is a church here to St. John the Baptist with huge murals on the outside wall and inside a gory statue of St. John minus his head which is on a platter. The surface of the shallow part of the lake below the bridge was covered with a huge shoal of fish, apparently spawning. They appeared to be Chub and Roach and many were very large. It was extremely hot and we managed to buy ices in the village before driving back to collect among the meadows down the valley. These were not rich in insects despite the masses of flowers—some *C. australis*, *L. bellargus*, *P. icarus* and *C. semiargus*. I did find some half grown larvae of *G. rhamni* L. on a Rhamnus bush. A storm was now threatening above the peaks so we drove the long journey back to our hotel to arrive as it broke with crashing thunder and torrential rain.

The next day was our last at Kranjska Gora and we made an early

start to drive down to Ljubljana. It was a dull morning after the storm and we stopped to explore some woodland about 20 Km. short of the City. *M. athalia* were sitting about on the grasses and on the young Firs I found several resting *N. ilicis* of both sexes. There were also some very large *L. idas* which we picked from the grasses. A drizzle drove us on into Ljubljana where we had a room for the night at the Grand Union Hotel. Right in the centre of the City, it is quite luxurious and we were entertained at dinner time by a large group of American guests who were of Slovenian origin and were touring their native land singing American and Slovenian songs. At 7 p.m. another huge storm broke and this lasted all night with rain gushing out of every gutter and the roads awash. On the Monday morning the storm was still with us as we scrambled into the car and drove off towards Zagreb. Surface water was washing debris off the mountain slopes and the roads were quite difficult and the rain almost blinding. We drove the 80 odd miles to the outskirts of Zagreb before stopping and at last got beyond the storm but ran into the worst traffic jam I have ever met. It took us nearly two hours to travel 4 km. but at last we got beyond the City and reached the airport with plenty of time to spare. We were lucky as when eventually our BAC 1-11 did arrive, over an hour late, the British Airways had overbooked by sixteen seats and the late comers were left behind to travel next day. Flying into the setting sun we climbed into the storm clouds and did not see anything below us again until we came out of cloud over the Belgian coast to land at Heathrow at the start of a heat wave. During our trip we had recorded 74 species of butterfly and despite quite a lot of bad weather had been able to see some wonderful country, photograph many rare flowers and add another area of Europe to our travel map.

P. W. CRIBB (2270)

NOTES ON BRAZILIAN LEPIDOPTERA

Gonepteryx chlorinde, Godt.

The elegance of *G. chlorinde* is due to its delicate colouring, shape and size. It has a satin-white upperside, relieved by a pale yellow patch on each forewing, while its verso is the palest of pale greenish white. The curves, angles and points of its wings give it a similarity in shape to the Brimstone, and its $3\frac{1}{4}$ inch spread make it one of the largest of the Pierid family.

It is a very swift high-flyer and dodges at rapidly changing heights from tree to tree, flower to flower, always, however, in fairly open areas. It is very fond of the flowers of Cassia, Hibiscus and Bougainvillea, and where all these are available it settles only momentarily on the blooms of any of them before hurrying off urgently to sample the others. If, in fact, *chlorinde* has a preference, it appears to me that it may be

any of the varieties of Hisbiscus flower, whose yellow stamens seem to tempt it to loiter longer than it is wont to do at the other flowers.

This butterfly is not uncommon in some years and usually appears during the period marking the end of the wet season and commencement of the dry weather, but during some years with quite normal seasons it is extremely scarce for no apparent reason.

I have seen *chlorinde* in various regions of Brazil—North, North-East and South-East, from sea-level to 3500 feet—and have sometimes come across it in quite unexpected places. One, in 1948, near the town of Sertania in the “Sertao” (or Hinterland) of Pernambuco, at about 1800 feet, after recent rains had freshened the country side (which in that region is very arid in the dry season), and left it lush and green, I came upon large numbers of fresh-looking *chlorinde* flying about aimlessly and in apparent confusion (I have sometimes wondered if this was the result of a mass-hatching of large quantities of chrysalides, and whether this was the starting point of a migration). Another time, (in 1956, in the latter part of a season of no rain), on the slopes leading to the town of Triunfo perched on a mount at 3,400 feet, whence copious springs gushed out to form, lower down, a “brejo” or oasis in this arid part of Pernambuco, *chlorinde*, together with other Pierids and several species of Nymphalids, were very much in evidence. Yet another unexpected sighting of *chlorinde* was in Alagoos beside a tributary stream of the Rio Mandahu, when my glance was attracted by a frantically waving, tall grass stalk, on a dripping fern and grass-covered cliff. On the tip of this stalk, there was a fine *chlorinde*. I was surprised, as this was not the type of terrain where *chlorinde* was likely to loiter, there being no flowers at all. However, it was soon evident that this butterfly had probably not intended to dally there but had been simply flying past and had bumped into a spider’s web. And the spider was already on hand, busily and efficiently wrapping it up with sticky threads

Phoebis philea L.

The male of this species with its orange-flushed yellow wings is one of the most handsome of butterflies. It spans 3 inches. From near the costal nervure of each forewing a patch of bright orange splashes across the cell. The hindwings, of the same refreshing daffodil-yellow are also tinged with orange in a wide suffusion along the outer margins.

The slightly smaller female has, perhaps, a richer colour pattern than the male. The forewings are devoid of orange markings. They are of a deeper yellow, brown freckled and brown tipped. The yellow hindwings have a pinkish tinge with a wide red-orange splash at the outer margins.

The flight of both sexes is very rapid and erratic; usually oscillating at heights between 10 and 25 feet.

The larvae feed on *Cassia alata*, and *C. fistula* (known popularly, in

Brazil, as "Chuva de Ouro", or Golden Rain because of its delightful cascades of yellow blooms). Not only the caterpillars, but the angular chrysalids, too, are hard to find, even when fairly numerous, so well does their colouring blend with the light-green foliage of the food-trees.

The butterflies, male and female are partial to the yellow *Cassia* flowers and hover fussily about these blooms, returning to them repeatedly after sampling other flowers.

The females also like the flowers of Poinsettia (*Euphorbia pulcherrima*), wild Lantana and Bougainvillea, but the males are less often to be seen on these flowers. And, whilst I have often seen a female hovering about the "Flambayante" trees which abound in Alagos and Pernambuco, and revelling in their fiery red and orange blooms, I have seldom noticed a male amongst these glorious flowers.

The gnarled and stunted 20 ft. high "Cajá" or Cashew-nut trees (*Anacardium occidentale*) growing wild in the sandy coastal areas of Pernambuco, have an attraction, with their pink- and-yellow blossoms, for both sexes of *philea* which vie with numbers of small bees, Buprestid beetles and a few day-flying moths in sampling these flowers. In a Pará forest, however, I once came upon another species of "Cajá, growing straight and tall to over 45 feet. The foliage was not at all dense, and it was possible to see the glint of bees' wings sparkling in the sunshine, amongst the blossoms. But no *philea* were in evidence. I suppose this was because his butterfly prefers more open spaces, and perhaps the tree was too high for its liking, for quite close by, near the fringes of a clearing, I spotted four or five of them in the course of the forenoon.

P. philea appear in their largest numbers towards the end of the season of heavy rains. In a country as vast as Brazil the periods of this season vary considerably in different regions. Thus, in Minas Gerais the incidence of this butterfly is greatest in February and March, whereas in Alagoas and Pernambuco it is most often seen during May, June and July. Over many years in the North-Eastern and South-Eastern regions I have come across *philea* at altitudes ranging from sea-level to 4,600 feet, and think that altitude has little or no influence on the appearances of this butterfly (up to 4,600 feet at least).

P. philea prefers the early forenoon for flight, when the sun is beginning to get hot, while the vegetation is still glistening with dew and moisture from the morning mists. Towards midday it tends to disappear from the air, but appears again for a short time some two or three hours later. At any hour of the day, however, in open areas, if the sun is shining, the male especially may be found with other Pierids and a few other butterflies, on wet ground at the margins of the lakes and streams. This is particularly so in places where the ground has been churned up by cattle into muddy, polluted slush. In such places, and also on wet, lime-impregnated soil near limestone cliffs and in the vicinity of concrete

constructional work, I have often observed them with companions of other genera engrossed in the pastime of sipping moisture from the soil *Sarmentoia phaselis*, Hew.

At Cera Grande, on a marshy plain near the left bank of the Riodas Velhas, in the municipality of Pedro Leopoldo in Minas Gerais, there is a rugged grey limestone rock of enormous proportions. It is 1,200 feet by 300 feet and looms vertically to a height of 130 feet. In this limestone outcrop there are many caves, some of which had once served as shelters for a forgotten aboriginal tribe of Indians, as coloured rock-drawings and other remains testify. Some of the caves are located up in the cliff face; others are lower down and some have, in recent times, been inundated, as evidenced by much dried silt. Due to the lime which impregnates the soil, the surrounding Terrain supports a luxuriant secondary forest and dense brush, interspersed with patches of tall grass and a very virulent species of stinging nettle, which completely conceal some of the cavities. Numbers of parrots (*Psittacus virescens*) and many small monkeys desport themselves in this area; and butterflies, too, abound, especially towards the end of the wet season which lasts from October to April. *Morpho achilles* L. is plentiful, as are various Heliconids and Pierids, and *Catagramma sorana* Stoll, among many other Nymphalids, etc.

Within some of the lower caves, on three separate occasions—in 1964, 1965 and 1972, I saw several Hesperiid and secured a few specimens. Previously, in 1962, I had seen some of the same species in the dry, cavernous entrance “hall” leading into the beautiful grottoes at Maquine in the Municipality of Cordisburgo, also in Minas Gerais. All these Hesperiidæ were *Sarmentoia phaselis*. In each case they were at rest on dusty or silt-coated stalactites or stalagmites or on the walls of the cavern, in the half-light near the entrance.

In 1970, on the shore of a reservoir known as the Lagoa dos Inglezes, in the Serra da Moeda in Minas Gerais, I made a lucky fluke-capture of a specimen of *S. phaselis*. The red iron-oxide soil was dotted with many “ant” hills—really the nests of termites (*Cornitermes* sp.). One of these, a 5 ft high mound, had an 18-inch-diameter hole in its base, where armadilloes (which are very partial to termites) had dug deep into the almost rock-hard mound. Hoping to see an armadillo emerge, I had flung a handful of gravel into this hole, whereupon, to my surprise, an extremely fast-flying butterfly shot out and into the net held in my left hand. This was a *phaselis*.

Apart from the cases recounted above, I have never caught, nor seen, another specimen of *phaselis* and so am inclined to think that this butterfly favours dry, rather gloomy cavernous places in which to repose.

All these specimens had a wing span of 1-1½ inch. In colour they are basically light-brown. There are light small well-defined, irregular,

semi-transparent whitish marks on the forewing and seven ill-defined dark brown dots (or tiny blotches) on the hindwing. The body is rather furry.

Pachylia syces, Hubn.

In Brazil, the streets and squares of many towns and cities are heavily arborized to alleviate the tropical glare, and of course, for the sake of shade. One of the trees most admirably suited for this purpose is *Ficus benjamina*, which, with its thick evergreen foliage lends beauty to many a street and square.

F. benjamina is the principal food tree of the caterpillars of the large hawk-moth, *Pachylia syces*. These caterpillars also feed on the leaves of the Jack-fruit tree (*Artocarpus integrifolia*) and on many species of fig other than *benjamina*; but they are generally to be found on *benjamina* which is the food-tree abundantly available to them.

Until the final instar the *P. syces* larvae are light green with two parallel white stripes along each side; with thin narrow bands between the segments. The head and short stiff tail are of a darker shade of green. Even when their droppings make it obvious that they are feeding on a certain tree, it is extremely difficult to locate the caterpillars because of their colouring, aided by the density of the green foliage.

Immediately before pupating the caterpillar becomes black, and the bands between its segments take on a greenish hue, while the head turns red. At this instar, the caterpillars, now some $4\frac{1}{2}$ inches long and near $\frac{3}{8}$ inch thick at the middle, crawls down from the food-trees and searches for a convenient place in which to pupate. At this stage, on various occasions, in the States of Paraiba, Pernambuco, Alagoos and Minas Gerais, at all altitudes up to about 4,000 ft. I have seen numbers of these caterpillars roaming about on the streets and pavements, always in the season when most of the heavy rains have passed. Pupation takes place in loose soil or amongst the dead leaves accumulated in the nooks and crannies between or near the roots of convenient trees in the vicinity. A flimsy web or cocoon of coarse silk sometimes encloses the $2\frac{1}{2}$ inch dark-brown chrysalis, but more often there is no covering whatsoever.

The adult *P. syces* emerges some three weeks later, and may be seen at night, alternately orbiting the street lamps and swooping off into the gloom, looking like a bat; and in the early morning, at rest on a nearby wall, or clinging to the dewy leaves of a garden plant; or on the trunk of a *benjamina* fig tree.

The appearance of this Sphinx moth is unprepossessing—something of an anti-climax after-seeing the handsome caterpillar from which it developed—being dark brown in colour, relieved only by some hardly discernible paler markings and one clear-cut pale patch on the coistal border near the apex of each forewing. The outer margins of both, upper and lower, wings are serrated. The body is gross and its upper-side is brown with the hint of a greenish sheen in the abdomen, while

the underside is fulvous. *P. syces* is a swift strong flyer, with a wingspan of $3\frac{1}{2}$ - $4\frac{1}{2}$ inches. The wings of the male are slightly narrower than those of the female, otherwise their general aspects are similar.

Terence C. Hanson (5242)

NOTES ON THE LEPIDOPTERA OF THE ISLE OF LEWIS

While camping at Uig Sands, Isle of Lewis (Outer Hebrides) with the Schools Hebridean Society, I made a brief survey of the lepidoptera around the campsite. The dates were from the 12th to the 22nd of August, 1976, and the weather was hot and sunny, although windy on some days.

Most of the land around the campsite consisted of dunes, with a few outcrops of rock, the most abundant vegetation was Marram Grass, although plenty of other plants were found. There were several large patches of Ragwort, which attracted much lepidoptera to its flowers.

BUTTERFLIES

By far the commonest butterfly was the Meadow brown (*Maniola jurtina*, L.) which could be found among grass on the dunes. Also among the dunes could be found the Common blue (*Polyommatus icarus*, Rott.) This, however, was less common than the Meadow brown, and I only saw two (one of each sex).

Several Red Admirals (*Vanessa atalante*, L.) were seen, and this butterfly seemed to like the flowers of Ragwort. On several days, I saw one fluttering over the yellow blossoms, and when feeding, they were quite tame, and I could get within several inches of them. Their larval food plant, Stinging Nettle, was not abundant, but several patches grew nearby.

While visiting a small village about a mile from the campsite, I saw a White butterfly. As I did not have my net with me, I could not make a certain identification, but it was either a Small white (*Pieris rapae* L.) or a Green-veined white (*P. napi* L.).

Three other species, the Large white (*P. brassicae*, L.) the Small tortoiseshell (*Aglais urticae*, L.), and the Gatekeeper (*Pyronia tithonus*, L.) were seen by other people on the campsite. However, I am inclined to disagree with the record of the Gatekeeper, as it is not often found so far north.

MOTHS

Nine species of moths were found, two of them belonging to the family Geometridae, and the rest to the Noctuidae.

The commonest Geometrid was the Common carpet (*Epirrhoe alternata* Müll.). The specimens caught were on the sub-species *obscurate*, south. The other Geometrid was caught on my last day at the campsite, and I think it was a Purple Bar (*Lyncometra ocellata*, L.). The markings

were the right shape, but they were more black than purple. However, its food plant, Lady's bedstraw, was plentiful, so as far as I can tell, the moth was a Purple bar.

I found nearly all of the Noctuid moths on or around the flowers of Ragwort. Several species could be found on this plant throughout the day. The two commonest moths were the White-line dart (*Euxoa tritici*, L.) and a species of Ear Moth (genus: *Hydraecia*). These could be found in numbers on Ragwort flowers.

A few Large yellow underwings (*Noctua pronuba*, L.) were found, mainly on Ragwort. Another quite common moth was the Antler (*Cerapteryx graminis*, L.). This pretty little moth was another visitor to the Ragwort.

Three other species were found less commonly. Two Deep-brown darts (*Aporophyla lutulenta*, Schiff.) were found on Ragwort, both of the dark form *luneburgensis*, Freyer. One Common rustic (*Apamea secalis*, L.) was found, although on reflection this could have been a tatty Ear Moth! Finally, one Pale mottled willow (*Caradrina clavipalpis*, Scop.) was found.

Martin Harvey (5772 J)

SOME NOTES ON CONOCEPHALUS DISCOLOR (ORTHOPTERA: TETTIGONIIDAE)

Conocephalus discolor Thun. (the Long-winged Cone-head) is a small bush-cricket with fully developed wings. It is usually a green colour with a brown dorsal stripe, although all brown individuals have been seen. The fore wings are also brown and the hind wings extend slightly beyond the fore wings. In the female the ovipositor is long and slightly upcurved, and in the male the cerci have a tooth on the inner surface.

C. discolor is always found close to the coast and is quite common on waste ground in Portsmouth. Unlike most British bush-crickets it is active by day, moving rapidly if disturbed. During the summer of 1976 I obtained a number of individuals and observed a number of aspects of their little studied life history.

Due to the possibility of cannibalism, individuals were kept in separate gauze topped jars with 1 to 2 inches of sand in the bottom. Initially grasses found in the area of capture were provided for food but this did not seem very successful. For the rest of their period in captivity the bush-crickets were fed on various insects but mainly blowflies which were captured daily. They appeared to survive quite well on this purely carnivorous diet eating 2 or 3 flies per day.

Many insect songs have been an ultrasonic component, and in bush-crickets the sound is often mainly in the ultra-sonic range. This is true

for *C. discolor* where sound up to 90 kHz. have been recorded. The song of the male is high pitched and faint to the human ear and consists of continuous bursts of sound. Singing began in the morning and often continued well into the night. As in other species there was short maturation period before stridulation commenced. One male, which was captured as a nymph, first sang four days after becoming adult. Prolonged stridulation began the following day. There was also a brief period during which singing ceased after a successful mating attempt, but this lasted only a matter of hours.

Similarly there was a maturation period in the female which lasted slightly longer than that of the male. In two females captured as nymphs, the maturation period lasted six and nine days after becoming adult. Unlike the males, there was no return to a sexually receptive state after mating. However this may have been due to the death of the females within three weeks of mating.

Very little mating behaviour is shown by this species. When males are in a receptive state they stridulate and receptive females approach stridulating males. Mating itself is a short affair lasting only 10 to 15 minutes after which the sexes separate. The body of the spermatophore can be seen on the abdomen of the female after mating, and this is usually eaten by the female.

Egg laying began the day after mating and was then continuous but the numbers laid fluctuated. The eggs were cigar shaped, about 5 mm. long and a pale brown colour. Unlike grasshoppers, bush-crickets lay their eggs singly, in most cases in crevices in vegetation. This can make it rather tedious when it comes to searching for the eggs especially if a daily check is kept on egg laying. To overcome this problem I have devised a simple but effective device. It consists of a number of poly-porous strips (as used for staging) held together securely but not too tightly with an elastic band. The female will then be able to insert her ovipositor between the strips and deposit her eggs which can easily be collected. Using this device I was able to keep a daily check on the egg laying of *C. discolor*.

Most eggs were laid soon after mating, the numbers laid per day declining thereafter. Days on which no eggs were laid became more frequent as time progressed. Of the four females observed the maximum total number of eggs laid was 59 and the minimum was 27 (average = 42). The average number laid per day was 2.7, the maximum laid in one day was 16 eggs.

D. Janssen (5585)

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SALES, G. and PYE, D. (1974) Ultrasonic Communication by Animals. Chapman and Hall.

A LIST OF THE FOOD PLANTS OF EAST AFRICAN MACROLEPIDOPTERA

PART 2—MOTHS (HETEROCERA)

(Continued from Volume 35 page 195)

- Ascotis selenaria* Schiff.—*Acrocarpus fraxinifolia*, *Cassia* (Caesalpiniaceae) : *Cupressus lusitanicus* (Cupressaceae) : *Ricinus* (Euphorbiaceae) : *Geranium* (Geraniaceae) : *Chlorophora excelsa* (Moraceae) : *Eucalyptus torelliana* (Myrtaceae) : *Maesopsis eminii* (Rhamnaceae).
- „ *reciprocaria* Wlk.—*Ipomoea batatas* (Convolvulaceae) : *Ficus urceolaris* (Moraceae) : *Eucalyptus* (Myrtaceae) : *Arachis hypogaea* (Papilionaceae) : *Coffea robusta* (Rubiaceae) : *Datura* (Solanaceae) : *Anacardium occidentale* (Anacardiaceae) : *Nerium* (Apocynaceae) : *Julbernardia magnistipulata* (Caesalpiniaceae) : *Combretum*, *Quisqualis* (Combretaceae) : *Acalypha* spp., *Ricinus communis* (Euphorbiaceae) : *Loranthus* (Loranthaceae).
- Aphilopota nubilata* Prout—*Maytenis heterophylla* (Celastraceae).
- Racotis zebrina* Warr.—*Popowia caffra* (Anonaceae).
- „ *divisaria* Wlk.—*Julbernardia magnistipulata* (Caesalpiniaceae) : *Combretum gueinzii* (Combretaceae) : *Diospyros villosa* (Ebenaceae).
- „ *proximaria* Wlk.—*Acacia mollissima*, *Albizia adianthifolia* (Mimosaceae).
- Boarmia octomaculata* Wllgrn.—*Combretum gueinzii* (Combretaceae).
- Euexia percnopus* Prout—*Celastrus verrucosus* (Celastraceae).
- Paracotis hyrax* Townsend—*Schinus molle* (Anacardiaceae).
- Racotis squalida* Btlr.—*Annona* (Anonaceae) : *Michelia* (Magnoliaceae).
- „ *zebrina* Warr.—*Uvaria* (Anonaceae).
- Cleora nigriparsalis* Janse—*Eucalyptus citriodora* (Myrtaceae) : *Coffea arabica* (Rubiaceae).
- „ *rothkirchi* Strand—*Cupressus* (Cupressaceae) : *Ricinus* (Euphorbiaceae) : *Geranium* (Geraniaceae) : *Eucalyptus* (Myrtaceae).
- „ *herbuloti* Fletcher—*Eucalyptus cloesiana*, *E. saligna* (Myrtaceae) : *Pinus patula* (Pinaceae).
- „ *dargei* Herb.—*Cupressus* (Cupressaceae) : *Entandophragma angolense* (Meliaceae) : *Eucalyptus* (Myrtaceae) : *Pinus patula* (Pinaceae).
- „ *pavlitzkiae* Fletcher—*Cupressus lusitanica* (Cupressaceae) : *Pinus patula* (Pinaceae).

- „ *scobina* Fletcher—*Cupressus lusitanica* (Cupressaceae) :
Eucalyptus torelliana (Myrtaceae).

N.B. I have omitted all records of *Cleora acaciaria* Bsd. and *C. tulbaghata* Feld. The former is not East African and so many species have been misidentified as the latter in the past that it is not certain to what they really apply.

- Medasina ugandaria* Swinh.—*Piper umbellatum* (Piperaceae).
Tephрина catalaunaria Guen.—*Delonix regia* (Caesalpinaceae).
 „ *deerraria* Wlk.—*Acacia* (Mimosaceae).
Luxiaria curvivena Warr.—*Eucalyptus torelliana* (Myrtaceae).
Oedicentra albipennis Warr.—*Pinus radiata* (Pinaceae).
Semiothisa rectistriaria H.Sch.—*Albizia* (Mimosaceae).
 „ *turbulentata* Guen.)
 „ *elata* Prout) *Acacia* (Mimosaceae).
 „ *brongusaria* Wlk.)
 „ *trinotata* Warr.)
 „ *feraliata* Guen.—*Maytenus heterophylla* (Celastraceae).
 „ *fulvimargo* Warr.—*Acacia mearnsii* (Mimosaceae).
 „ *subcurvaria* Mab.—*Acacia abyssinica*, *A. xanthophloea* (Mimosaceae).
Coenina aurivena Btlr.—*Ipomoea*, *Stictocardia* (Convolvulaceae) :
Ricinus (Euphorbiaceae) : *Hibiscus* (Malvaceae) :
Lantana (Verbenaceae).
Xenimpia erosa Wlk.—*Ipomoea batatas* (Convolvulaceae) : *Ricinus*
communis (Euphorbiaceae) : *Citrus nobilis* (Rutaceae).
Epigynopteryx ansorgei Warr.—*Laggera alata* (Compositae) : *Coffea*
arabica (Rubiaceae).
 „ *coffaea* Prout—*Coffea arabica* (Rubiaceae).
 „ *flavedinaria* Guen.—*Ricinus communis* (Euphorbiaceae).
 „ *tabitha* Warr.—*Coffea* (Rubiaceae).
Petrodava leucicolor Btlr.) *Ziziphus mauritiana* (Rhamnaceae).
 „ *albosignata* Wlk.)
Nothobraxas commaculata Warr.—*Lantana* (Verbenaceae).
Zamarada ochrata Warr.—*Acacia* (Mimosaceae).
Melinoessa croesaria H.Sch.—*Vitis* (Ampelidaceae).
Lomographa aridata Warr.—*Acacia* (Mimosaceae).
Xenostega fallax Warr.—*Harungana madagascariensis* (Hypericaceae).
Hyalornis docta Schaus—*Ipomoea batatas* (Convolvulaceae) : *Coffea*
(Rubiaceae).
Pigiopsis convergens Warr.—*Psidium cattleianum* (Myrtaceae).
Xanthisthisa tarsispina Warr.—*Cupressus lusitanica* (Cupressaceae) :
Pinus patula (Pinaceae).

PYRALIDAE**Galleriinae**

Trachylepidea fructicassiiella Rag.—*Cassia mannii* (Caesalpinaceae). In seeds.

Lamoria impella Wlk.—*Ficus eriobotryoides* (Moraceae). In fruits.

Corcyra cephalonica Stn.—*Balanites aegyptiaca* (Simarubaceae). In seeds.

Crambinae

Chilo zonellus Saalm.—*Panicum maximum*, *Pennisetum typhoides*, Sorghum, *Zea mays* (Gramineae).

Chilo traea argyrolepis Hamps.—*Panicum*, *Pennisetum*, Sorghum, *Zea mays* (Gramineae).

Schoenobiinae

Obtusipalpis fusipartellis Hamps.—*Ficus storthophylla* (Moraceae) : *Coffea* (Rubiaceae).

Anerastiinae

Maliarpha separatella Rag.—*Oryza sativa* (Gramineae).

Rhodochrysea superbella Hamps.—*Daucus carota* (Umbelliferae).

Phycitinae

Homoeosoma dimera Hamps.—*Piper umbellatum* (Piperaceae)

Euzophera villora Feld.—*Solanum gilo*, *Solanum* sp. (Solanaceae).

„ *sagax* Meyr.—*Coffea robusta* (Rubiaceae) : *Camellia sinensis* (Theaceae). In berries and seeds.

Hypsipylla robusta Moore—*Entandrophragma excelsum*, *E. utile*, *Khaya anthotheca*, *K. grandifoliola*, *K. senegalensis*, *Lovoa brownii*, *Swietenia macrophylla* (Meliaceae). In shoots and seeds.

Mussidia nigrivenella Rag.—*Kigelia aethiopica* (Bignoniaceae) : *Ficus* (Moraceae). In fruits.

„ *fiorii* T. & de J.—*Kigelia aethiopum* (Bignoniaceae) : *Cordia* (Boraginaceae). In fruits.

„ *albipartalis* Hamps.—*Khaya anthotheca*, *Khaya* sp., *Swietenia mahogani* (Meliaceae).

Cryptoblabes gnidiella Mill.—*Coffea arabica* (Rubiaceae). In the dry fruits.

Plodia interpunctella Hbn.—*Pinus palustris* (Pinaceae). In seeds.

Etiella zinckenella Treit.—*Cajanus cajan*, *Crotalaria*, *Lablab purpureus*, *Lupinus* (Papilionaceae). In pods.

Dysphyllia viridella Rag.—*Piliostigma thonningii* (Papilionaceae).

Hydrocampinae

Zebronia phenice Cr.—*Kigelia aethiopum*, *K. moosa*, *Markhamia platycalyx*, *Sterespermum kunthianum* (Bignoniaceae) : *Ricinus communis* (Euphorbiaceae).

Pyralinae

- Herculia tenuis* Btlr.—*Neoboutonia* (Euphorbiaceae) : *Eucalyptus* (Myrtaceae).
Dattinia perstrigata Hamps.—*Ceratophyllum demersum* (Ceratophyllaceae).
Sacada albizziae Tams—*Albizia grandibracteata* (Mimosaceae).
 „ *prasinalis* Hamps.—*Maesopsis eminii* (Rhamnaceae).
 „ *nicopoea* Tams—*Bridelia micrantha* (Euphorbiaceae).
Sceliodes laisalis Wlk.—*Solanum melongena* (Solanaceae), feeding internally on the seeds.

Pyraustinae

- Hymenia recurvalis* F. (*Zinckenia fascialis* Cr.)—*Amaranthus* (Amaranthaceae) : *Chenopodium* (Chenopodiaceae).
Pagyda traducalis Zell.—*Ziziphus mauritiana* (Rhamnaceae).
 „ *salvalis* Wlk.—*Buddleja* (Longaniaceae).
Ercta ornatalis Dup.—*Ipomoea batatas* (Convolvulaceae).
Marasmia trapezalis Guen.—*Brachiaria*, *Imperata cylindrica*, *Panicum maximum*, *P. trichocladum*, *Paspalum notatum*, *Pennisetum clandestinum*, *Setaria sphacelata*, *Sorghum vulgare*, *Triticum sativum*, *Zea mays* (Gramineae).
 „ *venilialis* Wlk.—*Pennisetum purpureum*, *Zea may* (Gramineae).
Syngamia abruptalis Wlk.—*Mentha piperita*, *Ocimum* (Labiatae).
Polygrammodes junctilinealis Hamps.—*Markhamia platycalyx* (Bignoniaceae). In seeds.
 „ *hirtusalis* Wlk.—*Gossypium* (Malvaceae). In seeds. *Ficus capensis*, *F. congensis*, *Ficus* spp. (Moraceae).
Piliocrocis laralis Hamps.—*Cineraria* (Compositae).
 „ *pterygodia* Hamps.—*Hoslundia opposita*, *Ocimum*, *Salvia* (Labiatae).
Filodes costivitalis Guen.—*Thunbergia* (Acanthaceae).
Dichocrocis usalis Wlk.—*Hibiscus diversifolius* (Malvaceae).
 „ *crocodora* Meyr.—*Coffea* (Rubiaceae).
Botyodes asialis Guen.—*Ficus* (Moraceae). (Indian record).
Sylepta balteata F.—*Rhus vulgaris* (Anacardiaceae) : *Canarium schweinfurthii* (Burseraceae) : *Geranium* (Geraniaceae) : *Eucalyptus torelliana* (Myrtaceae).
 „ *derogata* F.—*Ochroma lagopus* (Bombacaceae) : *Althaea*, *Gossypoides kirkii*, *Gossypium*, *Hibiscus*, *Thespesia danis* (Malvaceae).
 „ *ovialis* Wlk.—*Vitis vinifera* (Ampelidaceae).
Lygropia amyntusalis Wlk.—*Coffea* (Rubiaceae).
Agathodes musivalis Guen.—*Erythrina abyssinica*, *Erythrina* sp. (Papilionaceae).

- Margaronia unionalis* Hbn.—Jasminum (Oleaceae).
 „ *aniferalis* Hamps.—Vernonia (Compositae).
 „ *arachnealis* Wlk.—Picralima (Apocynaceae).
 „ *bonjongalis* Plotz—Alstonia boonei (Apocynaceae).
 „ *incomposita* B. Bak.—Antiaris usambarensis (Moraceae).
 „ *indica* Saund.—Cucumis sativus, Cucurbita pepo, Lagenaria, Melothria, Momordica foetida (Cucurbitaceae) : Pasture grasses (Gramineae) : Gossypium (Malvaceae).
 „ *ocellata* Hamps.—Funtumia elastica (Apocynaceae).
 „ *sericea* Drury—Conopharyngia, Tabernaemontana coronaria (Apocynaceae). Le Pelley gives Gardenia (Rubiaceae), but this is almost certainly a misidentification of Tabernaemontana.
 „ *prasinalis* Saalm.—Tabernaemontana coronaria (Apocynaceae).
 „ *bicolor* Swains.—Nerium (Apocynaceae).
 „ *sycina* Tams—Chlorophora excelsa, C. regia (Moraceae).
 „ *stolalis* Guen.—Ficus carica, F. natalensis (Moraceae).
 „ *sinuata* F.—Moduca. (An Indian record, but I am unable to trace the plant).
 „ *argyraspides* Tams) Ficus spp. (Moraceae).
 „ *sycina* Tams.)
- Sylepta balteata* F.—Anacardium occidentale (Anacardiaceae).
Neostege holoxutha Hamps.—Grewia (Tiliaceae).
Lamprosema indicata F.—Arachis hypogaea, Phaseolus, Vigna unguiculata, Voandzeia subterranea (Papilionaceae).
Leucinodes orbonalis Guen.—Solanum (Solanaceae).
Crocidolomia binotalis Zell.—Capparis, Gynandropsis gynandra (Capparidaceae) : Brassica oleracea, B. rapa, Nasturtium officinale (Cruciferae) : Moringa oleifera (Moringaceae) : Tropaeolum major (Tropaeolaceae).
Hellula undalis F.—Gynandropsis gynandra (Capparidaceae) : Brassica oleracea, B. rapa (Cruciferae).
Thliptoceras octoguttale Feld.—Coffea arabica, Tricalysia (Rubiaceae).
Terastia meticulousalis Guen.—Erythrina (Papilionaceae) : Coffea (Rubiaceae). In stems.
Maruca testulalis Geyer—Ricinus communis (Euphorbiaceae) : Arachis hypogaea, Cajanus cajan, Canavalia ensiformis, Lablab purpureus, Lupinus, Phaseolus, Pisum sativum, Kotschya africana, Vigna (Papilionaceae).
Psara phaeopteralis Guen.—Cynodon (Gramineae).
Udea ablactalis Wlk.—Kigelia aethiopum, Tecoma (Bignoniaceae).
Antigastra catalaunalis Dup.—Sesamum (Pedaliaceae) : Antirrhinum (Scrophulariaceae) : Duranta repens (Verbenaceae).

- Mecyna gilvata* F.) *Lupinus* (Papilionaceae).
 „ *polygonalis* Schiff.)
Pyrausta incoloralis Guen.—*Asclepias*, *Calotropis* (Asclepiadaceae).
 „ *fulvilinealis* Hamps.—*Markhamia platycalyx* (Bignoniaceae).
Chalcidoptera trogobasalis Hamps.—*Nauclea diderrichii* (Rubiaceae).
Epipagis olesialis Wlk.—*Securinega virosa* (Euphorbiaceae).
Sceliodes laisalis Wlk.—*Solanum* (Solanaceae).

The following four species cannot be referred to sub-families from the literature available in the National Museum, Nairobi.

- Audeoudia haltica* Meyr.—*Spirostachys africana* (Euphorbiaceae).
Eldana saccharina Wlk.—*Cyperus papyrus* (Cyperaceae) : *Saccharum officinarum*, *Sorghum vulgare*, *Zea mays* (Gramineae).
Pempelia virescens Hamps.—*Ficus mallatacarpa* (Moraceae). In fruits.
Pogononeura xantholepia Hamps.—*Eriobotrya japonica* (Rosaceae).

(To be continued)

D. G. Sevastopulo

BOOK REVIEWS

THE SWALLOWTAIL BUTTERFLIES OF EAST AFRICA (LEPIDOPTERA, PAPILIONIDAE) by R. H. Carcasson, pp 30, 11 plates, tp+index. 1975. small crown 4to. E. W. Classey Ltd., Farringdon, Price £1.80.

This publication is a reprint with the original illustrations, but re-set type, of the author's paper first published 1960 in the *Journal of the East African Natural History Society*. It is a great pity that the re-set type has been done by a non-registration typewriter, as a result of which the text looks like a xerox reproduction of a typed manuscript. The uniform lettering makes the text confusing to use as does the inconsistent use of underlines, applied to countries (But only under "RECORDS"!) sub-species, and, sometimes, families: e.g. *Acraeidae* on page 19. The illustrations on the plates are black and white drawings by the author. The facies of Swallowtails do in fact lend themselves to this type of diagram and the paper they are printed on is of sufficient quality for any owner to do his own colouring on the illustrations.

For a variety of reasons, Africa appears in the past to be the least well served continent in respect to Entomological publications. This is now being put right and the author of the present work obviously has a good grasp of his subject and it is a pity that, since the now sixteen year old article was to be re-typed, the opportunity was not taken to correct previous errors and include additional material. As a concise guide, bibliographical reference, and identification key to, the Swallowtails of Uganda, Kenya and Tanzania, this booklet is of inestimable value and should be of use to all interested in African butterflies, in spite of its faults.

SRG

GENITALIAS (ANDROPIGIOS) DE LAS ZYGAENAS DE LA PENINSULA IBERICA, by Dr. Fidel Fernandez-Rubio. Published by A.E.P.N.S. 1975 pp. 32, 26 of which are b/w photographic plates.

This is the first of a series of publications planned by Spanish entomologists to list and illustrate the genitalia of the Iberian Lepidoptera. It forms part of the great out-pouring of work from that area now taking place due to the enthusiasm and dedication of greater and greater numbers of Spaniards towards the subject of entomology.

This booklet consists of a series of photographic plates of the genitalia of the Iberian Zygaenidae. There is a very brief introduction and a list of the illustrations, which consists of a general preparation and an enlarged view of the aedeagus. As a general reference work to anyone trying to identify holiday captures this booklet is of use. We would however like to have had a few words of explanation, pointing out differences of closely allied species, and, typographically, we would ask that future editions and publications in this series, have the pages numbered. The booklet is well printed on good quality paper and is apparently sent free on request to interested persons.

BOCG.

GENITALIAS (ANDROPIGIOS) DE LOS ROPALOCEROS DE ALAVA Y SU ENTORNO IBERICO. PARTE 1. LYCAENIDAE. By Dr. F. Fernandez-Rubio. Published by A.E.P.N.A., Seccion de Ciencias del Consejo de Culture de la Excma, Diputacion Foral de Alava, Victoria, Spain, 1976 pp 78, 71 of which are b/w photographic plates. Price not known.

This is the second of the series of booklets portraying the male genitalia of Iberian Lepidoptera. It consists of a brief introduction and photographs of dissected genitalia (male) of the Lycaenidae. The plates are $6\frac{1}{2} \times 4\frac{1}{2}$ ins. but scale of magnification is not indicated. The pictures are very clear but the work would have been much more useful to the student had there been notes with the pictures indicating the salient features to look for when separating the species where superficially there appears to be little difference in the armatures. This is certainly a book which will be of use to those who include the butterflies of Europe in their interests and will help in more positive identification of some border-line cases.

PWC.

MOTTO:—If you want to live and thrive, let a spider run alive:—
Quoted by Twiggy on T.V.

MOTHS IN COLOUR, by Leif Lyneborg. Illustrations by Niels Jonsson. Translated out of Danish by K. C. Ferguson & Edited by H. J. Midwinter. pp. 177; 48 col. plates; small 8vo. Blandford Press, Poole. 1976. Price £2.50.

This is yet another of the now all too numerous small books on the market dealing with but a tiny selection of Europe's (or Britain's for that matter) insects. There is perhaps little to choose between them and most are suitable as a brief introductory present for a parent or friend to give the tyro entomologist.

The plates really are quite reasonable, but we must query the usefulness of such small (that is to say natural size) representations of micros such as Nepticulids. The figured species are described and discussed in the text with details of distribution, habitat and life-history. There is a brief introductory chapter and some of the very confusing nomenclature used may be explained by referring to the bibliography which largely consists of books originally written 50-100 years ago. A Nannolitre I have heard of. But where, when and by whom was the term 'Nannolepidoptera' defined? Let alone the name 'Aplostommatoptera' for the Hepialidae. An elementary book like this for the beginner is not the place to introduce new, confusing and certainly controversial taxonomic revision.

It is the duty of an Editor, surely, to see that a book is not full of mistakes. Unfortunately in this instance he has failed. The number of spelling errors are so numerous as to be misleading and completely spoil the book. On this count alone it cannot be recommended. Page 11 is a particularly glaring example where we have Tortricidea for Tortricidea; Cossidea for Cossidae; geometride for geometrid; Sphingaideia for Sphingioidea; Sphingaidae for Sphingidae. The Descriptions of the Moths gets off to a bad start with *Laetheo* for *Laothoe*, correct in the index, which however quotes the Twent Plume moth, this however correctly being Twenty Plume in the text.

SRG.

CROSSWORD ANSWERS

For those who have spent the past three months puzzling over the clues in our last issue, here are the answers.

ACROSS: 1. Termite. 7. Chitin. 8. Eyed. 10. Orache. 13. Stylops. 15. Exuvia. 16. Feeler. 18. Exotica. 21. Yuccas. 23. Rami. 24. A Trail. 27. The Moon. DOWN: 1. Tsetse Fly. 2. Reedy. 3. Io. 4. Eclose. 5. Ni. 6. Pith. 9. Bo. 11. Adult. 12. Emanation. 14. Lilac. 17. Result. 19. Oo. 20. Imago. 22. Usta. 25. Ae. 26. Ee.

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EDITORIAL

There are some two and a half million fishermen in Great Britain and perhaps an equal number of sportsmen who shoot game of one sort or another. By their sheer numbers they are both affluent and have considerable power as pressure groups in politics and in planning matters. The number of Entomologists, on the other hand, is but a handful, some five thousand at most, and this, it would appear, is the reason we, as collectors of insects, are castigated by the conservation lobby and have such little influence in planning matters including habitat destruction. We are weak in numbers and finance and like so many minority groups can safely be turned upon and ignored. But the entomologist has as much right to collect insects as the fisherman has to fish or the sportsman to shoot partridge or deer. It can be argued that both fisherman and sportsman breed and stock their collecting areas. This is indeed so, but then so do entomologists. Long before the first world war insects were being bred and released. The late Sir Winston Churchill was a notable stocker of his garden with reared butterflies. Consider, too, the history of such species as the Map butterfly, the Large copper and the Swallowtail; There is absolutely no doubt that many more of these have been reared and released than have ever been caught in the whole history of collecting. It should be made quite clear that the entomologist has as much right to collect as the fisherman to fish, or the sportsman to shoot. The Naturalists' trust that lets the shooting rights in reserves for money really does not have a leg to stand on when it then forbids the collecting of insects. More and more evidence is accumulating that points to far greater destruction and disturbance of wildlife by the large parties that, non-collecting, now tramp around nature reserves. Two or three careful and responsible collectors, as most of us indeed are, remove less by capture from a given environment than fifty or more people, observing and photographing as they go, trample underfoot. Although it is obvious that the situation as a whole is very complex and there must be many variable and interrelating factors involved, people who object to collecting should, in many instances, first "cast out the stye in their own eye". How many nature-lovers bringing their dogs on field trips, object to the sight of a butterfly net and very conveniently "forget" that their dog is largely fed on the meat of whales, now considered to be being slaughtered beyond *safe* survival point—there was indeed a protest march held in London last December in support of a campaign to stop this killing.

Entomologists should be able to collect with confidence and without hindrance. They should also respect the country code and use the right to collect with discretion. Unnecessary killing must not be indulged in and there are of course a few instances—such as the present status of the Large blue—where no specimens should for the present be taken.

COCCINELLA

My dear, have you heard of that nice Lady Bird
Who yet is no Lady, and yet is no bird?
Who once, if not now, in the land of the plough,
Was called by the clod-hoppers there, Lady Sow,
Yet still is no lady, and still is no sow?
Who some Frenchman (at least, unless custom has ceased)
Call bête à Vierge, or the good Virgin's Beast?
Though never the Virgin, and never her beast?
Whilst others avow, with a frenchified bow,
It is bonne vache à Dieu, the Creator's good cow,
Though never a vache—I mean, never a cow?

Jennet Humphreys

SPRING COLLECTING IN CALIFORNIAN CHAPARRAL

During early May, 1975, I was lucky enough to do some collecting in the Los Padres national forest, some 55 miles north-west of Los Angeles. Much of this region is accessible only by rough track, and I was very fortunate in finding a fellow entomologist with a sturdy car who offered to take me.

The climate of southern California is of a Mediterranean type with warm to hot very dry summers, with abundant sunshine and warm, moderately wet winters. Whereas in Europe the typical vegetation of this climatic type is drought resistant carobs, olives, cistus, heaths and lavender, etc., that of California up to 4,500 ft is chaparral which, though resembling Mediterranean maquis, contains many species which are fire-resistant and a rich diversity of woody shrubs such as *Quercus spp* (oaks), *Cercocarpus spp.* (mountain mahogany), *Ceanothus spp.* and *Yucca spp.* These support a great many species of butterflies, particularly hairstreaks. In addition to the chaparral vegetation of the lower foothills, a considerable part of the Los Padres national forest is, above 5,000 ft, covered in pine forest (mostly *Pinus ponderosa* Dougl.) mixed with oak.

My collecting trip was in early May, at the beginning of the season, and was consequently too early for the majority of Lepidopteran species. Nevertheless, twelve species were taken. The most spectacular of these was the Pale swallowtail (*Papilio eurymedon* Lucas). This magnificent species I took at fairly low elevation alongside a small road which was bordered by a steep shaded bank covered with a variety of flowering

plants. It flew along a well-defined beat, occasionally alighting on mud to drink.

Three species of Pierid were taken, the most common being the Sara orange-tip, (*Anthocharis sara sara* Lucas). The wing tips of this diminutive orange-tip are of a much more reddish hue than those of the European species, *A. cardamines* Linn. and both sexes have orange tips. One specimen of the related Grinnell's marble (*Anthocharis lanceolata australis* Grinnell) was taken. This species is apparently rather scarce and lacks the orange wing tips of *A. sara*. The other species of pierid present was the Californian white (*Pieris sisymbryii sisymbryii* Boisduval) which preferred the tops of the hills rather than the sides. All the Pierids were found amongst hills covered with yellow flowering Compositae, so abundant at this time of year.

California is not a good area for the Satyridae, and only two species are found, one of which is abundant; *Coenonympha californica californica* Westwood. Some authorities refer to this species as a subspecies of *C. tullia* Mueller, and compared with European specimens is considerably paler, presenting a very faded appearance. This common butterfly was taken in dry grassland or oak woodland.

One representative of the family Nemeobiidae was taken, *Apodemia mormo virgulti* Behr. This polytypic species occurs throughout the arid regions of the Western USA and northern Mexico, though this particular subspecies is restricted to the chaparral of Southern California.

