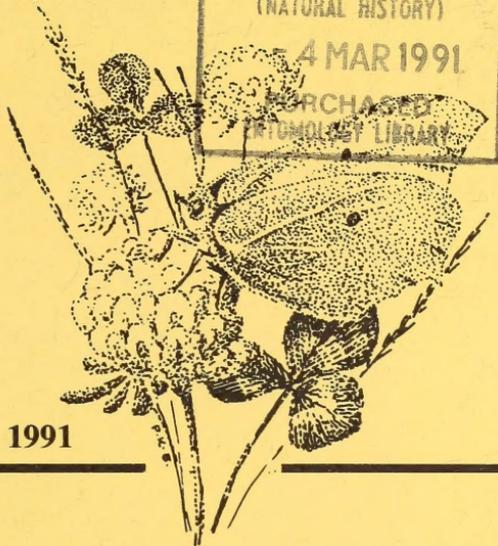




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The Bulletin of the Amateur Entomologists' Society

EDITOR

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

The Amateur Entomologists' Society

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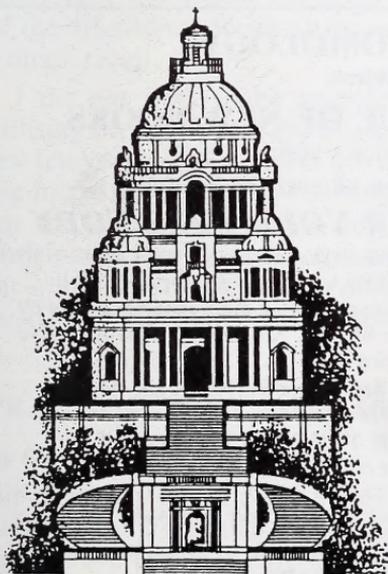
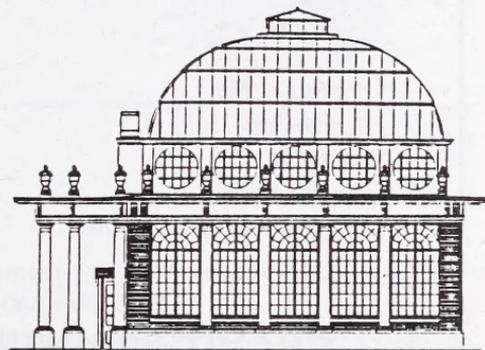
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AES BULLETIN

No. 374



LETTER TO THE EDITOR

Dear Brian,

I wish to express my complete support for the opinions voiced by Paul Batty in the Letter to the Editor (*Bulletin 49*: 137)

It is a pity that the one major service provided by our Society in which any member can actively participate, namely the Wants and Exchange List, is to be used as a source of revenue. Clearly the increase in rates for advertisers wishing to sell items will result in both a reduction in the use of the list and no doubt an increase in the prices of the goods on offer as a direct result.

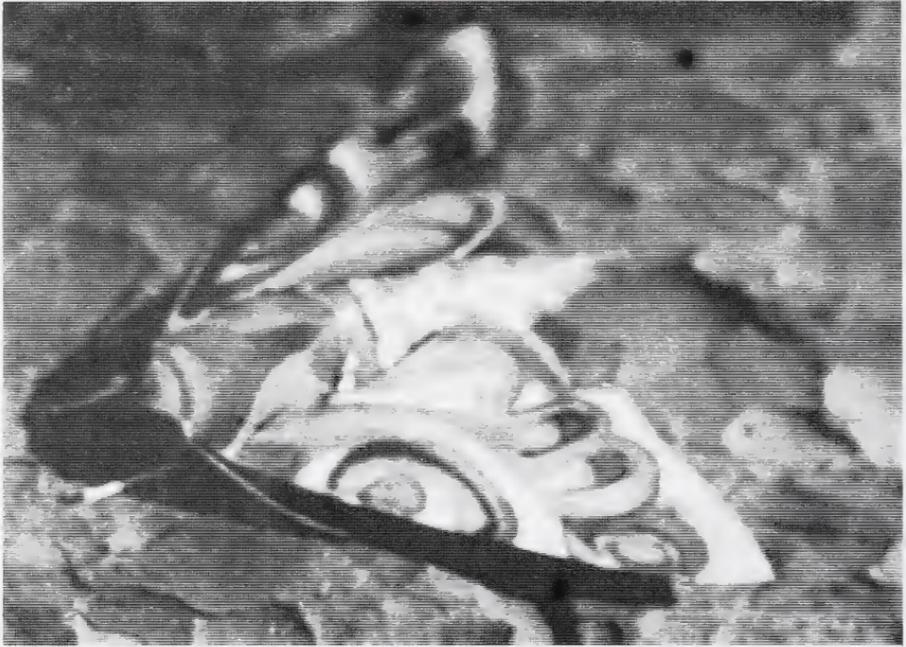
I do not wish to be ungrateful having personally benefitted from utilising the services of the list, possibly more than anyone else during the last ten years, at what have obviously been token rates. However, due to the increased cost of advertising, presumably resulting in more expense for the customer, perhaps now a higher standard of service could be anticipated. For instance, can advertisers expect a refund in the event of the non-appearance of their advertisements? And surely members could be offered some form of guarantee of trading terms and conditions?

Yours sincerely, Martin White (6003)

PRACTICAL HINT — SUGARING

by Christopher Nissen (7002)

When *sugaring* it is a good idea to add granulated jelly or cube jelly to make the mixture stick and to aid fermentation; yeast may also be added just before use, but care should be taken in storage as it is explosive. Posts on sand dunes can be productive. Apply the sugar on the side sheltered from the wind. Moths may be searched for, not only on the sugar itself, but also on other sides of the post away from the sugar. It is a good plan to sugar the same trees or posts every night.



ASUNTA'S HAWKMOTH — A NEW SPECIES?

by Leigh Plester (2968)

A Finnish friend of mine, Markku Asunta, spent some time in Cyprus in the early 1960s. One of his colleagues was a keen amateur entomologist whose enthusiasm respected no bounds. After listening to interminable accounts about how this rare species or that had found its way into the bug-hunter's impressive collection, Markku — himself a keen naturalist — decided that if it was that easy, he'd have a go himself.

Towards the end of his stay, he turned up a specimen illustrated, photographing it just before his colleague arrived with the inevitable killing bottle.

As nobody seems to have identified the specimen, I tentatively suggested that Markku name it himself, after contact with our local natural history museum, of course. In view of the time of year associated with its appearance, we feel that, failing recognition by AES members, the species could be most fittingly named *Daphnis vernalis* Asunta, type locality Cyprus.

IN PRAISE OF SUGARING

by *S.J. Patel (751)*

Very little seems to be written these days about sugaring. I hope that this — to my mind the most exciting method of collecting for the moth enthusiast — is not a dying art. But somehow, rightly or wrongly, I seem to have gained the impresssion over the last 20 years or so that very few entomologists these days go in for sugaring. If this is true, then it is a great pity; but I hope I am wrong. . . .

The few entomologists who still employ sugar, at least on occasions, all seem to belong to the old school of long-time enthusiasts such as myself. I have yet to meet a young student, or even an adult beginner, who has ever used sugar. Incredibly, a few of the younger ones aver that they have never heard of it!

The ignorance displayed by the lay public is amazing. “Don’t the moths get spoilt sticking to the sugar? How do you get them off?” is typical. “Do you just use ordinary sugar such as one puts in one’s tea? How do you get it to stick to the tree?” was less typical but vastly more amusing. The mind boggles.

More to the point are the questions asked by younger, less experienced entomologists. “Do you get females as well as males?” “Do other insects besides moths come to sugar?” “Do butterflies ever come in the daytime to sugared patches left from the previous night’s operations? These last three queries at least have a basis in reasonable thinking and are worthy of consideration. Let’s take the first one.

From my own records, I have obtained males and females in an approximate ratio of 40% to 60%. In other words, three females for every two males is about average, unlike light, which normally attracts more males (though there are some notable exceptions). It would seem to me that females are attracted to sugar because it is a kind of fast-food source, and females need adequate nutrition to enable them to produce plenty of viable ova to perpetuate the race.

Most female moths mate soon after emergence, and the odds are that if you take females at sugar they will already have been impregnated. A virgin female is more interested in getting pregnant than looking for nourishment. Then, and only then, will she look for a source of nutrition to boost her energy for egg-laying, be this honeydew, flower nectar, or your conveniently-sugared trees.

To take a second question, the other insects do visit the sugar patch, although normally these form a tiny minority compared with the moths. Earwigs are the main “other order” visitors, with the odd occasional beetle. Among non-insects, slugs are by far the most numerous group; a few snails also sometimes join them.

Toads and hedgehogs are not infrequent visitors, but not for the sugar itself; what attracts them are the fat moths that fall to the ground, replete with the intoxicating bait. Unlike the entomologist, the toad or the hedgehog will not care one whit whether the meal consists of *Xestia xanthographa* or *Eurois occulta*. So it behoves you to get there before he does.

I once had an experience I would not have believed unless I had seen it for myself. A moth larva came to sugar! This was a fully-fed larva of the Lackey moth (*Malacosoma neustria*). I was so surprised that you could have knocked me down with an entomological pin. This close encounter of the unusual kind occurred while I was sugaring some trees at the edge of the marshes near Burgh Heath in Norfolk in 1980.

A correspondent has suggested that the larva was not attracted by the sugar but was looking for a pupation site. I am more inclined to think that it may have been dislodged from the twig it had been on by the wind, and was making its way back again from the ground, since it was climbing purposefully up the tree at quite a respectable speed. This species spins a cocoon among the leaves, which it was probably ready to do.

As to the third query — butterflies visiting sugar patches in the daytime — this has never happened to me, but I do remember reading an account *in litt.* of a Red admiral (*Vanessa atalanta*) seen feasting at the remains of a sugar patch on a tree trunk that had been sugared the previous night.

If you have never gone sugaring, it is an experience you will never give up once you have tried it. It beats all other methods of collecting into a cocked hat. You never know what is going to turn up as you light your lamp or switch on your torch and make your round of the sugared trees. One cannot adequately describe the thrill of catching for the first time some moth which, while it cannot be described as a rarity, has eluded one completely for, perhaps, 30 years of more. It is also very exciting indeed on a “good” night to watch twenty or more moths jostling for position round the edge of the patch, being careful to keep their feet daintily outside the perimeter of the sticky banquet while they extend their tongues to imbibe the goodies that the entomologist has so thoughtfully provided, their jewel-like eyes glowing like rubies in the light of the lantern. No matter that they are only *pronuba* or *meticulosa* — they make a fascinating sight and one that you cannot see any other way.

Sugaring is good fun too, especially if you go with a companion and share a flask of hot coffee and sandwiches about half-way through the night's results, or weave fantasies about the *Catocala fraxini* that *might* turn up (you should be so lucky!). All around you is an eerie world of

dark woodland shadows, the soft scufflings and squeakings of little night creatures, the call of the tawny owl, the bark of a dog fox. You will see that I haven't mentioned anything about romantic moonlight; that's because moonlit nights are not, as a rule, any good for sugaring. Choose an overcast night, and the higher the humidity the better; this would seem to be more of a contributory factor to success than high night temperature. Avoid very windy nights, but a light drizzle will not stop the moths coming to the feast; in fact it seems to stir them into activity. It is best to sugar at the edge of a wood rather than in the middle, unless there are some broad open rides.

Another thrilling — and sometimes frustrating — experience is to have some gorgeous beauty attracted to the light of your lamp. You have spied one of the special *desiderata* at the sugar patch and are just fishing a glass-bottomed box from your haversack or anorak when — wham! — a large and obviously pregnant female of an equally desirable species flies straight to your lamp. What to do? If you put the lamp down while you box the moth at the sugar, you cannot watch both at the same time, and the lamp-attracted specimen is as likely as not to circle once or twice round the light and then flutter off into the blackness of the surrounding wood. OK, so you've boxed the other one safely; do you now stand around waiting for the second one to come back? If not, and you carry on with your sugar round, you keep thinking about the one that got away . . .

Now that I've given you some idea of the joys of sugaring, what about a recipe for the magic brew? It's simple — there's no mystique about it. Closely-guarded recipes and "secret formulae" are all a lot of hogwash. All you do is take a pint of the darkest brown beer or stout (I use Newcastle brown ale), put it in a large saucepan and bung in a pound of dark Barbados sugar (obtainable in any supermarket) or molasses (from a health food shop) if you prefer. If you think the mixture is too thin, add more sugar. Fowler's black treacle is also a good ingredient, and if you use this instead of sugar you will have no problem about the mixture being too runny. Remember that it has to end up with a consistency that will enable it to stick to tree trunks without seeping into the bark or running down to the ground.

Now stir well and bring to the boil. When it boils, reduce the heat so that it will not fizz all over the stove, as it is very apt to do, but keep it on the boil for a few minutes. Then let it cool and divide it into tins or jars of a convenient size to take with you (with a two inch paintbrush) on your forays into the woods.

The proverbial tot of rum (or amyl acetate if you prefer) is added just before you go. On no account cook it with the mixture or it will evaporate into thin air. Should you just happen to have any overripe fruit, fermented jam or suchlike items, you can add them to the witch's

cauldron (after putting them through the blender) while it is bubbling. The sweeter the stuff and the stronger the pong, the more moths will be attracted.

The longer you can keep your stock tins or jars of sugar the better. I once made up a batch and put the tins on the top of a high cupboard, where I promptly forgot all about them. I suddenly rediscovered them — five years later. Boy, that was the best night at sugar I have ever had (Grendon Underwood, Bucks, 1947). So now I make up batches well in advance, though they are not perhaps kept quite so long.

The procedure is simple enough. Go into your selected woodland area at dusk, so that you can still see and choose individual trees. Large trees seem to produce better results than small, spindly ones. Paint a strip of sugar on the most sheltered side of the trunk from about head height to about four feet from the ground, the strip being about a foot wide. Sugaring is a sticky business, so wear your oldest clothes and take a plastic bag to put your brush and empty containers in afterwards to take home. To keep one's hands clean for boxing moths, using plastic disposable gloves is a good idea.

Children are fascinated by sugaring — if you'd like to start them up with an interest in moths, this is as good a way as any. Any females can be kept for eggs so that the children can rear the larvae and get to grips with the life-histories of the various species.

Good brewing!

ENTOMOLOGICAL CLUB GRANTS AND THE VERRALL SUPPER

The Entomological Club has a small income from investments and through the generosity of members attending its annual Verrall Supper. Grants are made to assist entomologists studying British insects. The Club would need to be satisfied that the line of work would lead to publication and that it is not fundable elsewhere. Grants would not exceed £200.

Applications should be addressed to Claude Rivers, The Entomological Club, 17 Cumnor Rise Road, Oxford OX2 9HD.

The Entomological Club organises the Verrall Supper in memory of a former member. It is held on the first Wednesday in March and invitations are sent to members who have subscribed in previous years. Entomologists interested in attending the Supper should write to Prof. H.F. van Emden, Verrall Supper Secretary, Reading University, Dept. of Horticulture, Earley Gate, Reading, Berks RG6 2AT.

ENJOYING THE GLASGOW AREA

by Frank McCann (6291)

On 6th May 1989 I went with three friends on a walk to Drumpellier Park near Coatbridge. We took a tape recorder to record bird song in woods on the way there, and in the park itself. I took my butterfly net and a killing jar as well.