Four species of the family Lycaenidae were taken. The tiny Western elfin (*Incisalia augustinus irioides* Boisduval) is an overall dull reddish brown butterfly common in early spring. It has an unusual foodplant, which is a vinelike parasite (*Cuscuta* sp.). Another hairstreak taken was *Callophrys dumentorum dumentorum* Boisduval, the Bramble hairstreak, a close relative of the European green hairstreak (*C. rubi* Linn.) which in its brown upperside and green underside, it greatly resembles. The specimen taken was rather worn, as this is a very early flying species and is normally on the wing from February to April. Two 'blues' were taken, *Plebejus icarioides evius* Boisduval and *Glaucopsyche piasus piasus* Boisduval, and only males were seen. The latter species is decidedly uncommon and is a montane species of Western America. The one remaining butterfly taken was a skipper, *Erynnis propertius propertius* Scudder and Burgess, which resembles a very large Dingy skipper (*E. tages* Linn.). It is a widespread species in California. With regard to Lepidoptera other than butterflies, one moth was captured, a day-flying Sphingid, *Proserpinus juanita* Stkr. Seitz (1908-1928) does not mention this species as occurring in California.

R. G. Payne (3856)

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SEITZ, A., (1908-1928). *Macrolepidoptera of the World*, VI. Alfred Kernen Verlag. Stuttgart.

**A NEW SPECIES OF *Polyura* (Lep: Charaxinae)
FROM THE NEW HEBRIDES WITH SOME NOTES ON ALLIED
SPECIES IN THE AUSTRALIAN REGION**

Butterflies have received more attention than any other insect group so it is hardly surprising that the many new species described annually are often closely similar to their known allies. The discovery of such a large and distinctive species as that here described is therefore a rare event.

Polyura sacco sp.nov. (Fig. 1)

Male forewing length (base to tip) of holotype 39mm (variation in type series 39-40mm). Recto ground dark brown-black; dense greenish basal scaling. Internervular white fringing. Outer forewing margin distinctly concave from veins R_4 to Cu_2 where it projects sharply. Two elongated quadrate primrose spots, basally concave, in areas R_5 and M_1 . Separate and basad two further spots in areas M_2 and M_3 , the former adjoining but not entering discal cell. These form an out-curving broken chain with a primrose band crossing areas Cu_1 , Cu_2 and 2A; this band expanding towards the inner margin. Distally a submarginal series of seven primrose spots (the last divided) from areas R_4 to Cu_2 , following outer marginal curvature. Hindwing crossed by a distally straight-edged median primrose band, tapering to a point in area Cu_1 . From area M_2 to just before anal angle, outer edge of this band interrupted by a fragmented bifid area of greenish scaling. Complete submarginal series of primrose lunules, darkly divided from a rectilinear marginal series of rich orange colour. Strongly tailed at veins M_3 and Cu_2 , the former more than one-third longer. Verso pattern broadly as recto but more ornate. Ground a rich red-brown, darker towards forewing tornus. Primrose spots and bands somewhat paler. All pale areas, other than submarginal spots, broadly margined with black basad. Submarginal forewing spots inwardly margined by light brown lunules and a silver-blue dark-edged line. Traces of this silver also on inner edge of the roughly triangular dark-margined spot at end of discal cell (hereafter referred to as the 'critical spot'), also around the dark bar crossing the cell. A silvery, dark-margined median band on the hindwing duplicated basally by a narrower stripe—tawny area separating these stands out sharply. Submarginal hindwing primrose spots reduced to small cusps. Between these and the orange marginal chain a further series of pale blue, black-centered, ocelli-like lunules. Bounding the median band distally a series of large reniform spots, inwardly blue-margined. These are deep maroon except those in areas R_5 and M_1 which are pale orange (a feature of allied *Polyura* species).

Male genitalia (Fig. 2) compared with the nearest mainland ally *P. sempronius* F. "male genitalia of *sacco* differ from those of *sempronius* in being, on the whole, smaller in size, with the aedeagus slightly shorter (9.2mm in *sacco* compared to 9.5mm in *sempronius*) and the valves also slightly shorter and narrower (cf. 2 A and B), with the apical hook of the valves smaller and the costa shorter, and the saccus smaller, and the two anterior projections of the juxta shorter". (Rydon 1976).

Female forewing length (base to tip) of allotype 49mm (variation in type series 45mm-49mm). Wing pattern on both surfaces corresponding closely with male; primrose markings rather more extended and outer greenish dusting of hindwing median band heavier.

Female genitalia not examined.

Additional notes on superficial anatomy (both sexes).

Antennae black, tipped with reddish orange. Palps and legs above black, below creamy. Four cream spots on head. Dorsal body surface clothed with greenish-brown hair-like setae.

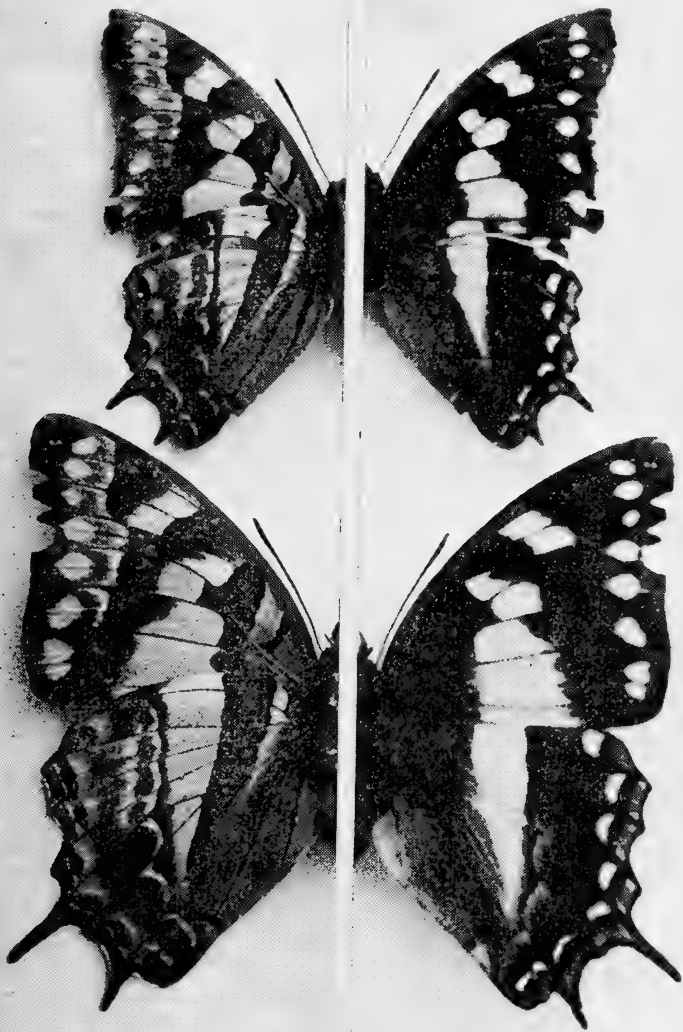
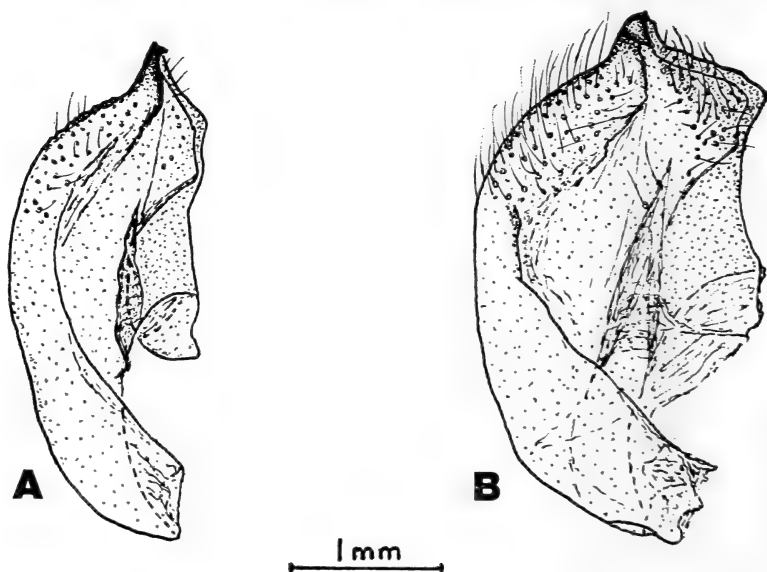


Fig. 1 *Polyura sacco* sp. nov. Tanna Island, New Hebrides. Top:—Male holotype, Lornatum, North of Isangel, 23/1/76 (A. Sacco)

Bottom:—Female allotype, Lenakel, 7/8/75 (J. A. Burgess) (Uppersides on right, Under on left; Natural size)

Types. Holotype male. Lornatum, north of Isangel, Tanna Island, New Hebrides 23/1/76 A. Sacco. Allotype female. Lenakel, Tanna Island, New Hebrides 7/8/75. J. A. Burgess. These and the paratypes, 5 ♂♂ and 5 ♀♀ in the Saruman Museum, Beckley, Sussex, a pair of the latter to be deposited in the British Museum (Natural History) London.

Type Locality. The New Hebrides (a Condominium administered jointly by Great Britain and France (see Fig. 3) form an incomplete double chain of approximately eighty islands stretching NW to SE for four hundred and fifty miles. Tanna Island is one of the most southerly and some thirty two miles long and fifteen across. It is the most fertile island in the group, well wooded and watered. Highest point Mt. Merrin (3420 ft). The mountain ranges include one of the world's most accessible constantly active volcanoes, Mt. Yasur. Rainfall is heavy; dry season lasts from 2-4 months. (Pacific Islands Yearbook 1972). "*P. sacco* is found in an area extending from five miles south to ten miles north of the district headquarters station of Isangel/Lenakel and for about a mile inland from the coast. As much of the south of Tanna is densely forested, however, and as collecting is confined to the few and primitive



A.H.B. Rydon del.

Fig. 2 Medial aspect of left valve of A) *Polyura sacco* sp. nov. and B) *P. sempronius* Fab. for comparison.

earth 'roads', it is probable that the butterfly occurs over a much wider area. The fact that it has hitherto escaped detection in a fairly well collected locality suggests that it may eventually be found to occur on the neighbouring islands such as Erromango" (Burgess 1975-6).

Field Notes. "The first specimen (a female) was taken by Father A. Sacco of the Roman Catholic Mission on Tanna and the species is named in his honour. By an odd coincidence I met him on the evening of the day on which I saw a male in the forest some five miles away from Isangel and he then described an exactly similar butterfly that he had seen for the first time in the garden of the Agricultural Officer's house that morning! The next day he brought me the first of the females so far taken. This and subsequent females were taken feeding on the sap oozing from the clump of young eucalyptus trees in Lenakel, the centre of the district headquarters, where the Royal Society expedition team collected intensively for about 3 weeks in 1972! They usually seem to sit head-down on the bark about five feet from the ground. Both Father Sacco and myself have seen the male on different occasions flying high along forest tracks some five miles north and south of the station, in an area about a hundred feet above sea level.

All the specimens so far captured (up till January 1976 only females and subsequently mainly males) have been taken while feeding on the exudation from wounded trees particularly mandarin orange which occurs in a semi-wild state throughout the area, but also on eucalyptus species and once on bamboo. On the last occasion the attraction was apparently the 'spittle' exuded by a dense colony of aphids or sucking insects rather than the sap of the bamboo itself. Normally these exudations seem to be most effective when fermenting, the butterflies becoming visibly drunk after feeding for some time; but none of the traditional baits for *Charaxinae*, alcoholic or otherwise, have so far had any success in attracting them.

At other times *sacco* seems to be very shy and retiring and has only been seen on the wing on two or three occasions. It has the typically powerful flight of the *Charaxinae*, and both Father Sacco and I were struck by the superficial resemblance of the upper surface to *Papilio machaon* L. when we first saw it. The foodplant is possibly a local species of *Poinciana* a tree endemic to Tanna known locally as 'mahogany', but all attempts to induce captive females to lay on this and other Leguminous tree species have so far failed." (Burgess 1975-6).

The relation of *sacco* to other Australasian *Polyura*.

The latest publication to list the known species of *Polyura* (Smart 1975) includes seven species occurring in the Australian region, *viz.*

species	generalised distribution
<i>athamas</i> Drury	Timor & Wetar
<i>gamma</i> Lathy (<i>aristophanes</i> Fruhstorfer)	New Caledonia

caphontis Hewitson
epigenes Godman & Salvin
clitarchus Hewitson
jupiter Butler
pyrrhus Linnaeus

Fiji
 Aola & Guadalcanal
 New Caledonia & Loyalty Is.
 New Guinea—Solomons
 Moluccas

All these species were known to Fruhstorfer (1927) and all are figured by D'Abrera (1971). The latter, however, regrettably transposed the figures of *epigenes* and *gamma*. On page 246 the specimen shown as *epigenes* ♂ is *gamma* ♂; that shown as *epigenes* ♀ is *epigenes* ♂ and that shown as *gamma* ♂ is *epigenes* ♀.

P. athamas is primarily an Oriental butterfly and may be disregarded for the moment, leaving six species to which should be added *sacco* and *sempronius* Fabricius; the latter found on the Australian mainland and also Lord Howe Island. Up till now *sempronius* has been treated by all authors as a race of *pyrrhus* from which it differs in the extended cream basal area and body colour, unequal tail length, more strongly orange hindwing margins and other details. *gamma*, *caphontis*, *epigenes* and *sacco* are so isolated geographically and unusual in wing pattern that they merit separate consideration. The remaining four species—*pyrrhus*, *jupiter*, *sempronius* and *clitarchus* form a reasonably homogeneous 'pyrrhus-group'.

The probable development of these Australasian *Polyura* (and indeed *Charaxinae* generally) will be outlined in a forthcoming article, but my preliminary researches leave me to speculate (and this *is* merely speculation) as follows.

Zeuner (1943) suggested Sundaland (the Pleistocene land-mass comprising the Malay Peninsula, Sumatra, Borneo, Palawan and Java) as the developmental site for the Indo-Australian 'Birdwings' (*Troides*, *Trogonoptera* and *Ornithoptera* (*Papilionidae*)). The very similar distribution of present-day *Polyura* species raises the possibility that we might look for their origins also in this area.

The discovery of *sacco* provides a clue to the way in which dispersal from Sundaland may have taken place. *sacco* possesses certain features that relate most strongly to Oriental *Polyura* species—for example unequal tail length, extended red-brown antennal tip, relatively unspecialised wing pattern with clearly defined bands and spots, orange hindwing margins and, most significantly the shape of the inner edge of the 'critical spot' in the discal cell on the underside of the forewing. In the set insect this edge is almost vertical, turning out very little and almost parallel with the basal side of the hindwing median band. The continuity of these features is particularly well demonstrated in the female (fig. 1). This formation is common to all Oriental *Polyura* except *dehaani* Doubleday and *delphis* Doubleday, both of which have a more specialised wing pattern. In contrast the 'critical spot' in all members of the *pyrrhus*-group turns out sharply.

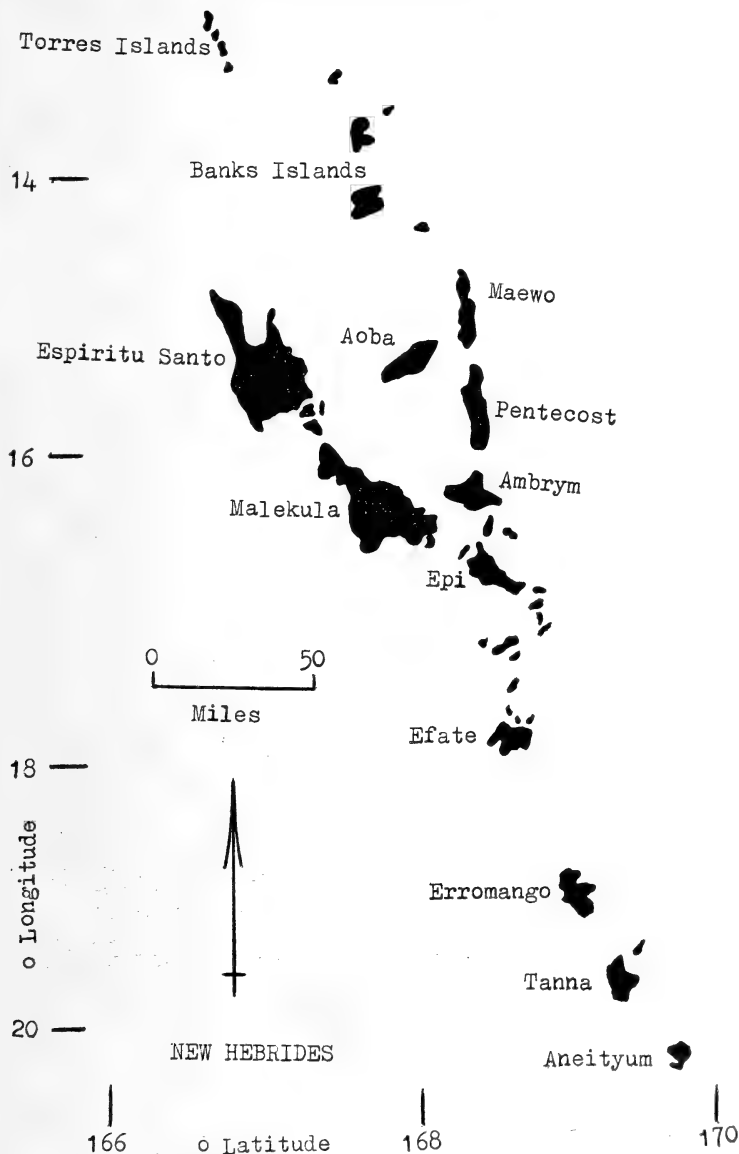


Fig. 3 Map of New Hebrides.

While *sacco* is therefore, in my view, the most ancient form, there is sufficient justification for regarding all the remote *Polyura* viz. *gamma*, *epigenes*, *caphontis* and *sacco*—as the product of an early dispersal from Sundaland, through New Guinea to the Solomons and beyond. The evidence for a much closer geographic relation between these areas was

provided by Wegener (1924). With the break-up and general south-eastern drift of land masses in this area, coupled with intense volcanic activity submerging much of the island chains, these four species have become isolated.

The development of the *pyrrhus*-group, from an ancestral form which I will refer to as *U-pyrrhus*, has taken place more recently. *sempronius* and *clitarchus* represent an early stage in the separation of this group. The presence of the latter on New Caledonia together with *gamma* is coincidental—they are widely separated in evolutionary time. The splitting of *U-pyrrhus* into *pyrrhus* and *jupiter* is certainly much more recent. Separation of races of these two species in the Banda Sea area proves difficult. It is possible that these forms represent a transitional stage in the development of *pyrrhus* and *jupiter* from the hypothetical ancestral form.

Acknowledgements

I wish to express my thanks to J. A. Burgess for drawing my attention to *sacco*, providing specimens, notes on behaviour, etc. The genitalic dissection of the male and comparative drawing were kindly undertaken by Dr. A. H. B. Rydon. For the map of the New Hebrides, the photographs of the type specimens and helpful comments generally my special thanks to Chris Samson.

Paul Smart F.R.E.S. (2293)

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SOME OBSERVATIONS MADE DURING A PHENOMENAL SUMMER

The summer of 1976, which followed a dry winter and a previous summer which had been unusual for its lack of rain and its high temperatures goes down in the records as unprecedented within living memory. Its effect on the flora and fauna of the countryside may be long lasting but we have been able to see some immediate results and a few of these are recorded here. As a bee-keeper I observed that the flow of nectar from most plants was greatly reduced and in my area the heaviest crop for the bee-keeper, the Limes, produced nothing, the blossoms opening

and withering almost immediately. Despite the ability to forage every day for months, the bees have stored only half the honey of last summer. The effect of the drought on butterflies has been most noticeable. Numbers have increased by large factors, particularly in the case of double brooded species. In July I noted that a nettle-bed which stretched along the side of a field had been completely defoliated by larvae of the small tortoiseshell, *Aglais urticae* L. The second brood of the Adonis blue, *Lysandra bellargus* Rott., emerged at the beginning of August as against mid-August of previous years and most colonies had doubled in numbers. Single brooded species such as the Purple emperor, *Apatura iris* L., and the White admiral, *Limenitis camilla* L., were not only more numerous than in previous years but also were observed in an extended range. Emergences were very early and I observed *iris* laying on the 9th July, already its wings badly torn while *camilla* was almost over and already larvae had hatched. The eggs were spattered widely in its haunts and I found three on one leaf. Predators appear to have increased commensurately as many eggs had been sucked by bugs or lacewing larvae and spiders were everywhere so that next year's crop may not be as heavy as would appear from this year's fecundity. Wood whites, *Leptidea sinapis* L., appeared along roadsides and were obviously spreading their range in early May. I have never seen the comma, *Polygonia c-album* L., so common and several patrolled my garden in early July. However the dryness changed the habits of many species. The Meadow brown, *Maniola jurtina* L., suddenly became a woodland butterfly, forsaking the fields to find the shade and moisture offered by woodland rides. Butterflies congregated at any source of moisture has been observed most often in South Europe and in the tropics. They would even alight on arms to sip sweat and many seemed exhausted by the conditions. L. D. Young observed *A. iris* males crawling over a rubbish dump trying to find moisture and it became quite easy to catch many species in the hand as they became lethargic and absorbed in the search for water. Dark green fritillaries, *Mesoacidalia aglaia* L., on the North Downs could be picked off the flower heads, a contrast to their usual rapid dashing about the slopes.

The Chalkhill blue, *Lysandra coridon* Poda, was out well before the end of June in some localities and I saw hundreds near Winchester on the 18th of July of both sexes. However the downlands were everywhere very parched and even the deep-rooted Horseshoe vetch, *Hippocrepis comosa* L. was shrivelled and in bad shape. Fortunately the butterfly normally lays its eggs on grasses near the foodplant and will not be needing it until next spring when it should have recovered. One matter of interest was that all the second brood imagines of the Small Copper, *Lycaena phlaeas* L., which I saw were of the heat form which is normally found in southern Europe, *f. eleus* Fab., being heavily suffused with dark scaling and having more pronounced tails than the typical form.

Several I took looked exactly like specimens I had taken in Corsica in July some years previously. Holly blues, *Celastrina argiolus* L., produced a second brood early in July and as the Ivy was not yet in bud one wonders what they chose as a foodplant. I have seen them laying on the flowers of *Cornus* sp., Dogwood, and this July I observed a female continually crawling about over the buds and flower heads of Bramble, *Rubus* sp., but could find no eggs.

Moths also seemed more numerous in some species while others, notably the hawkmoths, appeared to be about average. What was surprising however was the early date of emergence of species feeding up this year. On the 1st July I observed a Red underwing *Catocala nupta* L., on the wall of my house, a species which I do not usually expect to see until near the end of August. On the 2nd August I counted five specimens perched under the eaves. Dr. Paul Boswell informed me that he had seen a Herald moth, *Scoliopteryx libatrix* L., also at the beginning of July; a bit early to herald the coming of winter! Several trees locally were completely defoliated by the Bufftip moth, *Phalera bucephala* L., a species which had been much less common in recent years and everywhere on the Ragwort were the larvae of the Cinnabar moth, *Tyria jacobacae* L. It is certain that many species will have produced total or partial second broods this year and perhaps some, like the Small copper, will produce a third. What has also been noticed is the build-up in two migrant species of butterfly, the Red admiral, *Vanessa atalanta* L., and the Painted lady, *V. cardui* L. which first appeared early in May and produced a strong brood in August. The absentee, as far as my observations are concerned, was the Clouded yellow, *Colias crocea* Geoff., but my trip to France in 1975 had convinced me that we should not see another 'Colias' year despite the ideal conditions. That great arable barrier on the continent would prevent any massive build up of previous peak years. Even at this late stage I hope that we may find some arriving here via the south of France and Ireland and the west country. What I feel this year has proved is that given the right habitat and good weather, our butterfly and other insect populations can thrive. Several bad years and the decline in suitable habitat has reduced our relict insect fauna and just two good seasons have worked a change. If only suitable habitat could be increased to go with the change in weather, there would be no fear for the future. Man can control the latter but not the former and it is up to us individually and as a Society to try to bring about some improvement in the retention of suitable places for our insects to continue to live. Knocking collectors seems to have become even a national pastime from letters and items appearing in our national press but there is no evidence of any species having been made extinct by collecting, although some species in restricted areas must be given protection today. Amateur entomologists are the persons most concerned at any diminution of our native insect fauna and without their enthusiasm the little

progress that has been made might not have taken place. If the work is to continue then entomologists, whether collectors or not, should not be prevented from carrying a net with them when visiting suitable areas, whether the land be private or public as long as the public has general access to that land. It is not possible to study flying insects without netting at least the occasional one. In preventing the depredations of a possible 'demon' collector, the legitimate activities of others are hindered and the future training ground for entomologists of the future could cease to exist. If all keep to the 'Code of Collecting Insects', the man with the net should not have to face being accosted, sometimes beligerently, and threatened with possible legal action. Some thought Lady Granville mad for collecting butterflies—today there are those who are prepared to consider it criminal. Let us hope that we can retain some common sense and deal effectively with the black sheep without killing the whole flock.

P. W. Cribb (2270)

OBSERVATIONS ON THE EARLY HIBERNATING BEHAVIOUR OF THE PEACOCK

It is noticeable that some species of butterflies that pass the winter in the adult state, appear to go into hibernation at a much earlier date than one would expect, often when there is still plenty of available food and the weather is still suitable for flight. This behaviour particularly applies to *Inachis io* L. (The Peacock), *Gonepteryx rhamni* L. (The Brimstone) and *Nymphalis polychloros* Loff. (The Large tortoiseshell) whereas *Aglais urticae* L. (The Small tortoiseshell) usually carries on into the autumn until the weather becomes too bad for flight and feeding. This also applies to a lesser extent to *Polygonia c-album* L. (The Comma).

The following notes and table apply to *Inachis io* the records being mostly from my garden at Cheriton where ample food is supplied by several varieties of Buddleia, Valerian etc.

Taking the last three years including 1974 (a bad summer) it can be seen from the table that the summer flight comes to an abrupt end towards the end of August, with only one or two stragglers in September after an interval from the last day of abundance in August.

YEAR	SPRING FLIGHT		SUMMER FLIGHT		Interval in days	AUTUMN
	No. seen	between:—	No. seen	between:—		STRAGGLERS No. seen
1974	3	Apr. 11-May 19	43	August 11-25	14	2 on Sept. 8 — None after Aug. 26
1975	3	Mar. 7-May 20	169	July 11-Aug. 26	—	4 Between Sept. 5 and 26
1976	20	Mar. 28-May 24	228	July 6-Aug. 11	23	

To get some idea of abundance, the highest daily counts for each year were: —15 on August 20, 1974; 35 on August 3, 1975 and 23 on July 28, 1976, whereas the last '3 days' counts for each year in August were: —12 over the period August 22-25, 1974, 6 over the period August 24-26, 1975 and 18 over the period August 8-11, 1976.

After that, as can be seen from the table, there is an interval of anything from 14 to 23 days before one or two odd specimens are usually seen in September. One would imagine a gradual tailing off rather than an abrupt end to relative abundance.

Although only the last three years are given as examples my past records more or less show the same phenomenon, and it is difficult to see the reason for it.

Owing to its rarity, I have not been able to make suitable observation on *N. polychloros* but I think it is generally understood that this species has an even shorter summer flight, going into hibernation (or aestivation) not long after it emerges in July.

The only conclusion I can come to is that by the end of August the butterflies have reached the final stage of 'fat-body' development to withstand the winter and there is little point in continued flight. It is interesting to note, however, the near relationship between *io* and *polychloros*, and similarity in behaviour.

The unusual summer of 1976 has, however, brought to notice one interesting point and that is the early disappearance this year of *A. urticae*, in contrast to its usual habit of autumn flight. After what must have been record abundance during the summer, only 7 were seen after September 4th, the last sighting being on September 28th and not one visit to *Sedum spectabile* H. was observed.

In contrast the more vulnerable (non-hibernating?) *Vanessa atalanta* L. (Red admiral) has been seen this year on almost everyday during September and October, the last two seen feeding from *Choisya ternata* on October 16th.

B. R. Stallwood (1547)

A USEFUL AID TOWARDS BREEDING LARVAE IN CAPTIVITY

Over the years we have spent breeding lepidoptera we consider that we have found an answer to the problem of keeping specially kept plant material in a suitable condition in rearing cages for larvae. The most frequently mentioned method referred to in entomological literature is the use of a glass jar with a plug of cotton wool at the neck around the stems of the plant material to stop wandering larvae (often seeking moisture) from crawling down the stems and subsequently drowning. This method is certainly quite satisfactory for larger twigs and bulky material; but does have the drawback of involving a length of time in order to change old material for fresh.

In recent years, however, various proprietary brands of a foam

material has been available on sale through florists and garden centres for use by the flower arranging fraternity. This foam material absorbs water very quickly and its use towards keeping plant material fresh has the following advantages over the old method:—

1. It is easily penetrated by even soft plant stems.
2. It is particularly useful for holding the small plant stems required when rearing small larvae in their first and second instars.
3. The process of changing food material is far shorter (perhaps particularly beneficial to those who have limited time at their disposal!)
4. It provides a "dry" source of water supply without the attendant risk of larvae drowning, yet allows larvae to suck water from it.
5. It is extremely useful when rearing species which require an atmosphere of high humidity as this material acts as a source of water vapour in a sealed container. *Attacus atlas* larvae we find flourish with the use of this material in a container placed in an airing cupboard, otherwise too low in humidity.
6. This material is best placed on a metal or plastic disc or placed in a sealed polythene bag to avoid undue evaporation.
7. It is inexpensive to purchase.

N. F. Gossling (5169), C. Orpin (5736)

AN INVESTIGATION INTO THE ULTRA-VIOLET PATTERNS OF BRITISH BUTTERFLIES

Inspiration for this project was provided by an article that appeared in 'ANIMALS' magazine (now 'WILDLIFE') in January, 1974. The opportunity for the project to be compiled was presented by the Biology A-level syllabus, which allows candidates to submit a project as part of the examination.

By definition, ultra-violet patterning in butterflies is invisible to the human eye. However, this problem is easily resolved as ordinary film emulsions are sensitive to ultra-violet light.

There are two basic types of colouration present in butterflies: pigmental and structural. Pigmental colours are produced, as the name suggests, by the presence of coloured substances in the scales of the butterfly's wing. These substances are usually contained in pigment granules in the scales. Structural colours are produced by the constructive interference of light being scattered off the ridges of multi-lamellar structures present on the scales.

Pigmental colouration is responsible for most of the colours present in butterflies—the white of the "Whites", and the other browns, yellows and reds that occur. Structural colouration is responsible for all the metallic colours of butterflies, such as the blues of the "Blues", Morphos and Vanessids. Most of the instances of ultra-violet colouration in butterflies so far reported have been structurally produced.

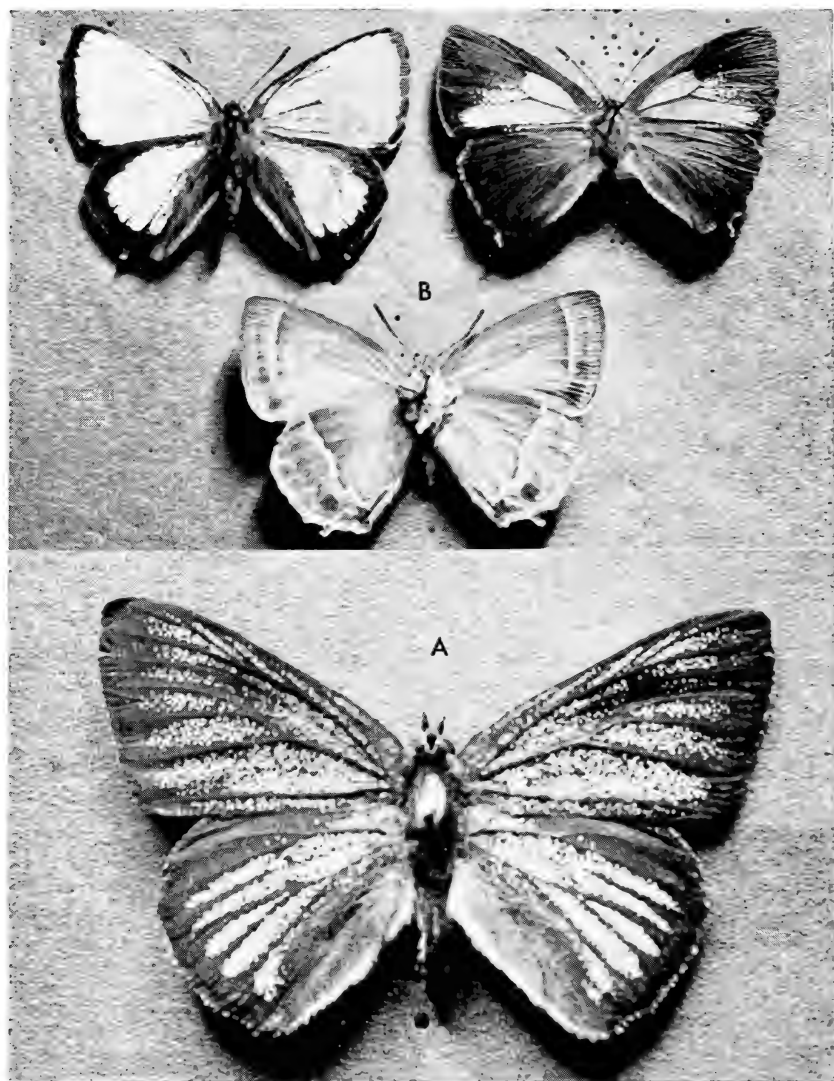


Fig. A. The Large Copper (*Lycaena dispar* Haw.) showing its hidden ultra-violet pattern, distributed amongst its structural red colouration. (Specimen is a German example)

Fig. B. The Purple Hairstreak (*Quercusia quercus* L.), typical of a species exhibiting structural ultra-violet patterning where structural patterning in the blue end of the visible spectrum is present.

The major part of the project was the compilation of an almost complete survey of the British Butterflies, to determine just which species exhibited any ultra-violet colouration. The specimens were loaned by the

natural history section of the Tunbridge Wells Museum, for which thanks are given.

The conditions for the photography in this survey were standardised from preliminary experiments with film and exposures. The source of ultra-violet light was a 125 watt mercury-vapour discharge lamp. The film used was entirely Kodak Plux-X (125 ASA), and the exposure details were: 30 seconds at f.8. A deep-violet and ultra-violet filter was also used to minimise the amount of stray light entering the camera.

Almost all the British species were photographed. Each photograph contained an upperside view of both sexes and an underside view of the male only. In a few cases of special interest an underside view of the female was also included. The results of the survey were on the whole rather predictable, but some individual cases proved to be most interesting. The results can best be summarised by a few brief comments about each family.

Satyridae. This family shows very predictable patterning in ultra-violet light, with all the light areas of the wings and the small metallic spots showing up clearly.

Nymphalidae. All the species in this family are basically non-ultra-violet reflecting, appearing to be very dark. Only the silver markings of the Fritillaries and the structural blues of this family show up clearly. A marked example of this is the Purple emperor (*Apatura iris* L.), whose iridescent purple markings in the male show up brilliantly.

Lycaenidae. The Blues continue to show that structural colouration in the visible blue range are also prominent in ultra-violet light, as do the Hairstreaks. (Fig. B).

The Coppers, however, present a strange anomaly. The structural colouration of the Coppers occurs at the red end of the visible spectrum. Thus, it might be reasonable to expect them not to show any ultra-violet patterns. The Small Copper (*Lycaena phlaeas* L.) complies with this suggestion, but the Large copper (*Lycaena dispar* Haw.) (Fig. A) exhibits marked ultra-violet patterning. It is quite unexpected that structural colouration in two distinct parts of the spectrum should be present in the same species.

Pieridae. The Whites are the only other family which requires any substantial comment, the Papilionidae and others being entirely predictable. The Whites are immediately worthy of comment because they appear black under ultra-violet light. As opposed to the other white pigments present in other families (the flavones), the white ureates of the Pieridae absorb ultra-violet light, hence appearing black. However, there appear to be various degrees of absorption and reflection from the pigmental colours of the Whites. Some work done in Japan claims that the common Whites do show pigmental colouration in ultra-violet light, although only slight evidence was found to support this view. Of all the Whites, the

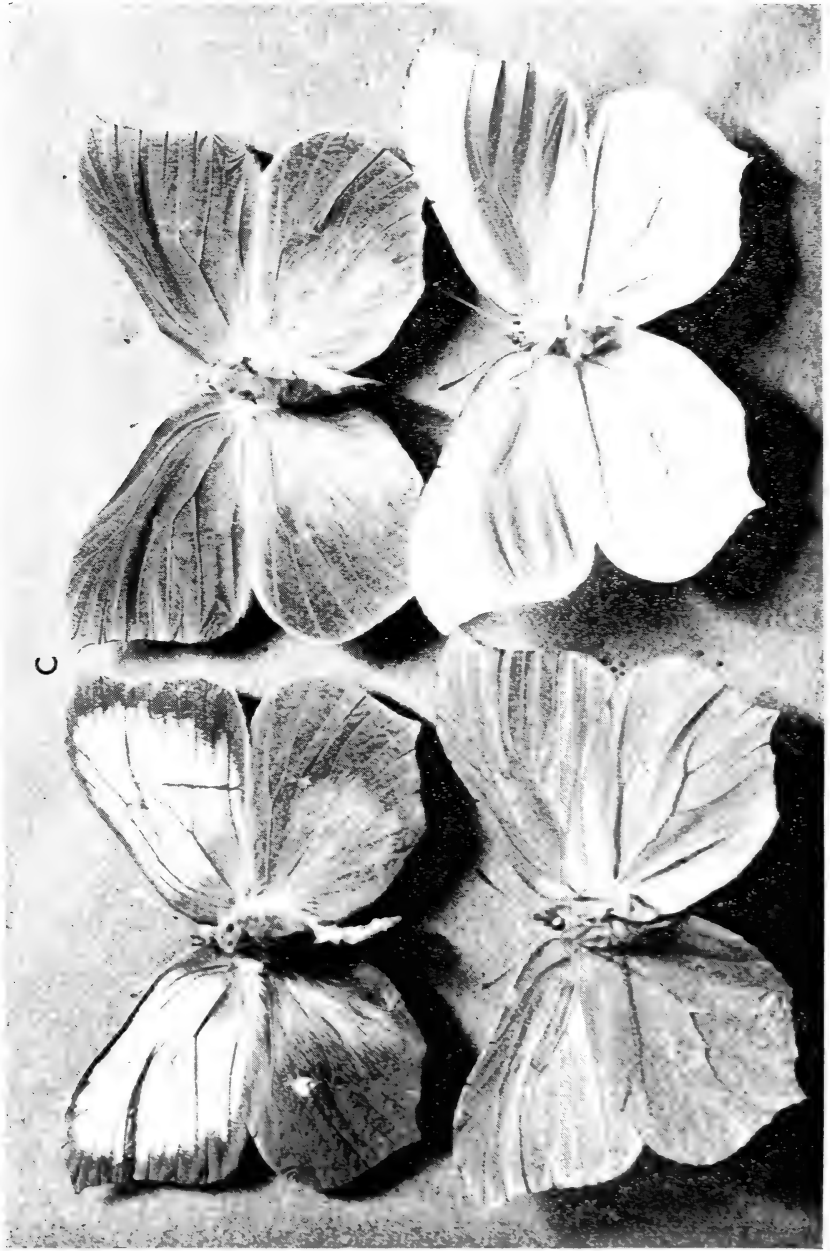


Fig. C. The Brimstone (*Gonepteryx rhamni* L.). The patterning of the male upperside in ultra-violet light is clearly visible (top left). Note also the female underside (bottom right).

Brimstone (*Gonepteryx rhamni* L.) is a special case and deserves further consideration on its own.

The Brimstone (*Gonepteryx rhamni* L.) was the first case of ultra-violet colouration to be recorded, and has since become the most famous. The original observation of the phenomenon was made by the Russian entomologist Yuri P. Nekrutenko. He also showed that other members of the genus *Gonepteryx* exhibit similar ultra-violet patterning. The colouration is of the structural type, and is limited to the upperside of the males forewings. The female is usually quoted as not exhibiting any ultra-violet colouration, however this investigation would suggest otherwise. The female appears to exhibit ultra-violet colouration on the underside (see Fig. C), but it is uncertain as to whether this is a structural or pigmental effect. This investigation also revealed that the ultra-violet colouration of the male is not confined to the ultra-violet region of the spectrum. The evidence for this first arose from a photograph of a male taken in violet light. The photograph showed quite clearly the same pattern as appears on the wings under ultra-violet conditions. Further, visible proof of this was obtained when the specimen was examined under the intense violet light of a mercury-vapour lamp, when a faint metallic-violet sheen could be seen across the male's forewings.

The fact that these ultra-violet patterns exist implies that they must serve some purpose. In the majority of cases the patterning is an expression of sexual dimorphism, and this would indicate that they are used for discrimination between the sexes in any particular species. Nothing can be claimed as yet in the direction of inter-species communication, as not enough is known about which species can or cannot detect ultra-violet light, although some have definitely been shown not to detect it. The significance of these patterns towards other classes of animals and insects has not been investigated, but work on their significance towards insect parasites of butterflies might be rewarding.

This project has barely managed to scratch the surface of a very large subject. There is still plenty of work left to be done on the behavioural significance of these ultra-violet patterns, and the prospect of being able to carry out this work is still very appealing to me. Meanwhile, I would be very glad to hear from anyone who has any thoughts on the subject.

Robert Sinclair (5415J)

1976—THE YEAR OF THE MIGRANTS?

The Summer of 1975 in Torbay was longer and hotter than usual, never seeming to end and causing an acute water shortage. Insects thrived in the heat and I noticed double broods of some species of moths. As usual, the winter here was quite mild and not too wet and we never really recovered from that beautiful summer. I remember commenting that we would never have such summer for probably many years. I was so wrong!

1976 brought even a longer hotter summer in Devon, resulting in such havoc with water supplies and vegetation, that parts of the County were encumbered with stand-pipes in the streets. I was able to search for larvae which were normally inaccessible on marsh land since this had dried up in the heat. From early April until late September, the land was parched beyond recognition of our normal lush green fields and trees. I found larval food supplies to be of poor quality and short lived, even when stood in that scarce liquid—water. With the family washing virtually in the same basin of water and bathing in a minute drop in the bath, I felt rather guilty filling jars with water for foliage on which caterpillars were to feed.

On most nights the lamp posts and pavements were littered with resting moths, and hundreds of Heart and Dart (*Agrotis exclamationis* L.) were forming snow-like storms around the lamps. Night after night I left my moth trap off because of "infestation" by this species. Indeed, that may sound exaggerated, but from one nights collecting, I released 307 Heart and Dart moths the following day many miles away from my area.

This then sets the scene in Torbay, and in such heat and weather, who wanted to go abroad in search of the sun. No doubt, many people did and regretted doing so. I was hopeful that there would be some moths and butterflies flying abroad to England, enticed by the lasting warmth of our summer. Every patch of Buddleia, Valerian and Sedum was examined, and I was finally rewarded by watching a Humming-bird hawk (*Macroglossum stellatarum* L.) feeding on Buddleia at Exeter on 3rd August, 1976. This first sighting seemed to send this little Hawk into my path and in 1976 I recorded the following sightings: —

1. On 3rd August, as mentioned above.
2. On 7th August, a personal sighting feeding on Valerian at St. Marychurch, Torquay.
3. On 6th September, caught whilst resting on a wall at Kennack Sands, Cornwall by a young boy who brought it to me alive.
4. On 17th September, a personal sighting feeding on sedum at Cowley Wood Conservation Centre, Parracombe, North Devon.
5. On 2nd October, a personal sighting, feeding on a group of garden flowers at Dawlish.
6. On 8th October, found inside a chemists shop at St. Budeaux, Plymouth and brought to me alive.
7. On 9th October, a personal sighting on Buddleia at St. Marychurch, Torquay.
8. On 20th October, a personal sighting, feeding on Buddleia at Hele, Torquay.

Local newspapers at Plymouth and Torbay reported the usual sightings of "Humming-birds" by members of the public. The reports were

answered as one would expect explaining about this attractive little Hawk moth.

Being basically a breeder, I found all of my time taken up by attending to hundreds of larvae of various species and I had little time for the contents of my moth trap, apart from selecting those females from which I could obtain eggs. However, on 24th August, 1976, I lent the trap to my neighbour—not to catch moths, but to enable him to see in the dark whilst doing some carpentry in his garden at night. When I retrieved the trap I was informed of a “huge” moth that had been flying around it. His assistant was so frightened that he ran inside the house until it had gone.

Disappointed that I had not caught the moth. I lit the trap again in my own garden and immediately heard a gasp from my wife who was pointing to a beautiful male *Convolvulus hawk* (*Agrius convolvuli* L.) resting on the garden wall looking very tired and inactive. My good turn to my neighbour was certainly well rewarded for me.

On 22nd September, 1976, a garage owner friend brought to me a spare part box and told me to cautiously open it as I may be interested in its contents. Inside yet an even bigger male *A. convolvuli*. It had been found resting on one of his cars on the forecourt of his garage.

I answered the doorbell on 25th September, 1976 to find a young boy holding out a Smiths crisp bag!! “I found it on the pavement at Babbacombe and brought it straight to you. It wasn’t there this morning”, he joyfully said. Yes, another *Convolvulus hawk* only this time a very battered female. Pieces of wing and a cloud of scales were inside the bag. I took her out and she immediately began to fly. Once captured from the curtains she was put in one my breeding cages 20” high by 15” x 12” with some Bindweed (*Calystegia sepium*), Her activity was incredible for a night flying moth at 4.30 pm. Nothing happened that night but on the night of the 25th September, she laid 95 eggs and then died on 26th. The eggs were placed in a 2” x 1½” plastic box. Their subsequent history is described in the following article.

It also occurred to me that this egg laying *Convolvulus hawk* must have flown by day as it could not have possibly remained where it was until 4.00 pm. without being trodden on or noticed by other people. The boy also stated that it was not there when he went to school. Had he missed it I’m sure one of the other boys would have noticed it on the pavement.

On 30th September, 1976, and in pouring rain at that, I found another female *Convolvulus* resting on a gate-post at Watcombe, Torquay.

On 2nd October, 1976, I was given my last *Convolvulus* moth which again was a female having been found on the front door of a house at Dawlish, Devon. Although both these females were put in the same conditions as the egg laying female, no eggs were obtained.

I wonder how many more of this species flew into Torbay in 1976 when I alone had five. There are indications.

For instance there was a newspaper report of "Humming-birds" and this was answered by Mr. A. F. Baker of Deancombe, Buckfastleigh stating that such sightings could also be *Convolvulus* hawks as he had seen three of these on the same evening at the same time feeding on his Sweet tobacco plants in early September. I spoke to Mr. Baker by telephone and he assured me of his facts and was somewhat disappointed that they had not returned at all since that evening.

Ken Bibbings (5712)

SUCCESSFUL REARING OF CONVOLVULUS HAWKMOTH

As mentioned in the previous article, 95 eggs were laid for me by a *Convolvulus* Hawkmoth (*Agrius convolvuli* L.) on the night of September 25th, 1976, the moth having been found at Babbacombe, Devon.

I regularly examined the 95 eggs which I considered to be quite small for such a large moth.

I was a bit surprised that they had not all collapsed though I noticed that a few had. After the fifth day I saw the tell-tale signs of eggs about to hatch and some Bindweed was put in a Blue Band margarine container together with the open box of eggs, and they were kept at normal room temperature which was 65° F. As a point of interest, only two eggs were deposited on the *sepium* by the female. The rest were on the wood supports and the netting of the cage. Seven days after being laid, 76 hatched on 2nd October. The remainder collapsed.

The hot Summer had baked the *Convolvulus arvensis* in my arear, and there was a little *C. sepium* and *C. silvatica* though this was beginning to turn yellow. I was anxious to find a vast food supply to feed so many so late in the year. I hurriedly planted seeds and forced them along—a futile attempt I found later as this supply was not enough for half a day for one fully grown larva. I tried to hurry the larvae along in a temperature of 80° F. only to lose two, drowned in the condensation. This idea was promptly abandoned.

The larvae grew very quickly on the Bindweed and four days after hatching the first skin change took place on 6th October. and for the first time I noticed one larva without a tail horn. I was determined that if disease struck, I would not lose all, and the larvae were divided into tens and put into plastic gallon ice cream containers, lined on the bottom with kitchen paper towels which absorbed condensation really well. The Bindweed was changed each day WITHOUT FAIL, and on one day I found some *arvensis* which was placed in the same container as some *sepium*. The larvae actually seemed to prefer the *sepium*. Another four days passed and the second skin change took place on 10th October.

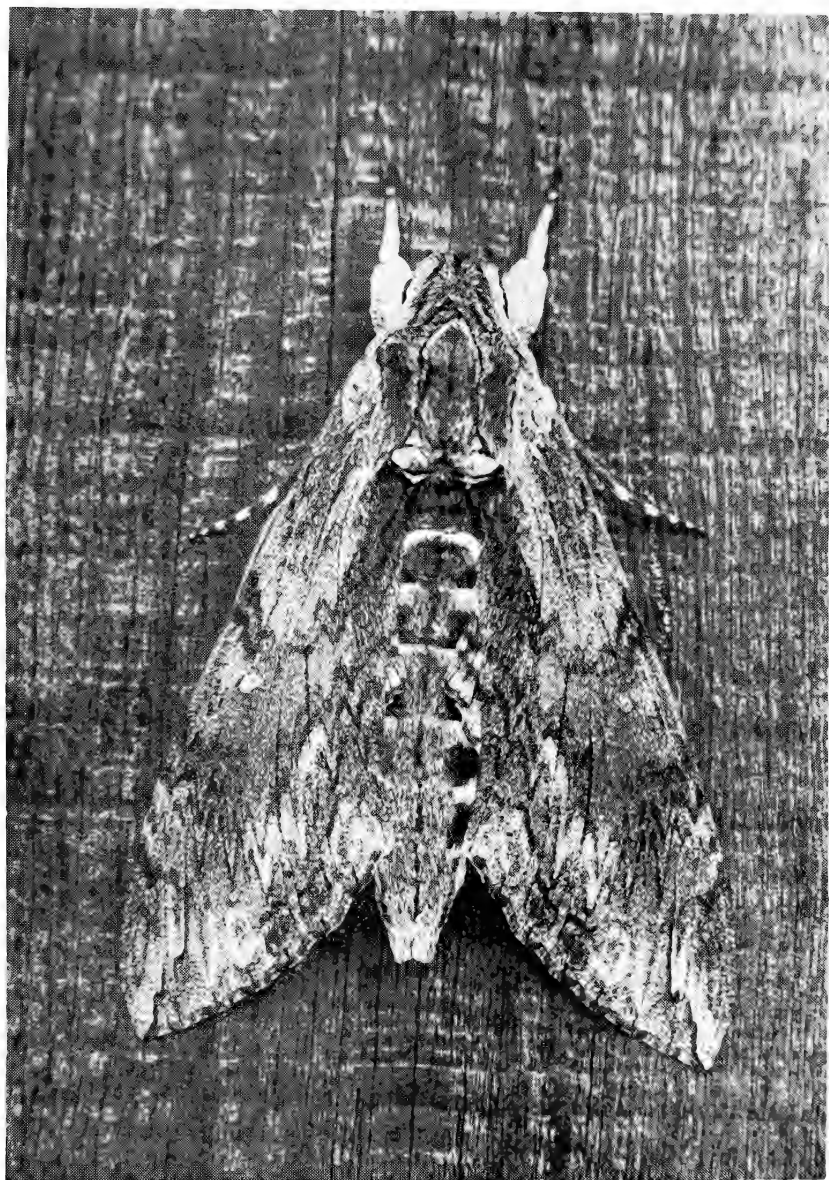


Fig. E Adult Convolvulus hawk photographed by Mr. Softly.

Two failed this change and died. All but three of the rest were green with paler oblique green stripes along the sides with bright orange spiracles and black horns. The other three were black with one yellow line on each side on their backs from head to tail looking a completely different species. I was delighted with the progress the larvae had made but was now very worried that I would lose all through the lack of food. When strolling along with my Police dog one Sunday morning, I walked into an open Council store where to my amazement I found a massive supply of very green fresh looking Bindweed amongst stacked lamp posts and paving stones.

Seventy two larvae made the third skin change successfully on 16th, 17th and 18th October. Having been taught to be cautious, I now split them up into threes in sweet jars and plastic containers. The larvae were most variable in their markings and colours in this instar and at least half of the green ones were now black. During one of the daily food changes, I moved a heavy plant pot of growing Bindweed and put it down straight on top of two larvae with fatal results. I called myself more names than anyone else had ever done. With my food supply still holding its own, the larvae began to consume large quantities each day. The rain that we had needed so urgently had become a nuisance to me having to dry off each individual leaf day after day, and with armfuls of it at a time, this practice was not appreciated by my son and daughter.

The final skin change commenced on the 23rd October; which one larva failed to make it properly and was discarded. Three others fed up for a while and then stopped eating and withered and these too were discarded. One larva for some reason unknown to me was two skin changes behind and very small. This one was released to the wild on *sepium* and soon vanished. I now possessed 65 perfectly healthy larvae and it became necessary to change the food twice a day and I maintained absolute cleanliness twice a day. This was very tedious and it appeared that tending these caterpillars was the only thing I ever did at home after work!

It seemed strange to me that all of these larvae displayed no green colour at all now and South reported the more usual form being bright apple green. My larvae were all of the dark form which was basically made up of black, orange, brown and white with five main variations which made them all appear to be from different species at first glance.

The largest larvae which were $4\frac{1}{2}$ inches long at rest were placed in a 24" x 15" x 12" fish tank a quarter full of peat. On top of this a piece of corrugated P.V.C. was rested on four posts thus holding it two inches above the peat. Bindweed was put on the P.V.C. sheet the corrugations of which conveniently collected the frass away from the food. After a long session of wandering, discarding the final pieces of body waste, 41 larvae were removed from the tank and placed in separate pupating containers which were sweet jars, one third full of new peat. The first



Fig. D Group of *Convolutus* hawk larvae feeding on Bindweed. (Photograph by Ken Bibbings)

group went down on 31st October, 1976, just 29 days after hatching. The remaining 24 larvae were left in the tank to pupate. The others had been removed to prevent overcrowding and badly formed pupae. The last went down on 7th November 1976, all having been extremely healthy. At last I could relax evenings.

I noticed that the larvae were non-aggressive in any instar, and when fully grown were quite happy to feed three to one leaf often attaching themselves to each others bodies, or walking over each other without the usual flinches to ward off intruders.

I let a month pass before disturbing the pupae and found each separate container revealed one perfect and lively pupa. Even the larva without its tail horn was perfect except that its wing cases are pointed. Elated with my first attempt at rearing wild *A. convolvuli* larvae so late in the year with 41 very large pupae to my credit. I went on to examine the 24 in the fish tank and—DISASTER!! All of them were either deformed or had failed to cast that final skin. The deformities were so bad that all were discarded. They had pupated well away from each other in beautifully smoothed cells. I concluded that possibly the peat held a disease of which I had no idea, and yet the other 41 had wandered on and lived with it for some time. Anyway, I disposed of all my peat and disinfected all pupating containers. My final conclusion is that the temperature fell to 55° F. to my knowledge and it had probably been lower at night during the time that the last 24 were pupating. The others never suffered this temperature drop at all. So it is possible that through me being too complacent at a crucial time, that it was my fault that these poor final few have had to perish.

However, I derived enormous pleasure from rearing these *Convolvulus* hawk larvae encouraged by the fact that it is rarely achieved from a wild caught female in this Country.

Ken Bibbings (5712)

CONSERVATION AND SCOUTING

In 1976 the Second Bexley Scout Group studied for the Cub Scout World Conservation Badge (introduced in World Conservation Year) and the Scout Conservator Badge. As it turned out the most popular of the many natural history and environmental projects was a "nothing evening".

After half an hour of theory (including safety rules) the boys observed the effects of a mercury vapour lamp set up in my garden. Forty-four species of macrolepidoptera were identified between 10 p.m. and midnight. All the species were common but they were of course mostly new to the boys who were particularly attracted to the larger and more brightly coloured moths such as The Large yellow underwing (*Noctua pronuba* L.), The Swallow-tailed moth (*Ourapteryx sambucaria* L.), The Angle shades (*Phlogophera meticulosa* L.), The Ruby tiger (*Phragmatobia fuliginosa* L.), and the Oak hook-tip (*Drepana binaria* Hufn.).

Of special interest was The Peppered moth (*Biston betularia* L.) which appeared in both the light and dark forms. The history of this moth is too well known to repeat here but on this occasion it provided a very useful if elementary illustration of natural selection.

The fascination of the m.v. lamp technique was such that the badge examiner (The Assistant District Commissioner for Cub Scouts) who looked in "for ten minutes" stayed for two hours.

May I suggest that other enthusiasts give demonstrations to youth groups in the cause not only of conservation but in an endeavour to arouse interest in entomology and wild life generally. Care must be taken to ensure that no children are endangered by any equipment used and they should always be accompanied by and under the control of their authorised leaders. It would be as well to make sure that any group which you entertain is covered by its own insurance.

If I might mention a side benefit of scouting, I was sugaring along a woodland lane in North Kent in Autumn, 1976, when I was stopped by the warden of the adjoining scout camp who had spotted the scout badge on my anorak. When I explained what I was doing he immediately gave me permission to sugar and use m.v. equipment within the grounds of the extensive scout camp. He generously extended this offer to a local society which I was helping with a wild life survey.

Ian Brydon (5881)

BOOK REVIEWS

THE INSECTS AND PLANTS OF THE ALVER ESTUARY, by David Appleton, Michael Bryant, Richard Dickson and George Else. pp. 154; 4to. Duplicated and published by R. Dickson, n.d. (1977) Price 60p. (By post 89p)

This is another of the excellent local lists that is being produced these days and although it extends to include more than just one order of insects the title is a little misleading as in fact only three orders are really covered, the Lepidoptera, Coleoptera and Hymenoptera, in that order, with 21 pages devoted to the plants.

The Alver estuary is in Hampshire and adjoins the Solent. We learn from the introduction that it is undoubtedly one of the most important entomological sites in the county, if not the country, and we learn of the utter sterility and callousness of Gosport Council's treatment of the site which is in great danger, both from greed and vandals (arsonists). This is a timely list which wisely draws attention to the problems facing the site and makes recommendations for its future. Let us hope they be followed. The introductory pages are of further use in that they give us details of how to get permission to collect and a map of the area is included, as well as a summary of the more interesting insects to be found.

The lists themselves are primarily of a decade of observation of the area by the various authors, plus gleanings from their friends and colleagues. It is therefore very much an up-to-date list, well laid out and with comments. The advantage of having a plant list published together with an insect list means that the insects can and have been correlated with the plants they are associated with.

This is an interesting list and in view of the price, worthy of a place in any entomologists library. It should be made clear that it is a typed and duplicated book and it cannot be too strongly emphasized that both the typing and duplicating have been exceedingly well done.

It amazes us that Mr. Dickson has produced it at a price of only 60p. It appals us that H.M. Post Office charge 29p for its postage. At present copies are obtainable from any of the authors, and in particular Richard Dickson, Flagstones, Catisfield, Fareham, Hants (89p post free). Copies will however be available at our next annual exhibition. S.R.G.

BIRDWING BUTTERFLIES OF THE WORLD, by Bernard D'Abrera. U.K. edition 1976. pp. 260 including 216 colour plates. Hamlyn Publishing Group (for Country Life Books). Price £35.00.

Whatever else this lavishly produced book may be, I dispute the publishers' claim that is the definitive monograph of the Birdwing Butterflies. Large, heavy, handsomely bound, complete with an inscribed box holder—it is doubtless pleasing to the eye, but it is also very expensive and offers little to the entomologist seeking a practical reference book on this remarkable group of insects.

The focal point of the book consists of Mr. D'Abrera's own colour photographs (life-size) of set male and female specimens of nearly all 120 species and sub-species of the *Ornithoptera*, *Trogonoptera*, and *Troides* genera which are covered. Interspersed with these are nearly eighty colour photographs (in close-up) of the early stages of nine species reared by the author or his colleague Mr. Richard Carver, mostly in Australia. Some of the latter shots are remarkable—I like in particular a whole-page study of the fully grown larva of *Ornithoptera urvilliana* on p.89. Grouped at the beginning of the book are a further fourteen colour photographs of typical habitats ranging from Sri Lanka through Malaysia and New Guinea to Queensland. The quality of all these plates is of a very high order, printed as they are on a very heavy coated paper.

The text provides little more than verbal decoration to the colour plates. Apart from a brief introduction and a useful bibliography, the book consists solely of the author's discussion (*not* description) of each species illustrated; this consists of a highly personal summary of what he thinks the reader wants to know about each species. In the process a certain amount of interesting information about the Birdwings as a whole is buried amongst references to previous authors, anecdotes of personal acquaintances, and descriptions of breeding experiments and various collecting expeditions. Mr. D'Abrera does not attempt to make any overall survey of such vital topics as distribution, taxonomy, life-cycle, conservation, larval food-plants etc. and so his book lacks any overall theme. For all this, it is interesting to glean such information as the fact that *Troides prattorum* is immune from collectors because of its restriction to a single Indonesian island which is used as a prison camp,

inhabited by cannibals, and surrounded by shark-infested waters! Incidentally, a historical error has crept into the text on p.22: MacGillivray and Huxley's scientific voyages in Australasia in *H.M.S. Rattlesnake* took place between 1847 and 1850, not in 1884/5.

Regarding the distribution of species, the author assumes his reader is thoroughly familiar with the Far Eastern region, thus the range of *O. victoria epiphanes* is stated badly as "San Cristobal, Bauro" which happens to be one of the Solomon Islands. This treatment might suffice if linked with individual distribution maps for each species, but on its own it hinders rather than helps the reader. The only map provided is a half-tone atlas of the Far East drawn to a very small scale which merely marks most of the place-names mentioned in the text; it is thus very difficult to get any visual idea of the relative distribution of different geographical races of certain species—and these are very numerous amongst the Birdwings.

No doubt the few professional entomologists who are experts in this field may welcome this book for its pictorial excellence, but to the majority of us it will seem a luxurious accessory to the coffee-table. This is regrettable because the Birdwings deserve a definitive work and this will have to wait until the difficulties of studying these insects under natural conditions are overcome and the life-histories of many species have been recorded. In many places their rain-forest habitats are being destroyed in the name of economic progress, while the huge size of the females and the brilliance of the male specimens has made some Birdwing species such highly-prized collectors' items that today a dealer can ask over £200 a pair for certain *Ornithoptera*, and in Taiwan and Japan there are various concerns geared to the commercial exploitation of these insects for decoration. It is hardly surprising that the conservation of the Birdwings in the wild before it is too late is now becoming a subject of increasing importance. In Papua, New Guinea the government has imposed a total ban on the unauthorised collection of these butterflies and set up a native butterfly-farm industry aimed at encouraging the export of specimens to accredited dealers only—probably the first time legislation has been passed anywhere to maintain a healthy local stock of insects and to develop their potential investment value at the same time! All these developments were taking place while Mr. D'Abrera was writing his book, so it is particularly sad to see nothing but a very passing reference to conservation or to the PNG scheme in its pages. But then this is essentially a beautiful book to be looked at, not a practical book to be used or referred to.

N.H.C.

BUTTERFLIES THEIR WORLD, THEIR LIFE CYCLE, THEIR BEHAVIOUR, by Thomas C. Emmel. 1976 pp. not enumerated (262); small Royal quarto. Thames and Hudson, London, Price £12.50.

Oh dear! Oh dear! What a mess! This book has fallen between

several stools. It really doesn't know what it has tried to be, but I think it is an attempt at futuristic typography and, as such, it makes me shudder, the only decent thing about it being the use of grey tinted paper, ruined of course by the use of appalling typographic layout and the use of jet black to the margins of most of the coloured illustrations with the result that the book looks used and dirty even when new in the bookshop! Much of the white printing on the black paper is difficult to read. The text is set in one of two columns to a page. When in single columns the other half of the page may contain a figure legend; a small illustration; a subtitle; or just the page number. A good half of the pages do not bear a page number which makes finding ones way about by using the most inadequate index most frustrating. The "printing" is non-registered, like that of a typewriter, and in view of the way the text is set to maximise paper wastage, it would have been better to save on the cost of paper and spend the money on proper composition. There are no less than nine pages blank or bearing solely a chapter title.

This is yet another expensive book that has been rushed into press without being proofread. There is the inconsistent use of capital letters and many misspellings of scientific names; For instance:—*welskei* for *weiskei*; *kayuga* for *kaguya*; *batava* for *batavus*; *mani* for *manni*; *venatus* for *venata*; *xerces* for *xerxes*. These are just the ones we happened to notice and know of. Two of the above were in one figure legend. How many others, pray, go undetected? We also have such statements as the legends of Fig 234. "Mourning cloak or Camberwell beauty (*Nymphalis antiopa*); Britain" but, Fig. 235. "Peacock butterfly (*Inachis io*): England," Fig 149 labelled *Apatura ilia* is *A iris*, a fact correctly stated in the index and where on earth and by whom was *Colias australia* (Fig. 287) originally described.

To our mind carelessness of this order is quite inexcusable, insulting to the intelligence of the potential reader, and certainly unacceptable in a book of this price range.

Most of the coloured illustrations are good and the subjects well chosen and well printed. We have again however a pair of the stools between which the book has fallen. All of the doublepage and some of the single, are too large and need to be viewed, as does a painting, from a distance of several feet. When this done they are most effective, but who wants to study a book that way.

The text is obviously by an author who knows his subject and contains many interesting anecdotal facts and observations about butterflies, marred, as already mentioned, by lack of proofreading. That reputable publishers are churning out this sort of atrocity is appalling but a sign of the lowered standards of present day remote control business. Perhaps our younger members *like* this sort of production. To my mind the best way of preventing its future occurrence is to leave it on the shelves of the bookshops.

NATURAL HISTORY AUCTIONS 1700-1972, by J. M. Chalmers-Hunt, pp 189; Sotheby Parke Bernet Ltd. 1976. Price £12.50.

It has to be acknowledged that the appearance of a book purporting to be a history of auctions is not calculated to precipitate a rush to secure copies, yet this pioneer work, compiled by Michael Chalmers-Hunt and containing valuable introductory articles by him and other well known specialists, possesses considerable merit and abounds in interesting detail. These articles cover 51 pages out of a total of 189, the remainder consisting of a chronological Register of Natural History Auction Sales. That the new book is an important adjunct to such reference works as Hagen (*Bibliotheca Entomologica*, Leipsig 1862/63) and Horne & Kahle (*Ueber entomologische Sammlungen*, Berlin 1935/37) is unquestionable.

This review is of necessity concerned with the entomological aspects rather than with the other branches of natural history covered, and in this context the attention of the reader will first be caught by the Editor's eleven-page article which displays his wide knowledge of entomological history.

Writers on this subject are well aware of the paucity of information extant on some of the early entomologists whose names are well known to us. Many of these persons do not find a place in the Dictionary of National Biography and biographical memoirs are practically non-existent in the earlier volumes of our older periodicals and 'Proceedings' of societies.

Thus in the case of John Francillon (1744-1818), his profession has variously been stated to have been that of a doctor and a jeweller. Both the Editor and the Reviewer also, in a recent publication, followed H. A. Hagen (1862/63) in stating that J.F. was a doctor. This had been questioned by a correspondent and the Reviewer has established from City records that the address given on the sale catalogue, 24 Norfolk Street, Strand, London refers to premises which at the material time were occupied by J.F. and his Partner trading as jewellers.

The new book contains its surprises: Thomas Vernon Wollaston (1822-1878) and J. R. le Breton Tomlin (1865-1954) both well known as coleopterists were malacological experts also, and Wollaston's extensive collection of shells was sold at auction. Other entomologists are also shown to have worked in fields other than their own.

Incidentally, two Wollastons are indexed and the Reviewer suspects that the initials J.V. on the catalogue of May 29th, 1894 sale, which he has verified, are an Auctioneer's error, and that the collection of Atlantic coleoptera sold on this occasion relates to T.V.W.

Much care has been expended by the Editor on the compilation and verification of the Register and his enquiries over a wide field have involved a large number of his friends and correspondents, as he acknowledges in his Preface. As a result, this well-produced and attrac-

tive book is not only remarkably free from error but is highly informative.

It is impossible to peruse the new book without a feeling of nostalgia and even of sadness and in the personal opinion of the Reviewer, reading of the introductory on Ornithology should, in the interests of conservation, constitute a compulsory duty for all entomologists.

Copies of the book which is published in a somewhat limited edition, are obtainable direct from the firm at 36 Dover Street, London W.1. or from E. W. Classey Ltd., Park Road, Faringdon, Berks.

C. MacKechnie-Jarvis

ARTHROPOD VECTORS OF DISEASE by James R. Busvine pp. (4); 67, 8vo, Edward Arnold 1975. Price £2.60 (hardback); £1.15 (paper).

After reading this book one wonders how the human race has ever survived in the tropics, let alone increased to the overpopulation conditions prevailing today. That it has done so is due in fact to the large measure of control, achieved during the past 150 years, over the factors causing transmission of the many lethal diseases transmitted by Arthropods, coupled with some degree of resistance being built up over the millenia by the local population involved. In large areas of the tropics today however these control measures are being negated by the slums caused by overpopulation and by political reasons.

This book is a plain and factual account of the many appalling diseases that are transmitted by Arthropods—most of which are of course insects—and their respective importance is assessed; the problems that have arisen in their control; possible prophylactics and preventative measures; attempts at curing the diseases.

Many of the diseases transmitted are caused, not by bacteria, fairly easily curable with antibiotics, but by viruses, rickettsia and trypanosomes and it is not perhaps sufficiently realised that there is no known cure for most of these diseases. They are mostly chronic and debilitating rather than short and spectacular, occur in poor areas of the world and do not therefore attract their fair share of research funds and attention. This is a book which should be read by anyone considering a trip to the tropics, and will also be of use to nurses and those interested in Public Health. Professor Busvine is to be congratulated on assembling all the facts together in such a concise and readable form.

GENETICS AND ADAPTATION by E. B. Ford, F.R.S. pp. VI; 58. 8vo. Edward Arnold 1976. Price £2.60 (hardback); £1.15 (paper).

This is no 69 of the Institute of Biology's excellent studies in Biology series. As might be expected from this well known author the subject matter is largely Lepidopterological and is a concise explanation of the subject. In addition it is an absolute mine of useful and interesting in-

formation. To give two examples, how many people know that a rather small bird, the Quail, can eat a dose of digitalis sufficient to kill 50 men! Secondly that a Blue jay having tried to eat a Monarch butterfly will starve to death rather than risk the taste of another!

Some elementary knowledge of genetics is assumed in the reader. To those who have this, various research projects, entirely suited to the Amateur Entomologist are suggested and others may well spring to mind. There is a useful bibliography but, alas, no index. This is an interesting and stimulating booklet whose only fault is that of being too short.

THE DYNAMICS OF COMPETITION AND PREDATION by Michael P. Hassell pp (4); 68. 8vo. Edward Arnold 1976. Price £2.60 (hardback) £1.15 (paper).

Definitely a book for the mathematically initiated, being full of graphs and equations. This is another study from the Institute of Biology's stable and in spite of the rather general title, some ninety per cent of the examples and work quoted comes from the insect world. Although these are drawn chiefly from parasitoids (e.g. *Nemeritis* on *Ephestia*) and the inter-relationships of beetles the relevancy of the subject to the understanding of the decline and extinction—or conversely the spread—of butterflies and other species is obvious. To those keenly interested in this subject and who can follow the rather technical arguments, this book should prove extremely interesting as it is a concise summary of the multitude of variable interrelating and complex factors involved. It is not for the faint-hearted nor for our younger members with less than A-level maths. A criticism which I hope will be remedied in any second edition is the objectionable *omission of the title* in the reference list. It would have been useful, also, to have had even a brief index. S.C.

NOTES AND OBSERVATIONS

SOCIETAS EUROPAEA LEPIDOPTEROLOGICA:—We already have a "Lepidopterist's Society" which is American based. Now a European Society with similar aims has been founded. Information concerning this society is as follows.

In the spring of 1976 R. de Jong and O. Kudrna issued an appeal to European Lepidopterists to form a European Society for lepidopterology. The response to this appeal was so good that by the summer of 1976 almost 100 lepidopterists from 17 European countries had indicated their willingness to join such a society to be known as:—

SOCIETAS EUROPAEA LEPIDOPTEROLOGICA (SEL)

The Inaugural Meeting took place in Bonn (Germany (BRD)) at the weekend September 18-19, 1976, in the Zoologisches Forschung-institut und Museum A. Koenig at the kind invitation of the Director, Professor

Eisentraut. The following 21 lepidopterists (from 8 countries) attended this meeting and became foundation members of SEL: Dr. B. Alberti, Dr. H. E. Back, Dr. G. Bernardi, W. L. Blom, Dr. C. Dufay, G. Ebert, J. Heath, G. Hesselbarth, Dr. R. de Jong, Dr. F. Kasy, O. Kudrna, Prof. Dr. Z. Lorkovic, C. F. Luhr, Thi Hong Nguyen, H. van Oorschot, Dr. M. Opheim, E. Schimdt-Nielsen, Dr. H. Schreiber, K. Schurian, R. I. Vane-Wright and Dr. R. S. Wagener. A provisional Council of SEL was elected at the meeting as follows:—

- President: Dr. R. de Jong (Rijksmuseum van Natuurlijke Raamsteeg 2, Leiden, The Netherlands).
- Vice-President: Mr. J. Heath (Institute of Terrestrial Ecology, Biological Records Centre, Monks Wood, Experimental Station, Abbots Ripton, Huntingdon, Cambs., England).
- Editor: Mr. O. Kudrna (Portsmouth Polytechnic, Department of Biological Sciences, King Henry I Street, Portsmouth, England).
- Membership Secretary: Dr. P. S. Wagener (Hemdenweg 19, 4-429 Bocholt, W. German).

It is intended to commence publishing both newsletters and monographs as well as general entomological matter concerning, primarily, the European fauna. In addition, if there is sufficient demand E. W. Classey Ltd. intend reprinting next year the famous "Monograph of the Genus *Erebia*" by B. C. S. Warren, brought up-to-date by the author. Anticipated price is DM 150 (£37.50),—with a special discount of 20% to fully paid up members of SEL who should send their orders as soon as possible direct to:—E. W. Classey Ltd., Industrial Estate, Park Road, Faringdon, Oxon, England.

The annual subscription is DM 20.—and the entry fee is DM 5.—These should be paid to Dr. H.-E. Back, Zoologisches Forschungsinstitut und Museum A. Koenig, Adenauerallee 150-164, D-53, Bonn, Germany, in cash or by cheque or international money order drawn on a German bank payable to Dr. H.-E. Back, Sonderkonto SEL, Postchekkonto Koln Nr. 1956 50-507. Provision will be made in the future for payment by direct credit transfer.

For those interested, further information about SEL may be obtained from Dr. P. S. Wagener, the Membership Secretary whose address is given above. At last years latest rate of exchange the subscription rate is £6.00 per annum and the entry fee £1.25.

OBSERVATIONS OF PARTIAL GENERATIONS OF LEPIDOPTERA IN 1975 AND 1976:—The two seasons of 1975 and 1976 will live long in entomologists memories. I will concern myself only with the partial generations of Lepidoptera I have noted.

On the 15th August 1975 at Beddgelert, North Wales, I saw a perfect male Small pearl-bordered fritillary (*Boloria selene* D. & S.) In the same month my friend Jon Foster captured a perfect male Small blue (*Cupido minimus* Fuessly) at Portsdown hill, Portsmouth. The following year, on 9th August, 1976, I captured a perfect male Dingy skipper (*Erynnis tages* L.) at Worth Matravers, Dorset.

In the season of 1975 I have captured fresh Holly blues (*Celastrina argiolus* L.) and Speckled woods (*Pararge aegeria* L.) during mid-October. The Speckled woods captured then are similar to those of the first normal generation captured in April.

In August 1976 large numbers of Ruby tigers (*Phragmatobia fuliginosa* L.) were captured on the Isle of Purbeck, Dorset.

These observations tend to show how favourable conditions have been for breeding and 'feeding up' in the past two seasons; this was in spite of the drought that made Southern England look like the Serengeti. It is a wonder how many species managed to find enough food to survive and give us a season to remember:—David Rees (5510J) and Jon Foster.

MORE CONVULVULUS HAWKMOTH RECORDS:—On the night of 22 September, 1976 a female *Agrius convolvuli* L. was caught in a mercury vapour light trap situated at Hayling Park, Hayling Island, Hampshire:—John Walters (5904J)

While on weekend visits to Norfolk I was privileged to find both adult and larva of *Convolvulus* hawkmoth! My first find was of a full-grown larva at Hemsby, Norfolk, on 23 July, 1976. Most unfortunately, while being carried around in my rucksack, in a polythene bag half full of nice pupating medium, it made its escape, undiscovered by me until my return home... The second sighting was of an adult and this took place over a month later, on August 30, 1976 at Aldeburgh, Suffolk:—R. A. Softly (5734) [See photograph Fig. E.—Ed.]

BUTTERFLIES ON MUD:—With reference to this subject, I have seen a Purple hairstreak (*Quercusia quercus* L.) imbibing where pond water has been splashed onto the banks on Wimbledon Common. I would also like to draw members attention to the remarks made two centuries ago by Moses Harris in the preface to his *English Lepidoptera* where he says "In hot and dry days it is common to observe the Butterflies settle in numbers on the mud in ditches and I have often seen above twenty so close together as to be contained within the circumference of a small hoop; by which it is found that heat with moisture best agrees with their nature."—R. A. Softly (5734)

CONGRATULATIONS:—For his services in saving and conserving the sites of the Large Blue butterfly an MBE was awarded to Allan Kennard in the New Years Honours list.

RED ADMIRALS IN SCOTLAND:—On the 5th October, 1976 and again on the 8th, whilst working at Coulport, Loch Long, Scotland, I saw 2 Red Admirals, both sunning themselves on a brick wall. This was the first time that I have seen this butterfly in Scotland.

Two weeks later, on the 22nd October, 1976, whilst working at Loch Goil, I again had the fortune to see a Red Admiral.—J. Green (4932)

ENVIRONMENTAL STUDIES:—There are a wide range of courses on this subject available at lovely Madingley Hall. In addition some natural history field courses are run in centres such as the Lake District, Suffolk coast and West Scottish Highlands. The courses are open to all interested and details are obtainable by writing to The Director, Cambridge University Board of Extra-mural Studies, Madingley Hall, Madingley, Cambridge, CB3 8AQ.

PARASITIC CHALCID WASPS—HELP WANTED:—These nasty-or beautiful-little animals (it depends on your point of view) are often brilliantly coloured and with a metallic sheen. Their favourite food, as grubs, is the egg/larva/pupa stage of other insects. Identification of the many hundreds of British species alone is extremely difficult. Dr. R. S. George, better known of course for his persistent studies and appeals on fleas from birds' nests, has now turned his energies to the study of these and would greatly appreciate receiving bred specimens, together with their hosts and accurate data. His address is 8, St. Peter's Street, Duxford, Cambridge CB2 4RP.

VANISHED HEDGEROWS:—It has been reported by Mr. Ian Purdy, Cambridgeshire County Planning Officer, that 80-90% of the County's hedges and 80% of its Frogs have been lost over the past 20 years. He goes on to say that the advent of the EEC Agricultural policies will result in further changes in the landscape. When such destruction is taking place, is it any wonder that our insects and other fauna and flora get fewer and fewer. More and more pressure needs to be put upon politicians (which includes local Councillors) to get them to pass legislation or take such other measures as will put a stop to this constant despoliation of our landscape:—Editor

MOISTURE DRINKING OR CLEANING?:—A casual observation made in July of 1976 may be of interest to our members and may also answer questions posed in our Bulletin over the past years.

Whilst sitting in brilliant sunshine enjoying the sight of several butterflies on the Buddleia bush close by, I paid particular attention to a rather splendid Peacock *Inarchis io*, Linn., dipping its proboscis deep among the flowers. After several minutes of feeding it would then alight on the grass close to where I sat and edge its way to a damp patch caused by overspill from my children's paddling pool. N.B. Before water restrictions! Once there it would carefully extend its proboscis, heavily coated with pollen from the Buddleia flowers, then with the

tarsus of the foreleg it would stand on the proboscis close close to the palpi, pressing it to the damp earth beneath: It would then draw out the proboscis from under the tarsus and repeat this procedure several times until the proboscis was clean. *Io* would then resume feeding for some long while repeating the cleansing process later.

Without my closer examination of *io*'s activity, which at first I thought was another example of moisture drinking, the above observation would not have been reported. It is possible that this is a widespread cleaning habit of several species of butterflies and could easily be mistaken for moisture drinking.

Any comments or similar observation notes would be appreciated:—
M. S. L. Simpson (4859)

ECOLOGICAL STUDY OF WOOD WHITE:—The Wood White butterfly, *Leptidea sinapis* (L.), is usually, though not always, associated with woodland and occurs in parts of southern and western Britain. Although the distribution is patchy the species is often abundant locally, making it especially suitable for a population study for which I have recently been awarded a grant from the Natural Environment Research Council. The basis of the project will be a detailed investigation of the factors determining its abundance, with particular emphasis on the potential for habitat management to help to ensure its survival in an area.

The value of this project will be greatly enhanced by the knowledge of local entomologists and it would be greatly appreciated if those who are familiar with the butterfly, either in Great Britain or abroad, could contact me. In particular I would be interested in details of extinctions, introductions or natural colonizations as well as site details such as habit-type, larval food-plant species, and the timing and length of each brood. Details of localities will of course be treated in strict confidence should that be requested:—M. Warren, Monks Wood Experimental Station, Abbot's Ripton, Cambridgeshire.

ENTOMOLOGICAL WRITING COMPETITION:—Data Courier, Inc., publishers of *Insect World Digest* are sponsoring a writing competition for articles on any entomological subject which must be illustrated with colour and or black and white photographs, drawings and diagrams. Not only will the prizewinning articles be published in the magazine, but all entries submitted will be considered for purchase at normal commercial rates.

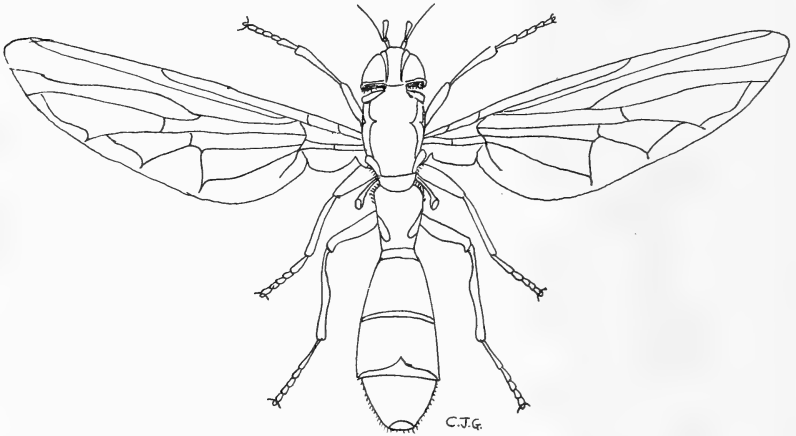
Five prizes are to be awarded; First \$500; Second \$200; Third, Three of \$100. The deadline for submission of articles is September 1st this year. Judging will be done by a panel of experts including the Editors of National Geographic Magazine; Entomological Society of America; *Insect World Digest*.

For detailed information, entry blanks and Guidelines for Authors, write to Dr. Ross H. Arnett, Jr. P.O. Box 505, Kinderhook, New York 12106, USA.

OBSERVATIONS ON *DOROS CONOPSEUS*

Doros conopseus Fab. is a very handsome and rare fly. It is a member of the dipterous family Syrphidae (hoverflies) and although rare, I have been privileged enough to see a good deal of it in the last year.

The first that I heard of it was when my father Mr. A. W. Jones took a specimen on the 29th June 1969 on a leaf of *Eupatorium cannabinum* (Hemp agrimony) in Friston Forest, near Eastbourne. Six years later my good friend Mr. R. Dumbrell took up Diptera and went to Friston Forest to look for it. He found one, not in the same locality, but about a mile away. The specimen he took was like my father's, a female, and was taken on a flower on June 14th, 1975.



Doros seems to be well established in the forest, for Mr. Dumbrell has taken it there again this year. This time however in yet another part of the forest near Friston Place.

Friston Forest is a good locality for the insect, however, I have been lucky enough to find *Doros* in three other places in Sussex. The first on the South Downs behind my home in Newhaven. On June 17th, 1976 I took one above Denton (in the Parish of Newhaven). It was on the wing hovering slowly about a bramble bush. On the wing, before I realised what it was, it had the appearance of a Crabwasp, its yellow and black banded body being very prominent. Later on the 23rd of June I found another specimen not far from Denton, also flying around a bramble bush on Forehill (South Heighton).

On the third occasion I was lucky enough to see *Doros* in some numbers (5 seen of which 3 males were examined). This unusual abundance was at Arundel Park on June 28th, 1976. At Arundel the flies were not all in exactly the same area but in various parts of the northern end of the park. They were hovering over logs and around bushes but none

settled. The flight of all the specimens I have seen has been sluggish and a little erratic not in my opinion at all characteristic of hoverflies which are usually strong and swift fliers.

I would be interested to hear from anyone else who has taken *Doros* in the last year. It will be interesting to see if this abundance is peculiar to Sussex or widespread. It will also be interesting to see the abundance witnessed this year will occur again in the next.

Richard Jones (5612)

A PRELIMINARY SURVEY OF THE FOOD AND FEEDING HABITS OF ADULT BUTTERFLIES (FIRST SUPPLEMENT)

(Continued from Vol. 32, p. 181)

NECTAR-PRODUCING FEEDING PLANTS INFREQUENTLY VISITED BY BUTTERFLIES

It is noticeable that some flowers, although obviously producing nectar rarely seem to be visited by butterflies. Examples are:—

1. *Epilobium hirsutum* L. (Onagraceae) Hairy Willowherb.
This plant seems only to attract Pieridae. *Pieris rapae* L., *P. brassicae* L., *P. napi* L. and *Leptidea sinapis* L. have been personally recorded and Knuth (1906) gives just '*Pieris* spp.'
2. *Pelargonium zonale* (Geraniaceae) Zonal Geranium.
Aglais urticae L. and *Gonepteryx rhamni* L. (male) are the only personal records, and these isolated cases.
3. *Tropaeolum majus* L. (Tropaeolaceae) Garden Nasturtium.
Flowers were seen to be visited by a single *A. urticae* L. which fed or attempted to feed from one yellow and one orange bloom. The long nectary suggests lepidopterous visitors, but no other butterflies have been seen to visit it, nor do there seem to be any moths attracted after dark.
4. *Syringa* spp. (Oleaceae) Lilac.
Butterfly visitors are few on this shrub: *Polygonia c-album* L. and *Callophrys rubi* L. on White Lilac and *G. rhamni* on Double-white variety. No records for the mauve varieties.
5. *Choisya ternata* (Rutaceae) Mexican Orange.
Here again the only recorded visitors are the Pierids *P. rapae* and *P. brassicae*.
6. *Daucus carota* (Umbelliferae) Wild Carrot.
Owing to its shallow nectaries the Wild Carrot is not an obvious choice as a feeding plant for butterflies. In Britain I have noted it visited by *Limenitis camilla* L. (a very brief settling) and certainly by *Aphantopus hyperantus* L. In France, however, 6 species of butterflies were seen to visit it frequently:—*Maniola jurtina* L.,

C. rubi, *Nordmannia ilicis* Esper., *Coenonympha pamphilus* L., *Heodes tityrus* Poda and *Thymelicus lineola*, ochs., as will be seen, mostly small insects suited to shallow nectaries. Avebury (1903) quoting H. Muller gives only two lepidopterous visitors (unspecified) to Wild Carrot as compared with 19 species of Diptera.

7. *Rosmarinus officinalis* (Labiatae) Rosemary

Very attractive to bees, *Apis* and *Bombus* but no butterfly visitors. It would be very interesting to know the reason why these plants, and many others, are to a greater or lesser extent largely ignored by butterflies. Could it be:—(a) Erratic nectar production, (b) Unsuitable colouration, (c) Dependency on location, (d) Unattractive scent (i.e. to the insect)?

Again, why is *Daucus carota* more attractive in France?

BUDDLEIA

Even the non-lepidopterist is aware of the attraction that *Buddleia* has for butterflies, and it is known by many as 'The Butterfly Bush'. Belonging to the family Loganiaceae there are quite a few species and varieties, some blooming quite early in the season, before the nymphalids are really under way. I have made a particular study of four varieties of *Buddleia davidii*, and of *Buddleia globosa* all of which I have planted in my garden. They are:—

Buddleia davidii a. The common pale mauve variety.

b. var. 'Black Knight' which is a very deep purple and from a few yards away appears black.

c. The purple variety.

d. The white variety.

The pale mauve comes into bloom at the end of July together with 'Black Knight' while the purple and white begin a week or so later, but are still in bloom when the first two have begun to fade. *Buddleia globosa*, however, blooms earlier and my specimen is in flower for the last three weeks in June and quickly fading.

During the last few summers, 1975 in particular, I have made the following general observations:—

a. The pale mauve variety does not appear to attract any butterflies for the first week of blooming.

b. The species is equally attractive to night-flying moths, Noctuidae, Pyralidae etc.

c. The varieties with the longest corolla-tubes attract butterflies, the larger moths and bumble-bees.

d. The variety with the shorter tubes (e.g. 'Black Knight') attracts principally the smaller moths, Pyralids, Plumes, Crambids etc. and is used by butterflies and the larger moths as a second choice from the mauve variety. 'Black Knight' also attracts honeybees which do not as a rule frequent the mauve.

e. *Buddleia globosa* attracts myriads of honeybees, few *Bombus*, many Pyralid moths (particularly *Eurrhynx hortulata* L.) but so far only one butterfly *Aglais urticae* L. and that an isolated incident.

Dealing with each variety in more detail:—

Buddleia davidii (Common, pale mauve, -Corolla-tube 8-10 mm)

An observation made in a disused chalk-quarry in Hampshire, 10-8-72 where there are some dozen or more self-sown pale mauve bushes, showed that although in bloom and in fine weather conditions no butterflies were attracted, most species seen were feeding from marjoram. A similar observation was made this year in my garden where, for the first week of blooming there were no visitors. Even allowing for the fact that the usual nymphalids were perhaps not yet flying. I particularly noted that the numerous Pierids completely ignored the bush. It would appear that for the first week or so of blooming nectar secretion must be too low and the presence of a rival source is a greater attraction.

My list of butterfly visitors to the mauve variety amounts to 24 species, but I have noticed that two species ignore *Buddleia* and they are *Aphantopus hyperantus* L. (which is common in my garden) and *Colias crocea*. Fourcr. (Stallwood 1973)

Observations after dark show that this variety is favoured principally by the larger moths such as *Triphaena pronuba* L. *Plusia gamma* L. *Xylophasia monoglypha* Huf. *Leucania pallens* L. *Mamestra persicariae* L. *Scoliopteryx libatrix* H. *Plusia chrysitis* L. etc. and to a lesser extent by Pyralids, Crambids and other small moths.

Buddleia davidii (var. 'Black Knight' -corolla-tube 6-7 mm)

This is altogether a smaller plant with smaller trusses of bloom. It is visited by butterflies more as a second choice, but at night it is mainly, but not exclusively, favoured by the smaller moths such as *Alucita* spp., *Lithosia* spp., Pyralids, Crambids etc., but with the occasional *T. pronuba* and *P. gamma*. On one occasion a specimen of *Ourapteryx sambucaria* was seen feeding with wings folded 'butterfly' fashion.

Buddleia davidii (Purple variety -Corolla-tube 9-10 mm)

Buddleia davidii (White variety -Corolla-tube 9-10 mm)

These varieties are in full bloom by about 18th August when the common mauve is long past its best and is relying on its secondary blooms. Both Purple and White appear to have an equal number of butterfly and moth visitors which at this period are forsaking the Mauve variety.

Buddleia globosa (Corolla-tube 4 mm)

The short length of corolla-tube would indicate that this species is more suitable to small moths and honeybees, and observations bear this out.

FEEDING AND TEMPERATURE

Observations in 1975 brought to light several instances of behaviour of butterflies feeding at flowers I had not previously noticed. While

endeavouring to photograph nymphalids on *Buddleia* during a very hot spell (well up into the 80's), in addition to the insects being very active, as is well known, it was noticeable that *Aglaia urticae*, *Polygonia c-album* and *Inachis io* often fed with wings tightly shut with occasional fanning. The reason for this was evidently to exclude radiant heat. A day or two later in a cooler spell the reverse behaviour was apparent. The majority were feeding with wings fully spread or half closed (i.e. at an angle of 90 degrees between them) in this case presumably to absorb radiant heat from the sun.

The above observations were made at the beginning of August, but later on in the second week of September on a sunny but cool day *A. urticae*, *P. c-album*, *Vanessa cardui* and *V. atalanta* were behaving in a similar manner, mostly with fully spread wings or at 90 degrees in sunshine. However, when the sun was obscured many settled on the lawn with wings flat and motionless, evidently to absorb all heat possible, and to resume feeding as soon as the cloud passed over.

In these cool conditions even the Pierids (which usually feed with closed wings) were imbibing with partly open wings and one *Pieris brassicae* was noticed with wings almost fully spread, which is most unusual. By chance I came across a reference by Kubo (1960) which to a certain extent bears out the above observations. He states that in Japan "Some of the spring brood butterflies (i.e. those resulting from hibernated pupae) keep the wings open while drinking, but others of these and all summer brood individuals, drink with their wings closed."