At Drumpellier Park I netted a male Orange-tip butterfly my friend Joe had noticed flying at the edge of the sloping wood, just above a small marsh which lies at the southern end of the wood. He said he saw a butterfly with "red" on its wings. I looked at it as it flew past me and saw it was not red but *orange* on its wings.

I chased after it, to the edge of the marsh and netted it at the second attempt amongst some dead grasses.

This was the first Orange-tip I have seen, and I was excited at the prospect of catching one, as I did successfully. It was a male, in perfect condition. (Editor's note: the Orange-tip has only fairly recently re-colonised its old habitats in Scotland, where it had practically disappeared by 1900. The first week of May is also an exceptionally early date for the area.)

Catching that butterfly certainly was the highlight of my day. My other friend Edward had recorded some good birds on tape, and Terry enjoyed the day out, with the rest of us.

Earlier in the park I had netted a Green-veined white butterfly along a woodland path near the centre part of the park.

About a week later, I netted another Green-veined white on a grassy area behind my house at Langbar Path. This butterfly had more white, and blacker veins on its wings than the one from the park. That one is more of a rich cream colour and the black veins less pronounced, on the upper side of the butterfly.

I was out walking to the east of the housing scheme of Easterhouse and there is a small birch wood on the right hand side of the country and I had found Iron prominent larvae there two or three times. I found one on a birch tree there around 1969 and another about 1972. They were both full-grown and very nicely marked. Later in May I went into the same wood to search for more but didn't find any.

However, about half-a-mile further east on the road to Townhead-Coatbridge, I stopped at a place on the left-hand side road near to Woodend Loch, which is across the road from Drumpellier Loch. I searched some hawthorns for Grey dagger larvae with no success, then I collected blackberries at the same place. I noticed a rather large sawfly

tree and a birch tree growing together just behind the roadside fence. I looked up into the birch tree's lower branches — it was a fairly large birch — and spotted a Prominent larva resting on the underside of a leaf. I detached the leaf and larva and put them into my small jar which I carry for the purpose of keeping larvae.

Then I found another one about the same size as the first, around the tree a little bit. I took them home and identified them as Iron prominent larvae and they were in about their third instar.

Towards the end of June 1990 I found on a hornbeam tree near my house, three larvae of the Vapourer moth. They were small, probably first instar. The hornbeam trees grow about 20 yards apart along the grassy centre of the dual carriageway of the Edinburgh Road. I had introduced this species as newly-hatched larvae which I had obtained from Sussex as a batch of eggs around 1980.

I hadn't found any larvae of the species since then, until now, although I did find a male in September 1982 at the housing scheme of Carnhill just north-west of my house. The hornbeam tree where I found the larvae is roughly south-east of the house. Later, when they had grown a bit, I released these three larvae onto a birch tree in my garden. The largest one — which will probably be a female moth — looked very beautiful as I placed it amongst the birch twigs and leaves. It is good to see such lovely caterpillars so close to home.

On 30th July 1990 I was again out at Drumpellier Park at its southern end. I was confident of finding Grey dagger larvae, as I'd found them there before. However, I couldn't see one caterpillar of any description whilst searching hawthorn hedgerows and trees in and at the edge of woods. I did catch two Meadow brown butterflies, but I wasn't really bothered about them. There were plenty of Meadow browns about, and Tortoiseshell, and various whites.

At around 6.30 pm I left the house in Langbar Path to go for an evening walk taking with me a small jar in case I came across any larvae. I walked along the middle grassy lane of the Edinburgh Road. I searched the leaves on the trees there which are predominantly hornbeam. Looking maybe to find more Vapourer moth larvae, I found a couple of larvae on the same leaf of hornbeam. One was a small larva of the Grey dagger moth and the other was a small Coxcomb prominent. These were the two species which I'd hoped to find earlier in the day, at Drumpellier Park.

The hedgerows at East Hallhill Road where these two species were common, have been removed along the entire length of the road owing to development of the land for houses, which are now being built there.

Another lost habitat. It was good to see a Coxcomb prominent nearer home, only to the west of the house instead of east.

The Grey dagger was on the underside of the hornbeam leaf, and the Coxcomb was on the edge. There had been a heavy shower of rain in the afternoon, but the leaves on the hornbeam were dry in some parts of the trees.

On Saturday 11th August 1990 I found a Knotgrass caterpillar at the roadside near Balgray Reservoir, Barrhead, Renfrewshire. I was coming from the reservoir with a friend along a rather busy road and I noticed the larva on a thistle plant on the left hand side of the road.

It was nearly full grown and is nicely marked. It is feeding in a container with thistle leaves, also ribwort plantain and bramble. I had been looking at plants such as meadowsweet etc, hoping to find larvae whilst fishing at the reservoir with friends.

It says in P.B.M. Allan's *Larval Foodplants* that the Knotgrass feeds on "various herbaceous plants" as well as a list of main foodplants and thistle is not mentioned as one of these. The thistle was growing near a hawthorn hedgerow along with stinging nettles, grasses, etc. I collected the other plants to feed it on — i.e. ribwort plantain and bramble, lower down the road at Barrhead.

BOOK REVIEW

The Management & Welfare of Invertebrates in Captivity Edited by N.M. Collins. Pp.(iv) + 90, illustrations, A.5. paperback. The National Federation of Zoological Gardens of Great Britain and Ireland, Regents Park, London NW1 4RY. Price £5.50.

This publication is the proceedings of a conference held on the subject in December 1988 and for anyone who keeps, or is proposing to keep, any invertebrates in either large or small numbers it is a mine of information on all aspects of the subject.

While this is not a complete guide to the rearing of any invertebrate, or even a select few of them, it covers many aspects of the subject which we have not seen mentioned in the many hundreds of articles concerning rearing and which are scattered over numerous publications. In particular over the past few years the huge upsurge in interest in, and demand for large quantities of invertebrates for research, hobby interest, Zoo displays and as foodstuffs (perhaps the largest use), has attracted the concern of legislators, with the result that there are now a number of Acts of Parliament and other regulations with which any breeder of invertebrates must now concern him or herself and this publication discusses some of the aspects of this. Most of this legislation, some of it un-noticed and obscure, it is pointed out, remains to be tested in the

courts. Also discussed are the problems that can arise through disease and the difficulties that can be encountered when rearing in tropical situations.

The speakers involved in the conference whose talks are here published are all experts in their field and are actively involved in the subjects they discuss. They include those in charge of Butterfly Houses, Zoos and Commercial firms involved in producing thousands of insects per week.

Many AES members will have visited one or other of the many "Butterfly Houses" that are now scattered around the world. Of interest to them, therefore, will be the chapter by Dr Gordon Spiers on how these are managed; their problems, aims and relations with other organisations. A further chapter by Gareth Ireland discusses the role of education played by some of the butterfly houses, particularly that at Stratford-on-Avon.

Although not specifically involved with insects, the chapter on aquatic invertebrates gives a good insight into the management of aquaria. Aquatic insects, and the rearing thereof, is a subject very rarely touched upon, but one which needs to be given more attention.

It is worth quoting the summary of the chapter on management of terrestrial invertebrates for display in Zoos, for this gives the current thinking on the subject:-

"This paper provides an insight into the author's (Lynne M. Collins) current thinking on ways to exhibit invertebrate animals in more natural surroundings. The contention is that too many displays subject invertebrates to unsuitable conditions, simply in order that viewing by the visiting public may be facilitated. It is important to develop captive breeding techniques so that zoo collections may be self-sustaining, and not dependent upon dealers in wild-caught specimens as is so often the case at present. Keepers of invertebrates must be rigorous in improving standards of practice, always seeking to improve our knowledge of the needs of these animals."

Dr David Wise, whose firm produces nearly half-a million crickets and some 7,000 locusts *per week*, discusses the ins and outs of such a commercial enterprise and how costs and rigid adherence to a known regimen must be controlled to ensure profitability.

The rearing of Agricultural pests is discussed by Dr David Twinn and aspects of disease by Claude Rivers. There are also chapters on research and conservation, while Margaret Cooper discusses the legal aspects of keeping, rearing and collecting, a subject of which we all now need to be aware.

In a booklet such as this, covering so wide an aspect of the subject, details are brief and to the point. Nothing is covered in depth, but many

references from which full accounts can be obtained are cited. In essence this publication shows the current thinking on the subject and while it is clearly biased towards the *largescale* rearing of invertebrates, be it of one or two species, or a multitude, anyone who is interested in zoos, conservation, legislation concerning invertebrates, or the rearing of more than the odd caterpillar or so, will do well to have a copy for information.

Brian Gardiner

IDENTIFICATION PROBLEMS WITH *COLIAS HYALE* (PALE CLOUDED YELLOW BUTTERFLY) AND *COLIAS ALFACARIENSIS* (BERGER'S CLOUDED YELLOW BUTTERFLY)

by Andrew Wakeham-Dawson (9379)

I would be most grateful if members of the AES could assist me with some problems I have encountered while trying to differentiate between *C. hyale* and *C. alfacariensis* (= *australis*). This July I caught what I believe to be two male and a female *alfacariensis* at Mosset near Prades in the French Pyrenees. The butterflies were flying fast over dry meadows (1200m). The upper surface ground colour of the males is lemon yellow and the grey basal suffusion on the forewings is restricted to the *Sla* area of the wing below vein 1 in both the males and the female. One of the male specimens, however, shows some of the characteristics listed in Higgins and Riley (1980) as being more consistent, though not exclusively so, with *hyale*; namely extensive dark forewing apical markings and hindwing submarginal black markings. No doubt there is much variation within both species and in a population of only two specimens any differences are going to appear exaggerated.

Upon my return to Sussex I chanced to see several Clouded yellows (*C. croceus*) on the South Downs above Lewes between the end of July and middle of August, though not as many as in the excellent migration year of 1983. I also saw two Pale clouded yellows: one at Cooksbridge near Lewes at the base of the Downs on 3.08.90 and one on Lewes Racecourse at the top of the Downs on 5.08.90. Both were flying over wild flowers. Unfortunately I did not have a camera or a net and though I studied the resting butterflies and decided that they were *alfacariensis* because of their bright yellow colour, I cannot be sure that they were not *hyale*. I would be most interested to hear from any members of the AES who have seen *hyale* or *alfacariensis* in this region of Sussex during 1990.

Such information would perhaps enable me to make a more informed guess as to which of the two species I saw.

REFERENCE

Higgins, L.G. & Riley, N.D. (1980). *A field Guide to the Butterflies of Britain and Europe*. Collins, London. Fourth Edition.

THE *COLIAS HYALE/ALFACARIENSIS* IDENTITY PROBLEM

by P. W. Cribb (2270)

The problems in the identification of these two species are such that it is probable that collections hold many incorrectly named specimens. The separation of the two species is relatively recent. This was achieved initially by breeding and, in my opinion, this is the only certain way. The larvae of the two species are quite dissimilar and the foodplants differ in the field. Despite what is stated in Higgins & Riley, *hyale* is a trefoil feeder, using clovers and lucerne, while *alfacariensis* is a vetch feeder using *Hippocrepis*, *Coronilla* and *Astragalus* species. Richard South figures the larva of *hyale*, using a drawing by Hübner, which is clearly *alfacariensis* and on its correct foodplant, *H. comosa*, so it is clear that South had not seen the larva of *hyale*. The imagines of both species are very variable, both in ground colour and dark markings though fresh males of *alfacariensis* are often very yellow. *C. alfacariensis* is widespread in France and Spain, so that many of the earlier records of *hyale* may in fact have been *alfacariensis*. *C. hyale* is an eastern species which migrates into western Europe and it is encountered much less often, as anyone who wishes to breed the species has discovered.

Higgins, in *The Classification of European Butterflies* (1975), shows that there is a structural difference in the male genitalia where the valves have a diagnostic feature, though he admits that the differences may not be sufficiently constant to be totally reliable.

Breeding would therefore seem to be the best answer to the problem. I am sure that if we were able to breed successfully many of the European species, more new species might come to light. I found out some years ago that while the larvae of *P. apollo* from most localities have red spiracular spots, those in some of the Alpine localities have bright yellow ones. In identification and classification all stages of an insect should be considered.

(Editor's note: For a *raison d'être* of the use of the name *alfacariensis* rather than *australis*, together with a detailed description and genitalic differences between these two species, see *The butterflies of Great Britain & Ireland* edited by Maitland Emmet and John Heath (Harley Books, paperback edition 1990). According to Berger writing in 1948 (*Entomologist* 81: 128) the specimens depicted on Plate 21 of Richard South's *The butterflies of the British Isles* as *hyale* are in fact *alfacariensis*, as are those depicted as *hyale* race *calida* on Plate 40 of Roger Verity's *Rhopalocera Palaearctica*. He goes on to say that we have to turn to figures 3-5 on Plate 26 (misprinted 25 in *The Entomologist*) of E.B. Ford's *Butterflies* to find true *hyale* illustrated. No wonder that two species have been so confused!)

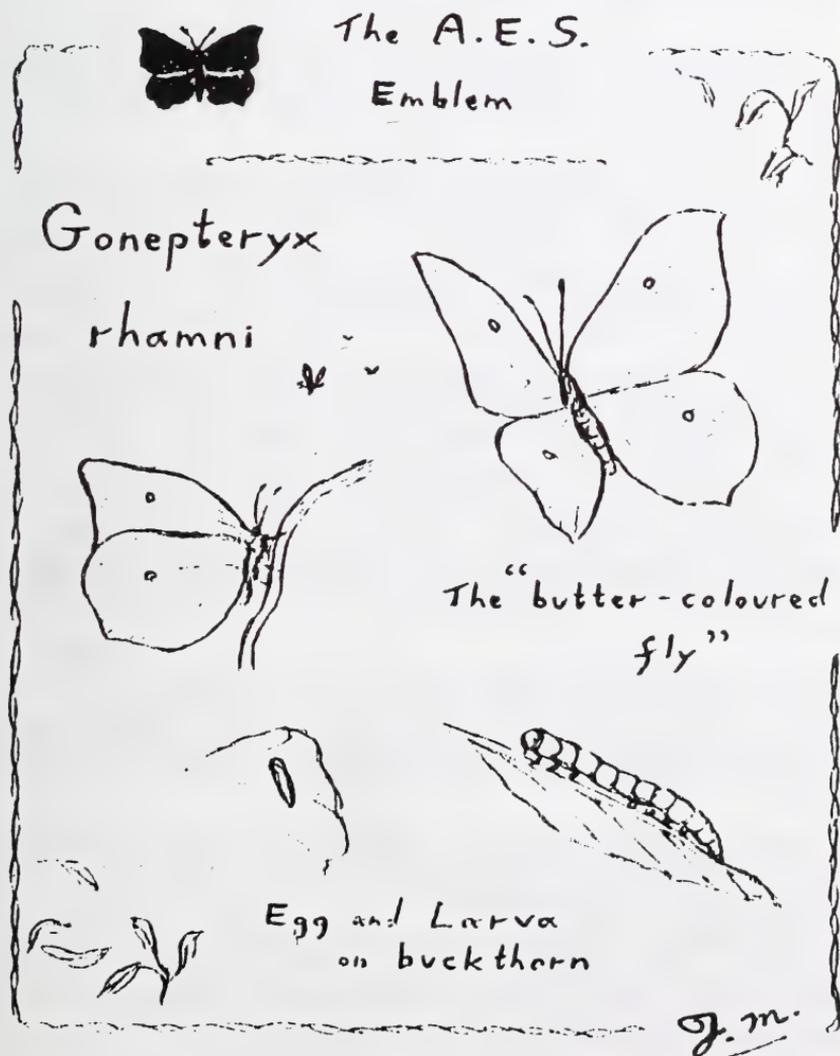
SWEET BUTTER-COLOURED FLIES

1. Sweet butter-coloured flies to dance once more,—
Some ministry of angels and of love
To raise the spirit from the forest floor
Unto the brim of stone, unto the shore
Of heaven, unto life, and high above!
2. The sway of summer grasses, golden green,
The chirp of cricket and the drone of fly,
And here small skippers, blues and browns convene,
And grace the gently English downland scene,
With nothing but to live, to mate, to die!
3. By day in woodland clearing and in ride,
Displaying over lowly violets,
And thus gracious fritillaries preside,
The speckled pair in concert, groom and bride,
High strung across the fairy woodland frets.
4. The meadow brown, the grave indifference,
The closing wound of earth, the seal of pain,—
Yet over-rides rare spirit, rarest sense,
Aristocratic airs, experience,
The dashing Duke, the noble Queen of Spain!
5. Through fields and forests, over sullen seas,
The beauteous Painted Lady, riding song,
And out, sweet migrant, from the vortices,
The whirling winds, and out, sweet waif, to freeze,—
Condemned no more to wander, nor belong.
6. Sun-loving fly of Dulwich, of plantain,
Long since confined to Wight's old Saxon shore,—
And still the spirit must the flesh sustain,
Go fluttering across the years, and gain
Upon the strand for dearest Eleanor.
7. Heart-leaves of cabbage, wondrous to the White,
Coarse grasses yet beloved of the Wall,—
Thus matters larval, matters recondite,
Imago and philosophy in flight,
In vanity,— thus nature's wherewithal.

8. Philosophy, the round of life and all,
The dance of wing on air 'cross shrubby heath,
The face behind the mask behind the shawl,
Such issues metamorphic, natural.—
Philosophy, the sacred floral wreath!
9. The evergreen, the ever-rounding blue,
The holly and the ivy, snow-covered.—
And there in tattered robes and wings to view,
The fallen spirit, sorrow deep and true,
Philosophy, the great unspoken word!
10. How tender reaching, and how secretive,
The flesh, the larval understanding too,—
And how so rends the spirit for to live
In corpus ephemeral, primitive
And pristine, and in blends of white and blue!
11. Arise sweet butter-flies on summer eves,
The Angelus for Incarnation sounds,
And sunshine hails the spirit, hails the leaves,
And haunting prayers, and sorrows, loose the sheaves
Of day, and deathly dark and cold confounds.
12. Hair tender-streaked, the sun soft clouded gold,
Until the season's passing and the cold
Of night, until the heart grows weary, old,
Until the forest sheds its leafy gown.
13. Sun-dappled lanes, life's sacred passage through,
Small Tortoiseshell and Comma yet to heed
The ringing, the great autumnal curfew,-
And yet as hairstreaks probe for honeydew,
And fair Adonis tenders precious seed.
14. For preservation, downland, forest, lea,
The mystic flux, old English country lore,
Hedgerows, the flow of dreams, philosophy,—
For preservation, nature good and free,
Or butter-coloured flies will dance no more!

15. Beloved haunts, the spirit's solitude,
 The Ringlet, sunny wayside wanderings,
 And matters of the heart and matters rude,
 All-seeing ocelli and pulchritude,-
 The spirit lone upon old tattered wings!

Frank Marples (8226)



WHY SHOULD SOME BUTTERFLY SPECIES EXHIBIT ALMOST NO VARIATION WHILST OTHERS EXHIBIT A TREMENDOUS AMOUNT?

by Chris Raper (7540)

This question came to me whilst I was poring over my modest collection of Ithomiines and Heliconines. I have only been studying South American butterflies for a few years now so what follows may be well-known by other more learned people, but here goes.

For those who don't know, Heliconines and Ithomiines are two groups of South American butterflies world renowned for their mimicry. Anyone who is unsure about mimicry should read the bit at the end of this article first.

Both groups of butterflies are, we are told, considered bad to eat by their main predators (birds) and have well-defined easily recognised patterns on their wings (usually mixtures of black, orange, yellow and red. Though a large group of Ithomiines have totally transparent wings with black borders and faint white patches).

A lot of the Heliconines and Ithomiines exhibit widely differing variations on their basic pattern. Those that spring to mind are, on the Heliconine side, the *Heliconius hecale* group and, on the Ithomiine side, the large and almost unidentifiable *Mechanitis* group.

It was this variation of the patterns that got me most perplexed. Why should large numbers of the South American butterflies exhibit such a variable wing pattern while the majority of European butterflies have comparatively no variation in wing pattern? In the *Mechanitis* group the variation is so great as to make each pattern like a fingerprint for that individual.

When combined with the fact that these groups of butterflies rely entirely on their mimicry patterns a thought dawned on me.

Any species that mimics things to survive must be quick to change to another pattern in case its original host dies out or mutates to a different pattern.

Take this one step further: Is there some sort of "gene coding" within their chromosomes that makes some butterflies more likely to vary in pattern to make them more adaptable?

Alas, this is as far as I can explore the question, not being a professional scientist. All this is probably well-documented somewhere, though where I don't know. But I would be grateful for any sort of response from the readers out there (comments, arguments etc).

Also, if anybody can give me a clue how to identify *Mechanitis* species

I will be eternally grateful because I've got a box load of the little devils and can name only a handful of them!

Beginner's guide to mimicry

Simply put, a mimic is something (usually an animal of some sort) that has copied the appearance of another thing for a purpose. Most butterfly mimics do it to avoid being eaten.

It is easy to understand mimicry when the mimic is good to eat and its host is not — any bird that has eaten the bad tasting one will leave the good one alone thinking they are the same species.

But when both are bad tasting you have to look more closely at the process that imprints the pattern on the bird's mind, namely that it has to have *eaten* one of the bad ones to know they are bad to eat! Therefore, if two species are bad to eat and look *different* the bird will have to eat one of each before it learns both patterns, whereas if they look the *same* only one of either species will have to be eaten before the bird learns to avoid the pattern.

This type of mimicry is called Mullerian mimicry while the first type is called Batesian mimicry, both named after the scientists who proposed the theories.

To go one step further, Batesian mimics could be defined as parasites, hence the use of the word "host", because they benefit from the pattern at the expense of their host — if the bird eats one of the good tasting butterflies it will think that the pattern means "safe to eat" and may have to eat two bad tasting butterflies to convince it that the pattern means "bad to eat".

So, getting back to the point of this article, the butterflies I am interested in are *Mullerian mimics* — they all taste bad but look alike.

Bibliography

Simply, at the moment there is only one book that deals in any great details with the Heliconines and Ithomiines and that is *Butterflies of the Neotropical Region* (Part II) by Bernard D'Abrera. Though if you get a chance to go to Costa Rica, *Butterflies of Costa Rica* by Philip DeVries is a must.

The price of D'Abrera's books puts them well out of reach of a lot of people, which is a shame, but for those lucky enough to have copies they are an invaluable source of reference. Part II (Ithomiids and Heliconids) has about 98% of the species but there is that annoying 2% that he couldn't find in the BMNH collection and just mentions in passing. I have a number of species/forms that fit the "unknown" category and it would have been nice if he had been able to give a few more text descriptions.

THE RARE WOOD-CRICKET IN DEVON: ERRORS CORRECTED

by the Editor

A recent Press Release by the Wildlife & Wetlands Trust *A rare woodcricket found in Devon Forest*, which was reported in good faith by the Environmental Council's publication "habitat" did not ring true and we found only contrary information in our library and therefore submitted the item to E.C.M. Haes, co-author of *Grasshoppers and allied insects of Great Britain and Ireland* (see Book Notice on page 280 of December issue) who replied as follows:—

"This must be one of the most highest concentrations of misinformation it is possible to condense into a single paragraph! I hope it was not contributed by a contributor to the (Orthoptera) Recording Scheme!"

The item as published in "habitat" read as follows, the numbers in parentheses indicating the errors:

A rare wood cricket, *Nemobius sylvaticus* (1) has been discovered recently under a log (2) in a forest in Devon. Until the discovery the species had only been recorded (3) in Cornwall and on (4) the South Coast. (5) Its presence at the Wildfowl and Wetlands Trust, Kings Nympton Estate has extended the range of this insect northwards (6) not only in Britain but for the whole of Europe. Four (7) types of cricket may be found in Britain — field crickets, mole crickets, house crickets and the wood cricket. (8) All are related to grasshoppers although they cannot hop so well. However, like (9) grasshoppers they make a chirruping sound by rubbing their legs (10) together.

As corrected, the item should read as follows, the more blatantly incorrect words as in the above version being given in parentheses:

A rare wood cricket, *Nemobius (sylvaticus)* (1) *sylvestris* has been discovered recently under (a log) (2) stones near trees in a forest in Devon. Until the discovery the species had only been recorded, probably erroneously, from (3) Cornwall and in East Devon near (on) (4) the South Coast. (5) Its main British stronghold is in the New Forest and the Isle of Wight. Its presence at the Wildfowl and Wetlands Trust, Kings Nympton Estate has extended the range of this insect (northwards) (6) westerly, not only in Britain but for the whole of Europe, although it is recorded from the Azores. (Four) (7) Five types of cricket may be found in Britain — field crickets, mole crickets, house crickets, the wood cricket and the scaly cricket. (8) All are related to grasshoppers although they cannot hop so well. However, (like) (9) unlike grasshoppers they make a chirruping sound by rubbing their (legs) (10) wings together.

We have informed "habitat's" Editor of the above errors in the Wood-cricket article, who has expressed concern and we understand will take the matter up with the Wildfowl & Wetlands Trust and also publish a correction. This mis-information shows that important distributional records should first be submitted either to the appropriate recorder or to a scientific journal and not rushed out as a "Press Release".

EARTHWATCH

from habitat

Sir Chrispin Tickell, former British Ambassador to the United Nations and an authority on climate change and world affairs, has become Chairman of Earthwatch Europe. He takes over from Max Nicholson who served as Earthwatch's founding Chairman for two years.

Earthwatch is an international charitable foundation which provides grants of both human and financial capital to field scientists conducting research in the Earth, life and human sciences. It also acts as a bridge between science, business and the community by inviting its members to spend two or three weeks working as assistants on projects they also help to fund. Grants dispersed this year will total almost £1.5 million. One of the recipients was Dr Roger Mitchell of the Nature Conservancy Council who received Earthwatch support for the Coastwatch Britain Survey.

Professor Richard Southwood leads the Earthwatch Science Advisory Group which reviews the foundation's science policy. In 1991 Earthwatch has places for 4,000 paying Volunteers on 130 projects in 43 countries. All projects are led by experienced researchers studying subjects as varied as rainforest fragmentation in Mexico, alpine meadows in the Rockies, acid rain deposition in Siberia, or pilot whales in the Canary Islands.

Interested applicants should write to: Earthwatch Europe, Belsyre Court/H, 57 Woodstock Road, Oxford OX2 6HU. Telephone 0865-311600.

PRACTICAL HINT — LARVA REARING

by Christopher Nissen (7002)

The larvae of both the Ringlet (*Aphantopus hyperantus*) and the Grayling (*Hipparchia semele*) need feeding the year that they emerge from the ova, and should therefore *not* be treated in the same manner as the Marbled white (*Melanargia galathea*) which requires no food until after hibernation. Grass should be available in January, however, as they often come out of hibernation early.

SWARM OF THE BEETLE *OCYPUS OLENS*

by K.C. Lewis (8095)

During the first week of October 1988 my mother had the misfortune to be a patient at the Brook Hospital, Greenwich which is about ten miles from London. As I was leaving after a visit at approximately 8.45 in the evening I noticed many beetles running about on the path and road. On closer inspection they were identified as *Ocypus olens* (Mu). As I walked the two hundred yards to the main gate they were seen in very large numbers. On reaching the main road I crossed and sat down on the bus stop seat and here too they were seen all over the path; in fact so many were on the road they were being blown about in the slipstream of the passing cars.

Misfortune again struck twelve months later to the very week (this time my mother-in-law) and once again I saw the same spectacle. The area in which the swarms occurred is built-up except for a strip of ground skirting the main road (part of Woolwich Common).

Only on one other occasion have I seen beetles in such great numbers. This was in Chalk Wood, Bexley, Kent, in May (1990) when I found hundreds of the beetles *Cryptocephalus hypochaeridis* (L.) on the flower heads of Compositae.



Misfortune did indeed strike.

Cravitz Printing Company apologises to Mr Lewis that his fine illustration of *O. olens* was accidentally omitted on page 277 of the last issue. The article is, therefore reprinted now with the illustration in place of the blank space.

LONGHORN HUNTING IN SOUTHERN ENGLAND

by B.R. Moon (9313)

I read with interest Mr O'Sullivan's article on the Cerambycidae native to his part of Ireland (*Bulletin* 49: 45) and thought that members resident in other parts of these islands might like to know a little about the longhorn fauna of West Sussex and adjacent areas.

One of the earliest, and by far the most abundant species appears to be *Grammoptera ruficornis* (Fab.), which is to be found on hawthorn blossom (*Crataegus monogyna*) almost everywhere throughout May and into June. Mating occurs during feeding and the eggs are laid in the dry, dead twigs of the adults' foodplant. Arundel Park, one of my favourite haunts, is an excellent locality for this species, and during hot weather in May '89 I counted literally hundreds of individuals there. Adults measure between 5 and 8mm (in body length — as with all lengths given hereafter).

Another, similar species, both in general appearance and emergence time, is *Alosterna tabacicolor* (DeGeer), with yellow-brown, as opposed to greyish black, elytra. Although fairly frequent, it is nowhere as common as *G. ruficornis*, and I have encountered it in only two localities — Arundel Park and surrounding areas, on flowers of wood spurge (*Euphorbia amygdaloides*) and hawthorn, and in rural Ifield, on greater stitchwort (*Stellaria holostea*). The larvae feed mainly in the branches of oaks (*Quercus* spp.). Adults are between 5 and 9mm.

Our two species of *Rhagium* — *R.* (= *Hagrium*) *bifasciatum* Fab. and *R.* (= *Megarhagium*) *mordax* (DeGeer) — are of widespread occurrence in pine plantations and oak woods respectively. Both species are around in early May and can give a sharp nip if handled carelessly. *Bifasciatum* females can be observed on warm, sunny days, poised menacingly on rotten stumps of Scots pine (*Pinus sylvestris*), their short antennae directed upwards, whereas the eye-patterned *mordax* is usually seen flying to hawthorn blossom. The third native species, *R. inquisitor* (L.), has also been recorded in Sussex, but is far more abundant in the north of the country. Large females of all three species average 20 - 22mm in body length. The males, as with most longhorn species, are more slenderly built and have longer antennae.