B. R. Stallwood (1547)

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THE URTICATING PROPERTIES OF EUROPEAN LYMANTRIIDAE

In J. H. Fabre's work entitled "The Life of the Caterpillar" published in English in 1912, he wrote several chapters concerning the "stinging" phenomena in the Pine Processionary (*Thaumetopoea processionea* L.) and the "Arbutus" caterpillar now known as the Brown Tail (*Euproctis chrysorrhoea* L.)

His simple, but effective, experiments established that the irritant substance is inherent in all species of Lepidoptera, in the blood of the larvae, the frass and upon the hairs if present. But the precise nature of the irritant chemical, its concentration in the blood, frass and hairs has not been fully elucidated. The area of insect urtication is wide open to investigation as he wrote" . . . The last step remains for us to take,

namely, to isolate the stinging element and obtain it in sufficient quantities permitting of precise enquiries into its nature and properties . . .”

The family the author intends to deal with, in connection with its urticating properties, is the Lymantriidae. The area in which the author lives is particularly well endowed with species of several genera, namely: *Dasychira*, *Euproctis*, *Orgyia* and *Lymantria*. Most of the urticating properties observed were gained as a result of painful personal experience.

The Lymantriids or Tussock-moths are a small group of species of rather diverse habits. One hundred and ninety-four species occur in the Palaearctic region, of which eleven species occur in the British Isles. These are further subdivided into six genera.

The most interesting genus from the point of view of urtication studies is perhaps *Euproctis*, of which the only British representatives are *E. chrysoorrhoea* L., and *E. similis* Fuessl. *E. chrysoorrhoea* is gregarious at all stages of development, and to some extent polyphagous. The ova of this species are laid in large batches of over a hundred and covered with hair from the anal segments of the female. The larvae hatch within about three weeks and they produce a small tent of several sheets of silk, normally at the apex of the plant. When still small they hibernate and do not resume feeding till early spring of the next year. About June the larvae when fully grown pupate in a small silken cocoon consisting of silk and hairs from the last integument. The imagoes hatch in July. At all stages of its development this species is irritant. The anal hairs, the larvae, the cast skins, the nest and the condition known as Urticaria can be caught from the adult moth. This leads naturally to the question, can we with any certainty predict the degree of irritation from the behaviour of the species throughout its stages?

In Table 1 the prediction as to the virulence of the urtication was based upon whether the larvae were solitary or gregarious, or if they possessed a coat of hair. The predictions were based upon the assumption that if a species has a hairy coat, and is gregarious by nature then it is likely to be irritant. In the species which were examined, all the predictions were correct except for *E. similis*. Although the larva of this species is extremely hairy, it is solitary when in the final instar. Experience tells us that it is very painful to interfere with. This can perhaps be explained when more details of its life cycle are reviewed. The ova are laid in batches and the larvae remain in gregarious colonies until a short time before pupation.

The Table deals exclusively with British species, but what of some of the European fauna? The example the author took from the European list was *T. processionea*. This was moderately common on established oak trees in Central and Southern France in 1973 and 1974.

TABLE OF URTICATING PROPERTIES IN LYMANTRIIDAE.

SPECIES NAME	LARVAL HABITS	COVERING	PREDICTION	PROPERTIES OBSERVED
<i>Orgyia antiqua</i>	Solitary	moderately hairy	not urticating	Larvae are not urticating.
<i>Dasychira pudibunda</i>	Solitary	very hairy	not urticating	No data available.
<i>Dasychira fascelina</i>	Solitary	very hairy	not urticating	The larvae are not irritant but hairs will stay in skin.
<i>Euproctis similis</i>	In early stadia gregarious, later become solitary.	moderately hairy	possibly urticating	Larvae extremely irritant at all stages.
<i>Leucoma salicis</i>	Solitary	slightly hairy	not urticating	Not irritant
<i>Lymantria dispar</i>	As solitary larvae In gregarious phase	slightly hairy	not urticating	The amount of virulence that this species carries is dependent upon the number of larvae in a given space. Sometimes irritant.
<i>Euproctis chryssorrhoea</i>	Communal	moderately hairy	urticating	In all stages of development this species is extremely urticating. The fur-covered larvae and ova as well as the cocoons and adult moths.

When the author opened one of the communal nests of this species to remove the pupae, he gained an extremely painful rash as well as some fine pupae. If we know a few of the details of the life cycle of *T. processionea* we can hopefully predict whether this species is urticating based on the details given in the Table. The ova are laid in batches covered in an anally spun web of threads, which is irritant. The larvae are once more communal, making their way to the leaves in long columns. During the day the larvae repose in a huge dome shaped nest which is spun against the trunk of a suitable tree.

After contact with larvae of an urticating species, examination of the infected spot seldom reveals any implanted hairs, so what can be the mechanism by which the irritation affects the skin, and causes inflammation? If the hairs of the Garden Tiger (*Arctia caja* L.) are examined under a high power microscope they are well barbed with pointed lateral projections, but *A. caja* causes no infection of the skin. However there are species which can implant countless hairs and not cause any irritation. For example, contact with a cocoon of *Dasychira pudibunda*, leaves the examiners fingers looking like a pincushion.

The hairs of both these harmless species are neither grooved or hollow. This is the case with the hairs of *E. chrysoorrhoea* which also lack a groove or hollow interior, yet these hairs as already mentioned are most virulent. It has been suggested that the irritant is spread on the hair, the hair being simply the vector. The hair is used to cause a minute puncture of the skin, enough to allow the irritant to enter the wound. But the chemical which causes the irritation remains undefined chemically although it would be probably a by-product of metabolism.

Mark Hadley (5315)

BREEDING PUGS

How much I agree with P. A. Sokoloff (*A.E.S. Bulletin*, 35, pp 148-9) in his views on breeding Pug larvae. When I was a naive and enthusiastic tyro I discovered the fascination of Pugs and resolved to breed them all. I religiously sterilized my breeding tins and changed the food of the little beasts every day. I pampered them with clean tissue paper and caressed them with fine camel-hair brushes. I watered them and gave them air and cherished them as my children and what was the result. You've guessed it. They died!

Some dried out and others drowned; some were parasitized and some got fungus, some emerged as cripples but most just vanished. They just disappeared and I've a shrewd suspicion that many of them were discarded with the day old food plant.

Well, I soon learnt my lesson. This isn't really the right answer in the end, I know, and the late Mr. P. B. M. Allan will be revolving in his grave but for me the secret of rearing Pug larvae is to ignore them. Just refuse to look after them at all; spurn their anguished cries for help

and firmly turn your back on their feeble wanderings. Nowadays if I find some nice larvae, some *expallidata*, for example, or a clutch of *absinthiata*, I bung them onto a 1 inch layer of peat with their flower heads in a sandwich box, I put on the lid, and I forget all about them.

Well, alright, that's not quite true; if the lid is too close fitting I mop up the sweat now and then and I *always* make sure that I don't put in too many flower heads. Leave a nice space around the sides of the box and don't pile the flowers up, that's the rule. Otherwise I really do just leave them alone. If they were reasonably well grown when collected their food will last quite well unchanged and they will pupate, but heaven knows where. Don't dare to look or you will end up throwing the lot away in despair. Just wait. Sure enough, in their own time, the moths will emerge and often in embarrassingly large numbers. You will be able to boast that you let most of them (where you found the larvae, of course). But then you won't have learnt much! Back to the drawing board.

Mark Young (3759)

A DEVASTATING ATTACK BY PTEROMALUS PUPARUM L. (HYMENOPTERA-CHALCIDOIDEA)

For many years I have been breeding the small gregarious fritillaries in captivity. My stock of the Glanville Fritillary, *Melitaea cinxia* L., has been around for a long time and I have a colony established locally from it on a nearby railway embankment where it leads a precarious existence due to firing by the local vandals. I always keep a large stock in captivity, both for possible release and to ensure a wide gene mixture in breeding. This summer I had about four hundred larvae in the last instar in two cages when I left for two weeks collecting abroad. Ample foodplant had been left for them and I anticipated them to be all pupated by the time of my return. One cage had about fifty larvae in it and the other more than three hundred. On my return I could not find any pupae or larvae in the larger cage and then discovered that the netting cover had been dislodged and I found the pupae in large masses pupated beneath an upturned container beside the original cage. They were in solid rows, some having spun webs around other pupae. I carefully detached them and placed them into a new cage and awaited their emergence. Those in the smaller cage started to emerge within a few days of my return and paired and laid but none were to be seen in the larger batch. About twelve days later I noticed several small wasps in this cage and on examination found several pupae with holes in the sides. I then broke open several more pupae and found them full of white grubs or the pupal wasps. To cut the sad story short it turned out that every one of the pupae had been attacked and thousands of wasps eventually filled the cage. The wasps were kindly indentified for

me by Dr. M. Shaw and I hope that this experience of mine will act as a warning for others. No matter how carefully you go about your breeding arrangements, it is essential that your cages or sleeves are completely insect proof. If the mesh is slightly too large these small wasps can enter and wreak havoc. The smell of a large congregation of larvae must attract large numbers of them to the area and they will alight on the larva waiting until it sheds its last skin. Then while the pupal shell is still soft it will deposit its load of destruction. One can see now why it is essential for gregarious species to split up and wander off to pupate—if they did not they would be a sitting target for these wasps. The species *P. puparum* seems to be very wide in its host preference and I have had them from the Wall, *Lasiommata megera* L., the Swallowtail, *Papilio machaon* L. and both the Marsh fritillary, *E. aurinia* Rott., and the Heath fritillary, *Mellicta athalia* Rott. this year. In each case the larvae have been exposed in the last instar and on each occasion there has been a total kill.

P. W. Cribb (2270)

PHOTOGRAPHING LEPIDOPTERA

I have always been interested in butterflies and moths but the collection of actual specimens does not appeal to me. However, I do not condemn collecting by others and have no wish to enter the long running battle between collectors and photographers. Both pursuits have their good points and it should be a matter of personal preference so long as the Code for Insect Collecting is not overlooked. I might add that the most dedicated collector that I know normally breeds insects for his collection and by releasing the surplus stock in the parent's original habitat could well be responsible for increasing the number of moths reaching the adult stage and making life difficult for their parasites.

I am building up a collection of colour slides as I have found prints too expensive and unreliable as to colour rendering. I use a hand held Praktica single lens reflex with automatic pressure diaphragm and a 3 dioptre close-up lens. I take every slide by flash, even in sunlight, in order to use the smallest stop to increase the depth of field and eliminate camera shake. I usually expose at f22 focussing as near as possible and consistently achieve correct exposures. Some light-coloured species such as The Large white (*Pieris brassicae* L.) would be over-exposed unless a baffle (e.g. one or two layers of white handkerchief) is placed over the flashgun.

Compared to some equipment described in earlier issues of the Bulletin and in journals aimed at photographers rather than entomologists my outfit is primitive and my technique not much better, yet I manage to take acceptable pictures.

Ideally, I suppose, I should use the pabulum or an appropriate plant,

rock etc. as the background and I am slowly acquiring a variety of material such as the bark of different trees. I have used rough slate quite often as the general background as there is virtually no light reflection and the neutral colour of the slate emphasises the colour of the wings and body of the insect portrayed.

Day-flying and night-flying species require different approaches. In daylight there is no difficulty with those obliging insects which sit calmly on fences or tree trunks, but real cunning and perseverance is needed to get a good picture of a Meadow brown (*Maniola jurtina* L.) which is not partly obscured by grass stems—particularly if you are trying to snatch a shot of one with its wings open for a second or two! Nervous and fast-flying species can induce the “thrill of the chase” as I dash after those specialising in erratic flight over uneven ground trying to spot where they land. I learned all about flash colouration in the field.

At night I usually collect moths in pill boxes and photograph them in daylight the following day when they are torpid. They are released that night where they were taken. If the return journey will not be possible the moths have to be photographed on site. This is where the slate is useful for I cannot carry all possible backgrounds with me and the site itself may not provide something suitable. When using a mercury vapour lamp there is enough light to focus by, but if the moth is at sugar a friend is needed to illuminate the moth while the picture is taken.

Identification in the field can be almost impossible with some species as I cannot always see the hindwings of those moths which sit with their wings flat or the upper surfaces of those which sit with their wings raised. Nor does there seem to be much in the way of published colour pictures of lepidoptera in their natural resting positions. If only there were some cheap, easily available, lightweight, wear and weather-proof, well keyed complete guide with illustrations like those in the booklets published by Jarrold Colour Publications, Norwich (text by George E. Hyde). Pending realisation of this pipedream perhaps other members with greater experience than mine could publish hints on quick identification of troublesome species which do not require examination of genitalia or damaging the insect in any way. As an example I would like to be able to distinguish between the Treble-bar (*Aplocera plagiata* L.) and the Lesser treble-bar (*Aplocera efformata* Guenée) at sight. A comparison of types is not possible in the field.

Ian Brydon (5881)



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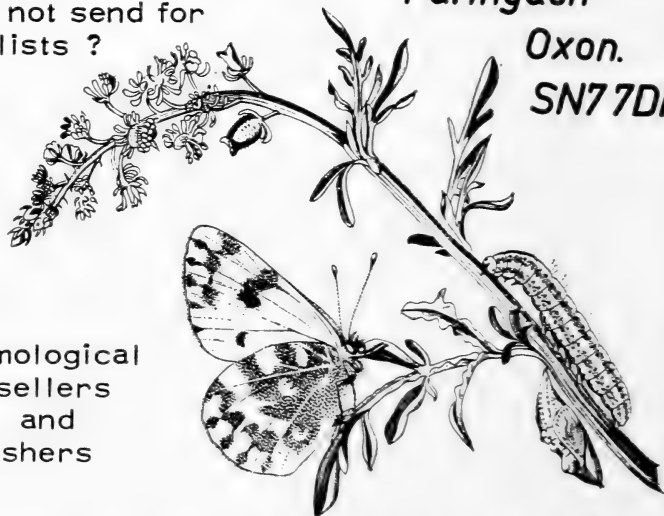
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VOL. 36 NO. 316



AUGUST 1977

THE BULLETIN OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

WORLD LIST ABBREVIATION:
BULL AMAT ENT SOC

EDITOR:
BRIAN GARDINER FLS FRES

The Amateur Entomologists' Society

(Founded in 1935)

President and Hon. Bulletin Editor :	B. O. C. GARDINER	c/o ARC Unit, Dept. of Zoology, Downing Street, Cambridge.
Hon. General Secretary :	P. A. SOKOLOFF	4, Steep Close, Orpington, Kent. BR6 6DS.
Hon. General Editor :	P. W. CRIBB	355, Hounslow Road, Hanworth, Feltham, Middx.
Hon. Treasurer :	N. H. COOKE	8 Gerard Road, Barnes, London, SW13 9RG.

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A.E.S. Exotic Insects Group :

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COUNCIL NOTICE

OUR EXHIBITION OPENS AT 11.00 A.M.

Council of the AES wishes to inform all members that the opening time of our exhibition this year will be strictly adhered to. Only permitted Traders and Exhibitors will be allowed into the exhibition hall before then in order to set up their stalls and exhibits.

Due no doubt to our exceeding popularity, members and visitors have been arriving earlier and earlier to our exhibition over the past few years. Last year was rather chaotic due mainly to large numbers of people arriving before official opening time and milling around the tables before either Traders or Exhibitors had had time to get themselves properly set up. This is not fair on anyone, least of all on those members who arrive with exhibits and then cannot get through the crush to set them up in comfort.

Our venue will again be University College School. This year the exhibits are to be set out in the upper hall, not the gallery, and, in order to avoid overcrowding, the space occupied by traders will be restricted so as to allow more room for the customers.

LADY-BIRD

Lady-bird! Lady-bird! pretty one, stay,
Come sit on my finger, so happy and gay,
With me shall no mischief betide thee;
No harm would I do thee, no foeman is here,
I only would gaze on thy beauties so dear,
Those beautiful winglets beside thee.

From "Times Telescope" 1823, upon the discovery of its utility as a devourer of aphids!

ANNUAL REPORTS FOR 1976 OF THE COUNCIL

The Council is pleased to record that, despite the capricious nature of the National Economy, the Society has continued to prosper. Three factors appear to be responsible for our success: the expert management of the Society's finances; the enormous amount of voluntary work carried out by Officers of the Society; and perhaps most important of all, the continued support of our members.

On 31st December, 1976 the Society had 1368 members, comprising 7 Honorary, 3 Life, 29 Affiliate, 308 Junior and 1021 Ordinary members. There were 244 new members, 12 reinstatements and 164 losses through death or non-payment of subscriptions, representing a net increase of 92 over 1975.

Four issues of the Bulletin were published under the Editorship of Mr. B. O. C. Gardiner, containing a record 196 pages of text, 15 half tone plates, and numerous other illustrations. Council hopes to further increase the size of the Bulletin during 1977.

A new membership list was published in August, and two leaflets revised for distribution during 1977: 'Collecting Lacewings' and 'Insect Light Traps'. However, the major publishing event of the year was the introduction of a 'Lepidopterist's Handbook' by Dr. Richard Dickson. Sales of publications continue to be satisfactory, and Council records its thanks to Mr. Christie for his work as the Society's Publication Agent.

The Council met on six occasions during the year. The Annual General Meeting was held in March at Caxton Hall, and presided over by Mr. Cooke. Mr. M. Tweedie gave an excellent talk on insect photography. The Annual Exhibition was staged at a new venue in 1976—University College School. The popularity of the exhibition exceeded even Council's expectations, and led to some overcrowding at times. Dr. Sutton gave a talk on the Zaire River Trip, which was staged twice to capacity audiences. Three Junior prizes were awarded. A fuller report of the Exhibition appeared in the February Bulletin.

The three AES Groups continue their work. The Exotic Entomology Group membership reached 211 by the end of 1976, and the EEG newsletter maintained its high standard under the editorship of Mr. C. J. Eschbacher, and included some excellent photographic illustrations. The Conservation Group now has 53 members, and Dr. Lonsdale continues to produce an informative newsletter. The Insect Behaviour and Ant Study Group has 20 members, and newsletters have been produced by Mr. M. Parsons.

Mr. T. G. Howarth retired as the Society's representative on the Joint Committee for the Conservation of British Insects. Mr. Howarth has represented the Society on "official bodies" for more than 20 years, and the Council extends its warmest thanks to Mr. Howarth. Our new representative on the JCCBI is Mr. N. H. Cooke, our Treasurer, and a past President of the Society. Mr. J. Roche retired as Hon. Secretary, but remains a member of Council.

The Council reports, with much regret, the death of three senior members of the Society: Mr. S. H. Humfrey; Mr. J. A. Robinson and Mr. S. H. Wakely.

P. A. Sokoloff
Honorary Secretary

OF THE TREASURER

In presenting the accounts of the Society for the year ending 31 December, 1976, it is once again my pleasure to report that in spite of the prevailing economic climate the Society's finances have been maintained on a sound basis. Our Income and Expenditure Account produced a surplus of £261, the Publications Trading Account a surplus of £639 and the combined activities of the three AES Study Groups achieved a surplus of £26. By the end of the year the value of the Society's reserves, measured by the closing balances of the three official Funds, has risen by £1,051 to the impressive amount of £7,767.

I hope that with the new classification of items in the Income and Expenditure Account, members will not require a detailed report of the Society's general financial activities in 1976—which in fact followed much the same pattern as in 1975. However, I must emphasise the magnificent increase in subscription income which resulted from the introduction of higher subscription rates coupled with a record increase in renewals covering no less than 86% of the 1975 membership and a continuous influx of new members which averaged nearly 20 per month. At a time of financial uncertainty, this demonstration of support by members has undoubtedly made the Treasurer's job easier in that the level of essential income has been brought into line with the ever-rising costs of providing essential services such as the Bulletin. I have no doubt that our subscription rates are widely regarded as good value for money.

Overall, the Society's general income from other sources such as donations, advertising and investment income rose satisfactorily, although the surplus on the annual exhibition was not unexpectedly lower due to the change of venue. On the other side of the coin, the Society spent over two-thirds of its total 1976 general income on producing and distributing Bulletins and also incurred the publication of a four-year supply of the 1976 Membership List at a cost of £337. Particularly pleasing was the minimal increase in administrative costs which, including support grants of £40 to the Study Groups, represented only 14% of total general income.

Perhaps the most dramatic financial development lies in the Publications Account with the rise in gross publications turnover from £827 in 1975 to £1,547 in 1976. The cause of this explosion was the publication of the Lepidopterists' Handbook which sold over 200 copies in the last four months of the year: we have invested nearly £1,500 in the first edition of this title, as the Account shows, with over £600 recovered already in sales revenue we are well on the way to generating new funds to maintain our publications programme in 1977 and beyond. Sales of other titles were extremely buoyant, the Silkmoth Rearer's Handbook and back numbers of Bulletins prominent among them once again. A

	Balance of Fund:		Current Assets:
3720	1st January, 1976	4267	Stocks, at lower of cost or valuation
403	Add: Trading Surplus for year	639	Sundry Debtors
144	Bank Deposit Interest	125	Cash at Bank:
		5031	Deposit
4267	Creditors	517	Current
275		4542	
		5548	5548
		4542	5548

STUDY GROUPS FUND (CONSOLIDATED)

	Balance of Fund:		Current Assets:
98	1st January, 1976	112	Cash at Banks
14	Add: Surplus Income for year	26	
		138	
112	Creditors	30	
13		168	168
125		7899	9215
		9215	
7899			

B. A. COOPER, *President*
 N. H. COOKE, *Hon. Treasurer*

THE REPORT OF THE AUDITORS TO THE MEMBERS OF THE AMATEUR ENTOMOLOGISTS' SOCIETY

We have examined the records of the Amateur Entomologists' Society, and in our opinion the Balance Sheet gives a true and fair view of the state of affairs on 31st December, 1976 and of the Income and Expenditure for year ended on that date.

L. G. WHITING, *F.C.A.*
 A. C. WOOD, *F.C.A.*

Honorary Auditors.

26th March, 1977.

THE AMATEUR ENTOMOLOGISTS' SOCIETY
INCOME AND EXPENDITURE ACCOUNT
 for the year ended 31st December, 1976

EXPENDITURE		1976	INCOME		1976
1975		£	1975		£
	Bulletin Costs:			Subscriptions:	
26	Editorial	35		993 at £2.00	1986
1288	Printing	1578		269 at £1.25	336
434	Despatch	547		Life Membership	
		2160	1548	Income	2
1748					2324
	Membership Services:			237 Donations	338
70	Membership List	337		Investment Income	
17	Wants/Exchange Lists	20		(gross)	
		357	56	Dividends	144
87			106	Bank Deposit interest	121
	Administration:				265
212	Stationery and Notices	165		Other Income (net):	
74	Postage and Carriage	101	110	Advertising revenue	160
39	Meetings Expenses	40	216	Annual Exhibition	95
27	Study Groups Support	40		Profit on Badges/	
8	Depreciation	17	23	Tie Pins	28
23	Insurance	25		Profit on sale of	
28	Sundry Expenses	53	—	Typewriter	9
		441			292
411				Income Tax provision	
		2958	62	no longer required	—
2246					3219
	Surplus Income to		2359		
113	General Fund	261			
		3219			
2359					

PUBLICATIONS TRADING ACCOUNT
 for the year ended 31st December, 1976

	New and Revised Publications:		827	Gross Sales	1547
3	Editorial	11	20	Translation Fee	—
1069	Printing	1562		Increase in value of	
		1573		Stocks at lower of cost	
274	Selling Expenses	515	902	or valuation	1180
		2088			
1346					
	Trading Surplus, to				
403	Publication Fund	639			
		2727	1749		2727
1749					

second edition of Leaflet No. 22 on Lacewings cost £75, for release in 1977.

Our Balance Sheet shows that we have closed 1976 with liquid assets exceeding £3,200 of which £500 has been earmarked by the Council for additions to the General Fund investments. During the year, the Society spent £102 on office equipment, which constitutes our only type of fixed asset: now that our Secretary has an efficient typewriter and a new system of membership files we have no further capital expenditure to plan for as yet.

Looking ahead, I sincerely hope that subscription rates can be held at their present level for another year but this will largely depend on the various factors which influence Bulletin expenditure:—printing costs, advertising content, postal rates, print-order and pagination, to name a few. Administratively, I suspect that in financial terms we will soon have to pay the price of our recent success as an organisation. Members cannot expect the administration of our rapidly growing Society to be shouldered indefinitely by a handful of dedicated (and in my opinion expert) volunteers: outside assistance of some kind will become necessary and will have to be financed either by new sources of income, or restrictions on Bulletin expenditure or by augmenting the slender capital resources of the Society from outside. In this context, may I close this Report by drawing members' attention to the charitable status of the AES and the corollary that any bequest made by them to the AES would be exempt from capital transfer tax: such a gesture at this moment of time would be of enormous benefit to the Society and therefore to the future of amateur entomology in this country.

N. H. Cooke
Hon. Treasurer

OF THE SOCIETY'S REPRESENTATIVE ON THE JOINT COMMITTEE FOR THE CONSERVATION OF BRITISH INSECTS

The Committee met twice in 1976: I attended the March meeting as an observer on behalf of our outgoing representative Mr. Graham Howarth, was appointed his successor in May by Council and duly attended the October meeting in my new official capacity.

A select number of rare species, chiefly lepidoptera, continue to concern the Committee: one of them, *Thetidia maritima* Prout (Essex emerald) has been proposed by the Essex Naturalists' Trust for inclusion in the schedule of species protected under the Conservation of Wild Plants and Wild Creatures Act 1975. The Committee feel that such a drastic step is premature and have given the Trust some token financial help towards further survey work and I am assured that any AES members will be very welcome in this task. *Maculinea arion* L. (The Large blue) is of course our only insect already protected under the Act and was reported to be holding out well early in the season at its

one remaining site in Cornwall: the effect of the subsequent drought on the local ant population is as yet unknown but with the crucial nature of this factor identified by Dr. Thomas there is greater long-term optimism being expressed for the future of this butterfly than for some time. *Papilio machaon* L. (Swallowtail butterfly) has apparently failed to establish itself in any numbers at Wicken Fen after its introduction there from Norfolk stock: however, *Gortyna borellii* Pierret, a moth new to Britain, is flourishing at a site on the Essex coast under the care of the County Trust, and in Wales a second site has been reported for *Eugraphe subrosea* Stephens (Rosy marsh moth) which is being kept strictly confidential.

Members may like to know that one of their colleagues, Dr. Chelmick, has completed an important survey of dragonflies in Scotland for the Nature Conservancy, which has also maintained its financial support for further survey work on *Carterocephalus palaemon* Pallas (Chequered skipper butterfly) by the Scottish Wildlife Trust: elsewhere, a rare dragonfly *Ceriatrion tenellum* de Villo has been introduced into Wood Walton Fen.

Only one specific threatened habitat came to the attention of the Committee during the year—Thorne Moors in Yorkshire, where a proposal by the C.E.G.B. to dump fly-ash from Drax power-station was quashed by the local authority aided (I hope) by official protest from the Nature Conservancy, Yorkshire Trust and the Committee. Ironically 1976 had been designated International Wetlands Year but instead we were all far more concerned with the effects of severe drought and it remains to be seen how disastrous the resulting heath fires have been for insects on such well-known reserves as Hartland Moor in Dorset and Thursley Common in Surrey.

Relations between entomologists and official bodies were prominent as a topic during 1976. The Committee welcomed proposals submitted by the Forestry Commission to publish a new explanatory leaflet for the benefit of all those who wish to collect insects on Forestry Commission land; in view of the widely varying treatment experienced by AES members applying for collecting permits at present, there is an urgent need for a coherent uniform policy to be adopted by the Commission's staff in this respect. Another large official landowning body of interest to naturalists, The National Trust, has been invited to send an observer to J.C.C.B.I. meetings on the same basis as the Forestry Commission. At an international level, the Committee has heard of the establishment of a Lepidoptera Specialist Group within the Survival Service Commission which forms part of the I.U.C.N.; this new group, which includes a strong contingent of British entomologists, is chaired by an American, Dr. Robert Pyle, who will be explaining the work of the Group to the Committee.

International trade and investment in rare butterflies has been discussed following the appearance of an article entitled "Why not try a flutter in butterflies?" in the national press and the implications of such articles were reported on by the Committee's Secretary in a paper submitted to the Council for Nature.

At the close of the October meeting, Mr. N. D. Riley announced his retirement from the Committee, thus ending a very long association with its work; he has been succeeded as chairman by Professor Mellanby of the Royal Entomological Society.

N. H. Cooke (3266)

OF THE EXOTIC ENTOMOLOGY GROUP

1976 was another excellent year for the EEG, and December 1976 saw us with 211 members (161 AES and 50 subscribers).

The highlight of the year was the first EEG meeting held at World-wide Butterflies Ltd., Sherbourne, Dorset. About 50 members attended from many distant localities, including Dunblane, Perthshire, Blackpool and Cardiff. All who attended thought the journey worthwhile. Besides the chance to chat with fellow members, there were extremely interesting demonstrations of setting, hand-pairing, printing, close-up photography and a conducted tour of the farm.

We were all well pleased with the extra space provided at the AES Exhibition, and 25 new members were enrolled.

Four newsletters were published giving a total of about 150 pages of articles by members plus the now well established additional page of photographs.

C. J. Eschbacher

OF THE INSECT BEHAVIOUR AND ANT STUDY GROUP

1976 proved to be the testing time for the very existence of the IBASG as, due to the pressure of work, the Honorary Secretary, Ken Mardle, was forced to resign his post. To save what I personally considered to be a highly interesting and beneficial group I decided to accept Ken's offer of its leadership. With my own workload also being heavy, I have had to adopt a slightly new approach to the group's management, concentrating on producing the Newsletter rather than the more difficult task of co-ordinating meetings. I have therefore defined myself as Editor/Treasurer.

Ken handed over to me entirely with our No. 11 issue for March 1976 which was duly distributed to a membership of twenty. There followed a slight lag, again due to the turmoil of the changeover but this resulted in the production of a longer, thirteen page, issue of our No. 12 Newsletter. This included a long and very informative article by Howard Lee called, "How to study Insect Behaviour". Howard has been most active within the group during 1976 and is at present

co-ordinating members comments and ideas on insect behaviour which we hope will culminate in an A.E.S. leaflet on this subject.

The format of the group newsletter has changed little since Ken first started its production. It contains the editors introduction followed by various items such as new members, changes of address etc. There is then a large section on members comments and present activities which allows a constant appraisal of the personal work of the members in the field of entomology. This section is then followed by articles dealing with a wide range of topics and finally we have our own wants and exchanges section.

Due to a good spirited response at the beginning of 1976 from members who donated as well as submitted their subscriptions, the Group's past financial difficulties were cleared so that there was an actual profit of Three pounds at the end of the year.

The future of the group still holds its promises and the field meetings system that existed in 1975 will hopefully be resumed. We welcome anyone interested in insect behaviour, ecology, breeding etc. We also want to strengthen the Ants side of the group and I will be only too pleased to hear from anyone interested in joining the group who is willing to send in notes or articles on Ant behaviour and Ecology. I hope to increase the frequency of the production of our basically quarterly newsletter so that our members can really keep in touch with each other. Those interested in joining should send an S.A.E. or 60p to me for a years subscription (Address on the inside cover of the Bulletin).

Michael Parsons (5432)

OF THE CONSERVATION GROUP

The system, announced at the 1976 AES a.g.m., whereby the Group's Committee shares its membership with a separate AES Conservation Committee has been working well; meetings were held in September 1976 and February 1977. A new member of the Committees, Mr. C. Hart has recently been co-opted. I have continued to act as Group Treasurer and I have again prepared accounts for the AES Treasurer. The accounts for 1976 show an increase in the Group's fund from £59.36 to £80.53 and the reasonably high level of donations over and above the minimum subscription has allowed us to hold that minimum at 35p p.a.

The Group's Bulletin and the reports to successive a.g.m.'s of the Society show our determination to help improve the co-ordination between all organisations and individuals involved in insect conservation, but there remains little evidence of progress outside the Group itself. In an attempt to improve liaison with other bodies, the AES Council has ruled that the Society's Representative on the Joint Committee for the Conservation of British Insects (JCCBI) should be a member of

Council as well as of our own Conservation Committee. Mr. N. H. Cooke has recently taken over this task following the retirement of Mr. T. G. Howarth who so regularly represented the Society for many years.

Despite the problems of general liaison faced by Mr. Cooke, we continue to have good relations with individual organisations. An example of such contact is our correspondence with Mrs. Mary Briggs of the Botanical Society of the British Isles. She drew our attention to a recent conference which that Society organised jointly with the Linnean Society at Newcastle University. The subject was 'Plant/Insect Relations' and, as it was obviously relevant to our work, a Representative was appointed in the shape of Mr. T. C. Dunn of Chester-le-Street. We also advertised the Conference to all AES members. Mr. Dunn reported that little mention was made of conservation although much interest was shown in our suggestion that amateur naturalists and professional research workers should co-operate more than at present.

Representation at an international level has unfortunately been a problem. The 'Xerces' conference, mentioned in our 1976 report to the a.g.m., did eventually take place in the U.S.A. last summer and we understand that there was some British representation. We had lost direct contact with the organisers and we could obtain no worthwhile advance information from any source in the U.K. Doubtless we shall hear of the progress made, if any, at this rather obscure event.

We continue to produce our bulletin and the present level of production; two or three issues per year promises to increase as judged by the current flow of news and views from members. We are also sending out copies of 'Habitat Digest' which, for a time, were available to all AES members. Little progress has been made on other information projects such as the proposed insect conservation handbook.

The level of interest in local site protection work seems to be on the increase, judging even on the basis of the letters from those members who bother to write in with their news. Our rate of recruitment of members has recently increased, and this is providing a higher proportion of keen conservationists, even though the activity of many is short-lived. We have many interesting recent reports on such areas as Bras-side Ponds, Co. Durham; the Empingham Reservoir area in Rutland; the Blackbrook Valley in the Kidderminster area; Abney Park Cemetery in N. London; Tenantry Down, Sussex and Barnes Reservoir in S.W. London.

We have held several field meetings since our last report two of which; at Merrist Wood in Surrey and Tenantry Down in Sussex, proved most interesting. In October 1976 a meeting at Abney Park Cemetery, held with members of the London Natural History Society was less interesting (mainly because of poor attendance) but more recently we have participated in two weekend 'task work' sessions held by the Sussex Trust for

Nature Conservation at Tenantry Down, and on the first day we made a major contribution to the effort. Our programme of field meetings for 1977 is very promising and I will gladly send details of any meetings which are still to take place after publication of this article to interested AES members.

Our stand at the 1976 AES Exhibition was very much field-orientated in that it was based on the practical protection of valuable sites. Much interest was generated by the illustrated examples of what has been done and what can be done.

The overall picture seems to be fairly encouraging and, in spite of a temporarily reduced effort on my part, there is every promise that activities are well on the way to a point where our role will become more and more widely acknowledged.

D. Lonsdale (4137)

OF THE BRITISH BUTTERFLY CONSERVATION SOCIETY

In his annual report to the members of the British Butterfly Conservatory Society on 5th March, 1977 at the Victory Services Club W.2., the Chairman, John Tatham said that the Society now had a membership of 950 and was the largest organisation solely devoted to butterfly conservation in UK. He cited instances where the Society had been able to support objections to planning proposals which had threatened certain well established habitats, with satisfactory results, and also through co-operation with local authorities certain areas had been preserved as existing habitats or would in due course be designated areas of

Habitat Surveys formed the backbone of the Society's work and records so far received augured well for the future furtherance of the Society's objectives.

Liaison with overseas members and similar organisations had revealed the same problems existed in many countries and the information thus gained and exchanged had been extremely helpful in minimising the destructive effects of modern development.

The conservation programme was to be up-dated in the light of the Society's experience over the last six years and as many members as possible were urged to undertake habitat surveys for a period of five years, if at all possible.

The most important factor was not so much the actual butterfly population, but its variation over the years and the causes of the variation; in order to conserve endangered species much more needs to be discovered about the factors that cause these variations, and it was towards this end that the Society's research would continue.

C. J. Tatham, Chairman

PARIS INSECT FAIR

The second International Insect Fair of Paris was held in the magnificent surroundings of the Palais des Congrès on April 23 and 24. It can best be described as similar to our own AES annual exhibition but held in surroundings like those of a Royal Society soirée. On the first day one was able to make a leisurely tour round and indeed one had the feeling that not many people were there. This was particularly noticeable during the lunch hour, taken more seriously on the Continent than it sometimes is here. On enquiry in the afternoon we were surprised to learn that there had already been more visitors than to our own exhibition, which, in view of the crush we experience, was a sure indication of the spaciousness of the venue. The Fair was reported on the French radio and the second day experienced a stream of visitors by no means all Entomological. Unlike our free show there was an entrance fee of 75p. The number of exhibits, as opposed to Traders, was very small, but we are pleased to report that the best was British and one of our members was involved. This was a joint display put on by Dr. Ian Watkinson of Shell Research and Mr. Claud Rivers of the Unit of Invertebrate Virology. It consisted of methods of rearing several Lepidopteran species on artificial diets and aroused great interest, for while Continental Europe is strong on taxonomy, rearing is apparently little undertaken by the average amateur Entomologist there.

The material on offer was much as can be found at our exhibition but with a great dearth of livestock. There were rather more Coleoptera and Other Orders but the beginner was scarcely catered for at all. The number of books to be seen was quite pitiful, which surprised us and we were disappointed not to find the very wide selection of secondhand apparatus and equipment we have every year in England. Nevertheless the new equipment available was extensive and it was interesting to see how it differs from our own. Not a cabinet of storebox to be seen. Instead the ubiquitous "Carton", wellmade, usually with a glass lid and the old peat "Moll" bottom replaced with modern plastic "Emalen". One of the best we saw was called the Tepro box and besides pinned insects it has been so designed that it can be subdivided by smaller boxes containing carded beetles, minerals etc.

There were also some magnificent decorative displays of Lepidoptera of a kind not, so far as I am aware, available in this country. Although of course not to the entomologists taste, they are popular with the general public and were beautifully prepared with great artistic flair. Not un-naturally they were fabulously expensive. There were also some rather fine and inexpensive wall charts of various insects.

One of the chief pleasures of all exhibitions and meetings is the chance to meet with correspondents and renew old friendships in person. In

this we were amply rewarded and this alone made the all too short trip to Paris worthwhile.

Brian O. C. Gardiner (225)

LETTERS TO THE EDITOR

Dear Sir,

I would like to know why we are sent "A code for insect collecting", when across the country Rothamsted type traps are used which kill everything that enters them. My MV Robinson trap caught between a few and fifty moths a night during March, and its living contents, after recording, were released early each morning into dense cover, whereas one Rothamsted trap I know of, operated by a well-known research establishment, killed more than seventy-five moths a night on several occasions during March. I can produce evidence to back this statement if needed.

Yours faithfully,

R. A. Bell (5222)

BOOK REVIEWS

THE WORLD YOU NEVER SEE—INSECT LIFE, by T. Rowland-Entwistle (with Oxford Scientific Films Ltd.). 128 pp. with 280 coloured plates. Published by Hamlyn Publishing Group Ltd. Price £2.95).

Oxford Scientific Films Ltd. have established that they are without equal in the filming of the intimate life histories of insects. The use of powerful heat-free lighting systems has enabled the production of very high magnifications of living insects and although specialising in 'movie' films, they have also produced still photographs of a very high order for illustration and instructional purposes. This new book includes many of their best pictures, built around a well written and informative text which makes an excellent introduction to the world of insects. It is more than just a book of good pictures and will prove of use to the beginner and to teachers in schools. At the price charged it could usefully be added to the bookshelf of most entomologists.

PWC

THE WONDERFUL WORLD OF BUTTERFLIES AND MOTHS, by Robert Goodden, pp 96. Royal 4to. Hamlyn Publishing Group Ltd. 1977, Price £2.95.

Our first reaction to this book was "where have we seen it before" and then it struck us. The title page has the same double-page spread of Anthony Bannister's photo of *Anthene amarah* sitting on some bright

red flowers as does Paul Smart's International Butterfly Book! (Reviewed *AES Bulletin* Vol. 35 p. 127). Apart from this however over half the photographs illustrating this book are by the author and he has clearly taken advantage of his interest in conservation and the importing activities of his firm to obtain photographs of some unusual Lepidoptera. We would cite for instance that of Ants attending the Large blue butterfly larvae on page 13 and the young *Morpho* caterpillars on page 61.

The book is divided into six chapters which include one each on breeding and conservation. The text, written in Mr. Goodden's usual breezy style, is there in its own right and is not just a peg on which to hang the photos which, each being accompanied by an adequate legend, can stand on their own. The text is in fact a useful source of information about breeding difficulties and possible foodplants as well as emphasizing biological and not taxonomic information.

The coloured photographs are good and well produced colourwise. The size varies and, alas, we have no indication of the magnification. It is our opinion that the full-page ones (remember that this is a large format book) are too large in some cases such as page 79 although that on page 21 of large moths natural size is fine. We particularly like the large double-spread endpapers however. Conversely the photo of the Giant atlas moth is too small.

As usual there are a few typographical errors as for instance *Utethsia* for *Utetheisa*, *Dielephila* for *Deilephila*. We still deplore the habit of bleeding many of the illustrations to the edges and not leaving decent margins.

The spate of new colourful books about insects continues unabated. The quality both of the colour reproduction and the accuracy and care taken with the text varies enormously, as does the price. This is one of the better ones and although a slim volume has packed quite a lot in and is very reasonably priced indeed for a hardback. An ideal present, or for anyone who wants a brief colourfully illustrated account of butterflies and moths.

BOCG

REVISED CATALOGUE OF THE AFRICAN SPHINGIDAE (LEPIDOPTERA) WITH DESCRIPTIONS OF THE EAST AFRICAN SPECIES. By R. H. Carcasson, p. 148, 17 Plates, 1976. Small crown 4to. E. W. Classey Ltd., Price £5.80.

This is the second edition of the work originally published by the East African Natural History Society in 1968. Unlike Mr. Carcasson's work on the Swallowtails, reviewed in our previous issue, this one is properly printed and the plates are half-tone, unfortunately not of very good quality, although equal to the original printing but genitalia are included. The usefulness of these illustrations are that they are of

species which have not previously been figured. The coverage is in fact a revision of the Hawkmoths of the entire Ethiopian faunistic region and should prove to be the standard work of reference for many years to come. It is not however a book for the beginner who will need to use it in conjunction with other works, in particular Seitz, for instance. The experienced enthusiast however, will now be able to differentiate previously confused species and relegate previous doubtful to their true position.

The author has, in our opinion very sensibly, continued and amplified the long established practice of basing Sphingid classification on Rothschild and Jordan's classic work of 1903. He has taken the opportunity of clearing up loose ends such as rejecting *Sesiinae* as a subfamily name on the very good grounds that these moths are no longer considered to be Sphingids. It should be borne in mind that this is a reprint and consequently no account is taken of recent work; by the author; Hodges; Darge; Hayes. Such changes as have been made subsequently however are not major and in no way detract from this book's usefulness.

MJC

INSECT AND HISTORY by Prof. J. L. Cloudsley-Thompson. pp. X +242. Weidenfeld and Nicolson, London 1976. Price £8.50.

This book is one of the World Naturalist Series and is by a well-known author who has served his subject well and produced a book worthy of a place in the library of any general entomologist, ecologist or interested lay reader. It is a book of horror stories with insects playing the anti-hero's part. To some extent the discussion is enlarged to cover diseases that while not transmitted, routinely, directly, but perhaps—the point is debateable—indirectly by insects. These include small-pox, scurvy, syphilis and, of course, famine which last can be caused overnight by a Locust swarm.

Intriguing points for discussion are raised. Did then the Sinhalese empire in Ceylon collapse because the Tamil invaders introduced Malaria or because their invasions disrupted agriculture and allowed the mossies to breed in the derelict irrigation channels? When the Goths cut the Roman aqueducts in 537 they not only ensured that Christians became the great unwashed but, by cutting and not stopping at source they ensured their army was surrounded, shortly, by a morass, ideal again for mossies and Malaria and indeed it was the destruction of their army by disease that raised the great siege of Rome.

The book concentrates on the pestilences rather than the medical entomological aspects and shows on what a knife edge of disaster we teeter. Those of us who express horror at some of the battle statistics quoted in normal history books would do well to ponder even more appalling death lists (not by the way normally quoted in official

casualty lists) resulting from typhus, yellow fever and the like.

The final chapter also includes commercial insects, the producers of silk, honey, shellac. Thereby showing that insects do indeed have their usefulness, but in no way alleviating the previous intriguing and fascinating story of horror.

BOCG

THE SECRET LIFE OF INSECTS, by P. Passarin, d'Entrèves and M. Zunino. pp. 384; many illustrations and cold plates. Demy 4to. Orbis Publishing, London 1976. Price £8.95.

The book is a simple non-technical introduction to various aspects of insect life with some species being examined and illustrated in some detail. Amongst these are Termites, Bees and the Deathhead hawk-moth. The various chapters deal with either an order of insects or else some ecological aspect such as biological control.

Many of the photographs are apparently 'stills' from film taken especially for a series of television programmes. While many of them are excellent there are some which are certainly out of colour balance (page 29) and others out of focus (top half of page 219). The illustration on page 336 is not only quite hopeless, but quite archaic so far as locust breeding is concerned. However the wide choice given from a long series of cinematograph shots, has meant a number of unusual and otherwise unobtainable aspects of insect life have been able to be selected. We have not for instance come across a photograph of an *atropos* actually on a honeycomb before. The shot of the Puss-moth's tails on page 255 is also an unusual one.

Besides the colour reproductions there are a number of line diagrams to elucidate points in the text although in some cases they are self-explanatory. In this book they have been particularly well drawn and printed.

The title of the book may be rather misleading since the majority of insects are Tropical whereas almost all the insects dealt with here are European and the selection has been of the better known and, to most of us at any rate, more interesting forms. With this in mind the book may be said to come up to expectations and to a reasonably well illustrated account of various aspects for the general reader.

This is a foreign book rendered into English but with the same illustrations as the original Italian edition. It was a most agreeable surprise to find that not only have they got the English right, but have spelt the scientific names correctly also, two aspects of printing which have been sadly lacking in some more expensive 'mid-ocean' books recently. Full marks to the publishers for the trouble they have on this score.

MJC

A GUIDE TO THE INSECTS OF AFRICA by Elliot Pinhey and Jon Loe. pp 36; 13 cold. plates, Hamlyn Publishing Group. 1974. Price (remaindered) 30p.

An absolute snip of a bargain not to be missed if obtainable. A very good mix of text, excellently done line diagrams, and coloured plates by Jan Loe, in style and quality equal to those of Gosse. The book forms an excellent introduction to the insects of Africa and our appetite is whetted by the fascinating variety displayed. Would that more of them were readily available for breeding in this country.

BOCG

THE BIOLOGY OF INSECTS by C. P. Friedlander. pp. 189; line diagrams; 8vo: Hutchinson of London, 1976. Price £4.95.