At first sight the large, robust females of *Stenocorus meridianus* (L.) arouse great excitement in the coleopterist. I have found this species in only one locality — Arundel Park. The males seem to emerge a few days earlier, and are more plentiful than the females. Both the sexes have a habit of resting on the stems of hemp agrimony (*Eupatorium cannabinum*) close to the bases of their host trees at around midday. The larvae develop mainly in rotten beech (*Fagus sylvatica*), deep down near

the roots. The female beetle tends to be darker than the male, the elytra being jet black in some individuals; males are tobacco yellow, but this is, in any case, an extremely variable species. I have seen the males visiting wood spurge and hawthorn inflorescence. Adults appear from mid-May to early June. This is a handsome beetle with very long legs and antennae, which may be a bright red in colour. The wing cases bear a coarse white down, which is most conspicuous in natural light. *Stenocorus* is another strong-jawed biter, so beware! The size ranges from 14 - 25mm. I have witnessed the mating of this species in the field, and it can be quite a violent struggle, especially when two males are involved.

The genus *Strangalia*, many times revised, is one very popular with collectors because of its mimicry of the Hymenoptera. The most common species in my region is *S.* (= *Rutpela*) *malulata* (Poda). This beetle, with its waspish markings, can be seen almost everywhere, visiting bramble blossom (*Rubus fruticosus*) near the stands of oak in which the larvae develop. Adults are seen from June to August, and range from 14 - 18mm. *Strangalia* (= *Stenurella*) *melanura* (L.) is also very common in woodland settings. This species exhibits sexual dimorphism, the females having bright reddish brown elytra with a broad, black sutural stripe; males have paler, more yellow elytra with a more indistinct stripe. I have observed the adults feeding on various flowers, including brambles, dog rose (*Rosa canina*), heather (*Calluna vulgaris*), common spotted orchid (*Dactylorhiza fuchsii*) and various unbellifers, from May to August. The size range is 7 - 10mm. The larvae feed in a variety of deciduous and coniferous trees.

S. (= *Leptura*) *quadrifasciata* L. is a large (16 - 22mm), scarce species with the appearance of a German wasp. I have found it in only one locality — Holmbush Forest, between Crawley and Horsham. Adults are found singly, resting on dead wood near their birch tree (*Betula* spp.) hosts, from midday to early afternoon during late July and through August. Its larvae also feed in willow (*Salix* sp.). I have to report with some sadness that I have not seen *quadrifasciata* since the great storm of October '87, many diseased trees having fallen and been carted away for burning. *Strangalia attenuata* (L.) is supposed to be extinct in Britain, but I found a single specimen resting among grass in the above locality during July '82. A slightly chewed elytron, discovered near an ants' nest in the same area around this time, may well have been of this species, too. *S. attenuata* is similar to *quadrifasciata*, but in much slimmer, with yellowish, instead of black, legs. The bands on the elytra are less ragged and the species is, at most, only 17mm in length. *Strangalia* (= *Leptura*) *aurulenta* (Fab.) (Fig. 1) is a gorgeous insect, 16 - 23mm in length. The antennae and legs are a reddish orange. The wasp-like elytra are a shining

lemon-yellow with brown-black bars in the robust female, and an equally striking orange in the slimmer male. It is rare, and I have seen only two specimens, again in Arundel Park — a male feeding on wood spurge flowers in June '88 and a female alighting on a fallen beech to oviposit in July '89. My father had seen another female landing among grass near this spot in mid-August '88. *S. aurulenta* was much more common in this area before the storm of '87 but most of the fallen host trees were removed by foresters.

Stenurella nigra (L.), a dark species similar in size to, but more attenuated than, *S. melanura*, also occurs in the region, but I have yet to find it, and the larval host plant in Britain has not been positively determined, although it feeds abroad on birch.

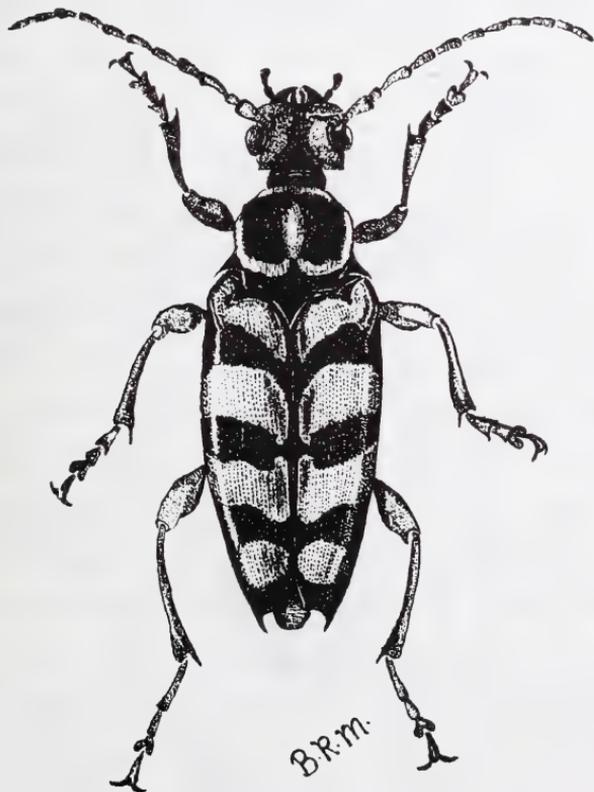


Fig. 1. Female of *Leptura aurulenta*.

A longhorn that has recently disappeared, perhaps temporarily, from Holmbush Forest and nearby Buchan Park after the '87 storm is *Judolia* (= *Pachytodes*) *cerambyciformis* (Schrank). It looks like a squat *S. maculata*, but the yellow of the elytra is more greyish and the pronotum is highly pubescent. Before 1988, during June and July, adults could be seen hovering above elder flowers (*Sambucus nigra*) and bramble blossom, rising and falling like miniature fighter jets. Development of this extremely local species probably occurs in birch and maybe in larch (*Larix*). Adult size is from 7 - 11mm.

Acmaeops (= *Dinoptera*) *collaris* (L.) is found in this part of southern England, and is similar in shape and size to *J. cerambyciformis*, but it has elytra which are a pubescent blue-black with a metallic hue, and the pronotum is reddish. The larvae feed beneath the bark of oaks, on fungi and frass in the galleries mined by other beetles. The adults visit hawthorn blossom in May. *A. collaris* is by no means common and is very local in occurrence. I have not found it myself.

Two species belonging to the tribe Asemmini are to be found in coniferous plantations. The first, and most common, of these is *Asemum striatum* (L.), which I have found on Scots pine in the Tilgate Forest area south of Crawley during May and June. Both sexes sit motionless during the day, low down on the trunks and stumps of the host trees. The southern specimens I've found seem to range from 14 to only 18mm, compared to the 23mm known for large Scottish individuals. Oviposition takes place in the bark of recently fallen or diseased trees. Sometimes healthy trees are attacked. I introduced a small, possibly mated, female *striatum* to the trunk of a Corsican pine (*Pinus nigra* var *maritima*) in my parents' garden in 1989 — and await developments!

The second, rather scarce species is *Arhopalus tristis* (Fab.). This large (19 - 27mm) and rather sombre beetle, rusty dark brown in colour, has a penchant for the fire-scorched trunks and stumps of pine and, more commonly, spruce (*Abies*). The nocturnal adults, which resemble giant click beetles, hide under loose bark during the day. They are to be found from June to September in West Sussex (St Leonard's Forest, near Horsham) and nearby Surrey localities. Again, this species has eluded me.

Clytus arietis (L.) is, perhaps, the best known and most easily recognised cerambycid species in Britain. Adults appear in wooded districts in May and June, and will occasionally visit garden flowers. I once captured a male specimen when it flew through the window of a train compartment in which I was travelling, opposite Gatwick Airport. The larvae develop in the wood of dead, dry beech, on which the adults may be seen running rapidly about and taking to the wind on hot, sunny days. This species has earned for itself the name Wasp beetle because the

elytra bear vivid yellow and black markings; the description is further supported by the insect's jerky movements and the stance of the short antennae. Size is 7 - 14mm.

Another species, similar to the above, is *Anaglyptus mysticus* (L.). It is said to occur in southern England but, strangely, I have never found it, despite a most rigorous search. The elytra carry a complex pattern comprised of wavy white markings on a reddish brown, shading to black ground. The larvae feed in the dead, dry branches and boles of hawthorn and other deciduous trees. All the available literature states that the adults are to be seen everywhere, on or around hawthorn in May and June, and so I have spent much time over a number of years looking for it, especially in the Arun Gap, where hawthorns abound, but to no avail. Maybe one of our readers has information as to its precise whereabouts?

For me, the most spectacular British longhorn, taking size and colour into consideration, is *Aromia moschata* (L.) (Fig. 2). The larvae develop



Fig. 2. Male of *Aromia moschata*.

in willow and sallow (*Salix* spp.), particularly in the trunks and larger branches of healthy trees, where they cause serious damage to the vascular structure. I have found the adults in one locality near Amberley in the Arun Gap, in June and July. They sit around sunning themselves on the branches and boles of willows, and when disturbed emit a loud creaking sound (stridulation). If handled, a strong musk-like scent is given off, derived, I believe, from salicylic acid in the wood of the larval foodplant, and reminding one of some deodorants! Hence the common name of Musk beetle. The elytra are a beautiful, shimmering, strawberry bronze. Artists' impressions show this insect as green or bluish green — which is the usual colour of a dried specimen. The long antennae and legs are a bright metallic blue. I counted one large female (33mm) in July '88, two males and a female (pairing with the larger male) in June '89, and one huge male (30mm+) and two females in the July. A telltale sign of the beetles' presence in a suitable site is a sprinkling of frass, low down between the axils of the branches of host trees. The exit holes can be a half-an-inch or more in diameter. Adults range from 13 - 34mm in size.

The "dreaded" House longhorn, *Hylotrupes bajulus* (L.), is rare in southern England, to which region it seems to be confined in Britain. Despite its rarity, it is a serious pest of coniferous timber, and the larvae can cause immense destruction in old buildings, the frameworks of which are rendered unsafe. I have only ever discovered one specimen (1st September, '83), a female that had emerged from the wood of an educational display in Porchester Castle, Hampshire. The insect had perished within the glass-fronted confines of the case housing of the exhibit, and I cannot deny a youthful impulse (fortunately suppressed) to smash the glass in order to secure the precious find! House longhorns are black in colour, with dense white pubescence on the head, underside and pronotum, which last also bears two raised, shiny nodules. There is a pair of white, hairy patches on the densely punctured elytra. The beetles range from 8 - 21mm in body length.

Prionus coriarius (L.), the only member of the tribe Prionini to be found in Britain, occurs only very rarely in West Sussex. It is a giant (19 - 45mm), the largest of native longhorns, and the females bear three distinct pairs of lateral spines on their thoraces. The huge larvae take as long as four years to develop in the roots of old and dying stands of beech, oak and sometimes of pine. The elytra of the adults are dark brown, leathery and crenulated, and the eyes and jaws are massive. The male antennae are 12-segmented and very serrate, those of the more robust female 11-segmented and less serrate. According to the *Natural History of Sussex* by E.C.M. Haes, *Prionus* is found in the Coates and Midhurst area of West Sussex. I have also determined its (?former) presence in Arundel Park, based on a label for a specimen seen in a

display at the 1984 AES Show, and at Worth near the Pound Hill area of Crawley. This last record is of a live male brought to my father for identification in September '79, presumably having flown to light. The nocturnal adults, both male and female, probably remain under bark and leaf-litter and, in the case of the females, inside their pupal cells during the day. They are said to be attracted at night by mercury-vapour lamps and by sugaring host trees, although I've never caught this noble insect myself. It was said to be fairly common in the New Forest, but now seems to be becoming scarce everywhere. Many of the old trees that fell in the Arun Gap during the great storm of '87 were removed, and this probably accounts for this species' apparent recent absence from the locality. The countryside can be made too *tidy* for wildlife! However, some of the felled areas in Arundel Park (Norfolk Estates) have been replanted, so perhaps there's hope for the future.

Leiopus nebulosus (L.) (Fig. 3) is a most abundant species throughout June and into July. The cryptically patterned adults may be found on dry

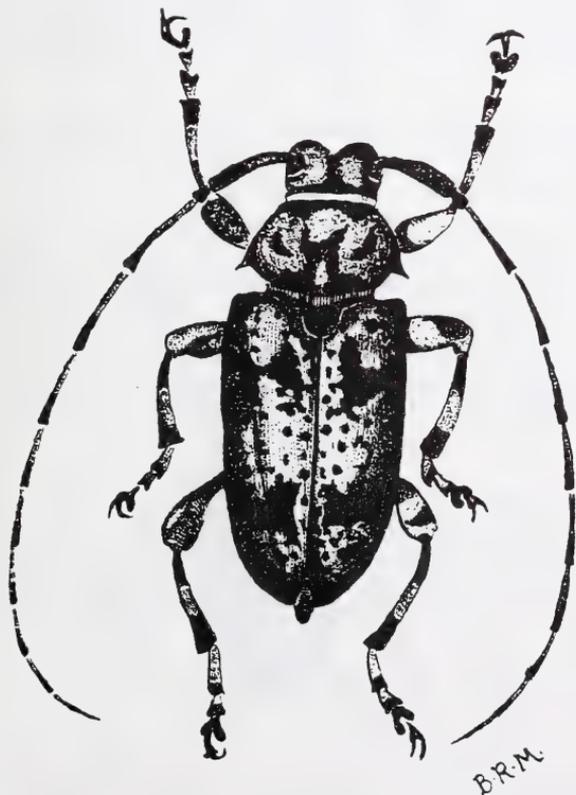


Fig. 3. Female of *Leiopus nebulosus*.

oak branches and fallen sprays, clinging to twigs which are covered with algae and lichens, on which I have seen the beetles feeding. To the untrained eye they are perfectly camouflaged, bearing a mottled pattern, made up of greyish white hairs on a black background, and they brandish long, fine, chequered antennae. In fact, these little beetles bear an astonishing resemblance to giant bark-lice in their appearance. They are very common everywhere within the region and it may be of interest that this tiny species (5 - 10mm) is related to the much larger Timberman, *Acanthocinus aedilis* (L.), a beetle not found wild in my area, but confined to the Caledonian pine forest of Scotland. *A. aedilis*, especially the male, has enormously exaggerated antennae, and *L. nebulosus* is like a smaller version — almost *aedilis*'s southern counterpart. The larvae feed in dead, dry twigs and branches.

The smallest of all our native longhorns is the diminutive *Tetrops praeusta* (L.) at 3 - 6mm. I have found specimens in the Ifield area on ash (*Fraxinus excelsior*) and cherry (*Prunus* sp.) in June. The species is fairly polyphagous, and its larvae feed under bark in the recently dead twigs of a variety of hardwoods, including the two mentioned. The rather inconspicuous adults can sometimes be found amongst the flowers of Umbelliferae.

Pogonocherus hispidus (L.) and *P. hispidulus* (Piller & Mitterpacher) may also occur within the area, but I know nothing of their distribution and habits in this region.

Since the devastating '87 "hurricane", the violent storms in January '90 have caused further tree damage in West Sussex. Again, much clearance of fallen timber has occurred, and this over-zealous practice simply serves to eradicate a number of our scarce longhorn species whose larval and pupal stages are harboured within. At the same time, abundant cerambycids may well become the scarce species of tomorrow unless more fallen timber is allowed to decay naturally.

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PRACTICAL HINT — LARVA REARING

by Christopher Nissen (7002)

Leaves of the butterfly bush, *Buddleia*, may be used as an alternative for those species normally feeding on mullein (*Verbascum thapsus*).

COLEOPTERA TRAPPED OVER A TWELVE-MONTH PERIOD

by K.C. Lewis (8095)

The end of April 1990 heralded the end of a year-long project in Chalk Wood, Bexley, Kent. The project involved three species of beetle: *Abax parallelepipedus* (Pi. and M.) (Fig. 1.) (= *Pterostichus striola* in Fowler), *Nicrophorus humator* (Gled.), and *N. vespilloides* (Herbst.) (= *N. mortuorum* in Fowler). But after two visits to the traps it was decided to add two more species to my list and they were *Philonthus marginatus* (Ström.) and *Agonum assimile* (Paykul.). Other species of beetle were counted but due to the very high number of insects trapped it was impossible to name them in anything other than genus. To take the species of beetle *Stenus* for example which has over sixty members in its genus I think it would have been totally irresponsible of me to kill 3,148 beetles in order to name them individually; also a time factor was involved as emptying out each trap took about half-an-hour when high numbers were found. The number of traps that I used totalled eight: four out in the open and four under bushes. In all cases the traps were surrounded by growing moss. The traps were made from empty coffee



Fig. 1. *Abax parallelepipedus* with branched antenna.

tins which have a plastic clip-on lid to which was added a cone made from plastic card which can be obtained from most good model shops. The traps were then buried in the ground as per my illustration (Fig. 3). At the start of my project I used a scrunched-up kitchen roll in the bottom of the traps for the insects to hide in, but this was discarded after the first trip due to its becoming wet in the confines of the trap. I next tried newspaper but this fared no better. Lastly I used aluminium kitchen foil which worked quite well. I have found it important that the inside of the trap does not become too damp as this, coupled with the decomposing meat, forms an ammoniacal smell and until I used the foil, beetle totals in the traps were always down. It is also important that the traps are visited on a very regular basis. On one occasion I was unable to visit the traps due to illness and all that were left alive inside the traps were *N. humator*, the rest of the beetles were only identified by their elytra. In every case once the traps were emptied the beetles were taken about one and a half miles across to the other side of the wood and there released but *N. vespilloides* and *N. humator* were spotted with a dab of white correction pen ink so that I could tell if they ever turned up again in the traps for a second time.

This occurred on two occasions only, by *N. humator*. One male and one female of *humator* were taken home after my trip to Chalk Wood on 16th March 1990, and placed in a clear plastic box. The carrion used this time was a piece of chicken leg. On the 27th March 22 eggs were counted under the bait which had now been rolled up into a ball about the size of a table tennis ball. The eggs were a pearly white colour and approximately two millimetres in length but some were slightly smaller. The maternal instinct is strong in this beetle and for the first day or so after the young are ready to feed, the parent feeds them a liquid diet from its mouth parts, after which growth is rapid. Hopefully, when the larvae have pupated, they will be transferred to clean moss and once emergence has taken place one of each sex will be kept for my collection and the rest will be returned to Chalk Wood. I last bred *humator* successfully in 1966 (*Bulletin* 25: 54) when my AES number was 3680. An interesting point to note is that twice last year I tried unsuccessfully to breed *humator*. On both occasions I used John Innes potting compost as it is clean having been heated to a high temperature to kill off any pests or bacteria. I thought this would be better than plain garden earth, but after all the precaution the beetles always died. I have found out since that trace elements are mixed with the compost to help with better plant germination — maybe this killed them. So this time I reverted to plain garden earth. Breeding programmes have also been successful with *A. parallelepipedus*, and *Carabus violaceus* (L.). Breeding of *Abax* was particularly successful; this was achieved by placing five each male and

FROM MAY 1989 to APRIL 1990	1990 JAN	FEB	MAR	APRIL	1989 MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
HISTER CADAVERINUS	0	0	0	0	6	1	0	0	0	0	0	0
NICROPHORUS HUMATOR	0	0	8	37	7	2	1	0	2	1	0	0
NICROPHORUS VESPILLOIDES	0	0	0	4	4	1	11	1	4	0	0	0
PHILONTHUS MARGINATUS	3	0	2	55	23	42	37	72	26	13	3	2
ABAX PARALLELEPIDOS	0	0	0	2	22	16	17	5	2	0	0	0
AGONUM ASSIMILE	0	0	2	5	31	1	9	1	2	2	2	0
STENUS, SPECIES	20	196	844	609	93	543	525	187	34	25	32	40
CATOPS, SPECIES	105	94	134	58	52	81	157	73	50	55	30	130
MONTHLY BEETLE TOTAL	128	290	990	770	238	687	757	339	120	96	67	172
TOTAL OF ALL BEETLES	2604	2894	3884	4654	238	925	1682	2021	2141	2237	2304	2476

Table 1. Monthly total of selected species and total (bottom column) of all beetles trapped.

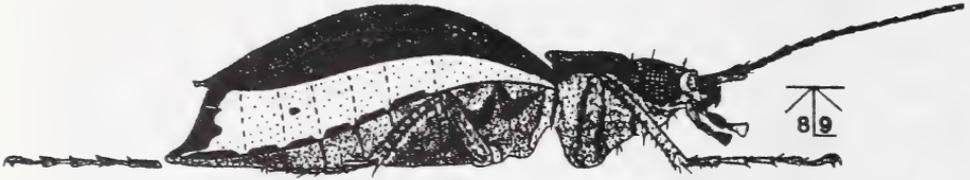


Fig. 2. *Carabus violaceus*, vivarium specimen with swollen abdomen.

male in a small vivarium furnished with moss, small stones and pieces of bark. The tank was sprayed with a mist spray used for house plants each week. Food for the beetles was in the form of meal worms, but you could use slugs, and research is at present being carried out by Mr W. Symondson at University College, Cardiff in the mass breeding of *Abax* in the hope that they may be able to protect crops like strawberry and lettuce. As *Abax* is unable to fly it is hoped that, by placing a plastic barrier all round the field, they would be contained and so destroy the slug pests. Keeping and observing *Abax* and *violaceus* has made me realise what terrifying beetles for their size the Carabidae are, and more than once I have seen an *Abax* run out from cover to sink its jaws into a meal worm, only to be joined by others pulling on it like a rope in a tug-of-war. Another observation of *Abax* that I have held in captivity for

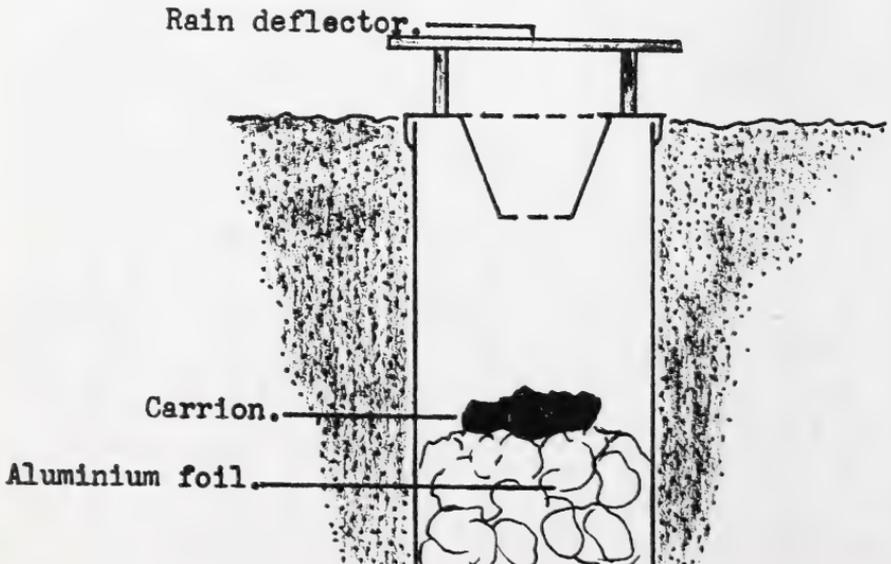


Fig. 3. The beetle trap.

over a year is that they mate continuously. The males run out from cover to grab any female passing by, time and again. I also found an interesting specimen of *Abax* in a trap that has a branched antenna. This is shown in Fig. 1. Fig. 2 shows a specimen of *C. violaceus*, its abdomen swollen, also from my vivarium. Lastly I have listed a chart with the total number of beetles trapped during the last twelve month period. One beetle not included in the list was a single specimen of *Trox sabulosus* L., a rare species that was found dead in one of the traps on the dry skin of chicken. Table 1 lists my total captures over a year. Note that I have listed *Hister cadaverinus* under its old name. It has recently been included in the genus *Margarinotus*, furthermore it has been found that *Hister cadaverinus* is identical with *Hister brunneus*. (Editor's note: *cadaverinus* Hoffman is a synonym of *impressus* Fab.)

Postscript: Since typing my report concerning the eggs laid by *N. humator* on the 27th March, at least two more batches of eggs have been deposited. These can be seen through the bottom of the plastic box. In the wild it is said that there are two broods a year, but I wonder if the egg laying process can be continued in captivity, as long as fresh carrion is supplied for them, and for how long.

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PRACTICAL HINT — THE SALLOW CLEARWING

by Christopher Nissen (7002)

This clearwing, *Synanthedon flaviventris*, is almost confined to south-eastern England where it may be locally common. The larvae take two years to feed up. When collecting the galls, indicated by a swelling of the stems in their second year, cut the willow branch about 6" below and ¾" above, and place in damp sand in order to keep it alive. One can cut 1" either side of the gall and get the larva intact but the twig may not grow well as the exposed part may contain damaged tissues. They are best collected in the spring (April) of even years or October in odd years. Galls are usually found in last year's growth which is greyish green below the light green top. The larvae only eject frass when full grown and cleaning their chamber prior to pupation.

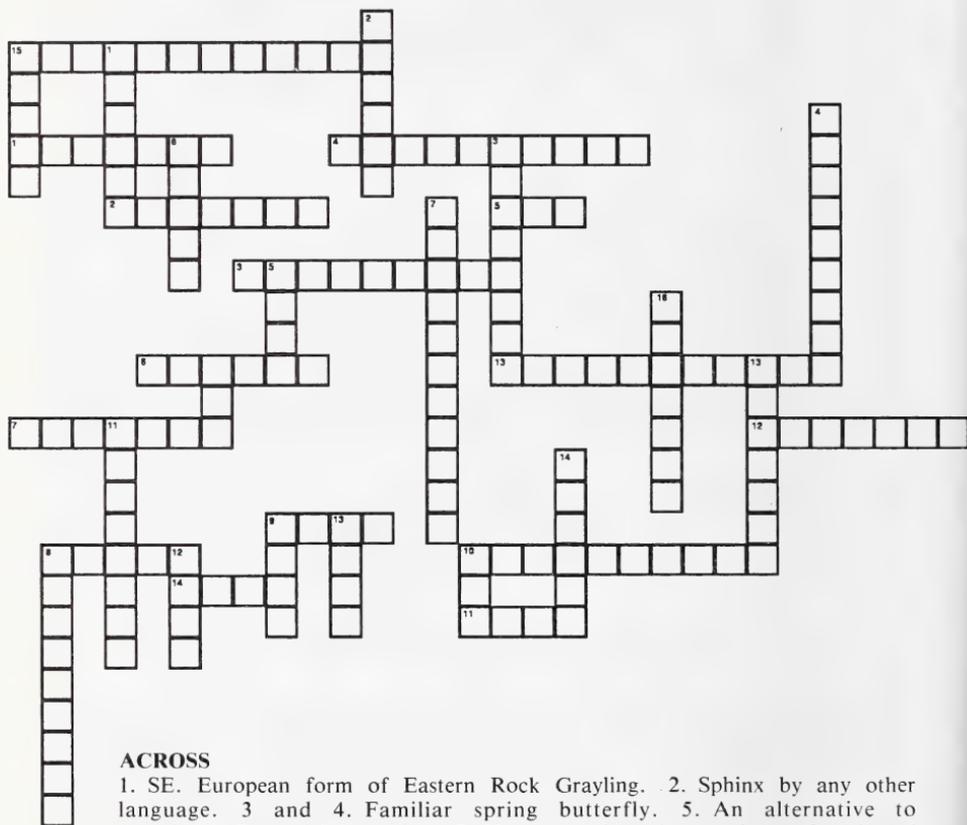
PRACTICAL HINT — REARING

by Christopher Nissen (7002)

Apple is an alternative foodplant for feeding the larvae of the Lobster moth (*Stauropus fagi*).

CROSSWORD

by Gareth King (8585)



ACROSS

1. SE. European form of Eastern Rock Grayling. 2. Sphinx by any other language. 3 and 4. Familiar spring butterfly. 5. An alternative to fennel. 6. Perennial favourite. 7. Not so much ancient as dark. 8. Edge of fore-wing. 9. Spiky foodplant. 10. Much maligned in Galicia. 11. The emperor's smaller cousin. 12. Specific name for a butterfly and a moth. 13. See 4. 14. Brush like in some butterflies. 15. An exotic sounding name for an exotic looking butterfly from southern Europe.

DOWN

1. The larva will touch nothing else. 2. Feeds on its namesake. 3. Butterfly, smetterlinge, papillons . . . 4. Living together. 5. Larval foodplant of *napi*. 6. Nitrogen-producing plant. 7. Large, useful and very beautiful. 8. Without this would be left lying around. 9. Before the imago. 10. See 12 across. The moth's English name. 11. A large moth feeding on 6 across. 12. Near to 8 across. 13. Poisonous, but useful. 14. National park in south-western Europe. 15. Familiar to us breeders. 16. S. European form of common British butterfly. 17. A rare visitor to British shores.

BADGER PREDATION ON BUMBLEBEES AND WASPS

by M. Hancox

A study of badger diet based on 2,000 scats on the Wytham Estate near Oxford showed that bumblebees and wasps were an important item of food during July and August (Hancox 1989a and Table 1). Insects comprised only 4% by volume, or 24% by frequency of occurrence in the overall annual diet; but they contributed up to 12% by volume during July, when the main earthworm prey was in aestivation and less available to badgers. The Carabid ground beetles though present in scats throughout the year, were less significant to the total diet than either Dor beetles (*Geotrupes* spp.) which sometimes amounted to 60 individuals per scat, or the summer nests of bees or wasps: Skoog recorded 300 wasps in one badger stomach. Numbers of individuals could seldom be estimated from the fragmentary remains in scats, although outside the summer months isolated individuals such as overwintering queens were present. Scats containing both bees and wasps were noted on 15 occasions in July/August.

TABLE 1. Monthly distribution of badger scats containing bumblebees/wasps.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Total
2/0	1/1	3/0	9/0	3/0	7/1	51/20	26/3	6/4	5/1	1/0	114/30

Studies on the distribution and abundance of bumblebees elsewhere suggest that there are only seven common species of bumblebees in lowland southern Britain (Hancox 1989b). The percentage occurrence being for Gloucestershire (N=1200) : 19 "White-tails" (*Bombus terrestris* & *B. lucorum*), 7 Garden (*B. hortorum*), 9 early (*B. pratorum*), 11 "Redtails" (*B. lapidarius* & *B. ruderarius*), 52 Common Carders (*B. pascuorum*). The comparable figures for Kettering, Northants, (N. = 500) were: 28, 8, 9, 31 and 21.