Dr. Friedlander is to be congratulated on producing a fresh approach to this subject illustrated with simple and easy to follow original illustrations. The text shows every sign of being right up to date and one feels that the author has his fingers on the pulse of current research as it progresses.

Inevitably, in a subject so vast as that of insects, selectivity has had to be employed and in general the aspects chosen are those not previously considered in many of the major general works available. The text is aimed at those already having some biological knowledge and while designated more for the use of A-level and University courses, the book is of use for all who would wish to know more about the biology—as opposed to the taxonomy and morphology—of insects. Much of the biology of course can be applied generally, but, as it pointed out, many insects do have a specialized biology of their own. Attention is also drawn to gaps in knowledge—something which is very useful in pointing would-be researchers in the right direction. In so many books gasps are either ignored or, reprehensibly, conjectural theory is presented as fact.

The book is divided into six chapters. In the first the physiological basis that has made insects such adaptable land animals is explained and discussed. Chapters two and three give a very concise illustrated review of the various orders and their fossil history and development. Chapter four, entitled 'Adaptive Radiation' is an amusingly illustrated account of how insects burrow, run, fly, jump, swim, feed and parasitise. Chapter five gives some account of behaviour and ecology and finally in Chapter six on the economic importance of insects, is discussed not only their control and the mode of action of insecticides, but also the diseases they can transmit and their economic impact. In any book one can usually find errors. In this one we noticed only one mis-spelling, and would, from personal experience, cavil at the statement that *Triatoma* and *Rhodnius* cause a very painful jab. They do not. These very minor

blemishes are more than made up for by the helpful and selectively annotated bibliographies attached at the end of each chapter. It is a pity however that an otherwise excellent book has been set by non-aligning IBM instead of letterpress. This lack of margin alignment spoils it and is to be deplored.

BOCG

EXTINCTION OF THE LARGE BLUE SOLVED—A COMMENT

We feel that Brian Gardiner's article on the extinction of the Large blue (*Maculinea arion* L.), which appeared in the Bulletin in November 1976, needs some qualification. While it may be true that Dr. Thomas has found the cause of the decline of the Large blue from sites which are ungrazed his findings have no bearing on the sites which still have a short turf, plenty of ants and from which the Large blue has also disappeared. In deed the fact that a lack of grazing leads to the disappearance of the Large blue has been known for many years (see for example Oliver 1920, Richardson 1946) and various mechanisms have been put forward to explain this disappearance (Spooner 1963) to which Dr. Thomas has added another.

As was originally pointed out in the pages of the Bulletin (Benham 1973) there have been many sites, particularly in the Cotswolds but also elsewhere in the Large blue's range, from which it has disappeared without reason. Many of these sites remain to this day; there are for example several Cotswold sites with very short turf and the right ants as well as coastal sites where turf is kept short by sea spray. Indeed some of the Cotswold sites appear better than the remaining Devon site from the point of view of shortness of turf and presence of ants. We also have to consider the evidence of amateur entomologists who knew the sites when the Large blue was present and on revisiting them today state that they have not changed. Thus there is a real problem in explaining the disappearance of the Large blue from a number of apparently suitable sites. This led us to suggest (Muggleton and Benham 1975) that isolation of colonies could by itself account for the disappearance without any other factors operating. The mechanism involved could be genetic, as a result of inbreeding reducing the population's fitness, or physical, for example very low densities of butterflies meaning that an individual cannot find a mate, or a combination of both genetic and physical factors. Such ideas are not novel and have been discussed at length elsewhere and often in relation to isolated colonies on nature reserves (Hooper 1971, Drury 1974, Diamend and May 1976) while Southwood (1976) suggested that in addition to the Large blue the extinction of a colony of the Checkerspot butterfly (*Euphydryas editha* Boisduval) in California may also be explained in this way.

The problem is summed up eloquently by Diamond and May (1976) who, referring to small isolated reserves, say,

'Consider first the question of immigration. Even if there are many small reserves, a species that is incapable of dispersing from one reserve to another across the intervening sea of unsuitable habitat is doomed to eventual extinction: its lights will wink out one by one, with no chance of re-ignition.

The decline of the Large blue in England over the last one hundred years has followed precisely this path. Even fifty years ago it was still a widespread species with many colonies and a more or less continuous distribution from Gloucestershire to Cornwall. Then, as a result of ploughing, lack of grazing and afforestation, the Large blue became extinct at many sites leaving the remainder isolated, since then one by one its lights have winked out and often without apparent cause. In 1963 when the Joint Committee for the Conservation of the Large blue came into existence there were thirteen colonies on the Devon/Cornwall coast, a year later the number of colonies was ten, by 1968 there were only two (Howarth 1973) and both these appear to have become extinct in the early 1970s.

Yet this aspect of the problem does not appear to have received sufficient attention from those concerned with the conservation of the Large blue. We have been told that as many other plants and animals survive in isolation so can the Large blue. The point that is missed is that the species we find today surviving in isolation are those that have managed to adapt themselves to this situation e.g. there is some evidence that selection has taken place in the Swallowtail butterfly (*Papilio machaon* L.) resulting in individuals with smaller wings and less powerful flight (Dempster, King and Lakhani 1976). How many species have failed to adapt and fallen by the wayside we can never know. That the Large blue is likely to be one of them seems certain, in which case its extinction in this country is inevitable. With man's help it may linger on a few more years but its extinction could occur at any time. This raises another problem for, in view of the limited resources available for conservation, it may be argued the effort and money at present being spent on this species (which is after all widespread in Europe) should be switched to other butterflies (or even other insects!) where there is more hope of success.

Although it now appears too late to save the Large blue we may perhaps learn from this example and, hopefully, prevent the same fate befalling other species. The species which may need attention are any which have a more or less continuous distribution which is then broken up leaving isolated colonies from which the species begins to disappear without apparent cause. Certain Fritillaries (*Argynnis* spp.) which are disappearing without any apparent cause from suitable habitats in eastern England (Heath 1974) may be examples of this. As a counter-

measure it may be possible to breakdown the isolation by transferring individuals from one colony to another. On theoretical grounds only very small numbers need be moved, and this could have been done with the Large blue while there were still several colonies but apparently it was not tried. Alternatively, if suitable sites can be found new colonies could be established nearby and this is now being attempted with the Large blue although in this case it is probably too late to have any effect.

Finally, it is important to stress that there is no one reason why the Large blue has declined in this country, a number of factors, some interacting and some which we do not properly understand, have contributed to its near extinction. It must also be admitted that on any reasonable basis attempts to conserve it must be judged unsuccessful. What we can hope for is that we will learn from the mistakes of the past, be less willing to accept that there is any one easy solution to problems such as this and ensure that we are better prepared in the future.

Brian R. Benham (4393)

John Muggleton (3253)

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CONSERVATION

The articles from the pen of K. J. Willmott (1974; 1975) have created an interesting discussion on the delicate and emotive subjects of conservation and collecting. He seems to have a fanatical dislike of collectors although he does say at one point there "are good types" as exemplified by a person he dissuaded from collecting a Purple Emperor (*Apatura iris* L.). One is left wondering when a good type becomes a bad type. Which species represent the borderline? Can one kill a Small white (*Pieris rapae* L.) or perhaps a White Admiral (*Ladoga camilla* L.) without being subject to the abuse of Mr. Willmott?

The views of collectors have been expressed with good taste and sound reason (Bryan 1976); (Sell 1975) and (Simpson 1975) and there does appear to be good reason to suppose that species will continue to come and go despite collectors and conservationists. The Black-veined white (*Aporia crataegi* L.) and the Gypsy (*Lymantria dispar* L.) have disappeared along with other species and all attempts at reintroduction have failed. They no longer find our island a fit place to live. The demise of the Black-veined white is fully recorded by Allan (1948). Other species such as the Comma (*Polygonia c-album* L.), Golden plusia (*Polychrisia moneta* Fab.) and Gold spangle (*Plusia bractea* Schiff.) have arrived or extended their ranges.

In Derbyshire and Cheshire there appear to be signs of a slight change in the status of the Large skipper (*Ochlodes venata* Bremer and Grey), less common and the Small skipper (*Thymelicus sylvestris* Poda), more common.

We cannot hope to conserve everything any more than we would desire to collect everything. On a nature reserve in Derbyshire we have a rare hybrid Orchid and the habitat has been "managed" to protect it. But at what cost? Trefoils, Clover and Birch have been cleared to ensure the survival of the Orchid but the same habitat is shared by many things including a colony of Common Blue (*Polyommatus icarus* Rott.) butterflies. What are their prospects? Gardiner (1977) "propounds a heresy" that small birds which feed on caterpillars could be controlled locally to increase butterfly populations. If lepidoptera are what we wish to protect the suggestion is sound, however the ornithological conservationists of Mr. Willmott's ilk would soon be castigating entomologists if this came about. We must remember that our larvae eat the botanists plants and are in turn eaten by the ornithologists birds. A beautiful balance. Nature's balance. *Homo sapiens*, the supreme predator, has a part to play both as collector and protector but we must be sure of the role. Nobody conserved or collected dinosaurs. *Homo sapiens* could not interfere as he himself had not evolved, yet they still became extinct.

Our efforts in the field of control and protection have not always met with success and in the case of the Large blue (*Maculinea arion* L.) the

protection afforded may have been detrimental (Gardiner 1976).

Photography is art not science. It can be interpretive and creative but no matter how skilled the photographer certain things are beyond his scope. One wonders if species such as Berger's clouded yellow (*Colias australis*. Verity) would have come to notice by photography alone or how the Grey and Dark Dagger (*Apatele psi/tridens*) would be separated not to mention *Eupithecia* spp. or *Procus* ssp. Surely only science can unravel these and other mysteries. It is hoped that the passion and abuse between conservationists and collectors can be kept out of a otherwise healthy discussion; after all we all desire the lepidoptera to flourish.

A. W. Speed (5278)

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TWO VIEWS OF PROVENCAL BUTTERFLIES

1. APRIL 1973

The idea for a spring collecting trip to the South of France was first discussed by us at the AES exhibition in the autumn of 1972. Neither of us could find sufficient time for a continental expedition later in the year, and having already seen a number of reports on the interesting butterfly fauna to be found in Var in early spring, we decided to plan a camping holiday in the area at this time. We were joined in this venture by Gillian Taylor and David Richards, who enjoyed the holiday despite our continual entomological enthusiasm.

Our journey south from London began on the bright and sunny afternoon of Friday, April 6th, and we soon met with delays in heavy traffic before we reached quieter roads between the newly green hedges. As we drove towards the coast we eagerly anticipated the warmth and rich insect life of Mediterranean France, and speculated on what we would find so early in the year. Sadly, we arrived in Newhaven only in time to see our evening ferry moving steadily away from the quay, and

so after an unplanned extra night in England we boarded the ferry for Dieppe the following morning. The weather continued with bright sunshine and a chill breeze for the crossing, and we continued on to the following morning we found the grass encrusted white and crunchy with frost, while the pale blue sky promised a fine day to explore Paris. We were able to travel through empty central streets and squares on this Sunday in early spring, with the willows and chestnuts just starting to come into leaf in the parks and beside the Seine. After camping south of Paris at La Genevraye, we continued our journey on the autoroute, the day being enlivened by observation of Black Kites (*Milvus migrans*, Boddaert) at regular intervals along the banks and fence posts, presumably awaiting easy meals from the road. Until we arrived south of Lyon the vegetation was less advanced than in England, but then, surprisingly quickly, pink and white fruit blossom appeared in the orchards beside the Rhone, together with willows fully in leaf. When we arrived at the camp site in Vedère (near Avignon) the wind was strengthening from the north, and by the time we had finished supper the tents were being battered by violent gusts and squalls. Luckily, an embankment with a group of Scots Pines alongside gave us some shelter from this sudden 'mistral'.

The next morning, Tuesday, 10th April, we were dismayed to see the consequences of the overnight storm. Snow remained in sheltered hollows at the roadside, and covered the slopes of the Montagne du Luberon. It remained cold with snow on the ground from Aix-en-Provence to St. Maximin-la-Ste. Baume, and we wondered how it would be possible to find butterflies in the region within the period of our holiday. However, as we continued east along the N7 towards Vidauban it became milder, and we experienced for the first time on the trip a pattern which was to become familiar during our stay in Var, namely the abrupt local changes in weather and vegetation that occur at this time of the year. In late afternoon we pitched the tents between oleander hedges at Le Pont d'Argens south of Les Arcs, in countryside which looked more green and entomologically promising.

The following morning we enjoyed a clear sky and warm sunshine which enabled us to begin collecting. We started in the vicinity of the camp site where the flowers at the edges of the fields and near the River Argens proved attractive to butterflies. We soon saw *Macroglossa stellatarum* L. buzzing rapidly to and fro between feeding, and we also saw *Colias crocea* Geoff. and *Polygonia c-album* L. We caught *Anthocharis cardamines* L., *Aricia agestis* Schiff. (the only record for the trip), *Carcharodus alceae* Esp., *Celastrina argiolus* L., *Euchloe ausonia* Hb., *Lycaena phlaeas* L., *Pieris brassicae* L., *P. napi* L., and *P. rapae* L.; a total of eleven species of butterfly for our first locality. We then moved on to a streamside area about 8 km south of Vidauban on the D48, where we were able to add seven species to the day's butterfly list.

These were *Callophrys rubi* L. (which in one spot had the habit of successively appearing from the same position behind a bush as if being released by an unknown benefactor), *Gonepteryx cleopatra* L., *Inachis io* L., *Iphiclides podalirius* L., a single fine fresh individual, *Nymphalis antiopa* L., worn but still magnificent in flight, *Vanessa cardui* L. (the sole record during our holiday) and finally *Zerynthia polyxena cassandra* Hb. We were pleased to find this last species, one of the main objectives of our trip, but disappointed not to find *Callophrys avis* Chapman in what appeared to be a suitable locality, with plenty of *Arbutus unedo* L. shrubs which are the foodplant of this species. Two kilometres further south we came to a wooded area which had been destroyed by fire some years previously, possibly in the widespread fire which originated at Cap Bénat in 1965. There were noticeably fewer butterflies flying in this area, so re-colonization had not been completed despite good vegetation regeneration. We managed to find a few large larvae of *Melitaea cinxia* L., an interesting find as we were to see the adults flying in two localities less than a week later. Our total of nineteen species of butterfly (including the *M. cinxia* larvae) on our first day collecting was much better than we had imagined could be possible after the weather we had experienced 50 km to the west the previous day.

A spring speciality of Var we particularly wanted to find was *Erebia epistygne* Hb. and we decided to try a locality mentioned by Shaw (1970), the area beside the Montferrat-Comps road (N555) a few hundred yards north of the Bargemon turn. On the morning of 12th April we stopped atop a ridge about 3 km north of Les Arcs, en route for the *E. epistygne* locality. To the north were wide views of distant snow crested peaks under a pale blue sky, and despite a stiff breeze we soon found good numbers of *Philotes baton* Bergstrasser flying close to the ground amongst the dry grass stems and small olive bushes. A little further north and on lower ground, conditions were more sheltered and we obtained permission to collect on the land of a small farm. This procedure excited the many farm dogs and amused the farmer greatly—after we had departed from his house we could hear his laughter as he told a friend of his strange English visitors looking for butterflies. Here we added *Lasiommata megera* L. to our list for the trip, together with *Coenonympha pamphilus* L., and a single *Tomares ballus* Fab. was captured by I.F.G.M. after a joint search alongside the road following a brief sighting as the butterfly took off from amongst the dry grass. Despite a further intensive search on the hillside among abandoned terraces and small olive trees, we were unable to find any more individuals of this local species. We then continued through Draguignan to the *E. epistygne* locality and arrived in the 'Zone Militaire' (which covers a large area of this region) for lunch. There were notices alongside the road stating that access to the area was absolutely forbidden,

but nevertheless we walked along the roadside looking for this species, which is the only spring *Erebia*. However, we were evidently too early on this occasion (possibly due to the recent cold weather) and we did not see any butterflies flying over the stony ground in windy conditions. Therefore, we continued northwards to the Grand Canyon du Verdon, a spectacular limestone gorge where the road twists between the edge of the sheer cliffs and the broad limestone hills. There was snow at the roadside at the west end of the Canyon, and the freezing wind rattled dried leaves on the small beech trees, a wintry contrast to the spring flowers at Les Arcs. That night, and throughout our stay at Les Arcs, the clear sky allowed temperatures to fall rapidly after sunset, so the warmth of a tent heated by stove and gas lamp was very welcome.

The next day, Friday 13th April, was very hot and sunny, and we decided to investigate the valley of the River Argens further downstream at Le Muy. This proved to be a rich collecting ground in a beautiful setting, with white fruit blossom set against the vivid red earth, and with a forested background on the steep slopes beside the river. A line of nettle tress (*Celtis australis* L.) were only just starting to come into leaf, but we soon found the Nettle tree butterfly (*Libythea celtis*, Laicharting) settled with outspread wings on the branches, occasionally taking off for rapid flights around the trees. Despite having come through the period of winter hibernation many were in good condition, though the irregular outline of the wings made this difficult to check without capturing the butterfly. We also took *Anthocaris belia euphenoides* Staud., though only the golden males were found at this time. The hibernated vanessids, *Nymphalis antiopa* L. and *Nymphalis polychloros* L. were both rather worn, but still flying with power and agility, and frequently capable of avoiding capture. One large Tortoiseshell made a splendid sight sunning itself with wings flattened against the warm earth, the colours still bright and fresh, belying its age. A single *Scolitantides orion* Pallas was captured by Gillian but did not appear for I.F.G.M. or C.D.W.-S. Other species taken for the first time were *Pararge aegeria aegeria* L., *Vanessa atalanta* L., *Leptidea sinapis* L., and *Pyrgus malvae* L. The *Z. polyxena cassandra* were flying in good numbers, and as previously observed they appeared to prefer riverside situations. In the afternoon we drove south to Ste. Maxime, and then leaving the hazy blue of the Mediterranean behind us we turned inland to Collobrières, where a brief inspection showed nothing of entomological interest. We therefore moved on to the Forêt du Dom where we unsuccessfully searched the strawberry trees for the larvae of *Charaxes jasius* L. As we returned northwards in the early evening the forested hills behind us were evenly shaded in paler and paler tints of blue-grey in blurred outline against the distant reddening haze.

The following morning we returned to the locality 3 km north of

Les Arcs where we had taken the single *T. ballus* two days before. Although the weather was sunny we were unable to find more, and so we carried on northwards to the Old Grasse Road from Draguignan. Here there are excellent collecting areas amongst the abandoned terraces and ancient olive groves. Here we saw *M. stellatarum* again, and found for the first time *Clossiana dia* L., *Colias australis* Verity, *Erynnis tages* L., *Glaucopsyche alexis* Poda and adult *M. cinxia*. In addition we found *L. sinapis* again, though we did not find the closely related *L. duponcheli* Staud. here or elsewhere on this holiday. In the afternoon increasing cloud made collecting unprofitable, and so we decided to explore the country to the west of Draguignan around Salernes. We returned to Les Arcs via L'Abbaye du Thoronet, which during our visit was isolated in sunshine against a dark and stormy sky.

On Sunday 15th April we decided to explore more intensively the valley of the River Argans downstream from Les Arcs. We parked close to a bridge across the river about 5 km south-east from Les Arcs, and spent the day walking eastwards through woods and meadows beside the river before returning to the car by a more northerly route. In hot and sunny weather we saw good numbers of butterflies, the *N. antiopa* and *N. polychloros* making a splendid exhibition flying strongly over the narrow meadows and fields. We saw *Papilio machaon* L. for the first time, and also noted *I. podalirius*, *Z. polyxena cassandra*, *L. sinapis*, *L. celtis*, and *S. orion*, plus most of the species seen previously near the camp site at Les Arcs and in the meadows at Le Muy.

The next day, Monday 16th April, we drove through Fréjus and St. Raphael to a valley about 2 km north of Agay. The warmth and sunshine resulted in very enjoyable collecting over rough, stony hillsides beside a stream, the air heavy with the scent of herbs. We soon found *Glaucopsyche melanops* Boisduval and *Spialia sertorius* Hoffmannsegg, but we did not see *Zerynthia rumina* L. in what appeared to be a very suitable locality, only taking *Z. polyxena cassandra* again. A single *Euphydryas aurinia* Rottenburg of the bright form *provincialis* was taken, but we were probably a little early for this species to find more.

Our final day collecting in Var, 17th April, began well with C.D.W.-S. taking a single *P. manni* Mayer near the camp site at Les Arcs, the only one taken during our holiday despite inspection of all the "small whites" seen. We planned to reach the Mt. Ventoux area by evening, so we decided to stop at the various sites we had previously inspected to the north of Les Arcs. The weather was as good as on the previous two days, providing ideal conditions for collecting butterflies. We stopped first at the ridge 3 km north of Les Arcs, and on this occasion C.D.W.-S. was able to capture a single *T. ballus*. Moving on to the New Grasse Road from Draguignan the only female *A. belia euphenoides* of the trip was obtained, together with *C. alceae*, *G. alexis*, *G. melanops*, *L.*

celtis, *N. polychloros*, *S. orion* and most of the other species seen previously in this area. We then continued on to the Montferrat-Comps road where in the fine weather conditions we soon found a strong colony of *E. epistygne* within the area of the military camp. We were able to secure both males and females in fine condition, though despite an apparently lazy flight they were surprisingly difficult to capture. The only other species found in the area was *C. dia*, the locality being still without flowers at this time of the year. It is interesting to speculate why *E. epistygne* should have evolved away from the later flight periods of other *Erebia* species. Possibly the early flight period enables the larvae of this southern species to exploit the food plants when they are in a greener condition before they dry off in the heat of summer. Our collecting in Var having been successfully concluded, the remainder of the journey was continued uneventfully to a camp site at Vinsobres, approximately 20 km north-west of Mt. Ventoux.

Thus ended our collecting in Var, with only *Gonepteryx rhamni* L. new to our list on the 18th April when we explored the valley to the north of Mt. Ventoux. We also found *C. rubi*, the commonest and most widespread species we encountered, together with *P. baton* and *E. tages*. The area seemed to be some time away from a good flight of spring butterflies, and we spent the next day exploring the region, including a drive above the snowline on Mt. Ventoux. We resumed the long journey north on Friday 20th April, and before reaching Grenoble we passed through a brief but heavy snowstorm on the Col de la Croix Haute which cleared suddenly to reveal snow covered hills to the north-east. We continued on to camp at Annecy where there was further snow overnight. The next day we drove through Switzerland via Geneva and Jura in sunshine and showers. The warmth and butterflies of Var seemed very distant as we passed through the Jura, clad in deep snow, towards Dijon.

After taking two days to cover the remainder of the journey across northern France, we arrived back in London on Monday 23rd April. On a very enjoyable holiday we found a total of 42 species of butterfly (listed below with localities). This was less than we had hoped for after the results of de Worms (1966—50 species) and Shaw (1970—51 species) but it was apparent that the season was later than experienced by these collectors, probably being similar to that experienced by Bretherton who obtained 42 species in 1962. For example, we did not see *C. avis*, which had evidently not yet emerged, while *C. rubi* remained fresh until the end of our stay. It is interesting to note that Nabokov (1931) found many of the species we encountered in Var a month or more earlier in the Pyrénées Oriëntales (Le Boulou), probably earlier than most would emerge in Var. From our own observations, and the paper by McLeod (1972), the Mt. Ventoux area appears to be later than Var, so collecting

expeditions for spring butterflies to these areas should be planned accordingly.

I. F. G. McLean (3848)
C. D. Warren-Smith (3908)

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TABLE OF SPECIES RECORDED

(All dates refer to April 1973)

<i>Anthocaris belia euphenoides</i> , Staud.		<i>Celastrina argiolus</i> , L.	
Le Muy	13.	Les Arcs	11.
Old Grasse Road, Draguignan	14.	8 km south of Vidauban	11.
3 km north of Les Arcs	17.	Le Muy	13.
New Grasse Road, Draguignan	17.	5 km south-east of Les Arcs	15.
		2 km north of Agay	16.
<i>Anthocaris cardamines</i> , L.		<i>Clossiana dia</i> , L.	
Les Arcs	11.	Old Grasse Road, Draguignan	14.
8 km south of Vidauban	11.	8 km south of Vidauban	11.
3 km north of Les Arcs	12.	3 km north of Montferrat	17.
Le Muy	13.		
Old Grasse Road, Draguignan	14.	<i>Coenonympha pamphilus</i> , L.	
5 km south-east of Les Arcs	15.	3 km north of Les Arcs	12.
3 km north of Les Arcs	17.	Old Grasse Road, Draguignan	14.
New Grasse Road, Draguignan	17.	3 km north of Les Arcs	17.
<i>Aricia agestis</i> , Schiff.		Les Arcs	17.
Les Arcs	11.	<i>Colias australis</i> , Verity	
<i>Callophrys rubi</i> , L.		Old Grasse Road, Draguignan	14.
8 km south of Vidauban	11.	New Grasse Road, Draguignan	17.
Le Muy	13.	<i>Colias crocea</i> , Geoffroy	
Old Grasse Road, Draguignan	14.	Les Arcs	11.
5 km south-east of Les Arcs	15.	8 km south of Vidauban	11.
2 km north of Agay	16.	Old Grasse Road, Draguignan	14.
3 km north of Les Arcs	17.	5 km south-east of Les Arcs	15.
New Grasse Road, Draguignan	17.		
North of Mt. Ventoux	18.	<i>Erebia epistygne</i> , Hb.	
<i>Carcharodus alcaeae</i> , Esper.		3 km north of Montferrat	17.
Les Arcs	11.		
New Grasse Road, Draguignan	17.		

<i>Erynnis tages</i> , L.		<i>Libythea celtis</i> , Laicharting	
Old Grasse Road, Draguignan	14.	Le Muy	13.
Near Salernes	14.	5 km south-east of Les Arcs	15.
5 km south-east of Les Arcs	15.	New Grasse Road, Draguignan	17.
<i>Euchloe ausonia</i> , Hb.		<i>Lycaena phlaeas</i> , L.	
Les Arcs	11.	Les Arcs	11.
8 kms south of Vidauban	11.	8 km south of Vidauban	11.
3 km north of Les Arcs	12.	2 km north of Agay	16.
Le Muy	13.	<i>Melitaea cinxia</i> , L.	
Old Grasse Road, Draguignan	14.	10 km south of Vidauban (larvae)	11.
2 km north of Agay	16.	2 km north of Agay	16.
<i>Euphydryas aurinia</i> , Rott.		New Grasse Road, Draguignan	17.
2 km north of Agay	16.	<i>Nymphalis antiopa</i> , L.	
<i>Glaucopsyche alexis</i> , Poda		8 km south of Vidauban	11.
Old Grasse Road, Draguignan	14.	Le Muy	13.
New Grasse Road, Draguignan	17.	Old Grasse Road, Draguignan	14.
<i>Glaucopsyche melanops</i> , Boisduval		5 km south-east of Les Arcs	15.
2 km north of Agay	16.	2 km north of Agay	16.
New Grasse Road, Draguignan	17.	<i>Nymphalis polychoros</i> , L.	
<i>Gonepteryx cleopatra</i> , L.		Le Muy	13.
1 km south of Vidauban	11.	Old Grasse Road, Draguignan	14.
Le Muy	13.	5 km south-east of Les Arcs	15.
Old Grasse Road, Draguignan	14.	2 km north of Agay	16.
5 km south-east of Les Arcs	15.	New Grasse Road, Draguignan	17.
2 km north of Agay	16.	<i>Papilio machaon</i> , L.	
<i>Gonepteryx rhamni</i> , L.		5 km south-east of Les Arcs	15.
North of Mt. Ventoux	18.	Montferrat	17.
<i>Inachis io</i> , L.		<i>Pararge aegeria aegeria</i> , L.	
8 km south of Vidauban	11.	Le Muy	13.
3 km north of Les Arcs	12.	5 km south-east of Les Arcs	15.
5 km south-east of Les Arcs	15.	<i>Philotes baton</i> , Bergstrasser	
<i>Iphiclides podalirius</i> , L.		3 km north of Les Arcs	12.
8 km south of Vidaban	11.	Old Grasse Road, Draguignan	14.
Le Muy	13.	New Grasse Road, Draguignan	17.
5 km south-east of Les Arcs	15.	North of Mt. Ventoux	18.
<i>Lasiommata megera</i> , L.		<i>Pieris brassicate</i> , L.	
3 km north of Les Arcs	12.	Les Arcs	11.
Le Muy	13.	Le Muy	13.
5 km south-east of Les Arcs	15.	Old Grasse Road, Draguignan	14.
Les Arcs	17.	<i>Pieris mannii</i> , Mayer	
<i>Leptidea sinapis</i> , L.		Les Arcs	17.
Le Muy	13.	<i>Pieris napi</i> , L.	
Old Grasse Road, Draguignan	14.	Les Arcs	11.
5 km south-east of Les Arcs	15.	8 km south of Vidauban	11.
New Grasse Road, Draguignan	17.	3 km north of Les Arcs	12.
		Le Muy	13.
		5 km south-east of Les Arcs	15.
		2 km north of Agay	16.
		New Grasse Road, Draguignan	17.

<i>Pieris rapae</i> , L.		<i>Spialia sertorius</i> , Hoffmannsegg	
Les Arcs	11.	2 km north of Agay	16.
5 km south-east of Les Arcs	15.		
2 km north of Agay	16.	<i>Tomares ballus</i> , Fab.	
Les Arcs	17.	3 km north of Les Arcs	12.
<i>Polygonia c-album</i> , L.			
Les Arcs	11.	<i>Vanessa atalanta</i> , L.	
5 km south-east of Les Arcs	15.	Le Muy	13.
New Grasse Road, Draguignan	17.		
<i>Pyrgus malvae</i> , L.		<i>Vanessa cardui</i> , L.	
Le Muy	13.	Le Muy	13.
Old Grasse Road, Draguignan	14.		
5 km south-east of Les Arcs	15.	<i>Zerynthia polyxena cassandra</i> , Hb.	
New Grasse Road, Draguignan	17.	8 km south of Vidauban	11.
		Le Muy	13.
<i>Scolitantides orion</i> , Pallas		5 km south-east of Les Arcs	15.
Le Muy	13.	2 km north of Agay	16.
5 km south-east of Les Arcs	15.	Les Arcs	17.
New Grasse Road, Draguignan	17.		

2. MAY 1976

My previous visits to Provence in the company of W. L. Coleridge and my father, the late H. J. Cribb, over ten years ago, had always been in late June and July, giving no opportunity to see those insects which are on the wing in early spring and produce only one generation. However this year I was able to remedy this in the company of Messrs. L. Christie, D. Marshall, Paul Whicher and R. Uffen. We used my Commer Wanderer camping van and a four-man ridge tent for transit and accommodation and left at 4 p.m. on the 29th April via Ramsgate Hoverport for Calais. This journey takes only 35 minutes and, despite the French clocks being an hour ahead of ours, we spent the first night sleeping on the edge of a copse west of St. Quentin. We did not linger on the way south, camping in the town site at Bourg-en-Bresse and then driving through Grenoble on the new motorway to stop on the Col de la Croix Haute where the flowery meadows of my memory were just emerging from the snow, some of which still lay in piles on the slopes. Just north of Sisteron we stopped for our first reconnoitre. At the roadside the slopes were dry and stony with grassy patches and clumps of Broom (*Cytisus* sp.) and there I found a newly emerged male *Anthocharis belia euphenoides* Stdr., the Dawn of Provence as the French call it. Several large day-flying geometrid moths were on the wing which I first took to be a form of Wood Tiger as their flight, size and colour were similar. These later laid long strings of eggs in the pill-box. The moth is *Fidonia pennigeraria* Hübn. I then disturbed a brown butterfly from the grass which when netted turned out to be *Erebia epistygne* Hubn., the earliest of the *Erebia* family. The Broom was alive with Green-Hairstreaks, *Callophrys rubi* L., which was to be the commonest butterfly seen on the trip as it occurred wherever we stopped from south to north France.

The sun was very hot and we drove on to Digne along the edge of the River Bleone. Since I was last here the town has grown to almost double the size, spreading westwards along the Bleone but happily not up into the valleys of the mountains behind the town. Unfortunately there are now restrictions on the collecting of lepidoptera in the domain of Digne which covers the mountains and valleys around the town and we decided to drive out on the road towards Entrages to just beyond the prohibited zone and camped in a small valley beside a stream where a spring issued from a hole in the rocks. There is a pass rising from here called La Clappe which leads eventually to Barreme on the way to Grasse. We drove up the pass but found that little was yet out due to the altitude and confirmed that our collecting should be restricted to the lower ground. Our camping routine had now established itself and while Dave Marshall and I slept in the van, Laurie Christie, Paul Whicher and Raymond Uffen shared the tent. We had brought all our food with us apart from bread and wine and had a light breakfast each day, bread and cheese for dinner and in the evening I cooked a meat meal with 'mash' or rice. In woodland camps we used open fires but on camp sites one needs Calor gas or similar means of heating. The weather was being very kind with very hot days but slight night frosts which made our extra blankets most welcome. The next morning was spent exploring the valley round the camp. Dave and I managed to catch two large green lizards, *Lacerta viridis*, a male and a female. Having found where the lizard basked and where its bolt hole was, the method was to return quietly when the lizard was again out sunning itself, place the butterfly net in the mouth of the bolt hole and then disturb the lizard which ended up in the net. We netted a male *Agria tau* L., flying along the roadway—it is a beautiful Saturnid moth and the males fly fast in the sunlight in search of females. We also found a female Emperor, *Saturna pavonia* L., which we kept with us for several days and despite her calling every evening she did not assemble one male and died unmated a week later. Several Large tortoiseshells, *Nymphalis polychloros* L., were visiting the Prunus bushes which were in full flower but all netted were bedraggled males. The Blues were present in large numbers, the commonest being *Glaucopsyche melanops* Bdu., a species I had not taken previously. It was flying with *G. alexis* Poda. (= *cyllarus* Rott.), the latter being distinguished from it by the blue dusting at the base of the underside wings. Present also were *Cupido minimus* Fuessl., our Small blue, and the Common blue, *Polyommatus icarus* Rott. All were in perfect condition. As the sun reached into the valley we found both *Leptidea sinapis* L., the Wood White, and its very local cousin *L. duponcheli* Stdgr. I found the latter mated on a flower head but was unable to keep the female alive long enough to obtain ova. Both these species seem fragile in captivity and succumb fairly soon in the confines of a pill-box. Along the roadside and around the camp we found



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webs of the Black-veined white, *Aporia crataegi* L. on the Hawthorn and Sloe bushes. Many had small larvae still present while others were empty and we found larvae in various stages on the stems feeding and one pupa already formed. Later many of the larvae produced both dipterous and hymenopterous parasites.

With the restrictions for collecting operating in the area, despite it only applying to the lepidoptera, we decided that we should move elsewhere and on the Monday morning after breaking camp we drove down to Digne for bread and the post office and then took the road north towards La Jarvie. We stopped about 10 km out of Digne to collect on some dry slopes adjoining the road. Here we saw *Iphiclides podalirius* L., the Scarce swallowtail, and several *Genepteryx cleopatra* L., the beautiful Southern brimstone. I took another specimen of *E. epistygne* and one *E. triarius* de Prun. just emerged. In this area the lavender fields had again been replaced by cereal crops and one would expect that the attraction of past years having gone, there would be a greater dispersal of butterflies. Certainly the numbers seen were not great. Here I also found *Euchloe ausonia* Hubn., just emerged, which I first mistook for a female Orange tip, *Anthocaris cardamines* L. which were now flying everywhere we stopped. We drove on beyond the village up into the high land beyond but only to find that the season was late and little was on the wing. I netted several specimens of the Pale clouded yellow, *Colias australis* Vty., quartering the ground above its food plant, *Hippocrepis comosa* L., and we took a female which subsequently laid a large number of eggs on sprigs of the vetch placed in a pill-box. I also took a few male Adonis blue, *Lysandra bellargus* Rott., which had just emerged. An assessment of the possibilities made us decide to retrace our steps and we drove back via Digne and took the road south towards Castellane. That evening we camped on a downside north of Castellane near to a stream and spent the evening trying to dig out Field Crickets, which filled the air with a noisy chorus. Each night at every camp we made on the trip we were sung to sleep, or kept awake, by a chorus of Nightingales and woken each morning by the Cuckoo. Each evening the small burrowing owl, Scops Owl, called monotonously from dusk until we fell asleep—it has a mournful short-hoot repeated every few seconds.

Next morning we stopped in the town square of Castellane, dominated by a towering rock on which is perched a large church. Here we restocked with water and bread and then took the road leading into the Gorges de Verdon, one of the spectacular rifts in the Provencal Alps. We stopped for lunch short of the entrance to the Gorge and collected alongside slopes. Raymond got his nose buried in some *Artemisia* sp. which harboured species of case bearing moths while the rest clambered about on the slopes which fell down to a wide river leading from the great artificial lake above Castellane. *Erebia triarius* was quite common

and on a damp patch there were the Provencal form of *Euphydryas aurinia* Rott., the Marsh fritillary, *Melitaea phoebe* Schiff., and a lot of *C. australis*. Of interest to Laurie were the large numbers of *Ascalaphus* species buzzing about over the slopes. These neuropterons hunt flies on the wing and we found them commonly all over the areas we visited, the females commencing to emerge during our second week. The larvae look rather like larval ant-lions but roam freely in search of prey. Entering the Gorge we stopped at the path leading up to a Tibetan monastery to photograph the Gorge and some of the orchids growing in the woodland. By the roadside Dave took our first specimen of *Zerinthia rumina* L., a species which I had not seen in the wild before. We also netted a female Camberwell beauty, *Nymphalis antiopa* L. This area appeared to be rich in plant and insect life but we had decided to press on to an area south of the Gorge which looked from the map to be very wild terrain. However as we came into the area we found that it was a vast military zone with plenty of 'Defense d'entrer' notices along the road and with much military activity going on. We were forced to drive on until we came to the edge of the enclosed area just north west of the village of Bargemon where we found a small valley with a natural camp site beneath some oaks. The valley on both slopes was wooded with scrub through which were the old paths used for timber extraction. I found a spring lower down which came up out of a tumble of limestone rocks. This was to be our headquarters for the next three days. Where we built our camp fire there was a large horse mushroom which we had next morning for breakfast with bacon—Paul refused to partake and expected to find us all dead before the day was out. On the slopes we again found *Z. rumina*, all males, and after some diligent searching found the food plant, *Aristolochia rotunda*, an insignificant plant with the 'pipes' almost black. Laurie had discovered that the small quarry near the road was alive with Scorpions which lived in the crevices of the quarry face. He and Paul spent a morning collecting them, perfecting a technique which included picking up the scorpion from behind by gripping the 'sting' between finger and thumb. Specimens for setting were killed with boiling water and then dried and stored in the 'fridge'. It was rather like dealing with lobsters. In the scrub I disturbed a male and female Black Cock and several snakes. We netted several Large tortoiseshells and another Camberwell beauty female. I placed the two antiopa we had now taken into a pill-box and put them into the 'fridge' where they went into a state of torpor. Later when we had returned home I sleeved these onto a willow, (*S. caprea*) in my garden and they laid their characteristic rings of eggs around the twigs. We also captured several female *C. dia* L. which laid eggs on the walls of the pill-box and not on the violet leaves provided for them.

We needed to go down to Bargemon for bread and wine and Dave and I took the van down in the morning, stopping on our way back by

the roadside just outside of the village. Along the roadside there were large groups of a yellow cruciferous plant *Biscutella laevigata* which were continually being visited by *A. belia euphenoides*, very brilliant males and the more subdued females. We netted several and then discovered their little orange eggs laid on the flower buds, small larvae and on one plant almost full fed ones. They are not unlike the larvae of the Bath white, *Pontia daplidice* L., for which I first mistook them as there were several females of that species flying along the roadside. Unfortunately the larvae, like those of our Orange Tip, are cannibals and although here, and later, we collected a lot of the eggs and larvae, I ended up with only nine full-fed larvae. The larvae in captivity ate the garden crucifer, *Lunaria*, Honesty, feeding on the young seed pods. The pupae simulate the pod a wild pea, *Lathyrus* sp., and are variable in colour. The stony banks were smothered in clumps of Soapwort, *Saponaria occymoides*, and this was attracting both Humming bird hawkmoths, *Macroglossum stellatarum*, L. Broad-bordered bee hawks, *Hemaris fuciformis* L. Back at the camp, there had been a lady visitor, a wife of one of the officers at the camp, and a helicopter had been making a 'reccy'. During the afternoon we took a few males of *rumina* on the valley slopes and also took two male *Z. polyxena*, Schiff. establishing that both species fly together over part of their range.

On the following day we broke camp and drove down via Bargemon to Seillans where on a previous trip I had found the lavender fields to be very rich in insect life. Today the village is hardly recognisable. It has spread out all over the slopes, eating up the lavender fields and old olive groves. We drove through the village and out towards Mons along a narrow winding road only to find that this had also been encroached upon, housing on one side and on the other the continuing military presence. Eventually we came upon open meadow land near the road junction to Fayence where we had lunch and did some exploring. A few butterflies were moving across against the breeze, mostly Pierids, and I netted a fresh female Small copper, *Lycaena phlaeas* L. Laurie discovered some interesting black earwigs under the rocks while searching for scorpions but after lunch we moved down into Fayence. Above Fayence we stopped where in a previous stay in this town I had found a wealth of insect life in some deserted small holdings. Several of these now had new houses erected in them and others had been cultivated but some of the slopes above the town were still quite wild, although new tracks into the area indicated that they might not be so for long. In the hot afternoon sunshine Scarce swallowtails were soaring along the slopes and I netted several together with a female *P. machaon* L. She later obligingly laid me 76 eggs on a spray of Fennel inside a large plastic box. I disturbed another male *Z. rumina* but was unable to find its foodplant although I searched the slopes. In one of the meadows, beside an irrigation canal, several fritillaries were flying.



These proved to be the Marsh fritillary, again of the light coloured Provençal form. Devil's-bit scabious, *Succisa pratensis*, was growing in abundance there, confirming that this was their food-plant. It is a form very close to the Spanish *beckeri* H-S. race but in Spain I found the food-plant to be Honeysuckle. I took a female but it failed to lay eggs. However I was able to keep it alive until my return to England where it successfully paired with one of my Cumberland males. The results will be of some interest as she immediately laid a batch of eggs. Most of the species met with on our travels were flying here. The slopes were dotted with *Spartium junceum* coming into flower and splashes of crimson of the Judas tree, *Cercis siliquastrum*, just going over. Despite the changes this was still an interesting and delightful spot. I disturbed two Golden Orioles from an oak tree and we found signs of a badger at work.

In Fayence a market was in full swing and we had a wander round while Paul telephoned home to give an account of our progress. The town has also spread down towards the airfield so that it has lost its imposing domination of the plain. Rough walls along the streets which used to house groups of geckos had been pointed and tidied up but Oleanders and exotic Agaves still overhung the roadway. After doing some basic shopping we drove south out of the town taking the road towards Frejus and as we approached the village of St. Paul-en-Fôret we noticed a 'camping site' sign, one of our lucky breaks. The site hugs the edge of old terraced slopes which have been invaded by secondary mixed woodland with a very open canopy of *Pinus pinaster*. We met the owner and pitched camp beneath the pines, appearing to be the sole campers present. The shop, swimming pool, etc. were closed as the season had not yet started but we were able to get a 'gaz' refill as open fires were not permitted. We were to spend the next five days here and could not have chosen a more exciting spot. Swallowtails and *G. cleopatra* were regularly passing through the camp and *euphenoides* was laying eggs along the side of the camp path. We found *Aristolochia rotunda* growing all round the edge of the camp and subsequently took further male specimens of *Z. rumina*. The orchids growing here were also very exciting and Dave and I found a group of huge Lizard orchids beside one of the deserted farmsteads at the top of the slope above the camp. As yet we had not been able to establish what the foodplant being used by *G. cleopatra* could be as none of the shrubs looked like *Rhamnus* spp. However Raymond had observed females visiting a dwarf shrub with small serrated leaves and this turned out to be *Rhamnus alaternus*. We picked a few shoots and placed them in with some females in a small breeding cage I had brought with me and they immediately started to lay their eggs on the underside of the leaf tips. We obtained about 36 eggs when a sudden gust of wind blew the cage over and the butterflies all escaped. Laurie had taken some good Buprestid beetles in

vivid scarlet and green colours, on flowers around the tent and I took a specimen of *Trichodes alvearius*, a beetle which is known to live inside bee colonies, both wild and domesticated. This is an area rich in apiaries and we saw many large ones on the hillsides where thyme and wild lavender carpet the slopes. After a day here exploring the vicinity of the camp we had added several new species to our tally.

The most interesting was the Nettle-tree butterfly, *Lybithea celtis* Fuess.; near the Camp we had observed a moth-like insect fluttering around a tree which was not yet in leaf. The tree had a smooth bark and the pointed buds which were starting to unfold looked rather like Elm leaves. The insect was crawling about on the tips of the twigs and we were able to identify it as *L. celtis* and therefore assumed that the tree was *Celtis australis*. I shinned up the tree which was about twenty feet high and was able to find several eggs which were laid on the leaf shoots or just below them. They were small and brownish and quite hard to find. These we gathered unfortunately hatched during our journeyings and although offered nettle and elm leaves they failed to eat and died. Later I learned that a friend back in England had a nettle-tree in his garden waiting for them. A Blue which was just beginning to appear was *Philotes baton* Bgstr., about the size of our Small blue and marked with black in the white fringes and heavily spotted on the underside. On the following day we made a sortee down towards Frejus. Just beyond St. Paul we found a rocky sandy area where a lot of ant-lion (*Myrmeleonidae*) larvae had their funnel-like pits. We dug a few out—they are sand-coloured and very difficult to see in the sand—and I have one in my green-house at the moment still catching ants that happen to drop in on him. The larva flicks sand up with the head to knock the ant down as he tries to clamber out. This area was rich in Orchids, the most spectacular being *Serapias vomeracea*, which grew at the roadside. This area is the start of the maquis scrub land and the garigue, low growing scented scrub, which stretches on down to the Mediterranean. Tree heaths and Strawberry trees, (*Arbutus unedo*), form thickets which are quite hard to penetrate. We hoped to see *Callophrys avis* Chapman, which feeds on *Arbutus* and *Charaxes jasius* L. which does likewise but we were not lucky. I think we were too early for the latter in view of the lateness of the season. We crossed a high pass leading towards Frejus and stopped at the top where the slopes were thick with white lilies and several species of Orabanche, one a bright primrose yellow. *Z. rumina* was taken by Raymond and there were hundreds of Ascalaphids quartering the slopes. This area is worthy of further exploration but after our lunch of bread and cheese we drove down through another military area to Frejus. It was very hot and we did not linger but took the road out leading over a high mountain pass towards the Esterel massif. Unfortunately a high wind was now sweeping across the

garigue and our stops to examine the heath-covered slopes yielded little but Green hairstreaks and wandering *G. cleopatra*. In the afternoon we took the road which cut inland across the Nice-Cannes motor way to stop by the new Lake of St. Cassien which replaces the old Frejus barrage. This lake is used for boating, finshing, etc. and the road runs along its edge and then crosses over it near the northern end. We stopped to search the slopes above the lake and found several larvae of *A. crataegi* on the Hawthorns which were just coming into flower. These also were attracting Rose chafers, *Cetonia* sp., and several species of Diptera. On one, quite near the van, I noticed a web of larvae feeding and assumed them to be one of the Lasiocampid moths which we were finding quite commonly on the Hawthorns but closer inspection discovered them to be the larvae of the Large tortoiseshell, *N. polychloros*. I was not aware that Hawthorn, (*Crataegus monogyna*), was one of its foodplants. The finding of this web incited us to start looking for others and when we got back to our camp that evening Laurie found two larvae on some pear suckers beside the entrance to the camp. I guessed that these must be larvae which had fallen from a nearby tree and we walked up to the entrance after our evening meal and there on the wild Pear (*Pyrus* sp.) were five separate webs of the larvae ranging from newly hatched to almost full grown. I climbed up to shake the largest down like ripe pears and we came back to the camp laden. Next morning I was explaining to the camp proprietor what we had been up to and he showed me a cherry tree in his garden which had been defoliated by larvae. I asked him where they were and he said 'je les ecrase toujours'. I asked if I could examine his fruit orchard and with Dave's help I managed to take several more webs of larvae on his Cherry trees. The problem of feeding such a horde of larvae was eased by their obvious acceptance of a wide range of trees and during the rest of the trip they ate Hawthorn, Cherry, Pear, Sallow and Elm but those I kept produced rather small pupae and imagines. The first pupated on the 18th May and emerged on the 3rd June. Several died in trying to pupate and two produced hymenopterous parasites (single cocoons) in the second larval instar. No other parasites occurred amongst my larvae and at the time of writing I am trying to keep the imagines alive to pair next spring by feeding them up and then keeping in a refrigerator over the winter.

That night a steady rain started to fall and this continued throughout the night and all next day so that we spent our time sorting out material and yarning in the caravan. In the evening we dressed up in our waterproofs and ventured out to do some stone turning in search of beetles, scorpions and anything else of interest. Laurie discovered an earwig-like insect which lives in leaf litter under stones, a member of the Order Embioptera. The insect makes a silken tube inside which it hides. The following day the rain cleared and we had another hot day

to do a little more collecting in the terrain around the camp. We found that the rain had completely obliterated the ant-lion pits but in captivity I later observed that when rain threatened (even with the cage inside my greenhouse) the larva obliterated its own pit by agitating the sand. David took a newly male *Limenitis reducta* Stdgr., sunning itself outside the tent.

We were allowing ourselves a fairly leisurely return north to arrive there on the Saturday 15th May and that afternoon we drove back via Fayence and Mons through beautiful mountain roads edged with Cowslips and Blackthorn in flower to the Col de Valferriere where we met the Grasse-Digne road. By evening we had reached our previous camp site outside Digne and spent the night there. Next morning we spent a couple of hours along the valley and roadside where I was able to take one or two more *L. duponcheli*. Laurie was searching some of the willows above the stream in the hopes of finding larval webs of *N. antiopa* and did find two small webs of larvae near their old egg batches but these later turned out to be *N. polychloros*, adding a further foodplant to the list. *N. antiopa* was quite common here now and we watched one crawling about the leaves of a large Poplar but I think she was in search of 'honey dew' rather than laying her eggs.

We had decided to go back via Gap instead of over the Col de la Croix Haute and found the road fairly easy and much less interesting than our southward journey. We stopped short of Gap to examine some downland near the road and here I found a lot of Adonis blues flying, including some females, and two *L. duponcheli* males flying with *L. sinapis*. The bushes had been defoliated by a small moth larva, in particular the Sloes. Unfortunately Raymond lost a camera fitting but after some searching he found it and we moved on through Gap to pitch camp in another deserted camp site above the town. The facilities were a little spartan but clean. The site is looking west towards the massif of Les Ecrins, permanently snow-capped, where lies the Meije and the village of La Grave, another happy hunting ground. The next morning we drove a short distance up the side road leading from the camp and spent an hour in some flowery meadows there beside an irrigation stream. A lot of insects were on the wing and I added the Mazarine blue, *Cyanirus semiargus* Rott., and our first *Mellicta*, *M. parthenoides* Kef., to my tally. The slopes were thick with Horseshoe vetch and the usual Adonis blues and *C. australis*. *Clossiana dia* was flitting along the edge of a wood in which Paul had found large clumps of Lady Orchids. This was quite a delightful spot but we had to press on and drove up the Col de Bayard towards Camps. On the border of the Department of Isère we stopped by the side of a vast, rocky slope where we spotted some dark brown butterflies on the wing. The slopes were alive with butterflies and we took *Erebia triarius* and *Lasiommata petropolitana* Fab., the Northern wall. Wood whites were

everywhere and we spent an hour or so scrambling on the rocky mountain-side. There was a lot of *Sedum* growing amongst the rocks and Dave found an almost full-fed larva of the Apollo, *Parnassius apollo* L., sunning itself on the rock beside its foodplant. While I was setting up to take a photograph of it Dave said "There is a snake about a foot to the left of you" and there was a small viper, with its colour exactly matching the brownish soil, lying just below the larva. We tried to catch it but it disappeared into a crack below a rock. In captivity the larva fed on shoots of the *Sedum* eating the lower leaves first so that the eatings were not apparent on casual observation. For me the point of interest was the colour of the larva. The ground colour is black with bright yellow spots along the spiracle line which coincides with the colour of the other Alpine races with which I am familiar. In comparison the larvae from Jugoslavia and Spain all have reddish-orange spots of a slightly different pattern and I feel that there may possibly be two species of Apollo.

By a river where there were clumps of Willows we stopped for a brief while and took some Duke of Burgundy fritillaries by the roadside. Laurie discovered that the trees and bushes were covered with newly emerged Cockchafers, *Melolontha melolontha* L. We collected a lot of these up as he wanted specimens and could have taken hundreds had we wanted to.

That night we camped again at the municipal camp at Bourg-en-Bresse and on the 13th May we drove north via Seurre to Dijon. We stopped just north of the town above the airport where there were some downland meadows and a coppiced wood, part of the Plateau of Langres. The woodland was thick with Cow-wheat, Solomon's Seal and Lilies of the Valley. I took the Duke of Burgundy and *Erebia medusa* Schiff, while on the downland there were *E. aurinia*, *E. tages*, *C. euphrosyne* and dozens of *C. australis*. Paul found Monkey orchids and crosses between it and the Lady orchid and some small Fly orchids and by the road there were several webs of *Aglais urticae* L. on a nettle bed. Later on this area would probably be alive with both downland and woodland species. In the afternoon we drove on via Chatillon, Troyes, Sezanne and Chateau Thierry to camp in a wood just south of Villars Cotterets. This was a delightful spot, a clearing in a wood which I found up a long bumpy drive. Again orchids were common and we added the photographs of some very large Bird's Nest orchids to our score. The soil was chalky and the wood dropped down to a swampy area thick with Sallows; Dave and I had a search for Purple Emperor larvae, *Apatura iris* L., which occurs all over this area but with no luck. In the early hours of the next morning I disturbed a group of locals who were gathering snails in the swampy area. Several times on the trip we observed people at this activity. We were now nearing the day of departure and after breakfast we drove to Pierrefonds where we stopped for victuals and to admire

the castle and then on through the forests of Compiègne and Retz towards Amiens. We stopped for our lunch near Montdidier and explored a swampy area in which was a large decoy pond which had been cut out of the peat. It was full of bream and I saw a small pike. Several Grass-snakes were sunning along the banks and I had a very good view of a Coypu which surfaced a few feet away from me. However the whole area was devoid of butterflies other than the Wall, *L. megera* L., and contrasted sadly with the richness that we had left behind us in the south. As we drove on towards Calais, via Boulogne, we passed through the vast wheat fields again where spraying of selective weedkillers was in full swing, filling the air with the familiar sickly smell. That night we spent in the municipal camp site at Calais. We arrived about 7 p.m. to find all services shut, even the wash-house. The site has a lot of permanent French-owned caravans on it and the space for genuine travellers is limited. It was still deserted of staff when we left next morning to drive to the Hoverport on the far side of the town. In a town which depends a lot on cross-channel voyagers the camp site is certainly not to be recommended and is no credit to the Burgfers. At the Hoverport we had a little time to spare and wandered over the surrounding sand dunes where signs of rabbits were everywhere. On the scrubby bushes of Sea buckthorn, *Hippophae rhamnoides*, we found dozens of webs of the Browntail moth, *Euproctis chrysorrhoea* L. Our trip back across the channel was as smooth as a bus ride and the journey back through Kent and Surrey was uneventful.

It must be considered to have been a very interesting and rewarding trip. The cost per head worked out to be about £53 which covered everything except wear and tear on the vehicle. From leaving Bourg until nearing Boulogne we had been worried by a rhythmic drumming of the front near wheel and changed the wheel as the tyre appeared to have developed a bulge. Subsequently I found that a large hole had formed on the inside of the tubeless tyre, probably occasioned by hitting a kerb or rock when in the south. As it could have burst at any time on our return journey we could have had a sticky end on some of those hairpin bends on the way back. Otherwise the vehicle behaved splendidly and averaged about 24 miles to a gallon of petrol. Arrangements for travel and insurance, etc. were made through the Camping Club of Great Britain of which I am a member, using their Carefree Holiday service.

P. W. Cribb (2270)

GUARDIANS OF THE ALDER KITTEN

On the 15th of June, 1976 with the sky cloudy and the mercury destined not to fall below 17 degrees Centigrade, I set out on a quest for *Harpyia bicuspis* using light. My wife unusually not being able to accompany me, and bugging friends on holiday, I was on my own.

On arrival at the chosen locality, with the Honda generator strapped to a wheeled shopping carrier and all other paraphernalia in both hands or crushing me in a rucksack, off I staggered into the dusk. A quarter of a mile and almost there. The only audible sound being my own muttering regarding previously questioned sanity and the swishing of long grass against shoes. It was a beautiful evening. Suddenly a great crashing of branches in the wood made fear add to the perspiration already streaming down my face. It could only be my arch enemies—the heifers.

Now I don't dislike young cows but they always seem to sense my unease and take full advantage—after which I usually end up climbing a tree. But not this time, oh no. Not even the entire herd, all now loosening up in the wood, would deter me from the hunt for Alder Kitten. Definitely not. Abandoning previous thoughts of a relatively open site for the light, and rounding a woody corner, I was confronted by a huge snorting and dribbling Minotaur. The load was shed in an instant, the Honda dropped, and I fled.

Allowing ten minutes for It to despair of finding me, a short search yielded the equipment and I set up with my back to a large climbable Birch tree—being situated in a box canyon composed of both this species of tree and Alder. The 250 watt bulb struck and heaving a sigh of relief I started drinking hot coffee from a surprisingly unbroken thermos flask. After a half hour it began to look good. A twelve foot column of insects were dancing and whirling around the mercury vapour bulb. Just checking moths on the sheet became almost impossible due to the numbers encountered—with many kinds of different insects paying a call. A wasp appeared, sheared both sets of wings from a Crane fly and made off with the still struggling body—ignoring the ultra-violet light. Midges whined in the ear, a couple of moths rummaged down my shirt, a beetle up a trouser leg—if *bicuspis* doesn't turn up tonight

Another crash from the woods brought me back, and then they arrived— 20 heifers in a steady stream surrounding the light. At this instant, amidst pictured scenes reminiscent of Custer's last stand, I saw a male Alder Kitten sitting tightly and composed on the outskirts of the sheet. Quickly boxing the little beauty I returned to the defence of the apparatus—waving a walking stick and shouting (as all good farmers do) "Gayup". In reaction to this appalling display of bad manners two bolted, one relieved herself, and the rest closed in. Redoubling my windmill like efforts saw little change and after noting the position of yet another Alder Kitten, I risked a full blooded charge

at my now raised hind quarters and boxed it.

Nevertheless, they were getting bored with their madman baiting and after looking back with a baleful eye, slowly wandered away. Four more *bicuspis* came to the light before midnight when a retreat was beaten in absolute darkness. But these guardians of the Alder Kitten had the last laugh. It was only on reaching the safety of the car that I discovered that my foot had found one of their trademarks—intermittently left like silent landmines on the dry pasture, ready for the fool with the light.

Colin Pratt

NOTES ON THE REARING OF OAK AND NORTHERN EGGAR

On the night of 25/26th July, 1975 while on holiday, I took a somewhat worn Oak Eggar (*Lasiocampa quercus* L.) at the MV light trap of Rear Admiral Torlesse in the New Forest. I brought the moth home with me to Oxford and on July 28th and 29th she laid a total of twenty-one light brown eggs loose in a cardboard shoe box. She died on August 1st having laid no more eggs. One egg was lost, the other twenty were kept in my unheated room and hatched on August 12th. It was very warm both inside and out at this time last year. The young larvae ate a small piece of the egg shell to enable them to emerge, then wandered away from the egg in search of vegetable matter. I kept them in plastic boxes and fed them on fresh hawthorn leaves which they took to and ate with no problems.

The first ecdysis occurred on August 23-24th. On August 26th the larvae were photographed by AES member Tony Leech, by which time the larvae were 1.7 cm \pm 0.1 cm. One larvae moulted for the second time on September 6th, the rest between September 10th-12th. They were placed outside in kilner jars in an old rabbit hutch on September 14th and were then ranging in length from 2.5 - 2.8 cm.

On September 27th, 1975 at the AES exhibition I purchased ten Northern Eggar (*Lasiocampa quercus callunae* Palmer) from a dealer. These larvae were at approximately the same stage as mine although a couple were slightly larger. I discovered that they had been received as ova at the end of July from an entomologist in the North of England and that soon after they had hatched they had been sleeved outside and were now feeding on privet although some had been kept on other foodplants. These larvae were placed in a kilner jar and joined mine outside in the rabbit hutch.

From October 1st I changed them from hawthorn onto privet, for the first couple of days giving them both foodplants, then solely privet. They appeared to have no problems adjusting and from the first day the privet leaves were eaten. I changed the type of foodplant for three reasons. (1) by this time of year the hawthorn leaves on the bushes were becoming

old and tough and looked very unappetising for young larva. (2) I knew that the larvae would be liable to continue feeding after the hawthorn leaves had fallen, to awake during the winter and possibly require food and to cease hibernation in about March, long before any wild hawthorn leaves would be available; whereas privet leaves would be on the bushes more or less all through the winter in some form. (3) I wished to compare the progress of the two types of larvae under as similar conditions as possible so I kept them all together in the rabbit hutch, the ten Northerners in one kilner jar and the twenty other Eggars divided equally into two jars, and have them all feeding on the same foodplant.

I shall now deal with the progress of the Oak eggars first, and then the Northern eggars for comparison.

The first of the young Oak eggar larvae completed the third ecdysis on October 11th and by October 18th all twenty had done so. At the end of October the larvae were transferred to cylinder cages containing cut privet sprigs standing in jars of gravel and water with the water level just up to the surface of the gravel,—so that the sprigs have ample water without running the risk of the larvae crawling down the stems and drowning. Down one side of the cage I stood a sheet of corrugated cardboard almost the height of the cage and bent round so that it covered just under half the inside wall of the cages. During November the larvae began to eat less and less and become more sluggish. I kept the foodplant to a minimum. The larvae tended to rest stretched out along the main stems of the foodplant and after a couple of days when no food plant had been touched and some of the larvae had moved onto the card, I clipped the leaves of the twigs to get rid of any material which might develop mould. I left the bare twigs standing in the jar in the cage with the larvae roosting on them. To my surprise, over the next couple of days the larvae all crawled down off the twigs and behind the corrugated cardboard into the dark, aligning themselves along the grooves. This behaviour makes good sense since it would be unwise to attempt to spend the winter in such an exposed position on leafless twigs both because of predators and the greater exposure to harsh weather. Whatever the cause of this behaviour it was very suitable from my point of view for I could now leave the single piece of card out with all the larvae roosting on it and clean the cage with minimum disturbance. Thus hibernation was commenced in clean cages around November 20th.

I kept a sprig of privet provided and renewed at intervals just in case a hungry larva woke up, but the best policy is to insure that the larvae are kept sufficiently cool so that they hibernate steadily till the first signs of spring.

My larvae began their first nibbles on February 18th, 1976 and were eating privet well on warm days at the end of February and in March. The 4th ecdysis occurred between April 15th-22nd and the larvae

assumed their second colour phase and pattern. In the previous instars they were bluish with a yellow, black and white marking on each segment. Now they had acquired tawny or golden fur with blue black between the segments, and no dorsal white markings along the back. The larvae were photographed for the second time on May 1st and on May 11th averaged 6.5 cm long. The fifth ecdysis occurred between May 18th to 24th. The maximum length attained in most cases was 8.0 cm \pm 0.1 cm, after which the larva tends to shrink slightly and feed less. The first cocoon was spun on June 12th, 6 cocoons were spun by June 22nd, 18 by June 29th and the last was spun on July 6th. The hard brown cocoons contain larval hairs and, like the larvae, should be handled with care as they may cause irritation. I usually took the precaution of wearing rubber gloves when dealing with the larvae and avoided suffering any such complaints. The cocoons were spun up amongst the leaves and stems of the foodplant.

The first male emerged on July 13th, followed by 2 females on July 16th. Emergences continued until July 31st by which time 8 males and 12 females had successfully emerged. After a number of specimens had been taken for my collection 3 males and 2 females were placed in a large netting cage on July 21st when a successful mating occurred. The first eggs were laid on July 22nd and hatched on August 10th. These ova were kept in a thick stone-walled outhouse somewhat cooler than last year's which may account for the fact that they took 19 days to hatch as opposed to 15 days in 1975. I was rather busy that summer and observed no pairings, but can say that the pairing period is fairly brief. I found that the adult moths, which do not feed, lived up to 2 weeks though a great deal depends on the temperature at which they are kept and their activity. The larval skin when shed at ecdysis is burst along the side of what corresponds to the larval thorax by a dramatic swelling (especially noticeable in young larvae) of that area, and the larvae emerges to leave the old head capsule generally attached to the old skin, which is not eaten. At the present time I am following the young larvae of the second generation through.

My treatment of the Northern eggars followed exactly the same plan. These larvae were just over 3 cm long by the middle of November and began hibernation at the same time. They seemed to be exactly like the Oak eggars in every way except for being slightly darker in colour. Then on January 1st (1976) a rather surprising event occurred. The largest of the ten Northern eggars moulted and assumed his equivalent of the second colour phase I mentioned earlier, only much darker overall, a deep sooty chocolate brown. He nibbled a privet leaf or two and then went back into hibernation. This was the first ecdysis shown by any of the larvae in this batch of Northern eggars since I obtained them. I recorded the maximum and minimum temperature each day

over the winter but at present can see no apparent cause that this was a temperature effect.

The larvae all resumed feeding in the second half of February. One larvae fell behind and died on March 17th. Between April 15th and 22nd the rest of the larvae moulted and assumed the second pattern of coloration and marking, although not as dark as the larva that moulted in January. On May 1st these larvae were photographed and on May 11th measured $4 \text{ cm} \pm 0.1 \text{ cm}$ except for the largest which measured 6.5 cm. Between May 18th and 24th ecdysis occurred again (in which the very dark larva changed into a lighter livery like the others) and the final ecdysis took place from June 17th. On June 23rd I went on holiday for a month while Tony Leech and my mother looked after and recorded the progress of my livestock. I returned on July 21st to find all nine surviving Northern eggars larvae still feeding. Then strange things began to happen. On July 22/23 a first cocoon was spun up amongst the privet leaves. On the 24th a naked pupa was formed on the base of the cage. On August 7th a third larva spun a partial cocoon but then crawled out on the 9th August and pupated in the open on August 13th. On August 25th a fourth larva spun a cocoon and pupated successfully. Between July 22nd and August 27th two full grown larvae shrank and became stumpy and together with a third died for no apparent reason. By August 27th I had 2 naked pupae and 3 normal cocoons containing pupae. One larvae was still feeding well and continued to do so until finally spun up without any problems on October 17th.

At the time of writing, October 28th, all pupae are alive but no imagines have emerged. They remain in the outhouse and will probably now hibernate to emerge next year. I hope to have details of any emergences included in a subsequent Bulletin.

From my observation while rearing this batch of Northern eggars alongside Oak eggars in similar conditions I would like to comment on three points.

(1) The life cycle of the Northern eggars seems to take significantly longer than the Oak eggars, even when both are reared under similar conditions, although I realise the limitation of drawing conclusions from such a small sample of larvae. Since the Northern larvae were about two months old and had been sleeved outside, before I obtained them, it is possible that they may have been preconditioned in some way.

(2) I have heard of several descriptions of different dark colour phases in Northern form larvae. Perhaps some factor such as temperature at ecdysis may influence the darkness of the colour phase shown from one instar to another, or possibly the change observed in the larva that moulted on January 1st resulted from some metabolic change that had occurred for hibernation.

(3) I wonder if there is some overall reason for the rather upset behaviour of the Northern eggars when pupating. Since I had no such problems with the Oak eggars kept in a similar conditions it would seem this was dependent on the Northerners themselves and I wonder if they were waiting for some environmental effect not present in an environment which suited the others. It has been suggested to me that over the generations Northern eggars may have become entrained to Northern conditions and adopt a two year lifecycle in response. Rearing them in Southern conditions seems to have mixed them up, perhaps a physiological clock was telling them one set of information and the information received from the environment conflicted with this, the effects being those described above.

P. Waring (4220)

1977—THE YEAR OF THE PUG—PART I

It seems that, comparatively speaking, few lepidopterists devote a great deal of time and attention to the fascinating group of just over 50 species comprised in the sub-family *Eupitheciinae*, popularly known as the 'Pugs'. Over 100 years ago the illustrious Reverend H. Harpur Crewe, of Suffolk, set us all a shining example by collecting, studying and breeding practically every then known British species of this group—not to mention discovering some new ones—but in the subsequent and current literature I can find no comparable example.

This group of pretty little moths always fascinated me, so it was with a considerable degree of astonishment that, on looking through my own records for the past 46 years, I discovered that I only ever seem to have bred about 17 of them! So I have decided to remedy this lamentable omission by making 1977 'The Year of the Pug' and seeing what I can do to breed out as many species as possible, especially those I have not bred before, and to interest others in doing the same, comparing notes with them and with anyone else interested in the project.

One of the great advantages of choosing this group for such a project is the possibility of discovering a species new to Britain. Moths of such diminutive proportions tend to be overlooked; furthermore, many members of this group look superficially alike and are thus easily confused. Even if one does not discover a new species, there is still a great deal to be discovered about the life histories. The early stages of even some of the commoner species are still imperfectly-known, and I strongly suspect that it is the exceedingly small size of the larvae, tending to render them all but invisible even when assiduously searched for, which has been the main factor limiting our knowledge of their larval habits.

The disadvantages of this group are that the adults are very 'fiddly' to set; however, to counterbalance this, a representative reference collec-

tion of the group does not take up much cabinet or storebox space. The eggs of these diminutive moths, being little bigger than pin-points, are consequently difficult to spot in the wild; and their larvae, scarcely more than animated slender threads, have a habit of escaping from the breeding-cage, or getting overlooked when cleaning out the cage and being thrown away with the discarded foodplant. However, by using smaller cages and smaller quantities of foodplant at one time, one can control this situation better; I shall put forward some suggestions on this point in a subsequent article.

Last year I found that numbers of females of this group came to my trap and, what is more, laid eggs in the egg-packing cartons (after all, that is what they are for!) In fact I have found that quite a few females of other groups also visit the trap, so the common assertion that 'practically only males come to light' is a myth! I will certainly admit that generally more males than females come to light, but after some of the results I had last year, I am already beginning to wonder!

According to my records, 10 different 'Pugs' visited my trap in Northampton last year; these were *Eupithecia centaureata* Schiff. (Lime-speck Pug), *E. castigata* Hb. (Grey Pug), *E. togata* Hb. (Cloaked Pug), *E. coronata* Hb. (V-pug), *E. subnotata* Hb. (Plain Pug), *E. nanata* Hb. (Narrow-winged Pug), *E. subfulvata* Haw. (Tawny-speckled Pug), *E. pumilata* Hb. (Double-striped Pug), *E. exigua* Hb. (Mottled Pug) and *E. absinthiata* Clerck (Wormwood Pug). Of these, *E. centaureata* was by far the most frequent visitor, with *E. castigata* a close second, followed by *E. absinthiata* in third place.

Of these 10 species, 5 produced ova, viz., *E. centaureata*, *E. castigata*, *E. absinthiata*, *E. togata* and *E. coronata*. Of these I bred the first four species, while the last-named laid a small batch of eggs which infuriatingly failed to hatch.

I suggest that those who run a trap breed from ova laid by females which come to light (believe me, you will get them) and in addition of course keep a weather eye open out in the field for all the early stages as well as the adults. Those who do not run a trap had better redouble their efforts in the field to make up for missing out on the much easier way of breeding by simply cutting out batches of ova from the egg-packing cartons! To ascertain the species, what I do is to check the catch for that particular night in my trap records; this, of course, obviously limits the identity of the ova to only those species which occurred among the catch. Supposing there are, say, three species: I then look up these three species in South's 'Caterpillars of the British Moths' Book 2 and check the descriptions of the ova, which usually enables me to make a positive identification. Even if only one species has turned up, it is still a good idea to check the description of the eggs in this book, as certain other small moths, such as *Sterrha* species, also lay very small eggs. Once one is reasonably sure of the identity

of the ova, a suitable choice of foodplant to offer the larvae on hatching can then be made.

I have frequently also found gravid females on walls, palings and fences, even in town; so do as I do and *always* be prepared by having one or two small pill boxes or other suitable containers at hand at all times. Boxes for this group need be so small that two or three will fit into an unobtrusive corner of a coat or jacket pocket, or a lady's handbag. The only thing then you may have to worry about is the frequently peculiar looks you get from passers-by as you box the moths. In the case of children, they will often ask you 'what you want that for'—and you have a golden opportunity of starting some young person off on entomology!

In my next article I will list a number of commonly-encountered 'Pugs' with brief descriptions of their ova and larvae, a selection of alternative foodplants, and for the benefit of those who do not run a trap I will also append some notes on the most likely habitats for finding both the imago and the early stages of the species described. A subsequent article will deal with the less common species, or the commoner species but whose early stages are little-known, with some ideas on how we can see what we can do to find out more about them.

S. J. Patel (751)

HYBRID HAWK-MOTHS

In response to Mr. Adam's report in a recent Bulletin, we also had an unexpected pairing during May 1976. We were breeding from about 100 Eyed hawk (*Smerinthus ocellata* L.) and 60 Poplar hawk (*Laothoe populi* L.) in the hope of obtaining hybrids between these two species. We were also breeding from a small number of Lime hawks (*Mimastiliae* L.) which were mostly female, and were most surprised to find a male Eyed in cop with a female Lime, when inspecting the breeding cages one evening. Unfortunately they had parted by the next morning, so the following evening we placed two male Eyes in a cage with a female Eyed and the same Lime hawk. Again a male Eyed paired with the female Lime, and they had parted by the morning. We repeated the procedure the following evening but this time decided to watch them, not long after midnight they parted following a great deal of convulsive movement and beating of wings by the female Lime hawk. She then deposited her first ovum shortly after parting, and a total of eight were laid over a period of five nights. As expected they all proved to be infertile.

Our success with hybrids between Eyed and Poplar hawks was much greater and fertile ova were obtained from three pairings between female Poplar and male Eyed hawks (*hybridus* Steph.) and two pairings between male Poplar and female Eyed hawks (*inversa* Tutt.). Of the

hybridus ova approximately 65, 40, and 5 respectively were deposited by the three female Poplar hawks. In all cases the parents parted before dark, and there was a great deal of convulsive movement and beating of wings by the females. In the third case in particular the female's desire to part was so great, that when the male came into contact with the side of the cage and clung on firmly, she tore herself free rupturing herself in the process. Although this female was able to deposit five ova that evening, by the following night leaking haemolymph had coagulated and she was unable to deposit any more.

As Mr. Adam's reports, the activity of the females when releasing from hybrid pairings does appear to be much greater than that observed in normal pairings, although our experience does not suggest that these are necessarily infertile.

Of the 110 *hybridus* ova, 94 emerged successfully, 75 were reared to the pupa stage, and 70 had emerged as adults by the end of August 1976. Some of the more interesting observations were as follows:

- (a) In the first instar the young larvae were very similar to Poplar hawk larvae. In later stages it was very easy to distinguish between them, the first stripe nearest the head being similar in colour and density to the next five stripes, whereas in the case of Poplar larvae the first stripe is much more clearly defined (see, for example, South).
- (b) The pupae all had strong male characteristics, the tubercles being slightly more prominent than in male Poplar pupae.
- (c) The adults had a wide range of spot sizes on the rear wings ranging from a smudge to quite clear blue/purple spots, with the brown markings of the Poplar as usual above the spots. The markings on the forewings generally followed that of the Poplar and in six cases they were very pretty being tinged with pink. This may have been inherited from either of the parents, since a number of Poplars have emerged from the same series also with pink wings.

Returning now to the *inversa* ova, we have not, as yet, had any success in breeding these beyond the first instar. There are a variety of reasons given for lack of success in breeding this hybrid, some of which claim that it is only rarely fertile, whilst most state that the reason is the smaller size of the Eyed ova. The ova obtained from three pairings in 1975 and 1976 were nearly all fertile although the larvae rarely emerged unaided. These were known to be fertile since the red horn (also characteristic of young Eyed larvae) was clearly visible through the shells of the ova, as was its head with the mouth opening and closing at irregular intervals.

Two of the larvae emerged unaided, possibly from the first ova deposited which, it is claimed in various literature, are larger than those deposited later. Unfortunately they died before the first moult, apparently from some sort of internal blockage. A number of larvae were assisted to escape from the eggshell or were released by cutting it open with a

razor blade. In some cases these did not start feeding, and in the remainder either died before or during the first moult, apparently due to either internal blockage or lack of strength whilst trying to shed the first skin.

There can be no doubt in my mind that the size of the Eyed ova is the cause of these problems, and although the larvae appear to be fully formed and able to gnaw at the eggshell, in the cases observed they seemed to lack the strength to chew it up even when broken or cut with a razor blade. This apparent weakness could either be due to lack of nourishment, or simply due to the cramped conditions in the ova which causes severe distortion of the young larvae, much greater than is the case with ova from normal pairings.

Another interesting observation which was made when extracting these larvae from the eggshell, was that they appeared to exude a substance which softened the shell. Has this been reported elsewhere or observed by anyone else, or were we mistaken?

Finally, females from hybrid pairings appear to deposit significantly fewer ova than are obtained from normal pairings, even when the females are relatively fresh. Comments would be welcomed on any of the above observations.

R. A. Fry (5765)

P. A. Fry (5450J)

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NOTES AND OBSERVATIONS

A NOTE ON CITHERONIA REGALIS:—From my experience of this species, the problems of rearing *regalis* in England would appear to be twofold. One, the coolness of the summers. Two, the selection of suitable foodplant. There is little doubt that the larvae do not thrive at low temperatures. The natural range of *ragalis* does not extend far north of the July 80° F. isotherm, therefore even 'room temperature' (72° F) may be too cool, certainly development will be slowed. The high humidity of the British climate should not, however present any problem, since this condition is typical of the S.E. of the United States. The selection of foodplant for this species is of the utmost importance. There is no doubt that SOME larvae will accept Hazel, Privet or Ash, however the two MAIN natural foodplants are Sumac and Walnut. I have found these plants to be interchangeable. Parental foods may be a factor, but I would assume that Summac or Walnut would always have a higher acceptance rate than other plants mentioned. I have seen Stag-horn Sumac grown widely in S. England as an ornamental, yet I have to hear

of anyone using it as a regular foodplant. I would respectfully suggest therefore that a small Sumac bush in a small house would provide an excellent micro environment for this noble species.—Chris A. Young (5236)

CABBAGE PESTS WANTED:—Dr. Christopher Payne is carrying out research on the incidence of granulosis virus disease amongst larvae of various pest species of Lepidoptera. This work is being carried out in collaboration with Hugh Evans of the Invertebrate Vivology Unit at Oxford. They would be most grateful for samples of both diseased larvae, and healthy larvae from known field outbreaks of the cabbage pests *Pieris brassicae*, *P. rapae* and *Mamestra brassicae*. Samples should be sent to Dr. Payne at the Glasshouse Crops Research Institute, Worthing Road, Littlehampton, Sussex.

EARWIG OBSERVATIONS WANTED:—I would be very grateful for any records or observations of predators of earwigs. So far, I have only recorded a few, mostly from literature, including the Robin and the Natterjack toad. Parasites and diseases found on earwigs, especially those other than the common earwig, *Forficula auricularia* (L.), are also welcomed.

I would also be extremely glad to hear of sightings of brachypterous specimens, which differ from the ordinary form of the common species in having reduced wings. Burr (1956) gives a record of two such females from the Isle of Wight, but was uncertain as to their authenticity, as Worthington (1926) had observed that some earwigs in a hibernating colony had had their wings nibbled off, and therefore appeared wingless. True brachypterous specimens can be told apart though, as their elytra would be rounded at the hind margin, while they would be cut off sharply in damaged or mutilated specimens. Besides this report, I have not come across any further records for the British Isles.

One of the smallest British species *Labia minor* (L.) is often seen in flight, and resembles a Staphylinid; the forceps telling the two apart. As regards this species, I would also like to appeal for records of its habitat, behaviour etc., and would be grateful for confirmation or otherwise that the shore earwig *Labidura riparia* (Pallas) is not extinct in the British Isles, as it used to occur at Pokesdown, near Bournemouth (Burr 1936), but has allegedly been exterminated by building operations, even though records are available for Dorset, Hampshire, Isle of Wight and Kent (Popham 1961). This species, as can be gathered from its name frequents sandy and shingle seashore.—Jervis Good (5398J)

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L. TRIFOLII ON HAYLING ISLAND:—On 5th and 6th June, 1976 I collected two larvae of *Lasiocampa Trifolii* (D. & S.) feeding on coarse grass. Two weeks later they were transferred to ordinary grass, as their foodplant was hard to obtain and only grew where the larvae were found on Sinah common. One died soon after this, but one pupated and then died due to parasites.—David Chitty (5899J)

AN EXPERIENCE WITH A. PLAGIATA:—On 13th August, 1976 I captured a female imago of *Anaitis plagiata* L. in my light trap. I kept it to obtain some ova. However the specimen very soon died.

I then put it in a container and left it. When I next looked there were many dead and dying larvae. I hurriedly collected foodplant and placed it in the container, none of the larvae ate and soon the remainder died.

Evidently after their mother's death the larvae ate out of the imago's body. This can only mean the eggs were either already fertile or the female failed to lay after fertilisation.—David Chitty (5899J)

[A more likely explanation is that the eggs had been laid in a crevice of the container. They are not very obvious at the best of times. The moral of course is never to give up hope and keep checking!—Editor]

REARING THE WHITE SATIN MOTH:—On the 20th June 1976, ten White Satin moth, *Leucoma salicis*. Linn. larvae were found feeding on Lombardy poplar at North Hayling. They were easily found by looking up into the branches of the poplars, the larvae stood out clearly; one pupa was also found enclosed in a cocoon spun up amongst the leaves of the foodplant. Between the 20th June and the 28th June I obtained 16 larvae and pupae, all the larvae pupated and started to hatch on the 27th June. The larvae were black with ten white marks down their backs, with two rows of smaller reddish marks, on each segment was a tuft of short brown hairs, when full grown the larvae are about 4 cm long.

The pupa is shiny, and jet black in colour, it is very hairy and enclosed in a loose cocoon in a poplar leaf. The moths have glossy white wings, their legs are striped black and white, the adults head is furry.

The moths were put in a cardboard box where pairing took place, the moths laid batches of eggs covered in a white foam which, when hardened, was like rice-paper. The young larvae hatched after a couple of weeks and after a few days they spun a cocoon each and went into hibernation.—John Walters (5904J)

ALDER MOTH LARVAE:—An Alder moth larva (*Acrionicta alni* L.) was found under an old railway arch near Old Ingarsby, Leicestershire. The larva was feeding on Blackthorn (*Prunus spinosa*) growing near a

stream, Alder (*Alnus glutinosa*) were growing the other side of the stream.

The larva was black with thirteen raised yellow bars across its back, there were ten clubbed hairs on the sides of its body, the head was shiny black.

As the larva was already full grown it pupated almost immediately making a loose cocoon amongst the earth in the bottom of the container that it was in, in due course the larva turned into reddish brown pupa which was very mobile. The pupa was placed outside on leaf mould to overwinter.—John Walters (5904J).

NOTES ON REARING THE PALE PROMINENT:—Two ova of the Pale Prominent, *Pterostoma palpina* Clerck, were found on the 6th August, 1976, in an old railway cutting in Leicestershire. The ova were laid on the underside of a willow leaf, the railway cutting was very damp and a number of willows and sallows grew thickly there. Pale prominents had been caught in small numbers at a light trap, at Houghton-on-the-Hill, Leicestershire a few days before.

The black heads of the young larvae could clearly be seen through the transparent eggshell, the larvae hatched on the 7th August and were blue-green in colour with a large black head. Both the larvae fed rapidly on willow (*Salix alba*) and were soon bluish green in colour with a black-edged white line along their sides.

The first pupated on the 14th August, taking only seven days to reach full size, the second pupated on the 16th August taking nine days to reach full size, the larvae pupated in a cocoon covered in particles of earth and now they are overwintering. The larvae were kept in a plastic container with earth in the bottom and sprigs of willow pushed into the earth.—John Walters (5904J)

HAWKMOTHS OF HAYLING ISLAND, HAMPSHIRE:—The Lime hawk, (*Mimas tiliae* L.) varies greatly from year to year. The larvae can occasionally be found on lime or elm trees or wandering around on the ground just before pupation. The males come to light fairly commonly, in May and June. *Laothoe populi* L. (Poplar hawk moth) is very common on the island; it is found wherever the foodplants poplar and willow are found.

The males are much more common at light than the females; mated pairs can sometimes be found on poplar trunks in May and June and usually again in August. The larvae are difficult to find because they feed high up in the trees.

Smerinthus ocellata L. (Eyed hawk moth) is rather a rare species on the island. I have not seen any specimens at light and have only found one pupa.

Acherontia atropos L. (Deaths Head hawk moth). A migrant, I have only seen one moth on the island, and have no record of this species breeding on the island.

Herse convolvuli L. (Convolvulus hawk Moth). This migrant appears regularly every year on the island, and comes to light readily.

Sphinx ligustri L. (Privet hawk moth). This species has decreased in recent years; it occasionally comes to light; larvae may also be found feeding on privet hedges in July.

Deilephila elpenor L. (large elephant hawk moth) is very common on the island; the larvae feed on willowherb growing in ditches. The moths come to light very readily in June.

Deilephila porcellus L. (Small elephant hawk moth) is a local species living on the golf course at the southern end of the island. The moth occasionally comes to light, in June.

Macroglossum stellatarum L. (Hummingbird hawk moth) arrives every year usually in June, July and August. The moths are seen flying by day at the flowers of various garden plants.—John Walters (5904J) EARLY SMALL WHITE:—I should like to record that at 11 a.m. on Saturday, 12th March, 1977, whilst working on my allotment in north Brighton, I saw a freshly emerged male Small white, *Pieris rapae* L. The weather was fine and sunny and there was a slight S.W. wind. The temperature in the sun was 65 F. 18 C. Also seen were a number of Small Tortoiseshells, *Aglais urticae*. However, I had first seen one of these at the same location on 25th February in similar weather conditions.—Jeff Dyson (5784)

CLEANING CAGES AFTER DISEASES:—All of us from time to time have an outbreak of disease in one or more of our larval broods. Usually this is due to a virus infection. Proper cleaning can help to prevent its spread, for virus spores can remain infective for several years. Furthermore they are resistant to the usual disinfectants which kill bacteria. They are, however, fairly rapidly destroyed by alkaline solutions. All cages and other containers which have contained larvae should be very thoroughly washed out with a solution of 5% washing soda to which is added a little detergent. If it is possible to provide a tank or sink in which the cages may be soaked for twenty minutes so much the better, as this ensures that all virus particles in nooks and crannies are reached and destroyed.—Brian O. C. Gardiner (225)

SPRING RECORDS:—On March 5th this year while walking through the middle of Aldershot I came upon a Comma butterfly (*Polygonia c-album* L.) sunning itself on a white painted car. The time was about half-past midday. On April 3rd, about an hour earlier in the day, I saw a small white (*Pieris rapae* L.) feeding on a Dandelion flower, while on April 13th I observed no less than five male Brimstones (*Gonepteryx*

rhamni L.) and a Peacock (*Inachis io* L.) alongside the Basingstoke canal at Mytchett, Surrey.—J. Green (4932)

UNUSUAL BEHAVIOUR IN CHIRONOMID:—In early April of 1977 I happened to observe a small, black fly on the wall of a kitchen. It was at night and the insect, whose general appearance indicated a chironomid, though I unfortunately did not capture it for identification, was probably attracted to the light. On closer examination, I noticed that the front legs were being held almost at right-angles to the body, and wavering slightly, sometimes rapidly, in antennal fashion. On disturbing it, this was immediately resumed when it landed after flying about ten cm away. The other legs were used for supporting the insects body as normal, and the feathered antennae were motionless.

Perhaps this occurrence is connected with courtship or maybe to cause a current of air to pass over the sensitive antennae to aid the sensory organs. I would be interested to hear of anyone else who has come across this, or of the reason for the behaviour.—J. Good (5398J)

THE EFFECTS OF A WET WINTER:—The summer of 1976 with its hot and dry months caused an explosion in the butterfly population, particularly amongst those species that produced a second, and in 1976, a partial third one. However that summer has been followed by one of the wettest winters I can recall. Torrential rain with mild periods interspaced with sudden hard frosts appear to have been disastrous for many insects. Heavy rain and flooding may physically destroy many overwintering insects, in particular those that hibernate at and below soil level. However the extreme humidity brought about by the sudden falls in temperature after rain seem to have affected most insects. I have never lost colonies of bees before during the winter, not even during the winter of 1963 when most bee-keepers had losses; yet this winter I have lost four colonies which on examination have the cluster of bees still on the honeyfilled combs, the whole mass invaded by fungal growth. They were not large colonies and it would appear that the all pervading damp has been too much for them. From the Large Tortoiseshell butterflies, *Nymphalis polychloros* L. bred from stock collected in France in the Spring of 1976, those left to overwinter outside in a shed all succumbed to moulds, both those I kept myself and those of Alan Waters at Dorking. Those kept in the refrigerator have fared better up to the time of writing this. Overwintering larvae of the Small Copper, *Lycaena phlaeas* L., and the Large Copper, *L. dispar batavus*, have also failed, the majority being mouldy on examination. Again those kept in the 'fridge' have come through quite well. Even two Purple Emperor larvae, *Apatura iris* L., sleeved in my garden were found to be dead and invaded by mould—again my first failure with this species. Those kept by a friend in his greenhouse have come through

satisfactorily. My small fritillaries, *Euphydryas aurinia* Rott. and *Melitaea cinxia* L., however have come through 100 per cent, probably well protected by their webs. I kept my *Mellicta athalia* Rott. larvae protected inside a small greenhouse and these have also come through well, there being only a few mouldy larvae. Only the coming season will show what affect this winter has had on the abundance of the previous summer. Let us hope that it will not be as bad as I fear.—P.W. Cribb (2270)

THE SOUTHERN SIERRAS OF SPAIN, JUNE-JULY 1975

After trips in 1972 and 1974 to northern and central Spain, I was keen to visit Southern Spain and in particular the Sierra Nevada, the haunt of some rather special butterflies.

I arrived at Bilbao on 26th June after a comfortable crossing in the Swedish Lloyd Ferry Ship S.S. "Patricia". Having been in touch with Senor Pardo a well-known Spanish entomologist, I drove straight to his home at Torrelevega near Santander, where I was given a warm welcome. Senor Pardo showed me his fine collection of Spanish butterflies and kindly presented me with some papered specimens of *Nymphalis polychloros* L. which he had bred from Madrid stock. He said they are often seen around that city.

Senor Pardo advised me to go to an area north of Burgos where he had recently taken *Euphydryas desfontainii* Gdt. and *Erebia triarius* de Prun. I reached the district in the evening in time to find both species still flying, although *E. triarius* was rather worn. This was an area of uncultivated hillside gay with wild flowers, including *Hippocrepis comosa* (horseshoe vetch) in full bloom and small clumps of Orchids.

I camped out in this delightful spot, and the following morning I found the following butterflies in addition to the two species mentioned:—*Plebicula dorylas* D. & S., *Lysandra bellargus* Rott. (one worn male) *Polyommatus icarus* Rott. *Plebejus argus* L.; *Cupido sebrus* Hbn (one specimen); *Mellicta parthenoides* Kef.; *Melitaea phoebe* D. & S., *Melitaea didyma* Esp.; *Melitaea cinxia* L.; *Colias crocea* Geof.; *Aporia crataegi* L.; *Coenonympha iphioides* Stdgr. Of these *E. desfontainii* was the most common with some fine large females. After obtaining bread, fruit and drink from a local village, I spent another night in these lovely surroundings.

After an early start I was soon through Burgos and on the busy Madrid road. Except for an occasional stop at roadside cafes for lemon tea, I kept driving until the evening when I pulled off the road into a wooded area. Camping on this trip was made easier by a simple adjustment to the seats of my Renault Four which provided a makeshift bed. When preparing an evening meal, I was pleased to see a pair of

large nightjars crossing overhead. A Forestry worker later turned up on a motorcycle and warned me against lighting fires.

The next day turned out to be a real scorcher particularly as I drove over part of the Sierra de Guadamarra. I was not looking forward to driving through Madrid, so on the outskirts of the city I engaged a taxi to lead me through the busy capital. Being mid-day on Saturday, the six traffic lanes were filled with cars and lorries. I hung grimly on the tail of my taxi, and after a rather hectic drive I was safely on the road to Andalucía.

Granada was eventually reached and after a quick tour of the Moorish palaces of the Alhambra I climbed the hill at the back where other collectors have done well. The only butterflies however that I found were *Pontia daplidice* L.; *Pararge aegeria* L. (light brown form) and *Coenonympha pamphilus* L. (form *lyllus* Esp.)

The Sierra de Alfacar was reached in the afternoon of 29th June. Lt. Col. W. B. L. Manley had told me that this is a good area for butterflies. Unfortunately this was a late season and several species that I had hoped to see had not emerged.