The bumblebees in badger scats comprised over 80% "Whitetails" (*B. terrestris* and *B. lucorum*) and fewer "Red-tails" (probably mainly *B. lapidarius*). The wasps were represented by 88% *Vespa vulgaris*, and the remainder *V. germanica*. Thus badgers were apparently taking nests according to their abundance and conspicuousness; one nest near a sett was ignored until late in the summer, when either its presence was more obvious or badgers were affected by a lack of their staple earthworm diet.

Most studies of badger diet record seasonal use of bumblebees and wasps, but few identify those eaten as to species. The most commonly recorded *Bombus* are *terrestris* and *lucorum* (Skoog 1970, Middleton 1935). Skoog also noted *lapidarius* and *muscorum*, while G. Barker (pers. comm.) noted *ruderarius* and *muscorum*, and Bradbury noted *monticola* from the hills of the Peak District. The most commonly

recorded *Vespula* are *vulgaris* and *germanica* (Andersen 1955, Skoog 1970), but Skoog also noted *rufa*, *sylvestris* and the non-British *media* (while Schmid and Lups 1988, similarly note *saxonica*). Even the Hornet (*Vespa crabro*) is taken occasionally (Skoog 1970); but it is hardly surprising that the parasitic *austriaca* and tree nesting *norwegica* are not reported so far. The absence of the Early and Garden bumblebees from studies so far may reflect their smaller nest sizes or overall scarcity contrasted with the larger nests of "White-tails".

Bumblebee nests were usually fully excavated, but many wasp nests were only half excavated when abandoned, suggesting stronger nest defence by even night torpid wasps. The presence of one inch long black and white hairs often revealed badgers as the gourmet, but foxes are said to take bumblebee nests according to Englund's Swedish study and Southern & Watson's English work (Alford 1975). Many queen bees use abandoned small mammal nests, and probably many new colonies are prey to wood mice, bank and field voles, shrews, moles, weasels, polecats and pine martens, and bumblebees may be an important food of mink in Iceland (Alford 1975, Jones & Corbet 1987). Wolverine and bear take nests on the Continent; while avian predators include honey buzzard, bee eater, red-backed shrike, spotted flycatcher and great tit. Amphibians, reptiles and brown trout also take bumblebees occasionally.

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PRACTICAL HINT — SUGARING

by Christopher Nissen (7002)

When sugaring for the Clifden nonpariel, *Catocala fraxini*, start before dusk on aspen trunks. Faggs or Long Rope Wood are good localities. The moth is an early flier often about an hour before dusk. When preparing your sugaring mixture, add the amyl acetate last, as this evaporates quickly. (Editor's note: Your Editor prefers to use old Jamaica rum!)

NOTES ON THE BEHAVIOUR OF THE LADYBIRD PARASITOID *PERILITUS COCCINELLAE* (SCHRANK), FROM AN UNUSUAL SOURCE

by Dr Michael E.N. Majerus (4027)

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Introduction

I have recently been fortunate enough to be asked to advise on the making of a television programme on insect camouflage and mimicry. In particular I supplied 7-spot ladybirds (*Coccinella 7-punctata*) some of which had been parasitised by *Perilitus coccinellae* (Hymenoptera: Braconidae). The cameraman, Mr James Gray, obtained some unique film of the relationship between this parasitoid and its hosts. I was invited by the researcher and producer of the programme, Messrs Gil Dom and Trevor Williamson respectively, to see the film before it was edited.

James Gray shot a considerable amount of film, somewhere in excess of 30 minutes. However, this film was edited down to a three minute sequence in the programme. Having had the chance to view both the full and the edited sequences, a number of points occur to me. Firstly the edited version gives a slightly distorted view of what actually happens, particularly in respect of time. Things appear to happen faster than they actually do. Secondly, a considerable amount of detail is lost in editing. The editor needs a short, concise, and if possible, dramatic or aesthetically pleasing package. The detailed minutiae of behaviour is not necessarily of great significance, and much will be left on the cutting room floor. This may be the case even when this detailed record of behaviour contains visual evidence of biological information not previously known to science. This is a likely possibility for a number of reasons. Firstly, the cameraman is paid to be patient, and spends hours and hours simply watching and waiting for the critical action. Secondly, and this is of particular relevance to insects and other small organisms, the cameraman will spend much of this time watching the action through a high powered lens, and at a distance where his/her presence may not greatly alter the behaviour of the organisms being viewed. Thirdly, at least for the action the camera deems to be suitable to catch on celluloid, the action can be viewed repeatedly. Indeed, with the facilities made available to me by Partridge Films, the film can be viewed at a great range of speeds or frame by frame, so that little need be missed.

To illustrate this theme, I here put down a series of notes I made while watching the rushes of the various passages of the life-cycle of *P. coccinellae* which take place outside the host.

It may be useful to note that a considerable amount was already known about *P. coccinellae* (see Hodek, 1973; Majerus & Kearns, 1989). It is a braconid wasp, which has thelytokous parthenogenesis (*i.e.* unfertilised eggs hatch and produce just females — no confirmed records of males are known). Females lay eggs in adult ladybirds with a thrust of the ovipositor through any weak point in the cuticle. The larva that hatches feeds on fat reserves and the ladybird's gonads, but leaves the vital organs intact. Before exiting, the larva is reputed to attack the motor neurones to the legs, thereby effectively immobilising the ladybird. The larva exits through the membrane between the fifth and sixth (Cushman, 1922) or sixth and seventh abdominal tergites (Sluss, 1968; Maeta, 1969), and spins a cocoon between the legs of the ladybird. The adult wasp emerges from the more pointed end of the cocoon (Balduf, 1926).

This is the basic story I knew of *P. coccinellae* before I saw James Gray's film. The notes I present here, are those made while watching and rewatching the film. They have not been changed in any significant respect.

Oviposition

Wasp approaches ladybird with ovipositor pointing backwards. Taps ladybird with antennae more than a dozen times, usually with just one antenna at a time, and often changing antenna. Wasp moves back from ladybird. Curles abdomen and ovipositor under body and between legs. Approaches ladybird again with ovipositor held forward. Taps ladybird again several times with antennae, singly or both together. Pushes ovipositor forward to come gently in contact with ladybird. Stands and walks on middle and hind pairs of legs only. Front legs held slightly up due to posture with abdomen curved under. Pushes ovipositor gently forward to contact with ladybird several times. Then slides tip of ovipositor along the surface of the ladybird presumably in search of any fine groove or crack which would indicate a fissure, and so a weakness, in the ladybird's hard exoskeleton. Initial touching contacts on head, pronotum laterally, elytra laterally, posteriorly and dorsally. Sliding of ovipositor mainly on pronotum laterally and elytra anterior-laterally and posteriorly at join of elytra. Wasp circled ladybird repeating the antennal tapping, ovipositor contacting and ovipositor sliding behaviour several times. (Several cuts in film so may have been many times.) Oviposition through a hard thrust or series of thrusts of ovipositor into the ladybird. Up to seven thrusts in sequence. Oviposition between pronotum and elytra, between elytra posteriorly or just under lateral edge of elytra. Lateral thrusts hard enough to rock the ladybird from side to side. Ladybird seems more or less oblivious to wasp until the moment of oviposition when it reacts by running away.

Larval emergence

Ladybird walking in apparently unco-ordinated manner. (Later) leg movement obviously restricted, no forward motion, not able to walk properly. (Later) leg movements very feeble. Larva exits head first between eighth and ninth abdominal tergites. Larva bends head round and as the rest of the body exits orientates itself to lie under the ladybird in the same direction as the ladybird.

Cocoon production

Produces a small base pad of silk on substrate and then begins to construct a loose cocoon between the legs of the ladybird, initially attaching silk to legs and pad on substrate. Some strands of silk are attached to the substrate two or three millimetres from the outer edge of ladybird giving better stability. First strands which tie in ladybird's legs are rather loose. New silk is sticky and obviously sticks to anything it touches. Movement is basically back and forth from one side to the other. Larva can bend upwards or backwards easily. Later spinning produces much more tautly stretched strands of silk. Hind legs of ladybird not always tied in. Initially silk is white, the larva inside being yellow and visible until cocoon construction is well advanced. Legs of ladybird still able to move feebly, but not able to break the rather small number of strands attached to each leg. Ladybird still able to reflex bleed.

Emergence of adult wasp

Silk of wasp's cocoon pale grey-brown. Pupa in cocoon much darker brown, and vaguely visible through cocoon. First evidence of emergence is appearance of minute hole at more pointed end of cocoon. Then mandibles become visible. Mandibles are elongated and squared off at the end with teeth at and just behind end. Teeth at end of mandibles used to cut through cocoon. One mandible pierces the cocoon and the other is used to scissor blade. Repeated opening and closing of "scissor-blade" causes fraying of silk rather than silk being parted with single sharp cut. Cutting very slow. Appears as if each outer strand cut individually. Cuts all round inside and the outer base strands or about 270° of a circle leaving small attachment ventrally. Opening produces a "pitcher" with hinged cap, the hinge being the outer loose strands of silk. Wasp exits head first using legs to push or prise itself out of the cocoon. Front and middle legs become free followed by antennae and then hind legs. Hangs onto cocoon and then moves onto substrate. Wings not fully expanded: crumpled at end. Antennae begin to be used as soon as they are free. Wasp moves away from cocoon and ladybird before wings expanded. Expansion of wings takes place some inches from ladybird, and wasp cleans antennae and legs during this period. Back legs cleaned last, one back leg being used to clean the other.

Epilogue

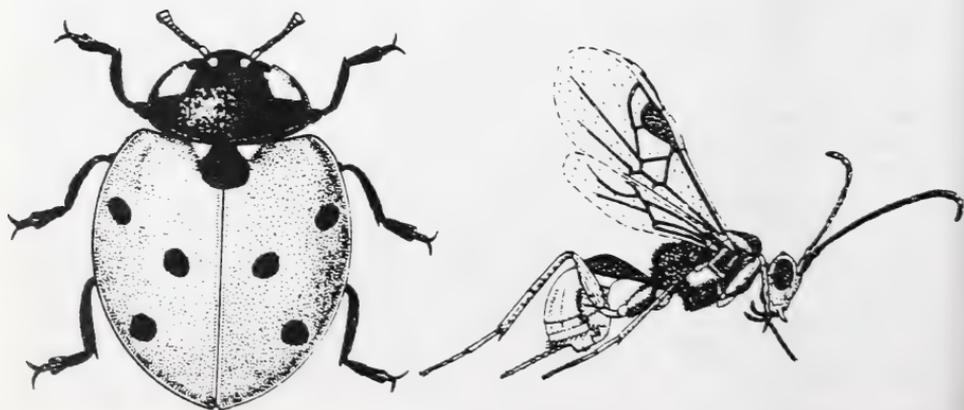
I wonder how much time I would have had spent watching and waiting to obtain this sort of observation without the celluloid record and the use of an edit machine. The fact that about half the observations contained herein came from film that was not used in the final programme also makes me wonder how much useful scientific detail is left on the cutting room floor. However, a great wealth of information is currently sitting in film cannisters on store shelves, in case it might one day be of use to the film-makers. If the people at Partridge Films are representative of their profession, then much of this material could and would be made available to those with a serious research interest in it.

Acknowledgements

I wish to express my thanks to Gil Dom who introduced me to Partridge Films, to Trevor Williamson, Gil and all at Partridge Films who allowed me access to their facilities, and to James Gray for his expertise, patience and the wonderful film sequences he produced.

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OVA OF THE PURPLE HAIRSTREAK, SILVER-STUDDED BLUE AND SMALL COPPER BUTTERFLIES

by Alan Butler

I recently had the opportunity to obtain some scanning electron micrographs (SEMs) of some butterfly ova and wondered if these might be of interest to other members of the society.

The advantages of the SEM over a conventional light microscope are mainly that very much greater magnifications are possible with greater depths of field. This difference in performance is fundamentally related to the difference in “wavelengths” between the electrons and optical light. With the SEM, magnifications of 20,000 times are routinely achievable, and magnifications as high as double this are possible. Such high magnifications are rarely of interest to the amateur entomologist however. The main disadvantages of the SEM, apart from the fact that it is rarely available to the amateur, is that it is a destructive technique. Samples have to be inspected under high vacuum and it is normally necessary to coat the samples with a thin layer of gold (which is not visible) to prevent electron charging effects during inspection.

The accompanying photographs show ova of three species of butterfly at various magnifications. Figures A, B and C depict ova of the Purple hairstreak, Silver-studded blue and Small copper respectively. To aid comparison between the species each SEM was taken at the same magnification of 100 times. I find it quite remarkable when I refer to Frohawk's work of 1924 (*Natural History of British Butterflies*) and see the high degree of accuracy to which he figured these species. His measurements on ova diameter and height are also remarkably accurate and agree with these photographs to within less than 12%

Figures D, E and F show an ovum of the Purple hairstreak at magnifications of 35, 150 and 300 times. In these photographs the exit hole of a parasitic wasp is clearly evident (at least it is presumed to be due to a parasitic wasp). In the high magnification shot the inside of the hollow shell is also visible. Finally figures G and H show the outer shell of the egg at magnifications of 500 and 1,000 times, where the structure itself is quite clear.

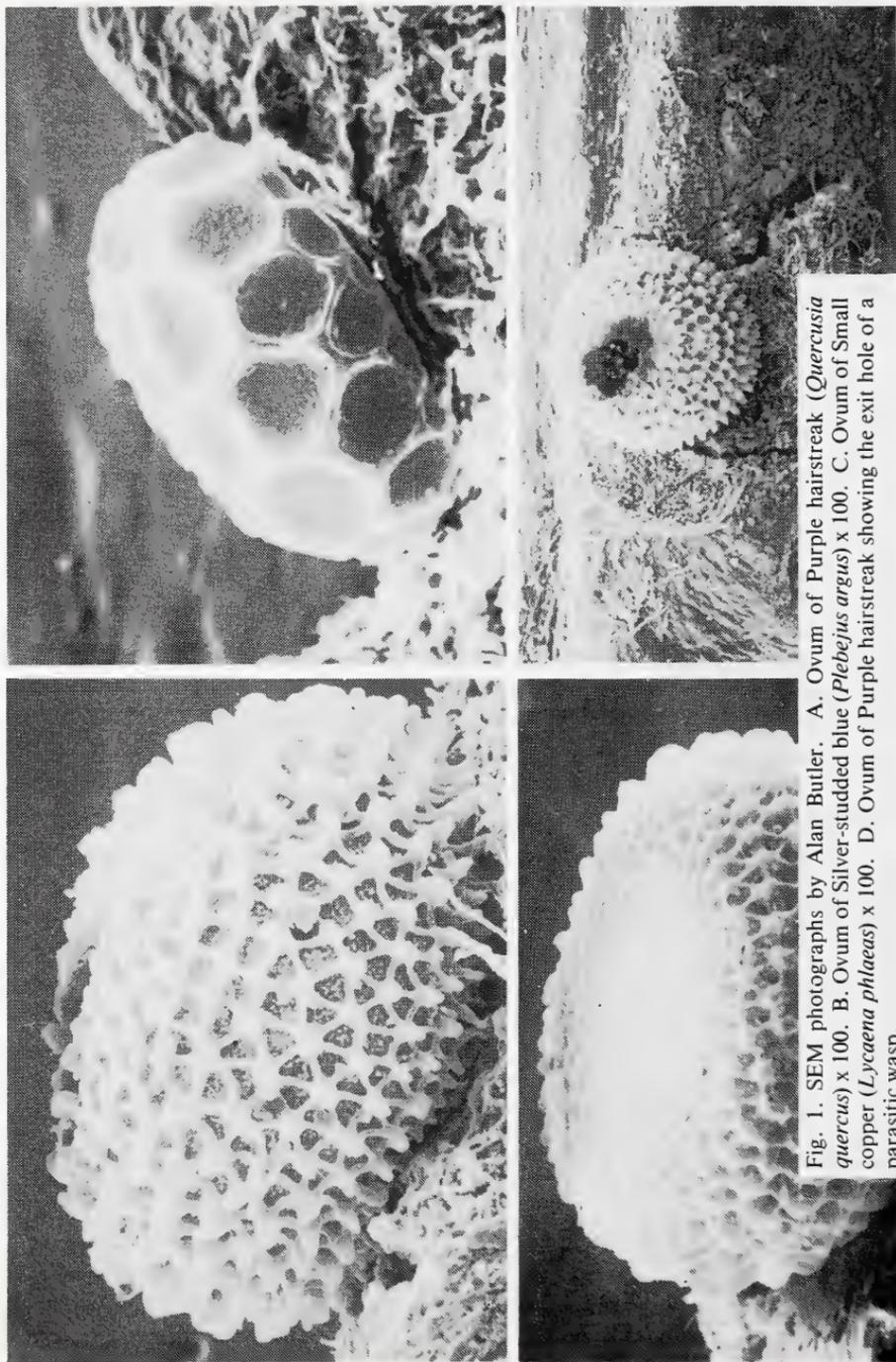


Fig. 1. SEM photographs by Alan Butler. A. Ovum of Purple hairstreak (*Quercusia quercus*) x 100. B. Ovum of Silver-studded blue (*Plebejus argus*) x 100. C. Ovum of Small copper (*Lycæna phlæas*) x 100. D. Ovum of Purple hairstreak showing the exit hole of a parasitic wasp.

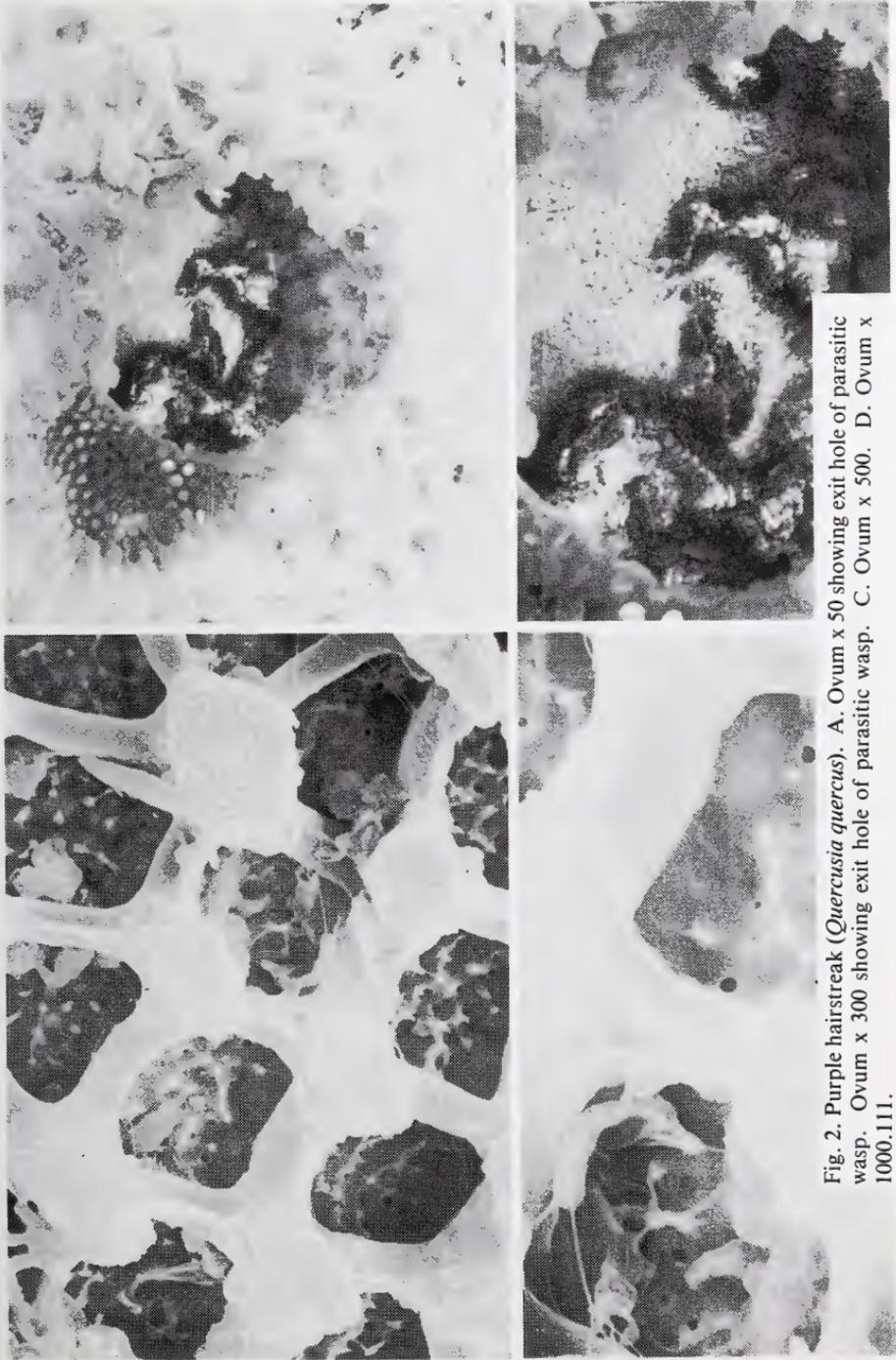


Fig. 2. Purple hairstreak (*Quercusia quercus*). A. Ovum x 50 showing exit hole of parasitic wasp. Ovum x 300 showing exit hole of parasitic wasp. C. Ovum x 500. D. Ovum x 1000.111.

SNOW-STORM ON THE WHITE DOWNS OBSERVATIONS OF *LYSANDRA CORIDON*, THE CHALKHILL BLUE

by Don McNamara (5537)

Two hours cycling from Uxbridge to Box Hill brought me to the scarp slope, a vital cup of tea and a chili-burger at Rykka's Cafe — and the prospect of a splendid day in the North Downs. The last Friday in July, the first day of the summer break. 0900 hours, warm. High cirrus clouds filtering the morning sun. Looking good.

The usual crowd was here. Bikers in leathers, a party of French adolescents absorbed in electronic games, lean cyclists, couples — kids perpetually munching, sweaty back packers. And on the neat tarmac a couple of coaches, some overnight lorries, cars. An urban island in a sea of chalk-downland. All around mixed woods, fields, farms and sharply rising hills. Nearby the River Mole sedately meandering along its valley bed. Excellent country for naturalists, particularly botanists and lepidopterists.

If you judge the seasons well, not easy with our shifting maritime climate, you can find a large proportion of our British butterflies in this area. *Callophrys rubi*, Green hairstreaks, and *Quercusia quercus*, Purple hairstreaks, abound, most of the satyrs, whites and skippers are here, the rising of *Lysandra bellargus*, the Adonis blue, is a sight to behold, with its lycaenid cousins, *Cupido minimus*, the Small blue, *Lycaena phlaeas*, the Small copper, *Lysandra coridon*, the Chalkhill blue, *Polyommatus icarus*, the Common blue, appearing in their own time.

There is a glade between here and the White Downs where *Limentis camilla*, the White admiral, sports accompanied by *Argynnis paphia*, the Silver-washed fritillary. Where tall oaks are spread among the tallows, the prospect of *Apatura iris*, the Purple emperor, is surely not fanciful. With a nod and a wink entomologists talk of a colony of *Strymonidia pruni*, Black hairstreaks, nearby.

You can never tell what you'll find around the corner, perhaps by a sudden glade — a rarity, an aberration of unique splendour. I've seen, on a previous occasion here, a viper of an unusual melanic form — your actual Black adder, no less. The thrill of expectation fuels the quest. I've never, as yet, come across stark, rising cliffs, a plateau on top of which dwell armoured saurians, leathery pterodactyls wheeling black against the sky — nor have I seen at the foot of such cliffs the bones of primitive beings, bleached. But the excitement of anticipation is never mundane. Professors Challenger and Summerlee would approve.

From here, sustained, a ride and push journey rising past Box Hill and West Humble Station, passing some old and reassuring flint and stone

walls, a show farm with happy kids sitting in a trailer being pulled by a tractor, past dozy sheep and some decidedly sane Fresian cows.

A familiar figure appears. Coming down the road from the station was AES-man, Peter "Hawkmoth" Howard, scholar and athlete, dressed in his Dr Livingstone gear. Intrepid. We arranged to meet later in the Stepping Stones pub, then onward and upward, off the road, through the woods, a touch of cyclo-cross. A sudden burst of rabbits, heart attacks all round, out the other side, skirting the trees edging a field, past a nectary of scabious, knapweed and teasel, populated by bumble-bees and tatty *Pyronia tithonus*, Gatekeepers, *Thymelicus sylvestris*, Small skippers, at the end of their season. Some fresh *Pararge aegeria*, Speckled woods, and a *Lasiommata megera*, Wall brown, also graced the flower-heads. This field was covered with *Melanargia galathea*, Marbled whites and *Argynnis aglaja*, Dark green fritillaries, just a few weeks earlier. Now they were gone.

Then, crossing a minor road, through yet more woods, snagged and prickled by hawthorn, suddenly out into the open. There before me, from left to right and below, looking southwards, was the Valley of the River Mole. Fields of oilseed rape, bright and yellow, some ploughed fields, rich brown, some wild, untouched. To the left but out of sight, settled in the Mole Gap, Dorking. Rising on the other side of the valley, which was bisected by a railway line, were regiments of conifers, patches of mixed deciduous woods. Further into the distance the sandstone hills of the Weald could just be seen, and beyond them, in the mind's eye, would be the South Downs. Then in the same general direction about 30 miles distant, the coast and the town of Brighton.

A footpath lay before me, running from east to west, the North Downs Way. Just the other side of this lay an unused, forgotten field. Too many flints and chalk boulders, uneven terrain — a chalk pit. No use for farming. Perhaps a little shooting. Rabbit territory though, cropped and tidied, short turf, areas of bright chalky soil, ants' nests topped with droppings. Patches of purple and yellow blooms, trefoils, meddicks, vetches — and especially *Hippocrepis comosa*, Horseshoe vetch, suggesting some of the butterflies that may live here. Above, the cirrus clouds had developed an underlay of cumulus. Perhaps it would rain. At about 100 feet wheeled a party of rooks or crows, black against the sky.

I'd been here many times before, a sort of compulsive pilgrimage. each season presenting a different flora and fauna. Last year, in the company of another AES-man, George Beccaloni, I in my naivete had foolishly walked by a *Coenonympha pamphilus*, Small heath (for was I not after more splendid things — perhaps a *syngrapha* form of the Chalkhill blue?), when, eagle-eyed, he excitedly pointed out that it was in fact an extremely rare Chalkhill blue form, var. *ochracea*. In any case surely Small heaths are worthy of admiration?



Fig. 1. Common blues on stony ground at Box Hill. Photo by Peter Howard.



Fig. 2. Common blues in cop on Box Hill. Photo by Peter Howard.

But I was totally unprepared for the sight that befell me now. The light was not that good although it was enhanced by the reflection from whitish patches of soil. A strip of "no-man's land" between the hedging and the open field was alive with a veritable snowstorm of male Chalkhill blues. Like large, swirling flakes, generally flying not higher than about three or four feet above the ground, they milled about, darted, charged at each other, swooped to inspect or to take time out for replenishment on the numerous flower-heads. Masses of insects. I walked carefully among them, the flurries parting about a yard in front of me, rejoining behind me. It was fantastical, almost an Alice-in-Wonderland situation. I'd never seen anything quite like it before. All I needed now was the appearance of a large, hurrying rabbit holding a pocket-watch to make the dream-sequence complete.

On closer inspection there were occasional pairs of Chalkhill blues in cop, clinging to grass stems or perched on flower heads. There were one or two darker females among the males and obviously the objects of the frantic activity. The males (which seemed to outnumber the females about 20 to one) — spotting the females, homed in, bustling each other while often the females "went to ground" — landing on the soil and temporarily seeming to disappear. The males "bombed" anything that remotely resembled the dark female underwing, especially the brownish beech leaves fallen from the previous autumn. Sometimes they were rejected out of hand by the females who raised their abdomens in the "proud" position. Sometimes they were accepted.

It was obviously a visual thing — males landing on leaves or pieces of debris, inspecting, contemplating — then dashing off to rejoin the madding crowd. No doubt pheromones played a part but only after sight had suggested a female presence.

I sat on the ground watching, letting it all swirl around me, the only distraction being the intrusion of an *Inachis io*, Peacock butterfly, unusually dark and alien in this enchanted landscape.

But soon it was time to go. I picked my way back downwards to the narrow, metalled road that led back to West Humble and to the Stepping Stones pub. Having swapped stories of the day's adventures with Peter Howard he decided to go to the Chalkhill scene to photograph the activity while light still held.

So back to the "smoke" then. The dubious delights of beer at £1.50 per pint and Sky television prompting me to make an early departure. Before leaving the chalk, a soft tyre required me to dismount to attend to it. By the roadside a female Chalkhill blue sat on a stone. I put it into a pill-box to "top-up" my stock. She seemed undamaged — possibly swept up by traffic turbulence but relatively unhurt.

Just after six in the evening I arrived back and took the box to the Chalkhill cage. Carefully unfastening the net door I opened the container. The butterfly flew straight out and over the fence into the church field next door. There are plenty of nectar flowers there so she should be all right.

THE SPANISH WHEREABOUTS OF THE MONARCH AND PLAIN TIGER

by Gareth King (8585)

There have been a few notes in the *Bulletin* recently on the appearance of the Monarch (*Danaus plexippus*) on the south coast of Spain around Málaga. From such observations that have been made it has not been clear whether they were simply immigrants (from the Canaries?) or resident there.

Literature which has come to my attention, however, states quite emphatically that it is a breeding species in restricted areas of Andalucía and has been so for a number of years.

It is found in the province of Málaga in Torrox, Morche, Nerja and Frigiliara, and in Alicante to the east between Orihuela and Murcia.

The fact that residents of Torrox claim to be used to seeing it throughout the year suggests that it is not a transitory phenomena.

Apparently, between 1979 and 1984 there was a drought in the south which may explain why it has taken a foothold, and it is a butterfly that prefers drier habitats. Having said that, its principal foodplant, *Asclepias curassavica*, prefers damper habitats and is to be found along the banks of the river Torrox.

The Plain tiger (*Danaus chrysippus*) is more widely distributed in Spain than the Monarch, being recorded as far north as the Ebro Delta in Tarragona; in Coin and Torrox in Málaga; Elche and Orihuela in Alicante, and Zeneta in Murcia. I saw several examples in Torrevieja and Guadarmar in September 1990, although there did not seem to be any *A. curassavica* or *Cynanchum acutum*, an alternative foodplant, present.