The following species however, were on the wing:
Melanargia ines Hoffmegg.; *Pyronia cecilia* Vall.; *Pyronia bathseba* Fab., also *icarus*; *didyma*. I had planned to spend another day here, but from the heights above the village of Alfacar, the snow-capped Sierra Nevada looked inviting, so I set off south again through the busy streets of Granada and was soon starting the long ascent to the Pico Veleta at the western end of the Sierra Nevada. I reached the Parador in the evening and after a rather tiring day was very pleased to put up there for the night.

This Government-owned hotel was most comfortable with good food, and I thought the charges were reasonable. In the morning I continued the ascent of Veleta and enjoyed the magnificent views and the alpine flowers above the snowline. At about 9000 ft I was interested to see several *Aglais urticae* L. flying at great speed. It was disappointing not to find *Erebia hispania* Butl. and the Nevada grayling *Pseudochazara hippolyte* Esp. but I was too early for these species. Butterflies were more numerous at lower levels and I found the three species of marbled white, *Melanargia psyche* Hbn.; *Melanargia lachesis* Hbn. and *M. ines*, also *Plebicula escheri* Hbn.; *Plebicula amandus* Sch.; *Lycaeides idas* L., and *M. parthenoides* ssp. *veletaensis* Ribbe.

The following day I drove to the eastern end of the Sierra Nevada and eventually arrived in the evening at the summit of the Puerto de la Ragua after a long climb up a precipitous and rough road. The summit is an area of low gorse with some recent afforestation where I camped for two days. Several well-marked Bath Whites were flying swiftly over the ground and I spotted one laying on Mignonette. I later potted up a plant and got a few eggs from a captured female. These eventually

hatched and produced two males on my return to England.

This was a good area for wheatears and I had some good views of these birds which appeared unusually confiding.

In the morning a shepherd brought over his small flock of sheep with two goats. We exchanged a few words and he kindly milked one of his goats and presented me with some fresh milk.

The Puerta de la Ragua is the home of *Parnassius apollo* L. ssp. *nevadensis* Obth., but again I was too early for this species. I was interested to find *Philotes baton* Bergst. ssp. *panopes* Hbn. flying in some numbers at this altitude (6400 ft.)

Later in the morning I took the road over the eastern end of the pass, and after about two miles I stopped near a mountain stream. Here the water was running across the road and provided a drinking place for about fifty *Iphiclides feisthameli* Dup. They made a charming sight with wings fanning rapidly as they drank. This proved a wonderful spot for butterflies and soon after my arrival I caught my first *apollo* ssp. *nevadensis* with orange-yellow spots. Besides the commoner butterflies the following were flying: —*Heodes alciphron* Rott ssp. *granadensis*, *Lycaenan phlaeas* L., form *eleus* Fab.; *Celastrina argiolus* Linn; *Aricia montensis* Vty; *P. amandus*; *Euphydryas aurinia* Rott. ssp. *beckeri* Ledr., a fine terra-cotta coloured species, which was common; *M. parthenoides*; *Pandoriana pandora* D. & S., one *Libythea celtis* Laich. (worn), also the three species of Marbled White mentioned before.

Of the Pieridae there were quite a few *Colias australis* Vty. on the wing and an occasional *Anthocharis euphenoides* Stdgr.

In the afternoon a car pulled up and the occupants turned out to be a Belgian collector and his wife who told me that appollos were flying in strength in the Sierra de los Filabres (Almeria) about 70 miles to the south east.

Needless to say this was my next stop and I arrived there in the evening. In contrast to the tortuous road to the Puerto de la Ragua, the road to the summit of the Sierra de los Filabres, although winding, was well surfaced, and I found a camping spot in a disused quarry near the summit. During the night a gale blew up and I had to anchor some articles of camp equipment. In the morning the wind had gone and it turned out another hot sunny day. I was at the summit about 9.30 a.m. and soon found *P. apollo* ssp. *filabricus* de Sagarra flying in good numbers. This race also has the usual red markings replaced by orange-yellow. I spent a day to remember in this peaceful spot under a deep blue sky with no sign of other visitors. In the evening I made the long descent, stopping to take photographs of what appeared to be a deserted village on the lower slopes of the mountain.

I returned to Guadix and then turned north and took secondary and rather slow roads to Albacete and Cuenca. I reached the well-known collecting area of Albarracin the following day.

Few butterflies were seen around Albarracin although in the gorges near the town I took specimens of *Aricia montensis* Vty; *C. iphioides* and two perfect specimens of *Strymon spini* D. & S. This was the locality where in July 1974 I collected with a friend Mike Hale who caught here a wonderful melanic specimen of *C. crocea* with the upper surface of the fore and hind wings a blackish brown.

I should have liked to have returned to Moscardon and Bronchales in Sierra Alta, but time was running short and I pressed on to Soria.

Senor Pardo had given me a locality for *Aricia morronensis* Ribbe, north of the city, and I was pleased to find this little butterfly flying in good numbers near the village of Abejar. *Maculineaalcon* D. & S. and *Maculinea nausithous* Bergst. are to be found in this district, but the only blues that had emerged were some large specimens of *Cyaniris semiargus* Rott. After a few drinks in a local cafe, I decided to camp in a copse near the road, but just when I had cooked an evening meal, a horde of midges appeared from nowhere and attacked me. In spite of frantic applications of anti-midge oil, the midges proved too much and I hurriedly packed and drove several miles to some pinewoods on higher ground, where conditions were better. The following day I collected in damp meadows and in an area of scrub oak rich in wild flowers and where I saw several large snakes in the undergrowth. Butterflies were quite numerous and the following species were recorded:—*Argynnis niobe* Linn; *Argynnis paphia* Linn; *M. parthenoides*; *Mellicta athalia* Rott; *Brenthis hecate* D. & S.; *C. iphioides*; *Maniola jurtina* L. ssp. *hispulla* Esp. *C. semiargus*, *Plebejus argus* Linn; *Aricia cramera* Eschz., *Strymon ilicis* Esp. There was also a good variety of birds here, including bee-eaters, hoopoes and a pair of azure-winged magpies.

From Abejar I made my way to Oña—a pleasant small town north-west of Burgos. I put up at the Hotel Paca where the accommodation was comfortable and reasonably priced. I had stopped here in 1974 with Mike Hale, and I was greeted by the proprietor and his family as an old friend.

I collected on the outskirts of the town and in the cherry orchards where I helped myself to the luscious fruit. There was quite a good variety of butterflies here and new varieties included *Maculinea arion* (two specimens); *Laeosopsis roboris* Esp.; *Lysandra asturiensis* de Sagara (just starting to emerge); *Limenitis reducta* Stgr.; *Polygonia c-album* L.; *Lasiommata maera* L.; *Melanargia galathea* L.; *Argynnis adippe* D. & S.

From Oña I took the secondary road to Ramales de la Victoria and collected at Alto de Tornos where I found a well-marked form of *P. argus* and some worn *Clossiana euphrosyne* L.

The following day 12th July, I took the coast road to Bilbao and embarked on S.S. "Patricia" after a most enjoyable holiday.

My thanks are due to Lt. Col. W. B. L. Manley; Dr. Miguel R.

Gomez Bustillo of Madrid; Otakar Kudrna, for helpful advice, and not least to Peter Cribb whose article in the A.E.S. Bulletin Vol. 28 No. 285 and Vol. 29 No. 286 encouraged me to visit Spain and experience the joy of collecting in the wild sierras.

H. G. Phelps (4666)

REFERENCE

MANLEY, W. B. L. & ALLCARD, H. G. (1970). A Field Guide to the Butterflies and Burnets of Spain.

RECORDING LEPIDOPTERA IN KENT

This short article is to introduce a scheme for the detailed recording of insect distribution in the County of Kent, but hopefully it will be of more general appeal to those interested in studying the distribution of insects.

For some years now, the Lepidoptera of the British Isles have been recorded by the Biological Records Centre at Monks Wood Experimental Station, using the 10 km square system. This system is derived from the National Grid of the Ordnance Survey which divided the Country into a number of 100 km squares (i.e. areas of land 100 km x 100 km). Each 100 km square is then divided into 100 smaller squares, each 10 km x 10 km—these being referred to simply as a "10 km square". Using the appropriate rules of map reading, each square can be assigned a unique grid reference. With this system, the Nationwide distribution of the Macrolepidoptera has been mapped, and data for the Butterflies and some of the larger moths has been published in map form.

Whilst this type of system is an excellent way to study the 'global' distribution of our Lepidoptera, most entomologists will have a keen interest in their 'local' bugs, and under these circumstances, the National Survey is of limited value. A glance at any Ordnance Survey map will show that any selected 10 km square will probably contain a variety of habitats, and more detailed mapping is essential to gain a satisfactory impression of the insect distribution within the area. Many Local Lists have been published over the years, although they often suffer from the disadvantage of covering only a few selected localities within an area. This does not, of course, diminish their value, but rather stimulates the desire to see the information used as the basis for a more systematic survey.

The County of Kent has a rich Lepidopterous fauna, and a wide variety of habitats. The most comprehensive recent work covering the area is "The Butterflies and Moths of Kent" by J. M. Chalmers-Hunt, which covers in three volumes, the Butterflies and 'Macro' moths—the distributions being listed under sixteen ecologically distinct zones. Since 1971, an even more ambitious scheme has been in operation: the mapping of ALL Kentish Lepidoptera—the Butterflies, 'macros' and 'micros' on a TETRAD square system. A tetrad, as its name implies, is

an area enclosed by a 2 km x 2 km square (i.e. FOUR sq km). Thus every 10 km square on the National Survey is sub-divided into 25 tetrads. The County of Kent contains 1044 such tetrads, so the scale of such a scheme can be appreciated.

In order for such a scheme to succeed, there must be three main ingredients: a skilled and enthusiastic team of organisers; a central point where records can be collected, collated and stored; and finally an ample supply of Recorders. For the Kent system, the skill and enthusiasm (and indeed, hard work) has been supplied by Mr. Eric Philp, the Keeper of Natural History at the Maidstone Museum, and Mr. Steven Whitebread—an AES member who resided in Kent before moving to Switzerland. The central point for Records has been set up at the Maidstone Museum, as part of a wider scheme: "The Kent Biological Archives and Records Centre", which aims to map the complete flora and fauna of each tetrad. This is particularly useful, as the distribution of the Lepidoptera can now be compared directly with the distribution of suitable foodplants. An additional bonus is that the Records Centre is available for all bona fide entomologists to study.

Although the scheme is well underway, there is always a shortage of Recorders. There must be many entomologists who have observed or collected insects in Kent, and the valuable information they have accumulated is locked away in a diary or on a data label. Perhaps entomologists who have collected in Kent since 1971 (the start of the census) would consider submitting their records, and participating in the scheme. Not only Lepidoptera records, but ALL Orders of insects are incorporated into the scheme when the records are available. For entomologists far removed from Kent—take heart! We have shown that such an enterprise is viable, and apart from the scientific advantages of the information obtained, the scheme provides a valuable means of sharing information with other entomologists. The Kent group has already held one informal meeting, and hopes to hold more in the future. Such informal gatherings provide an excellent opportunity to meet and talk with other entomologists who share an interest in a particular area, with the added bonus that a few 'experts' are usually in attendance, and are only too happy to through your small case of unidentified insects, providing names at a glance through your small case of unidentified insects, providing names at an alarming speed for the specimens you have spent weeks puzzling over.

Maidstone Museum and Art Gallery, St. Faith's Street, Maidstone, Kent
ME14 1LH.

Paul Sokoloff (4456)

SOME USEFUL SETTING HINTS

It does surprise me how few collections that I have seen are comprised of well set butterflies. In the main it would seem that little care and

attention has been paid to this aspect of collecting. With the general decline in numbers of our butterfly population, leading to more discriminate collecting, coupled with escalating transport costs to and from collecting areas, it follows that we should attempt to achieve as high a standard as possible in our setting, in order to eliminate the need for collecting a replacement specimen for the one spoiled on the setting board. More care in setting would also enable us to display our collection to advantage and further compliment the beauty of the butterfly.

For some time I fumbled my way through the setting process, not really enjoying it and indeed looking upon it as an unpleasant but necessary chore to be carried out after the enjoyment of collecting. Realizing my shortcomings in setting I sought the help of fellow collectors whose set specimens were a delight to behold. Also I turned to AES leaflet No. 28 entitled "Killing, Setting and Storing Butterflies and Moths" which covers setting in a most helpful and practical manner. I would particularly recommend this leaflet to our younger members. The notes relating to patience and attention to detail pinpoint the key to good setting. Amongst other things this leaflet recommends the vertical pinning of the insect and not with pinhead sloping forward as suggested in some other guides. Without a doubt the vertical pin is by far the better method for both setting and displaying.

One cannot stress too much the importance of good preparation and naturally this embraces the relaxing of specimens, should this be necessary. Other articles on this subject have been printed in our Bulletin previously and I would suggest that reference is made to Mr. P. W. Cribb's "Use of a new material for relaxing tins" (*AES Bulletin* Vol. 31. No. 292. August 1971). I have always found however, that specimens that can be set on the day of capture are by far the easiest, giving a more satisfactory result than those that have required relaxing.

A most important part of good preparation is in having the correct setting equipment readily available. I make a mental check list before starting to ensure I do not have to stop off to find a piece of forgotten equipment. Whilst there have been recent introductions as replacements for cork setting boards because of rising costs, where possible it is worth staying with cork, cleaning and repapering them as necessary. Good curved forceps both blunt and pointed are a must as indeed is a good setting needle. It was the setting needle which caused me most problems. I tried all types even going to the expense of a hand made adjustable one, but without much success as each one damaged the wings to some extent despite great care on my part. At long last I have found at least for myself what I consider the perfect setting needle for most butterflies, a number O black insect pin. By holding the point and using the small head of the pin, wings can be manoeuvred quite easily without causing damage. Whilst on the subject of black pins, as these are almost impossible to obtain now, stainless steel pins are being used as a very accept-

able alternative. A word of warning, however, these spring far more readily than the old black type and antennae, abdomen and even wings will fly in all directions if insufficient care is taken when handling the pinned insect.

Another helpful item of equipment in use is a large cork bung obtainable for a few pence at Boots the chemists. This I use for pinning a number of glass headed pins into before commencing setting. These pins are then easier to handle than when fumbling in the pin box and at the same time keeping a watchful eye on the insect being set. Glass headed pins are of a sturdy construction and tend not to spring on removal from the setting board. One must not forget to exercise great care in removing pins and tape from the setting board for as much damage to the insect can be done at this stage as at any time during the whole setting procedure. After use, setting tape can be reversed and used again but I do not consider the saving worth the risk of damage from a previous pin hole.

To eliminate as much as possible the springing of wings, I always leave set specimens on the board for at least four weeks in a warm dry atmosphere. A corner of the airing cupboard is ideal.

If there is time available I prefer to make out data labels in full and position these alongside the respective butterfly on the setting board, at the time of setting. The label can be held in place under the setting tape by the use of two pins either side of the label. However, if time does not permit this, I number each set insect with a mark on the setting tape and a corresponding number on the appropriate fishing tackle type envelope that held the specimen. At the time of capture I would have marked the envelope with full data as this is vital to the entomological value of any collection. Labels are then made out later from this information.

This article is not intended to be a step by step account on setting for as previously mentioned, this subject has been adequately covered elsewhere. I trust however, that the hints will be of assistance to some of our members, enabling them to derive more enjoyment from setting and hopefully result in better set specimens.

There is no reason why even a storebox collection should not be well set and presented, demonstrating the care and attention that we have shewn to that beautiful part of nature for which we have so much regard and from which we derive so much pleasure.

M. S. L. Simpson (4859)

NOTES ON BRAZILIAN LEPIDOPTERA

Phoebis argante, Fab.

This orange-coloured $2\frac{3}{4}$ -inch Pierid is reported to be found all over tropical America. This I can well believe as, personally, I have seen it in

the North, North-East and South-East of Brazil, between 2 deg. N. latitude, in the Territory of Amapá, to 24 deg. S. in the State of Sao Paulo.

In Brazil, as far as I have noticed, the greatest frequency of its appearances is geared to the regional variations of the wet and dry seasons of that vast country. In the North and North-East *argante* normally flies from April to August. In those regions this period takes in the latter half of the rainy weather and the early part of the dry season; it marks the transition from the cool time of the year to the hot. In the South-East, however, January to June is the intermediate time between the wet and dry seasons, and it is during these months that this Pierid usually appears. Incidentally, in the South-East this period also heralds a change in the weather from warm to cold. In the highlands of Minas Gerais this part of the year is not only dry, but also very cold, with frequent frost-temperatures in the more elevated places.

But, as long as the sun is shining, any portion of the day between 9.30 am and 4.00 pm seems to be suitable for *argante*. It is strongly attracted by open areas with low-growing bushes, reeds and the long stalky grasses of marshlands adjoining lakes and flooded fields.

The flight of *argante* is rapid, if irregular, and with no obvious objective. From its usual flying height, just above the low bushes of a fairly open space, it will suddenly alter course, swerve towards the bordering vegetation, and rise abruptly to clear the tree-tops, questing, perhaps for more interesting terrain in another open area.

Like many other Pierids, it is addicted to the pastime of sitting on wet sandy or muddy river beaches and cattle-churned slush, sucking in moisture.

P. argante is fond of flowers, and yellow ones are its favourites. In the garden of a house where my wife and I once resided, in Pernambuco, there were numerous flowering trees and plants. These included *Cassia alata* and *C. fistula poinsettia* and varieties of *Hibiscus*. The flowers of all these were visited constantly by numbers of butterflies, but the two species of *Cassia*, when in flower, were the most popular with *argante* of both sexes. They were just as popular with the large Sulphurs, *P. philea*, and both species were frequently present together, skirmishing and dodging about, their bright shades of yellow and orange enriching the colours of pale green foliage and yellow blooms of the *Cassias*.

The larvae of *philea* feed on *Cassia*, so egg-laying obviously accounted, to a large extent, for the visits of their adult females, but the preference shown for these plants by *argante* is less understandable, as their larvae do not live on *Cassia*. Good authority has it that they feed on species of Capparidaceae, (of which plants I have no knowledge), and whereas I have often found larvae of *philea*, I have never set eyes on a caterpillar of *argante*.

Helicopsis Species

The three species *Helicopsis trinitata* Seitz, *H. cupido* L. and *H. acis* Fab., intermingle freely in flight. They are all cream, brown-black and orange, but with different colour patterns. All have adornments of tiny silvery-gold spots in the verso design of their hindwings. Their 15 mm. antennae are black with about ten bands of white and a 3 mm. black tip. With a span of 25 mm. *H. trinitatis* is the smallest of the trio; *H. cupido* has a 30 mm. spread, while *H. acis*, the largest, reaches 45 mm.

As they flit daintily amongst the riverside vegetation or on the forest-fringe, these Erycinidae seem, at times to emit minute sparklets as the rays of the sun play on the tiny metallic markings of their undersides.

I came across these beautiful little butterflies on several occasions, in 1964, 1966 and 1967. Their favourite haunts are in humid and damp places where foliage is plentiful, but not dense, and amply penetrated by sunshine.

In Pará; I found them to be abundant just outside Belém, and at Marituba on the borders of the heavy "mato" surrounding a rubber plantation; and on a journey to the Atlantic coast-town of Salinópolis I saw quite a few near the leafy borders of the roadsides.

I have seen them flying in their leisurely, rather feeble fashion, delicate tails a-quiver, through the open sides, and over the awnings of river boats on the Rio Pará and Rio Amazonas. In Amapá, too, near Macapá and Santanna on the North bank of the Amazon, I observed them in numbers.

These Erycinids are most plentiful just before the season of heavy rain, which, in Pará, Amapá and Amazonas is from January to June. In December 1964, in swampy districts and along the "igarapés" or jungle waterways, they were extremely common in areas near Belém, as I saw.

Helicopsis are very weak flyers, and this disadvantage puts these fragile butterflies at the mercy of heavy gusts of wind. With a gentle breeze they float and flutter about at from 4 to 10 ft. above ground (or water) surface, resting frequently on whatever foliage is growing near by. Any sharp gust, however, sends them fluttering, seemingly in panic, while they seek shelter and settle on the undersides of the of the largest leaves they can find.

Terence C. Hanson (5242)



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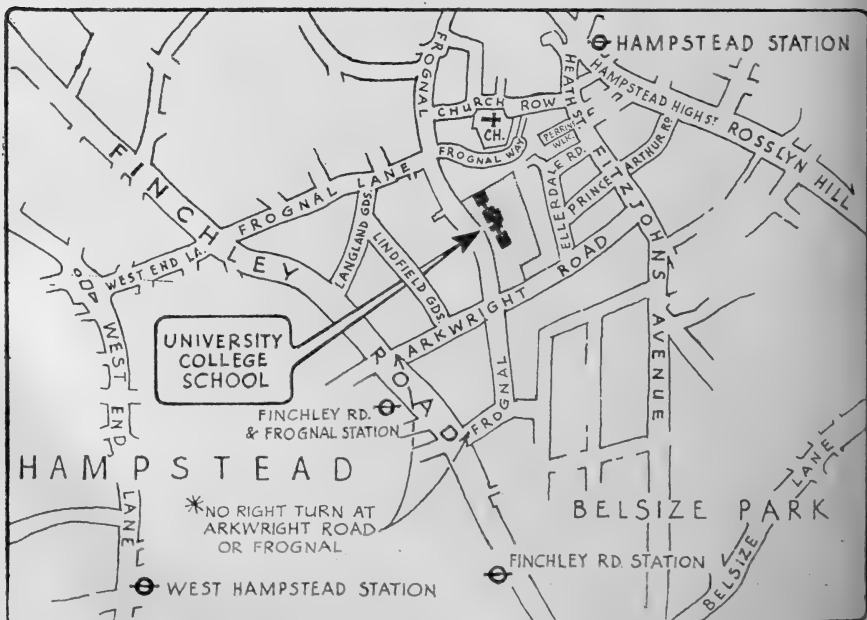
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NOVEMBER 1977

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EDITOR:

BRIAN GARDINER FLS FRES

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(Founded in 1935)

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EDITORIAL

For many years now our Annual Exhibition has been one of the major, and certainly the best attended, entomological events of the year. Its very success has led to problems and the solving of these has been under serious discussion by Council for some time now. In view of the many criticisms—in all directions—which have been made, and the very obvious need, quite evident last year, for a larger venue, Council have decided that the most sensible course to take is that of considering the views of members. For this purpose a form is enclosed with this issue of the Bulletin. Please return it promptly and make your views known. For this year, as those who attended will now know, the number of stalls at the exhibition had to be drastically curtailed to avoid the unpleasant crush of the previous year. Members should also perhaps be informed that our old venue, Holland Park School, is no longer available for letting. The shape and venue of future exhibitions will be guided entirely by the return received to the questionnaire. So, if you have definite ideas, please make them known.

WOOD AN INSECT

By long observation I have understood,
That two little vermin are kin to *Will Wood*.
The first is an insect they call a *wood*-louse,
That folds up itself in itself for a house:

* * * *

The next is an insect we call a *wood*-worm,
That lies in old *wood* like a hare in her form;
With teeth or with claws it will bite or will scratch,
And chambermaids christen this worm a death-watch;
Because like a watch it always cries *click*;
Then woe be to those in the house who are sick:
For, as sure as a gun, they will give up the ghost,
If the Maggot cries *click*, when it scratches the post.
But a kettle of scalding hot water injected
Infallibly cures the timber affected:
The omen is broken, the danger is over;
The maggot will die, and the sick will recover.
Such a worm was *Will Wood*, when he scratched at the door,
The death of our nation he seemed to foretell;
I think the best thing we can do is to scald him.
For which operation there's nothing more proper
Than the liquor he deals in, his own melted copper.

JONATHAN SWIFT.

AN ATTEMPTED BREEDING OF THE DEATH'S HEAD HAWK

On the 21st August 1976 one dozen ova of *Acherontia atropos* L. arrived from Ray Adams. Unfortunately one had hatched and died in the post. The rest were placed in a small plastic box and left to hatch..

The following morning two more had hatched. These were transferred to another plastic box containing a potato leaf. By the time that I arrived home that evening it was evident that they had both started feeding. Two days later on 24th August another three larvae hatched. The rest of the eggs failed to hatch for some reason. They were not indented and appeared to be fertile—it is possible that the hot weather killed them in transit.

The progress of the larvae was as follows:—

25th August 1st larva settled for 1st ecdysis. 30th August 2nd larva now in 3rd instar. 3rd September 1st larva settled for 3rd ecdysis. 9th September 1st larva settled for 4th ecdysis. 12th September 1st larva now in 5th instar. 13th September 2nd larva now in 5th instar. 22nd September 1st larva ready to pupate.

The larvae were all the same yellowish green in colour until the last instar when two of them turned out to be of brown form. When they were full grown and had stopped feeding they spent several hours coating their bodies with saliva from their mouthparts before moving off the foodplant to search for a suitable pupation site.

When the larvae started to wander about and change colour they were placed individually into large plastic ice cream cartons full of peat. They soon burrowed down to the bottom of these (about eight inches) and formed large pupation chambers.

The larvae "went down" on the following dates:

1st 22 September. 2nd 23 September, 3rd 25 September.
4th 27 September. 5th 29 September.

Up until this time the larvae had been kept at living-room temperature. After they had "gone down" they were transferred to a small spare room which was maintained at a temperature of between 70-80° F.

On the 5th October the pupae were dug up for examination. They were all perfectly formed—two males and three females. They were laid on slightly damp peat in a plastic box and examined each day for signs of development.

On Friday 22 October it was noticed that one of the pupae had changed colour from dark brown to black. The pupal case was still hard so it was evident that emergence would not take place the next day. The pupa was left where it was. The following day it had softened somewhat and it was decided to move it to a netting cage for emergence. However for one reason or another I forgot and the next morning it was found to have emerged in the plastic box and was squeaking loudly. The moth was a male and had only managed to half expand its wings.

Another pupa—a female—was by this time changing colour and by the next day was starting to soften. It was transferred to the netting cage and emerged the following day (26th October). A third moth, another male, emerged on Thursday 28 October.

Several attempts were made to induce the moths to feed on both pure honey and honey and water by carefully unrolling the comparatively short, thick proboscis and dipping it into the cap containing the fluid. The moths seemed totally uninterested and struggle vigorously to get away.

At this time they were being kept in a 2ft. cube netting cage containing a potted potato plant. The next day (Friday 29th October) I had to go away for the weekend. One of the two remaining female pupae was almost ready to emerge—I put this one into the netting cage. The other showed no signs of imminent emergence. When I returned on the Monday the male with the half expanded wings, was dead as was the oldest female. The second male had escaped from the cage, as well as the second female which had emerged while I was away. They were, however, found and put in a 1ft. diameter cylindrical netting cage so that the larger cage could be made more escape proof.

At approximately 11 p.m. that evening when I looked in the moths were pairing in a side by side position near the top of the cage. They remained together for about two hours parting sometime between 12.30 and 1.30 a.m.

The next day again I tried without success to feed the moths and after explaining the situation to Dr. Mike Hull he suggested that I try again with some honey from his hives; the bees not having been artificially fed as apparently happens frequently with bees kept for commercial purposes. When he gave me the honey I tried it, undiluted, on the female *atropos* (the male had died). She struggled again but when I released her she almost dived into the honey and remained with head and thorax bent over the cap, proboscis probing for over five minutes before finally taking off around the room.

As previously mentioned I had several potted potato plants and one of these was placed in the cage with the female *atropos*. She was also supplied with cut twigs in water of winter flowering jasmine, *Jasminum nudiflorum*; Snowberry *Symphoricarpos alba*; Dogwood, *Cornus sp.*; and a Deadly nightshade plant, *Atropa belladonna*. The moth was fed every day as described and was very active every night but did not lay any eggs and eventually died on 12th November. I presume that the ova of *atropos* take some time to develop after the emergence of the moth but as the moth lived for eleven days after pairing (which occurred two days after emergence) she should have had eggs ready for laying before she died. The right stimulus was apparently lacking.

I would be very glad to hear from anyone who has any ideas or ex-

perience relating to *atropos* which may shed some light on the reason for my failure to get the female to lay any eggs.

It may be worth noticing that all of the moths squeaked loudly when disturbed but not at any other time. It has been suggested that the blowing of air through the proboscis, which causes the squeak, originated as a mechanism for clearing the proboscis after feeding. My moth did not squeak at all after feeding—until handled! It has also been said that the moths squeak a lot more prior to mating. I cannot confirm this either.

ALAN MARSON (5172)

[The most likely explanation for the lack of fertile ova is that the observed pairing was abortive and no spermatheca passed to the female.—Editor.]

THE YEAR OF THE PUG—PART II

The following notes are intended as a very brief guide to some of the commoner species of Pugs.

Eupithecia centaureata Schiff. (Lime-speck Pug)

Imago: one of our commonest species; comes readily to light, and may frequently be found sitting on the outside of the MV trap, or on the wall nearby. The species is double-brooded, the first brood appearing from May to August, with a second brood in September and October. *Ovum*: roundish-oval in shape, delicately pitted, semi-translucent and shiny. They are creamy-white colour when first laid, but deepen to orange immediately before hatching. The eggs are laid in May and June.

Larva: South says it is greenish, while Stainton's Manual describes it as a pale straw-yellow in colour. From my own experience I would incline to the latter view. There is a row of red dorsal spots, with some oblique red streaks running from these down to a row of sub-dorsal red spots in either side. South states that some specimens may be devoid of these dorsal or sub-dorsal markings, but all the ones I have bred have been marked with red, some more obscurely than others.

Pupa: this is reddish, and enclosed in a slight earthen cocoon under the soil at the base of the foodplant.

Foodplants: the flowers and sometimes the seeds are eaten, so if you are looking for the larvae in the wild, search these, not the leaves. This species is partial to a number of plants, including ragwort (*Senecio jacobaea*), groundsel (*S. vulgaris*), yarrow (*Achillea millefolium*), hemp agrimony (*Eupatorium cannabinum*), black knapweed (*Centaurea nigra*), golden-rod (*Solidago virgaurea*), burnet saxifrage (*Pimpinella saxifraga*), etc.

Eupithecia castigata Hb. (Grey Pug)

Imago: This pug is generally-distributed and appears to be common in

the Midlands. It may be found in May and June, and there is usually only one brood, but South says that odd specimens occasionally feed up, pupate and emerge in the autumn. The latest specimens I have taken were one on July 9th in 1975, and one on July 16, in 1976, but these would, of course, only be late first-brooders.

Ova: the usual rounded-oval shape common to this group has, in this species, a depression around the micropyle, and the opposite (basal) side is somewhat flattened, making the egg somewhat bun-shaped. The upper surface only is delicately pitted. The egg is very shiny, and is of a delicate cream colour, darkening before hatching.

Larva: a pale, dusky olive-green, darker dorsally. South states that some specimens may be reddish-brown; I have not seen any like this. The Rev. Harpur Crewe observed that this larva had a series of dusky lozenge-shaped spots along the back, and reddish segmental divisions. I have never observed any of these, so no doubt the Rev. Crewe's eyesight was a good deal sharper than mine!

Pupa: this is enclosed in an earthen cocoon at the base of the food-plant. The pupa itself is reddish, slender and tapering, and the eagle-eyed Rev. Crewe has observed that the thorax and wing-cases are lighter in colour than the remainder of the body.

Foodplants: There is hardly a plant that this (fortunately for us entomologists) polyphytophagous larva will not eat, so it is superfluous for me to recommend any in particular.

Eupithecia pumilata Hb. (Double-striped Pug)

Imago: this pretty pug is one of the smaller species and generally distributed; common in the Midlands. It occurs from April to November but appears to be most frequent in the first brood. Although definitely double-brooded, no one seems to be sure whether there are three broods or not, so perhaps we can see what we can do to find out and settle this question for good! For the record, I find September the best month in the Midlands for this pug.

Ova: these are pearl-like in appearance, very shiny and smooth, with no pitting or reticulation. They are the usual oval-roundish shape, convex above, and slightly flattened beneath.

Larva: Crewe describes it as short and stumpy, tapering slightly towards the head; it is certainly less slender than some of the other species, and possibly shorter because the species is one of the smaller ones. It is somewhat variable in ground colour, varying from olive, reddish-olive or obscure dusky olive, to a rusty red. There is a dark olive dorsal line, almost black in some specimens, and a chain of dusky arrow-shaped spots along the back, with a yellowish lateral stripe on each side. South says that first-brood specimens are usually larger in size and more strongly-marked than later brood specimens.

Pupa: this is enclosed in a slight earthen cocoon at the base of the food-plant. The pupa is yellowish. Crewe has stated that the thorax and wing-cases are paler than the rest of the body, and that there is sometimes a reddish tip to the abdomen.

Foodplants: Flowers of furze or gorse (*Ulex europaeus*), broom (*Sarothamnus scoparius*), holly (*Ilex aquifolium*), hawthorn (*Crataegus monogyna*) and traveller's joy (*Clematis vitalba*). (Stainton states also *Calyptegium*).

Eupithecia rectangulata L. (Green Pug)

Imago: this pretty species is found over most of the British Isles and is a frequent visitor to light in the Midlands. Owing to its larval propensity for feeding on apple and pear blossom, it frequently occurs in orchards, gardens and suchlike places. The moth is out in June and July, and is single-brooded, as far as I am able to ascertain.

Ova: These are laid on the unopened flower buds of the foodplant. They closely resemble the colour of the bud and are therefore difficult to spot except at close range.

Larva: this is yellowish green, blending well with the colour of the young opening buds. Short and stumpy in form, it tends to be darker when not long hatched, becoming lighter as it becomes larger; this is because the buds upon which it feeds also lighten as they expand. There is a more or less distinct dorsal line, reddish or greenish, and the divisions between the segments are reddish. The body has a curiously transparent appearance, and on close examination with a hand-lens the internal organs can be discerned. It may be found feeding in April and May.

Pupa: A slight earthen cocoon is spun at the base of the tree. The body is tapering, reddish at the abdominal extremity, and with thorax and wing-cases yellowish, suffused with olive. Crewe has observed that this species spends only two weeks in the pupal stage.

Foodplants: Crab-apple (*Malus pumila*) and cultivated Apples and Pears such as grow in orchards and gardens.

Eupithecia coronata Hb. (V-pug)

Imago: This is another very beautiful green pug with a distinctive V-shaped marking on each forewing, which renders it quite unmistakable. It is fairly widely distributed, being more frequently met within the southern half of the country, and is double-brooded; South says a third brood can sometimes be obtained in confinement. I have never had this species later than July so have not been able to take him up on this assertion. Since he says that the first brood emerges in June and July, it would appear that his stated second brood emerging in the autumn is not commonly found in the Midlands. No doubt this occurs in the more southern counties.

Ova: These are the usual 'pug' type, cream-coloured and shiny. I had a female which came to my trap lay a goodly-sized batch of ova, but they failed to hatch. Very annoying!

Larva: this is extremely variable all through the green shades, with three reddish dorsal lines, the central one being the most distinct and sometimes widened to form triangular or lozenge-shaped markings.

Pupa: The earthen cocoon is closely-spun, giving it a heavier and more substantial appearance than is usual in this family. It is found at the base of the foodplants. The pupa itself is of a pale yellowish or reddish shade. Crewe states that blackish spots appear on the thorax and wing-cases some time after pupation has been completed.

Foodplants: The flowers of hemp agrimony (*Eupatorium cannabinum*), golden-rod (*Solidago virgaurea*), purple loosestrife (*Lythrum salicaria*), traveller's joy (*Clematis vitalba*), hawthorn (*Crataegus monogyna*), and bramble (*Rubus fruticosus*).

(To be continued)

S. J. PATEL (751)

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 STANTON, H. T. (1856). *A Manual of British Butterflies and Moths* (J. van Voorst).

NOTES AND OBSERVATIONS

ANNUAL GENERAL MEETING.—The Annual General Meeting of the Society will be held as usual at Caxton Hall, Westminster. The date is Saturday, April 1st, 1978. Make a note of the date now. Time and speaker will be announced in our February issue.

WICKEN FEN SWALLOWTAILS.—In spite of last year's prolonged drought which gave great cause for anxiety. I am pleased to be able to announce that the re-introduced Swallowtails on Wicken fen are holding their own and numbers of adults, survivors of last year's wild-bred stock, have been seen on the fen and eggs and larvae are about rather more plentifully than was anticipated.—

Brian O. C. Gardiner (225)

RED ADMIRALS IN SCOTLAND.—With reference to the note under the above heading on page 88 of the May Bulletin, it may be of interest to record that on September 23rd 1976 I counted 38 on Buddleias in the Scottish National Trust's Malleny Garden, Balerno, Midlothian.

In a conversation with the gardener he described to me a butterfly which he had seen in the garden the previous year, which undoubtedly was a peacock (*Nymphalis io* L.).—C. J. Gent (5382).

BRILLIANT EMERALD DRAGONFLY.—I would like to record that a young friend of mine, Graham Teakle, has successfully reared a female Brilliant emerald dragonfly. *Somatochlora metallica* (Lind.). He found

the nearly full grown larva at the end of May 1977 in a small pond which is situated in the middle of a wood not far from my house in Farnham, Surrey. The adult dragonfly emerged in the early hours of 9th June 1977.—D. H. R. Keen (3309)

AN AMOROUS CECROPIA.—1977 has been a good *Cecropia* season for me. My first cocoon emerged on May 20 and attracted a wild male on May 21. Then a cool snap interrupted the emergencies. On June 4 things got back into high gear again, with my females attracting an abundance of males. In fact a crippled female that I had overlooked in my emergence cage attracted six wild males on June 14. My star performer however was a female that emerged on June 10. A wild male was attracted to her. I put the mating pair into a sleeve and left them there the following day. A social function prevented me from releasing the male, as I needed some more ova and did not want to release the wrong one in the darkness. I did notice however that they had separated. Imagine my surprise when I went to the sleeve the next day and found only about 6 ova, and the moths were mating again! This time I released the male when they separated after another full day.

The female did not lay any ova that night and I released her the following night, when she at once assumed a calling posture! I looked for her the next day, but she was gone. I never saw my female again, but I assume she had a satisfyingly short life even if she never did lay her ova.—Chris A. Young (5236).

COMMENTS ON CONCERNING BRITISH BUTTERFLIES

We have received three replies in response to some of the queries raised in the above article (*Bull. amat. Ent. Soc.* 36: 15-18). We thank our correspondents and publish two below:

HAIRSTREAKS—

I was interested to note Brian Gardiner's assertion that of the two Hairstreaks, Black and White-letter, "the one flies high, the other low". He did not say which! However, in 1976 I watched Black hairstreaks (through binoculars) flying round the top of oak trees while others of the same colony sat or flitted around the blackthorn at chest height. On the other hand, I saw White-letter hairstreaks feeding on blossom at chest height while others sported high up on the elms!

Most literature tells us that the Grayling, the Purple hairstreak, and the Holly blue rarely visit flowers, but there is a Devonshire station where all three regularly feed on Hemp agrimony and Buddleia.—A. Archer-Lock (5787).

BIBLE MOTHS—

In the Bible there are in fact twelve references to moths and damage therefrom, according to "Youngs Concordance".

Eleven appear to refer to the Clothes moth or its larva (*Tinea* sp) but one, Job 28: 18 might well be a reference to a species of Silk moth. "He buildeth his house as a moth, and as a booth that the Keeper maketh." Could this be a comparison to a cocoon?

Early pictures of butterflies are more difficult, yet there appear to be three unidentified species on a fragment from a Theban tomb, titled "Hunting with the boomerang" reported to be from the reign of Sethos I in the nineteenth Dynasty.—Cyril Youll (4510).

WELCOME

A new Entomological journal has joined the field. This is "antenna" being the Bulletin of the Royal Entomological Society of London and it replaces their former Proceedings C. Edited in a lively and entertaining style by Peter Hammond it is to appear quarterly. The first number includes a beautiful colour plate of the painting by Brian Hargreaves which the Society presented as a Jubilee gift to its Patron, Her Majesty The Queen. The subject is, appropriately, the Lepidoptera in the garden of Buckingham Palace.

The intention of this new Bulletin is to give news of Entomological doings. This purpose it appears to fulfil adequately. Besides reports of meetings that have been held, there are accounts of Entomological doings in Research Stations and a diary giving details of forthcoming major entomological events. These include a useful section pointing out changes in the British insect fauna. There is a stimulating and amusing opening preface by Miriam Rothschild. We wish "antenna" every success.

INSECT COLLECTING AND ACCESS TO FORESTRY COMMISSION LAND

Entomologists have for some time appreciated the variety of insects that occur in woodlands managed by the Forestry Commission. However, it does not appear to be generally known that a permit to enter particular Forestry Commission areas to collect insects must always be obtained beforehand, usually from the local Commission office. (The address is in the local telephone directory.)

Permission will normally be given by the Forestry Commission for most forests and woodlands provided that the applicant agrees to observe the "Code for Insect Collecting" laid down by the Joint Committee for the Conservation of British Insects.

There are, however, certain areas where permits must be strictly regulated and in others where permits may not be available due perhaps to the prior rights of others, leasehold arrangements of the property, forestry operations or where conservation or wildlife studies are being made. Permit holders will find that in most cases their authority to enter is quite specific.

The Forestry Commission hopes that these attempts to regulate entry to its land are not misconstrued as unnecessary restriction. As forest managers the Commission is attempting to manage the whole ecosystem and not merely silvicultural aspects. In trying to maintain a balance between different claims on the use of the land the Commission also tries to prevent indiscriminate collection of insect life.

Regulation of entry in this way also goes some way towards helping us to meet another problem. The Commission, as occupier of the land, owes a common duty of care to all visitors and a duty to take reasonable steps to see that the visitor will be safe or is aware of known hazards. It is also the Commission's duty to take any reasonable steps to limit liability and lessen the risk of losses by seeking indemnities wherever possible from would-be visitors.

Regulations can be tiresome, but, because of the reasons explained they are unavoidable. Despite this the Forestry Commission is confident that its good relations with entomologists will continue.—Forestry Commission Press Notice, 1 July 1977.

Members are invited to let our Hon. Secretary know of any difficulties experienced over access to Forestry Commission property.

1st EUROPEAN CONGRESS OF ENTOMOLOGY

Following the initiative of representatives of a number of European Entomological Societies that met in Giessen, Germany, in March 1976, the Royal Entomological Society will sponsor the first EUROPEAN CONGRESS OF ENTOMOLGY, which will be held at Reading University in Britain from 19th-22nd September 1978.

Entomologists, whether amateur or professional, are cordially invited to the Congress. Contributions concerning recent research into problems related to European entomology will be welcome, however, papers on entomological research in other areas will also be considered. It is hoped that young research workers will contribute a large part of the programme. All interested entomologists are asked to send their name and address to the above address before 31st December 1977, and they will then be sent further details of the Congress in due course.

Entomologists wishing to offer a contribution should send the title and 150 word abstract to: 1st European Congress of Entomology, Department of Zoology, The University, Earley Gate, Reading RG6 2AT, Britain, by 1st December 1977 at the latest. Contributions in English, French and German will be accepted.

It is thought unlikely that the programme will be able to accommodate all of the contributions offered, but the Planning Committee will select papers from those received by the date stated and will produce a stimulating and structured programme. Contributions will not be pub-

lished other than as preprints of extended abstracts issued to participants at registration.

It is anticipated that attendance at the Congress will cost about £50 for those booking full accommodation, and participating in all events and visits. There will be a reduction for family members and bona fide students. A sightseeing programme will be arranged for accompanying family members if there is sufficient interest.

BOOK REVIEW

HANDBUCH DER SCHMETTERLINGSZUCHT, by Ekkehard Friedrich. pp 186 including 2 col. and 16 b and w plates. 8vo; 1975 Kosmos Franckh. Stuttgart Price DM 24.00 (£6).

To those who can read German this is by far the best book ever published on rearing methods for palaeartic Lepidoptera. Detailed and well illustrated instructions are given for maintaining all their stages. There is a general biological introduction with attention drawn to those enemies to be avoided (which are illustrated), the parasite hymenoptera. Following is an account, again illustrated, of pairing cages, and in detail, how to attempt handpairing. We are then taken through the various methods of keeping and looking after the eggs, larvae, pupae. It is gratifying to see the correct methods of sending material through the post also described. We are then informed as to how to kill and record the (adult) results of our breeding.

The second half of the book takes us through the European families of the lepidoptera, drawing attention to their foibles and quirks and how to give them the right conditions. Something over 200 species are given individual attention with, frequently, their rear relatives also getting a mention. There is a brief bibliography and an index. The colour plates are a bit gaudy and the black and white ones depicting close-ups of various moths and larvae have been added to give the book more visual appeal rather than to elucidate the text. This they do adequately and may we hope the publishers will see fit to issue an English translation.

BOGG

ALPENA, JUNE 23, 1977

One advantage of my work is that I travel the entire state of Michigan, and June 23 found me in the general area of Alpena, which is almost at the top of the Lower Peninsular. Two days of less than normal sleep, and a long drive had left me fatigued, but I had bought my light trap along, and decided to use it. I left the motel with plenty of light left, and searched for a suitable locale. Along the highway all the land was conspicuously posted with 'Keep Out' and 'No Trespassing' signs. Not wanting to venture too far from my motel, I made up my mind to take the next turn off, and this found me on a dirt road with the familiar

signs on each side. Although I had passed a Dead End sign I kept going for about two miles when I came to a large ranch house. I decided to stop in and ask for permission to light trap. The owner, a Mr. Dupont, informed me that he owned 960 acres on the south side of the road. He had, by casual observation, some knowledge of Lepidoptera, especially the early stages and mainly then of the pest species. He kindly agreed to let me light trap on his property, and explained that the signs were to deter individuals who poach the wild deer, which are plentiful on his land.

I found a suitable spot, and although the ground sloped rather sharply, drove off the road. I need not have bothered, since I did not see another person as long as I was there. I set up the trap as best as possible, but it was perched rather shakily on the hood of my Pontiac. Since it was still light, I took a short walk. I noticed a large number of Monarch (*Danaus plexippus* L.) Larvae which seemed to be at a more advanced state than their relatives further south. There were also numerous species of Geometrids flying in the dusk amongst the low herbage. As I returned I noticed an animal near the car. My level of knowledge concerning N. American Mammalia is certainly not great, but there was no mistaking this Porcupine for anything else. I was considering how to get it to leave when it saw me and ambled off the road, climbed an oak and started feeding away. I'm glad I didn't stumble over it in the dark!

I turned the light on and waited. Nothing came for an hour or so, and I began to think the trip was in vain. Then a few Noctuids arrived, along with the inevitable Tent caterpillar (*Malacosoma americanum* Fab.) whose populations had reached plague proportions this year, possibly due to the warm spring. In any event mile after mile of Wild Cherry (*Prunus* Sp.) were defoliated earlier this spring. Then, about 11 p.m., the first of many *Sphinx gordius* Cramer arrived, eventually there were about a dozen flying around, unfortunately all males. One male Pine Sphinx (*Lapara bombycoides* Walker) came which escaped on the drive home.

By 12 midnight I was thoroughly exhausted and returned to my motel, my main quarry the *Imperalis pini* Mich. never arrived. Hopefully I'll find it the next time I go north.

Chris A. Young (5236).

SOME OBSERVATIONS—SPRING 1977

Following last year's hot and dry summer it has been interesting to note this Spring's butterfly occurrences. The numbers of overwintering Vanessids observed has not been encouraging. The Comma, *Polygonia c-album* L., was about as frequently seen as in other years and was the first Vanessid to visit my garden in Middlesex. The Small Tortoiseshell, *Aglais urticae* L., was quite scarce and at the time of writing in mid-June I have yet to find any webs of their larvae which are usually quite

common here. Several Peacocks, *Nymphalis io* L., patrolled the nettlebeds in early May but not more numerous than in the previous Spring. The commonest hibernating species seen was the Brimstone, *Gonepteryx rhamni* L., which I observed flying along the lanes in Surrey and Sussex on most trips in April and May. They even reached my garden, errant males, where I have not seen them before. The late frosts and generally wetter and cooler weather meant that most species that overwintered as pupae made a late emergence. The Orange Tip, *Anthocharis cardamines* L., and the Wood White, *Leptidea sinapis* L., were both very common in late May and early June in their Sussex/Surrey haunts, about a fortnight later than in 1976. The Orange Tip was also quite common in my garden and I observed a female laying on the flowers of Horse Radish in the last week in May. On a trip to the Hampshire border in the first week in June we found that the Purple Hairstreak population had exploded, *Quercusia quercus* L., as most oaks beaten had several larvae present. Normally at this time the larvae are about to pupate but many were quite small and the majority only half grown. In a wood where in the previous year we had observed the eggs of the White Admiral *Limenitis camilla* L., spattered about quite liberally, we were hard pressed to find larvae and eventually did find two, both on the same plant, which were again only half grown. Normally in this area the Meadow Brown, *Maniola jurtina* L., is well on the wing by mid-June but to date I have not yet seen one. The Wall Brown, *Lassiomata megera* L., was on the wing at the end of May here but in very few numbers which might reflect the shortage of grass in the area last summer and the large number of grass fires. One butterfly that did seem to be quite common in the garden in late May was the Holly Blue, *Celastrina argiolus* L. I observed several females laying on the flower heads of Holly growing in my garden. On the 12th June the Adonis Blue, *Lysandra bellargus* Rot., was observed to be quite common on the North Downs in one of its well-known haunts and had obviously derived a benefit from the previous summer which enabled the second brood to pair and lay, something which is often frustrated by cold and wet weather in late August and early September.

My general observation would be that the damp winter did affect disadvantageously those species which overwinter as adult insects but other species, though late, derived a benefit from the 1976 summer conditions. One surprising observation was the very large number of queen Wasps observed this Spring. One would have thought that the wet winter would have killed off many of them.

P. W. Cribb (2270).

FIG-JUICE, OR ENZYMATIC RELAXING OF LEPIDOPTERA

The following is a new and novel method to relax hardened moths and butterflies. In my country, Japan, three different methods are

currently in use. Whichever one is chosen, it is first of all necessary to place the specimens for a day or two in a vessel with sufficient moisture so that the damage of the antenna may be avoided. The three methods are: 1. Injection of boiling water; 2. Some collectors with clever fingers are fond of such a method as putting one or two drops of amyl-acetate paste or of some woodbonding glue on the basal spots of the wings, after first pricking these spots with a sharp needle and smashing the muscles of the wings; 3. Injection of the liquid enzyme which dissolves protein.

Now a useful way of using the third method is described below and is the one I use. In Japan the third method has been difficult for amateur collectors because the enzyme is difficult to obtain and the highly refined product for medical use is very expensive. Thus a substitute was searched out. It is this, namely the milky juice obtainable from both the fruit and sap of the tree of the Fig (*Ficus* sp.) which is widely grown in both Japan and Britain. If you have a Fig tree, you can utilise the enzyme for nothing. This is how I make the home-made enzyme which is powerful enough to dissolve the wing muscles of lepidoptera.

- (1) Cut into the joint of the fruit where it joins the trunk with a sharp knife.
- (2) This will cause two or three drops of milky juice to come out.
- (3) Promptly suck this up with either a hypodermic needle or other suitable form of small glass pipette and immediately (for the sap is very sticky and will gum up if left) discharge into 4 or 5 times its volume of warm water in a specimen tube.
- (4) Leave overnight in a refrigerator.
- (5) The liquid will separate into two parts, the clean and yellowish "enzyme-liquid" and the milky sediment.
- (6) Separate off the upper part by pipette or hypodermic needle and put the enzyme liquid in another small bottle. Keep this liquid in a refrigerator, then you can utilise the enzyme for a long time as required.
- (7) One or two drops injected into the thorax will show a marvellous efficiency, after half an hour, in relaxing your specimen.
- (8) In case of the separated enzyme being too strong add more water. This will be apparent by it being too sticky to be pipetted.

S. Kinoshita (5886).

A METHOD OF SETTING HEMIPTERA, HETEROPTERA OR OTHER SMALL HARD BACKED INSECTS

The usual method of setting small insects by pinning through a card into their ventral surfaces and then fixing the legs, etc., with gum onto the card, is not always easy, particularly when the legs are folded together underneath the body. The method described overcomes this

problem as the setting procedure is carried out with the insect on its back with the legs in full view.

Equipment required:

Lepidoptera setting board

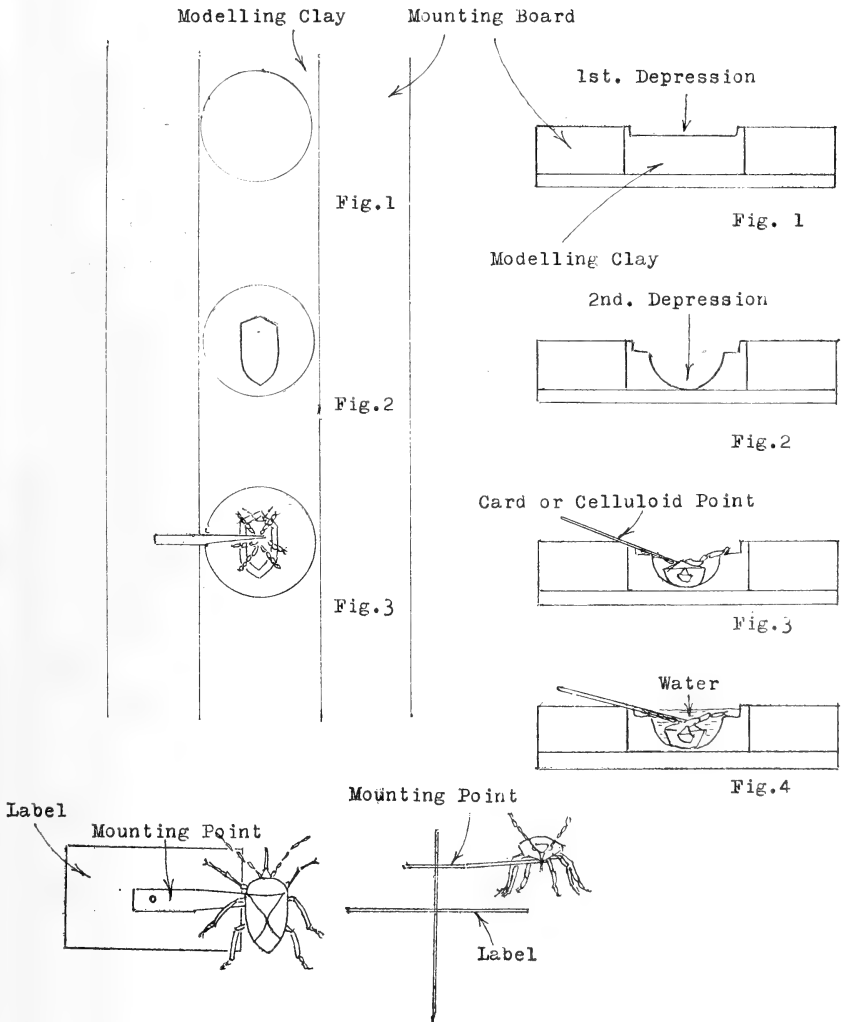
Modelling clay (Plasticene, Blutak etc.)

Water soluble gum (Gum arabic, Gum tragacanth etc.)

Water insoluble cement (Balsa wood cement, cellulose acetate dissolved in acetone etc.)

Paper or celluloid points

Setting needles, lens, etc.



Method:

A Lepidoptera setting board is chosen with a groove somewhat wider than the maximum width of the insect, when set. The groove is completely filled, flat and level, with the modelling clay and a shallow depression made in the mid line of the groove of a size and shape slightly greater than that of the outspread insect, by pressing into it a button or similar object (Fig. 1). In the centre of this depression a smaller one is made of the size and shape of the inverted insect, sufficiently deep that the legs of the insect, when set, will rest in a natural position on the rim of this depression (Fig 2). This may be done using the end of suitable articles, such as pens or pencils or shaped wooden sticks. A drop of water soluble gum is then applied to the centre of this depression and allowed to partially dry. The insect, in an inverted position, is placed on the gum and all is set aside to harden. Meanwhile other cavities may be prepared. When the insect is firmly held down by the gum, the legs can be easily manipulated into their required positions and held in place by a small drop of water soluble gum at the rim of the inner depression. When all is complete, the board is set aside until a reasonable setting time has elapsed, depending on the size and type of insect.

A card or preferably celluloid point is now prepared with a touch of water insoluble cement on its tip which is then placed on the under-surface (ventral) of the insect and allowed to set (Fig 3). This only takes a minute or two. The cavity is then flooded with water to dissolve the water soluble gum holding the legs back in position (Fig 4). As the insect becomes free, it is lifted away from the setting board by the card or celluloid point, after removing the excess of water with a fragment of absorbent paper tissue. Any remaining traces of water may similarly be removed and the mounting completed in the usual way by passing an entomological pin through the square end of the point and through a suitably inscribed label (Fig 5). The board may be used as many times as required. In the interests of uniformity in the collection, insects should be mounted on their points in the same relative way.

H. E. Wagner (5498).

OBSERVATIONS ON CARAUSIUS MOROSUS BRUNNER

I had placed some eggs of *C. morosus* in different conditions of humidity at room temperature (18-22°C) and observed if there was any difference in hatching-time for ova. The results are shown in Table 1.

TABLE 1

Humidity	Hatching time in weeks			Number	Ova
RH %	Short	Long	Normal	hatched	placed
40-50	9	15	9-12	n= 158	In a dry box
70-99	10	13	11-13	n= 11	On moist sand
100	9	16	—	n= 3	In water ¹

¹ Only 3 hatched (I had 15 eggs), 1 after 9 and 2 after 16 weeks.

CONCLUSION

It was always some that hatched early (Short), others late (Long) but most hatched at the same time (Normal).

Moist conditions seem to be bad. One reason could be that they cannot stretch out their legs in water and moulds form on the moist sand used.

Ulf Carlberg (5771 J).

OBSERVATIONS ON RHOPALOCERA IN AUSTRIA—JULY 1976

During July 1976, when most of England was experiencing the beginning of the acute drought situation of unprecedented duration, I and a nephew of mine, Christopher Orpin (a fellow Member), visited Brand (Vorarlberg) for one week with the express purpose of collecting and recording a wide range of Alpine butterflies with the full knowledge that the mid-period of July is usually considered to produce the best results, although inevitably one is bound to miss a few of the earlier Spring species. We left England's shores at Folkestone on 19th July mid-day and crossed the Channel by Sea-Speed Hovercraft to Boulogne, where we joined a coach and thereafter travelled through the rest of the day and night before arriving at our appointed hotel in the centre of Brand on the morning of the following day. During the night whilst crossing through West Germany it soon became apparent that the weather conditions had changed and low cloud and rain were upon us! Our arrival at Brand therefore, did not provide us with the magnificent views of high Alpine scenery as we had hoped. However, undaunted, we decided to explore some of the lower pasture areas close to the hotel after lunch with always the hope that the cloud and rain would lift and glorious sunshine would immediately shower us with bountiful insect life! This was not to be—I regret to report that throughout the whole of our week's holiday the weather conditions were, to say the least of it, appalling and depressing with almost constant rain or drizzle with the additional hazard of swirling low cloud and an average daily temperature of between 7° and 10°C with the exception of a brief half hour's spell of sunshine during the morning of 21st July and two hours of hazy sunshine with a warmer temperature on our last morning of 27th July.

However, despite such unseasonal weather conditions, I am happy to report that our visit was not fruitless and for this reason Christopher and I considered that an article on our observations would be of interest to Members.

Brand, itself, is in fact better known as a ski resort and lies in a broad valley (Brandnertal) running between Eludenz in the north and a spectacular large Alpine lake to the south (Lunersee) within the western province in Austria known as Vorarlberg, lying to the west of the better known Tyrol province, and is perhaps not so frequently visited by foreign holidaymakers during the summer season. The general terrain

is, of course, mountainous with extensive summer pastures to the west of Brand, which can be approached by two chair lifts. Brand, itself, is a well established cluster of hotels, chalets and small shops strung along a modern road meandering up the valley towards the Lunersee, where it ceases, and is approximately 1000 metres above sea level, but well short of the tree line, which in this area is approximately 1700 metres. It was soon apparent to us that this particular area contained largely alkaline soil, although a certain amount of acidity must have also existed in this region because there were many species of Alpine flowers present which normally would not have tolerated large quantities of chalk or limestone. I was particularly interested over this discovery, since I was well aware that the Liechtenstein Alpine region which lies close to the west of Brand, is comprised predominantly of acid bearing mountains and soil. Inevitably, therefore, we encountered certain species, which I did not record in Liechtenstein in 1974 during the early part of July of that year. (*Bull. amat. ent. Soc.* Vol. 34 p.149).

In view of the restrictions placed upon us by adverse weather conditions, we decided to concentrate our efforts by studying and collecting in an area of open summer pasture, which had remained reasonably undisturbed, at an altitude of approximately 1200 metres on the westerly side of Brand, which was easily approached by well marked paths. Little or no attempt was made to approach higher altitudes, and we were particularly disappointed that we were unable to explore above the tree line and in particular round the Lunersee. Christopher, however, on our last morning whilst there was still a little sunshine, explored a lower pasture area down the valley on the eastern side, which yielded exciting results, referred to later. Although there were extensive areas of coniferous trees lying on both sides of the valley, there were always areas of summer pasture and waste land present near at hand and there is no doubt that the whole area is worthy of more extensive exploration. It is quite possible to reach an altitude of 1800 metres or higher as well as a lower altitude of 800 metres or less, thereby affording one an opportunity of recording insect life within a broad and varied altitude range. Deciduous trees were certainly more abundant close to the river in the valley and were more widespread below 900 metres. The species we came across are described below.

Papilio machaon gorganus Fruhstorfer

During the morning and afternoon of 23rd July Christopher found eight larvae in their fifth instar and I found another in its final instar feeding on wild carrot close to ground level in a small area of summer pasture on the western side of the valley behind Brand at an altitude of 1200 metres. Christopher collected a further number of final instar larvae a day or so later in the same area. We noted that this particular locality was confined to an area of land no more than twenty metres

square within an altitude at which wild carrot appeared to be most prolific in a belt around the valley. No larvae were encountered at lower altitudes, where vegetation tended to be naturally somewhat sparse on account of hay-cutting in progress within recent weeks. All larvae found displayed the usual markings and colouration and no aberrations were recorded. It is perhaps interesting to report that the larvae which were brought home with us and offered fennel as a substitute to wild carrot, appeared to accept this plant with some reluctance and all larvae were generally very sluggish in behaviour and in the case of a few larvae pupation did not occur for up to ten days. All pupae are at present overwintering and the imagines are expected to emerge during 1977.

Pieris brassicae L.

One male imago was sighted by Christopher on our last morning at a lower altitude of approximately 900 metres in an area of rough pasture on the eastern side of the valley lying 1 kilometre or so away from Brand. Surprisingly enough this common species was not recorded by either of us on any other day during our visit, and we can but presume that the few imagines which were on the wing at that time were reluctant to appear in flight whilst the weather conditions were so adverse. In any event our visit probably fell between broods of this species.

P. rapae L.

This species was certainly more abundant, although imagines were never recorded collectively in large numbers. Both of us encountered a few roosting on top of scentless mayweed flowers during our searches in the summer pastures above Brand and in a low pasture area lying on the eastern side of the valley adjacent when the conditions were very wet and overcast. All imagines appeared to be in good condition.

Colias australis Verity

During the brief sunny spell on our second morning (21st July) I encountered one fine male in flight in the summer pasture area above Brand where most of our field activities were concentrated, and Christopher found another male imago on the last morning in the same area. We both concluded that in view of the excellent condition of both our specimens, this species was probably just emerging and appearing on the wing. The general colouration on both the upper sides of the fore and hind wings was particularly bright canary yellow and the orange discoidal spot on the upper side of the hind wings was also notably bright in colour.

Aporia crataegi L.

This species was never encountered in flight; Christopher, however, found both a male and a female roosting amongst wet meadow flowers on our first afternoon in a lower pasture area lying across the valley adjacent to a children's public play area. He also found a worn male

during a later afternoon in our more frequently visited summer pasture area on the western side of the valley above Brand. In all probability this species would have been more frequently encountered in flight in the lower pasture areas close to the river in the valley, if there had been more extensive sunshine present. Both of us marvelled at the manner in which it was able to survive in the open in such wet conditions, since the wings have but a very thin veneer of colour scales and in wet conditions this butterfly can only be described as being very bedraggled and forlorn in appearance! In any event we were both very pleased to have recorded this handsome species, which for me was my first encounter with this insect in Austria.

Argynnis adippe Schiff

This species is probably not so commonly encountered above 1000 metres in this area of the Alps, although it is found in abundance at such an altitude amongst the Alpine slopes of northern Italy, where I encountered some fine large specimens in rough pasture area above Lake Como some years ago. However, during the two sunny spells earlier mentioned I did encounter both a male and female of this species in flight and I was particularly interested to observe that they were *form cleodoxa*, which do not display the usual silvery marginal and discal spots as is the case with the nominate form. It is quite likely that *cleodoxa* is more commonly encountered in this region although this is likely to be a transitional area in which both forms are present. The general size, markings and colouration appeared to be uniform in character, although I was rather surprised to note that the female did not display dense black suffusion in the basal areas of the fore and hind wings as I would have expected.

A. paphia L.

This prize species was only encountered by Christopher quite by chance whilst he was briefly searching in rough pasture approximately 900 metres on the eastern side of the valley during our last morning before the sunshine finally disappeared altogether. He succeeded in collecting a fine female *form valesina* Esper as well as a male in good condition. In view of the altitude at which these imagines were found, we both concluded that it was perhaps unlikely that this species would have been found with any abundance at a higher altitude. However, we were very pleased that this species had at least been recorded so close to Brand and we are convinced that this is likely to be frequently encountered during the latter half of July further down the valley towards Bludenz amongst waste ground and rough pasture areas in the midst of deciduous trees.

A. niobe L.

Once again this was a species which was only encountered during the two spells of sunshine previously mentioned, and proved to be quite

abundant in the same summer pasture area in which we encountered *A. adippe* and *M. aglaia* and in fact all three species were frequently sighted together in flight. Both the nominate form as well as *form eris* and an intermediate form were found and observed. We both concluded that on balance *eris* was the most prevalent in this area. The females were particularly dark in colour with extensive black suffusion along all veins particularly on the upper sides of the fore wings. In other respects the general colouration was fuscous with a tendency to display a paler yellowish colouration towards the apical area of the fore wings. The males on the other hand displayed a brighter fulvous colouration with regular smaller discal, post-discal and marginal markings and were distinctly smaller in size. Flight pattern was also notably fast and powerful. In view of the general good condition of most imagines recorded and collected, it was clear to us that this species had not been on the wing for more than a week or so.



Fig. 1. *Argynnis niobe*, form *eris*, female.

A. aglaja L.

This species appeared readily on the wing as soon as there was any appreciable sunshine and both sexes were recorded and collected in our chosen summer pasture area above Brand on the western side of the valley. It was fully apparent to us that it tended to favour areas of pasture where there was plenty of knapweed and thistles in flower, since these provide a ready source of attraction to it. Strangely enough there appeared to be two distinct forms of the female present in this area. One form displayed heavy blackish suffusion in the basal areas of the fore and hind wings, which sometimes even appeared slightly greenish in colour, and the discal and post-discal spots were often heavily marked on the fore wings with a broad black sub-marginal band. The other form was distinctly larger in size and the general colouration was particularly fulvous and the black markings were less intense in character. Furthermore, the sub-marginal band was broken with small fulvous spots. This second form was particularly beautiful and was most distinctive in flight. The males were found to be generally in poor condition, although we did find one or two specimens which were in better general condition, which led us to conclude that the females probably tend to emerge slightly later than their male counterparts. We never encountered this species when the weather conditions were wet and overcast. The general flight behaviour was powerful and determined, although this insect readily came to rest on knapweed and thistle flowers in open stretches of pasture which afforded us the opportunity of observing them at close quarters.

Mellicta aurelia Nickerl

During the morning of 21st July Christopher found one worn female of this species, and since no further imagines of either sex was found during the period of our holiday, we both concluded that this was probably a late emerged specimen. This species is more likely to be encountered during June than in July. This one specimen was found fluttering amongst dense grass in the southern extremity of the summer pasture area lying behind Brand.

Melanargia galathea L.

This species proved to be very abundant in all pasture and wasteland area visited, and was frequently encountered resting on the top of flowers during wet afternoons as well as in flight when sunshine was present. Both sexes were recorded, and the general markings and colouration appeared to be fairly constant. Flight was particularly weak and languorous when the temperature was low and the conditions wet.

Erebia ligea L.

Apart from a couple of worn females collected by us in the upper summer pastures above Brand, this species appeared to be more concentrated in the lower pasture areas lying to the north of Brand at an

altitude of 900 metres or less, and were largely recorded by my nephew during the last morning in the same area where he encountered *A. paphia*. We both concluded that this species is the first of the *Erebia* genus to appear on the wing in July and is probably more widely distributed at lower altitudes in this region of Austria. No unusual features were recorded with this species, and it was easily distinguished from other species by the well developed white post-discal band present on the under side of the hind wings. The post-discal band on the upper side of the fore and hind wings did appear to be somewhat pale in colour due largely to the worn condition of the specimens caught.

E. aethiops Esper

This was undoubtedly the most widely distributed of the *Erebia* genus found around Brand, and although it did tend to hide away amongst long grass and pasture growth when the conditions were wet and cloudy, it readily appeared on the wing as soon as sunshine was present.



Fig. 2. *Erebia aethiops*, male.

Most imagines sighted were male, although a small number of females were also caught. The post-discal band on the upper side of the fore wings tended to be broad and brick-red in colouration. In other respects the colouration was deep velvet brown on both sides of the fore and hind wings with the small black spots lying within the post-discal band having small white pupils in the centre. There was an increased number of black ocelli present within the post-discal band on the fore wings of female imagines, and furthermore, the under side of the hind wings of female imagines tended to be two-toned in colour with a distinct greyish basal and post-discal band and a darker contrasting discal band. In view of the abundance of imagines sighted as well as their apparent general good condition we concluded that this species had reached its peak period of emergence during this mid-July period.

E. melampus Fuessly

Only three or four male imagines were collected by us in our summer pasture area above Brand during the morning of 21st July and the last morning of our holiday during the periods of sunshine. This is a small species of *Erebia* and is one of a group of similar species, which can easily be mis-identified if not caught and examined with care. This species does not display a strong flight pattern and tends to fly in a weak indeterminate manner close to the ground in hollows with dense grass and undergrowth. The hind wings have the appearance of being more developed than the fore wings to the extent that they appear to be larger and seem to protrude beyond the extremities of the fore wings. The general colouration is chocolate brown with a disconnected orange post-discal band with three or so small vestigial black spots within this band towards the costal region of the fore wings.

Maniola jurtina L.

A small number of both sexes were encountered in flight during the sunny spell on our last morning in an area of open but uncut pasture close to that in which the swallowtail larvae had been found. It appeared to us that the overall colouration of this species was paler than the insects usually found in this country. However, this fact may have been due to the worn condition of the majority of imagines sighted. It remains however, to be confirmed as to whether or not there is a local form of this species present, which does display distinctive pale colouration.

Palaeochrysophanus hippothoe L.

During the brief spell of sunshine during the morning of 21st July Christopher encountered two male imagines in worn condition which had been disturbed whilst roosting during his foray through the meadow pasture land lying to the west above Brand where so many of the recorded species were found. Unfortunately the striking purple-flushed areas of the upper sides of the fore and hind wings was scarcely

discernible owing to the worn condition of these insects. We both concluded that the date of sighting was late in the season for this beautiful species and imagines in good condition are more likely to be found from the middle of June onwards, since primarily it is one of the earliest to appear on the wing throughout Alpine regions, although the period of emergence varies according to altitude factors.

Heodes alciphron Rott.

One solitary female imago of this species was also discovered by Christopher within the same locality and once again we both concluded that this was an isolated late insect on the wing, since this species has a similar emergence pattern as that of *P. hippothoe*. It favours damp hollows and low meadow and rough pasture areas flanking mountain streams, and we were therefore, somewhat surprised to have stumbled upon it in an area of land, which was rather more exposed in nature to that of its usual habitat. This particular specimen displayed a universal deep brown colouration with a distinct series of somewhat irregular black post-discal spots with a larger single black spot in the discoidal cell on the upper side of the fore wings. The orange lunules normally present in the sub-marginal area of the hind wing upper sides, were not well defined. This may have been due largely to the fact that this particular imago was not a freshly emerged insect and the colour and markings were correspondingly less distinct in character.

H. tityrus subalpina Speyer

Within the same area in which the above mentioned "coppers" were encountered was also found one female imago of this species. This also turned out to be worn in condition, although the general deep brown colouration was intact. The female can quite easily be confused with a female of *H. alciphron* in view of their general brown colouration, and a careful inspection is required so as to avoid confusing the appearance of these two species. The sub-species status is not entirely recognised amongst some entomologists and further taxonomical study may yet have to be undertaken before positive authority is declared. I, for my own part, have always tended to treat this sub-species to be an extreme form of variety of the nominate species, which is isolated by altitude factors, which give rise to certain constant features of colouration. Within my own experience I have found that the general dividing altitude band is round 1000 meters below which the nominate form is prevalent and above which the Alpine form is predominate. Intermediate forms may from time to time be found around 900 metres or so and the boundary demarcation between the two forms varies by 500 metres or so according to in which direction the ground area faces. In particular on southern slopes *subalpinus* often does not appear until the altitude of 1500 metres is reached.

Cupido minimus Fuessly

Strangely enough only one worn male imago was found by Christopher within the same area of meadow pasture referred to above on the morning of 21st July and at no other time was this common species ever encountered. Usually it is particularly abundant during extended sunny spells throughout most of the summer months, and I have frequently found as many as thirty to forty imagines fluttering close to the ground around damp patches and pools along mountain tracks and paths throughout earlier visits to resorts in Austria and Liechtenstein. Presumably the unfavourable general weather conditions throughout the period of our visit deterred these butterflies from appearing in any large numbers, although it is also likely that our visit fell between the major Spring and Summer broods of this particular species.

C. semiargus Rott.

Amongst the various butterflies caught in particular during the morning of 21st July within the summer pasture area above Brand, we identified one female imago in worn condition. Surprisingly no males were ever sighted on that morning, and we therefore, both concluded that once again this was merely an isolated late emerged insect, since our visit was perhaps too early for the main Summer brood to be on the wing. This species is however extremely widespread throughout central Europe and I have certainly found it to be one of the most common species to be found in Alpine meadows from June through to the end of September and has been encountered up to an altitude of 1900 metres in Liechtenstein.

Aricia allous Geyer

Also amongst the batch of insects caught on the morning of 21st July was one male imago of this species, which was found to be in reasonably good condition. It differs from *A. agestis* by reason of the total lack of any orange lunules within the sub-marginal area of the upper sides of either the fore or hind wings. The markings and colouration on the under sides of both the fore and hind wings on the other hand are generally similar to those of *agestis*, although I have found the black post-discal spots on the under side of the fore wings to be often larger and better defined in character to those of *agestis*. It also appears to have more than one brood during the spring and summer months, and I have no doubt that we would have encountered more imagines if the weather conditions had been better. This is certainly not uncommon above 800 metres or so and is often found on the wing from mid-June onwards around sunny banks and areas of sparse vegetation.

Lysandra coridon Poda

Both male and female imagines of this species were found everywhere and provided us with our major clue as to the general alkalinity

of the soil around Brand. Many imagines were in fact easy to find by reason of their habit of resting on the top of a variety of flowers, in particular knapweed and thistles, whenever sunshine was totally absent. Most imagines were very torpid in such wet conditions and it was an easy task to coax an imago to crawl onto one's finger so that a careful study of its markings on the under side of both fore and hind wings could be carried out before release. Activity on the wing became immediately apparent at the slightest hint of sunshine. Most imagines were found to be in very good condition and were none the worse for their exposure to so much rain and humid conditions. Only one particular aberration was found amongst male imagines and that was *form caeca*. This particular form is noteworthy for the total absence of black spots in the post-discal and basal areas of the under sides of both fore and hind wings. It is likely that other aberrational forms could have been found in this area in view of the population density of this particular species.

Hesperia comma L.

We found this species to be as widely distributed as *L. coridon* and tended to favour the same kind of open habitat. Both sexes were in fact easily found at rest on knapweed and thistle blooms, and it was not uncommon to find more than one imago on a single flowerhead. Whilst weather conditions remained wet and overcast they were very torpid and any movement resulting from our disturbance was exercised with extreme reluctance! However, during the last morning's spell of sunshine this species became particularly active on the wing and displayed a remarkable degree of aerial agility. The markings and colouration appeared to be uniform and constant and no aberrations were recorded.

Despite the obvious restrictions placed upon us we were pleased to have recorded no less than twenty-three different species, most of which were recorded in our frequently visited summer pasture area to the west of Brand. In all probability we would have found and recorded possibly as many as a dozen other species elsewhere at higher altitudes if only weather conditions had been favourable.

I had personally hoped to have been able to photograph many insects for which purpose I had fully equipped myself; but such opportunities were few and far between, and my results, I regret to say, were not as exciting as I would have wished. I was, however, fortunate enough to be able to photograph at close quarters a freshly emerged male of *niobe form eris*, whilst at rest on a knapweed flowerhead. It is unlikely that I would have been so fortunate to photograph this insect at such close quarters, if there had been full sunshine present, since it proved very difficult to stalk up to this species even when engrossed in nectar feeding. Much patience and a certain amount of knowledge of the ground area was essential for successful results, which clearly can be most rewarding.

It is to be hoped that we will experience better fortunes another time, when we shall be able to carry on a proper sustained field study in such a beautiful mountainous country.

N. F. Gossling (5169).

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AN INTERESTING BRAZILIAN ARCTIID

Halisidota dukenfieldia Schs.

In Pernambuco, one Sunday morning in June, 1956, the rainy season have come to an end and the weather being reasonably dry, I was driving with my daughter and son-in-law from Recife to Itapuáma, 30 miles or so along the coast, for a day's fishing. At about 8.00 am we were passing through some dunes of snow-white sand covered with fresh green grass, in patches,—with Lantana bushes, and many stunted Cashew trees. Some of the latter were bearing unripe fruit, and some were in blossom. Here we noticed several black moths hovering around and over the Cashew trees. Keen amateur entomologists though we were, none of us had brought a butterfly net; so, anxious not to waste good fishing time, we pushed on.

Catching the tide at its best we had fairly good fishing, and eventually set off on the return trip. To our surprise, in the area where we had seen the moths in the morning, there were still numbers flying about. The sun was low but not yet over the horizon, and the light was good; so not now being pressed for time, we stopped and tried to capture some of these moths. This we were able to do with our still wet landing-nets (which shortly before had seen use at Itapuáma), as they fluttered about.

Their flight was leisurely, and apparently quite un-orientated. When engulfed in a net, they clung on, motionless, for a moment before attempting to escape through the large meshes. Some got out easily; but between us we secured four or five specimens.

There elongated wings are black, spanning 2-2½ inches, with extremely narrow buff-coloured borders on the outer margins of both pairs of wings, and a thin buff streak near the base of each forewing; the antennae are black. From tip of the head, on the upperside, a crimson patch runs over the central portion of the robust thorax to nearly the middle of the rather stout abdomen. The remainder of the abdomen is black except for the tip, and this is crimson. The furry sides of the thorax at the wing bases are also black, with a thin buff line curving down to the base of the forewing. Underneath, the abdomen is decorated with three tiny white dots aligned along each side, and the legs are black and crimson.

A few days later, in the Institute of Agronomy, in Recife, these moths were identified as the Arctiid *Halisidota dukenfieldia* Schs.

Though not as brightly marked or as gaudy as some other moths of

the same family, *H. dukenfieldia* are, by reason of their contrasting colours, perhaps, at least as striking as most other Arctiids.

The locality where these moths were captured had been visited by me several times previously, but I had never before seen one of this day-flying species. Neither, on subsequent visits to the same place, equipped with a suitable net, did I set eyes on another specimen.

Not until February, 1970 and March, 1972, in the Highlands of Minas Gerais, when the wet season was ending (which in that region happens in March), did I again come across *dukenfieldia*. The first sighting was in the Serra da Moeda, on a hillside overgrown with *Arnica* and ground orchids. At this spot I saw two, and netted one. The latter sighting at a place called Taboues, near Ibirité, in a green valley, with thick low secondary forest growth, and bordered by heavy forest. I captured a single specimen, of the three or four which flew past above the low vegetation. In both these instances the flight was similar, just as leisurely as in the case of those seen in Pernambuco.

Apart from the great distance—over 1000 miles—between the place where these moths appeared in Pernambuco, and where I found the others, in Minas Gerais, there is the fact that while the altitude of the first locality is no more than 75ft., the other two places are between 3500 and 4000ft. above sea level, with different climatic conditions and temperature ranges; and in each of the three localities the vegetation is quite unlike that of the other two,—all of which leaves one guessing as to the vastness of the habitat of this day-flying Arctiid moth.

T. C. Hanson.

PREDANTOR

Dinaponera gigantea Perty.

Only the female of this species, glistening black, like polished anthracite, is generally seen, and this huge female Brazilian ant has a body length of $1\frac{1}{8}$ – $1\frac{1}{4}$ inch; but if its long legs are taken into account the total length is a good deal more.

It has a powerful sting at the tip of its supple abdomen, which can be moved both downwards, and laterally, from which it can inject a considerable dose of poison. It catches insects for food. Gripping its prey with its mandibles, it swings its abdomen into position and stings it to death or into paralysed submission.

The males, as described by Dr. Paul Zahl (in the National Geographic magazine, May 1959), are “brick-red, winged, with fragile legs, wasplike, and less than half the size of the females”, and seldom leave the confines of the underground nest.

Although living in colonies, underground, these ants are solitary in habits when away from their nest, and rarely are two or more found together.

In the vicinity of Garanhuns, in Pernambuco, I have seen *D. gigantea* in roadside ditches and on pathways, nearly always following bare trails, free of grass or other vegetation, or smooth water-worn ruts. But I have also seen them amongst thickly strewn leaves, hunting for insects, possibly.

Like most kinds of ants, *gigantea* cannot stand much cold, and near-frost temperature kills them. At Garanhuns, from May to July, night and early morning temperatures drop commonly to about 4°C. At Garanhuns and the vicinity, altitudes range from 2800 ft. to 3300 ft. and I have, at times, found two or three dead specimens in the course of a morning stroll, which I think must have been caught out in the cold and perished before reaching the warmth of their underground shelters.

I have seen these giant ants in other parts, too, in the interior regions of Pernambuco, Paraiba and Alagoas. And in Pará, in 1967, while looking for beetles in and around a dank and gloomy ruined Jesuit chapel near Belém, I found a few *gigantea* amongst the leafy mould and Strangler-fig roots. This was the same place where some years previously Dr. Zahl collected male as well as female *Dinaponera* ants (described in the National Geographic magazine of May 1959). My specimens, however, were the giant females. Wise, from a painful experience when I was handling one of these ants rather carelessly, in Pernambuco, I was not stung again!

On the outer sides of the ruined walls, where the Strangler-figs were growing more profusely out of the fissures, the voids amongst the tangled roots and dilapidated masonry were occupied by numerous hairy spiders of the "bird eating" variety airing themselves at the orifices of the silken tunnels leading to their murky lairs, and while messing about there I disturbed three large snakes, which glided away silently into the "mato".

All the *gigantea* I came across in Alagoas, Pernambuco and Paraiba were at altitudes ranging from 1200 ft. to 3300 ft., whereas those in Pará were found only a few feet above high-tide level; and all were the giant black females.

T. C. Hanson (5242).

RED AND WHITE AND BLACK

Utetheisa ornatix L.

I have met with this beautiful little, 1½-inch Arctiid on a great many occasions in Brazil. It is quite common. But until a night when one appeared on my table in the saloon of a train travelling in the "Sertao" of Pernambuco, near Serra Talhada, I had never appreciated the beauty of this little moth.

The attendant had just brushed away numerous small beetles, micro-moths and other miscellaneous insects which, attracted by the lights and the white tablecloth, were filtering in from the outside darkness to the brightness of the train, and cluttering up the table, when *U. ornatix*

suddenly alighted. There was hardly time to blink before its white abdomen and hindwings were encased by its creamy-pink forewings, which covered all but the front of its pale-cream thorax. The forewings have a red costal border containing three tiny black dots. The attendant flicked it with his middle finger, but, instead of moving off, the moth shuffled and displayed its hindwings, which are white, black-patched at the outer margins, and considerably wider than the forewings. Another nudge from the attendant's finger flipped the moth over on to its back. Seen thus, the undersides of the forewings are bright red, blotched with black, and very striking, and the hindwings have a colour pattern similar to the obverse, black and white.

On recovering itself from its upside-down position, the moth fluttered off the table, into an obscure corner; and though many other insects invaded the saloon, this lone *Utetheisa* was the only one of its kind to appear. Indeed, it was the only time that I have ever seen *ornatrix* attracted to light, and although I have seen this species in many places, by the score, sometimes, these sightings apart from the single occasion in the train, were all by day.

The female is very much like the male in size and shape, but is slightly paler in colouring.

In flight, *ornatrix*, in spite of its smallness, is rather conspicuous because of the bright red underside of its forewings; in repose, however it is not so easily noticed.

While walking amongst clumps of knee-high grass on hillsides and stream banks, my movements have frequently dislodged this little moth from its resting place. In such cases, almost invariably, it has flown off weakly at a height of two or three feet to settle a short distance away on a grass stalk. Motionless in such a position, enveloped within its creamy-pink upper wings, and brightly coloured underside completely hidden, it blends with the grass stalk and is not noticed by the casual eye unless disturbed.

The larvae live inside the pods of various species of beans, wild and cultivated, which they ruin, leaving only the outer shell, but as the larvae are frequently parasited, damage caused to cultivated crops is not very serious. The moths emerge in the dry months.

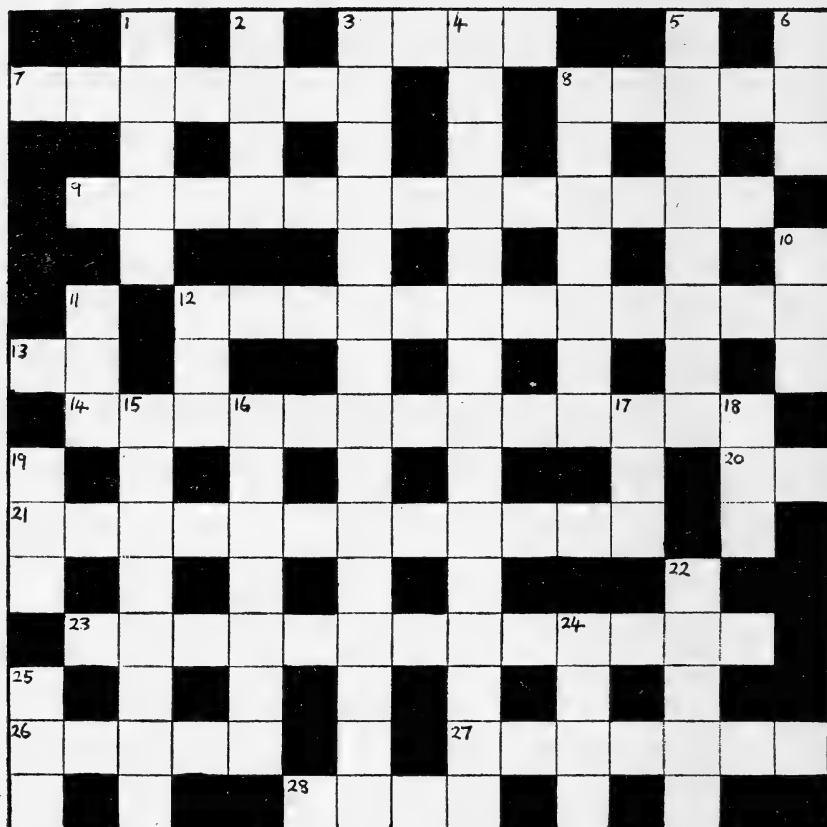
T. C. Hanson (5242)

THE AES CROSSWORD

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CLUES DOWN

- | | |
|----------------------------|--------------------------------------|
| 1. Colourful carabids (12) | 9. Anopluran genus (9) |
| 2. Skeletal (9) | 15. Long-winged papilionid (4) |
| 3. Lacewings (10) | 17. Hereditary unit (4) |
| 4. Eats insects (13) | 18. <i>Bembix</i> (Hym.) habitat (4) |
| 5. Micro family (6) | 22. Specific peacock (2) |
| 6. Cuckoo spit (8) | |



CLUES ACROSS

- | | |
|---|---|
| 7. Family of parasitic hymenoptera (13) | 16. Genus of tropical butterflies (6) |
| 8. Suffolk thunderfly (5) | 17. A Cecidologist would study this (4) |
| 10. Meloidae are beetles (3) | 19. Net-spinning genus of Symphyta (4) |
| 11. Trees threatened by a Scolytid carried fungus (3) | 20. Salamanders and Newts (7) |
| 12. . . . pteran or termite (3) | 21. Eggs of 9 down (4) |
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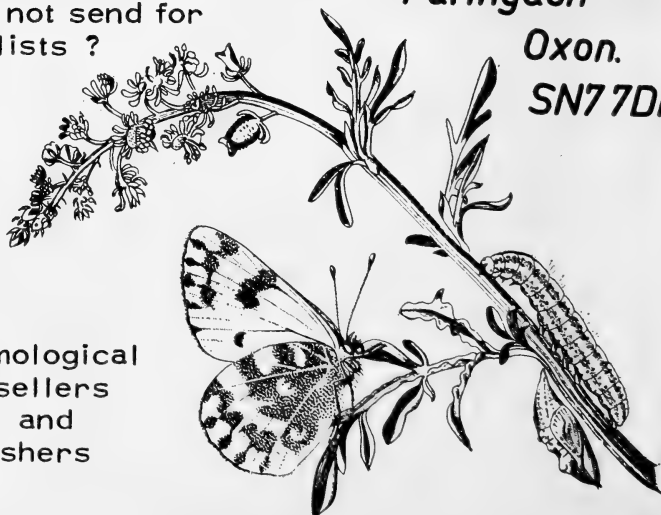
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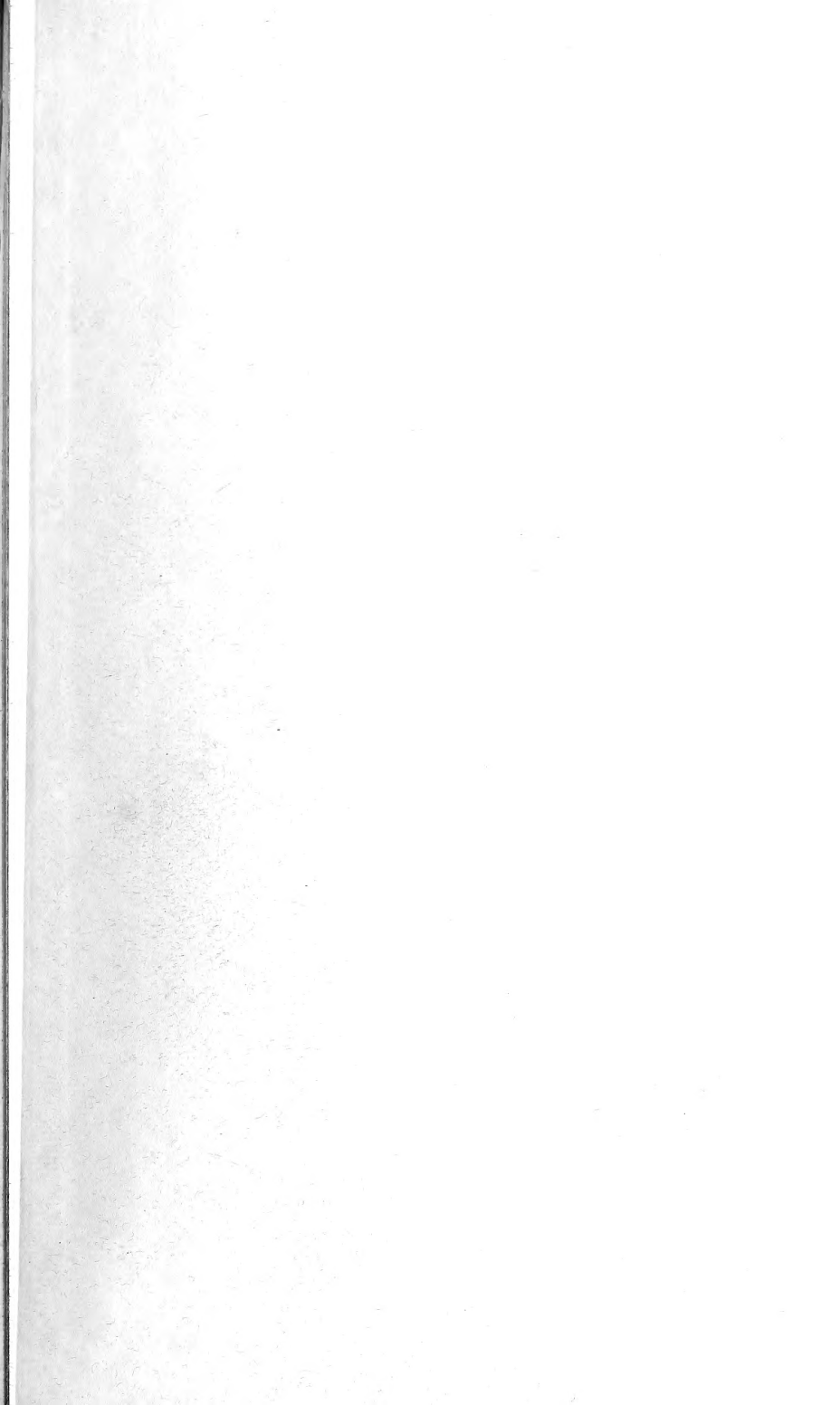
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