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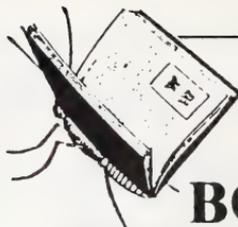
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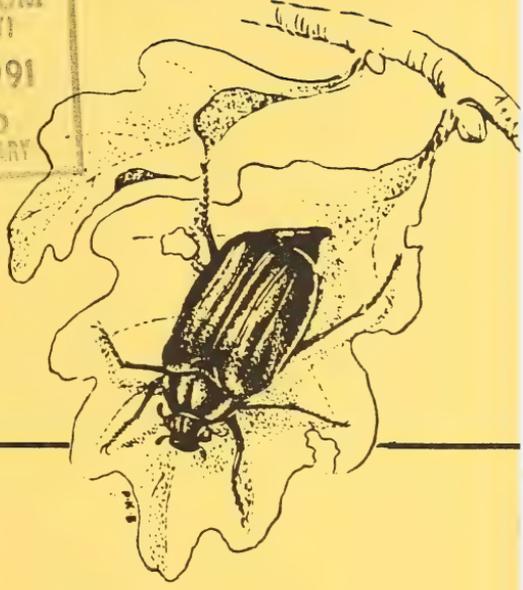
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CONTENTS

Asunta's hawkmoth — A new species? <i>by Leigh Plester</i>	2
Badger predation on bumblebees and wasps, <i>by M. Hancox</i>	35
Book review	9
<i>Colias hyale/alfacariensis</i> identity problem, <i>by P. W. Cribb</i>	12
Coleoptera trapped over a twelve-month period, <i>by K. C. Lewis</i>	29
Crossword, <i>by Gareth King</i>	34
Earthwatch, <i>from habitat</i>	19
Entomological Club grants and the Verrall supper	6
Enjoying the Glasgow area, <i>by Frank McCann</i>	7
Identification problems with <i>Colias hyale</i> (Pale clouded yellow butterfly) and <i>Colias alfacariensis</i> (Berger's clouded yellow butterfly), <i>by Andrew Wakeham-Dawson</i>	11
In praise of sugaring, <i>by S. J. Patel</i>	3
Letter to the Editor, <i>by Martin White</i>	1
Longhorn hunting in Southern England, <i>by B. R. Moon</i>	21
Notes on the behaviour of the ladybird parasitoid <i>Perilitus coccinellae</i> (Schrank), from an unusual source, <i>by Michael E. N. Majerus</i>	37
Ova of the Purple hairstreak, Silver-studded blue and Small copper butterflies, <i>by Alan Butler</i>	4
Practical hints, <i>by Christopher Nissen</i>	1, 19, 28, 33, 36,
Royal support for insect conservation	41
Snowstorm on the white downs: observations of <i>Lysandra coridon</i> , the Chalkhill blue, <i>by Don McNamara</i>	44
Spanish whereabouts of the Monarch and Plain tiger, <i>by Gareth King</i>	48
Swarm of the beetle <i>Ocypus olens</i> , <i>by K. C. Lewis</i>	20
Sweet butter-coloured flies, <i>by Frank Marples</i>	13
Why should some butterfly species exhibit almost no variation, whilst others exhibit a tremendous amount? <i>by Chris Raper</i>	16
Rare Wood-cricket in Devon: errors corrected, <i>by The Editor</i>	18

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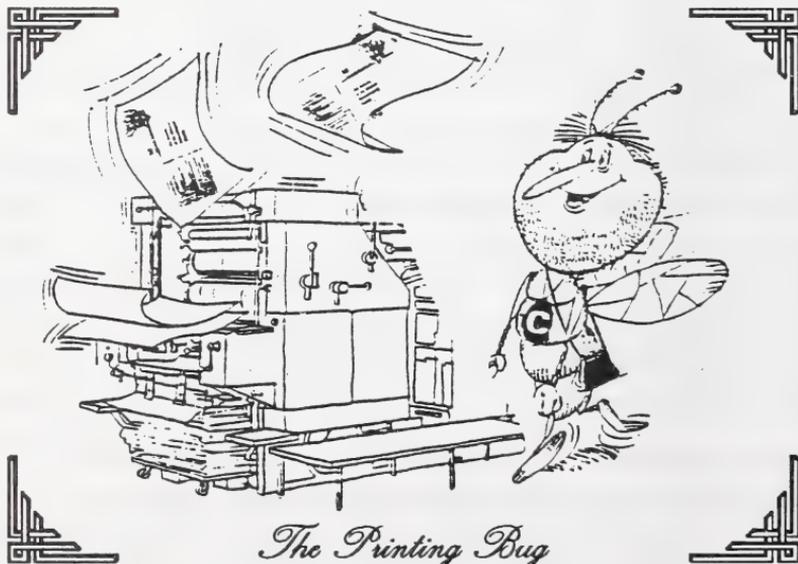
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AES BULLETIN

No. 375



OUR ANNUAL GENERAL MEETING

This will again take place at 2pm in the rooms of the Royal Entomological Society, 41 Queens Gate, London SW7 on Saturday 20th April, when Dr Anne Webb will be giving the talk this year on the subject of Arachnids.

LETTER TO THE EDITOR

Dear Editor,

I was very pleased to read the letter from M. A. Hope in the December last *Bulletin*. I was getting concerned that the view "all collecting of insects should be banned" was becoming firmly entrenched in the Society's hierarchy. I realise that some people will always feel very strongly about such issues but let us try to look at the facts as I see them.

Firstly I understand that all the fuss started with a letter from a member complaining that the exhibition has become a bazaar. He was reminiscing about the exhibition which he had attended, some considerable time before. Well I, and a number of my friends, have attended the exhibition every year for more than the last decade and the thing that attracts us to this exhibition is the possibility of picking up interesting livestock or perhaps a new book. We are always interested in all the exhibits BUT if the exhibition were to stop trading in insect species and stop most traders attending then our attendance would revert to once a decade if we remembered. Surely the very success of this meeting shows that it is providing what the people want.

Surely one of the Society's aims is to promote people's awareness of insects especially in the young. What better way is there than for the young (and old alike) to obtain livestock which they can rear and hopefully breed. What better way is there to prevent overcollecting in the wild than to provide livestock which, when bred on, can provide some for others to breed on. Surely the Society should be helping its members acquire captive bred stocks of rare species as this will reduce the likelihood of illegal collecting. The trade or swapping of livestock, especially among members should be encouraged not discouraged as this must relieve pressure on wild stocks.

I agree that some traders should be banned. When at the Leicester exhibition I saw one "trader" with a drawer of Large blue butterflies for sale. There were certainly over 60 specimens present and possibly over 100. All appeared to have similar data labels, being caught in the same fortnight in the same region of Europe. I find this sort of collecting obscene. My friend and I were both upset at seeing this display as were all we spoke to. We commented on it to the organisers who simply shrugged and said it was legal. The organisers attitude I also find highly distasteful and I may never return to Leicester. I Would hope that any similar display would be thrown out of the AES Exhibition with the full backing of the membership but we must not throw the baby out with the bath water.

Yours faithfully,
Roger A. Wright (6598)

AN UNUSUAL OCCURRENCE OF ICHNEUMON EMERGENCE FROM A CABBAGE WHITE LARVA

by Jan Koryszko (6089)

During most days in late summer I come across Cabbage white butterfly, (*Pieris brassicae*) larvae, their dried up skins on walls etc. and also the yellow and whitish cocoons near or close by of their well known parasite, *Apanteles glomeratus*. I have also sometimes observed a larva with maggots emerging through its skin and this unfortunate then dies almost right away.

During late summer 1990 I was doing some outdoor painting when I saw a Cabbage white larva with white ichneumon maggots emerging at its anal end. Then it carried on walking with a trail of yellow juice behind it, leaving the maggots to spin their cocoons.

I have never observed this before. I put the larva in a container with some cabbage leaves. It ate small amounts of the leaves, but finally got weaker and more sluggish and finally died. In fact it lived 48 hours after the emergence of the ichneumon parasites. Is this a freak occurrence, or have other members had similar experiences?

THE BUTTERFLIES OF ANSTON STONES 1986-1990

by Paul W. Batty (8926)

Anston Stones is one of the few remaining islands of wildlife left in our area, situated in an ocean of agriculture. It lies almost unnoticed alongside 1½ miles of the A57 trunk road, in the south-east tip of South Yorkshire. Luckily, as its name implies, the Stones has escaped development by being no more than a craggy limestone valley, drained by a small brook which runs on to become the River Ryton. Around 70% of the area is covered by mixed woodland, but the remaining 30% is grassland and scrub, rich in flora and wildlife. With many caterpillar foodplants available in and around Anston Stones it is no wonder that this place is the stronghold for butterflies in our area and cannot be equalled for more than 30 miles around.

Of the 58 or so species of butterfly found in this country, Anston Stones has a list of 25 (Table 1). At first, this may seem a small number, compared with 40+ for Oxfordshire woodland sites, but taking into account the relatively small area of Anston Stones and its latitude, this is probably one of the better lists for the area. Only one of the 25 can be classed as a chance rarity, the Clouded yellow, whose appearance is very sporadic and depends on the weather on the European continent as well as this country. There are also disputed records for one or two other species, such as the Dark green fritillary (*Argynnis aglaja*) and Grizzled skipper (*Pyrgus malvae*).

Table 1. Alphabetical (English names) list of butterflies occurring at Anston Stones.

Brimstone	<i>Gonepteryx rhamni</i>	Painted lady	<i>Cynthia cardui</i> **
Clouded yellow	<i>Colias croceus</i> **	Peacock	<i>Inachis io</i>
Comma	<i>Polygonia c-album</i> *	Red admiral	<i>Vanessa atalanta</i>
Common blue	<i>Polyommatus icarus</i>	Ringlet	<i>Aphantopus hyperantus</i>
Dingy skipper	<i>Erynnis tages</i> *	Small copper	<i>Lycena phlaeas</i> *
Gatekeeper	<i>Pyronia tithonus</i>	Small heath	<i>Coenonympha pamphilus</i>
Green-veined white	<i>Pieris napi</i>	Small skipper	<i>Thymelicus sylvestris</i>
Holly blue	<i>Celastrina argiolus</i> *	Small tortoiseshell	<i>Aglais urticae</i>
Large skipper	<i>Ochlodes venata</i>	Small white	<i>Pieris rapae</i>
Large white	<i>Pieris brassicae</i>	Speckled wood	<i>Pararge aegeria</i> *
Marbled white	<i>Melanargia galathea</i> §	Wall butterfly	<i>Lasiommata megera</i>
Meadow brown	<i>Maniola jurtina</i>	White-letter hairstreak	<i>Satyrrium w-album</i>
Orange-tip	<i>Anthocharis cardamines</i>		

* = Uncommon; ** = Sporadic; § = Introduced (see text).

All others common or reasonably so, see Table 2.

It is interesting to note that the fritillaries are not represented, but there are old records of the Dark green fritillary. The imagination may wander, as to how many other species may have existed in Anston Stones in the past. With both thyme and various species of ants present, one may suspect the Large blue and there is enough rockrose to have supported both the Brown argus (or Northern brown argus) and Green hairstreak. For the present, however, we will stick to facts.

The best represented families are the "browns" and the "whites". (Seven and six members respectively), while the blues are represented by only the Common blue and the Holly blue.

Small, Large and Dingy skippers:

The Small and Large skippers are both present in good numbers, although the Large is the more common of the two. Identification can often be difficult because the two fly together and old and tatty Large skippers can sometimes be mistaken for the smaller one. The Small skipper is the smallest butterfly in Anston Stones and is found in all of the meadow areas and extending onto the verges of the railway and along the footpaths. It has the ability to exist on even the narrowest strip of grassland with success, so I am sure that this charming little butterfly is in no danger and will continue to be with us for years to come. The Large skipper chooses coarser grasses for egg-laying. Sheltered positions along paths and around clumps of trees are chosen and because of this, the Large skipper does not seem to be affected by the fires which usually burn out in the centres of the grassland areas.

In 1990 no sightings of the Dingy skipper were made in Anston Stones, but reasonable numbers were recorded at three other sites nearby. Any slight increase in rabbits at Anston Stones seems to be kept in check by the Jack Russell users. Burning off the grassland has good results in keeping the grass thinner and gives a good improvement in wild flowers. It does however, kill off most of the hibernating butterfly caterpillars. The Dingy skipper does not seem to wander very far in its habitat and it is unlikely that it will recolonise Anston Stones.

The Brimstone and Whites

The Brimstone's foodplant (Purging buckthorn), is quite common in Anston Stones, and it is quite easy to find both the eggs and caterpillars on the leaves of the buckthorn. This shows that Brimstones are present, even if the adults have not been seen in the vicinity. In the Anston area in 1990, over 150 eggs and caterpillars were found. (Around 20 bushes were searched). Tiny bushes less than 12 inches high, in a newly planted hedgerow were found to have dozens of eggs and caterpillars on each (many more than the few leaves could sustain). Caterpillars reared in

captivity have produced only two percent parasites, even when they were collected from the wild at a late instar.

The Brimstone is a beautiful sight in the early spring days and the bright yellow males can often be seen on sunny days as early as March, winging their way up and down their favourite woodland ride . . . the railway line.

The three whites can be found in good and equal numbers each year, although the summer broods are always more numerous than the spring ones. It has been a mystery to me for some years, as to what the Large white uses as a foodplant in the wild. It is easy to find the caterpillars on cabbages and nasturtiums in the garden but I have never yet found a wild plant in Anston Stones or the surrounding countryside with a nest of Large white caterpillars on it. Being gregarious and vividly coloured it is unlikely that I have overlooked them. Perhaps the fields of rape may provide an answer as I have occasionally found eggs and caterpillars of other species of the "whites" on isolated self-sown rape plants in the hedgerows.

Although the Green-veined white at Anston Stones always appears to have two generations per year, sites further north have only one generation per year. Experiments in breeding the Green-veined white from Doncaster stock has shown that weather and temperature, and especially light levels, have a profound effect on the number of broods and determine whether pupae formed in May and June emerge in July/August or lay over and emerge the following April/May. If spring Green-veined whites are paired and the resulting caterpillars are reared at moderate light levels, almost exactly 50% emerge as second brood in late July and the rest overwinter and emerge the next spring. From 400 caterpillars reared in low light conditions in 1990, only two percent have emerged as second brood. One suspects that reared under bright and continuous light, 80 to 95% would emerge as second brood.

The Orange-tip appears in good numbers year after year. Size varies greatly on how well the caterpillar has fed in its last stage before pupating. A very small male specimen was found in Anston Stones in May 1987, with a wingspan of only 25mm instead of the usual 45mm average.

The Small copper

The Small copper is generally a fairly common insect in this area, but numbers in Anston Stones are always small. Perhaps the grass is too long or there is not quite enough foodplant, but nevertheless small numbers continue to be seen each year and there are one or two strong colonies elsewhere in Anston and Dinnington. The variety with blue spotting on the hindwings has also been found here.

The White-letter hairstreak

The White-letter hairstreak is on a very precarious footing, with the loss, over the past few years of most of our large elm trees.

The Common blue

The Common blue has been very low for the last few years although surprisingly it was still to be found after a fire destroyed a large area of the meadow in February 1987. In the 1960s and early 1970s the Common blue could be counted in hundreds in the grassy areas of Anston Stones. Even grassland in Dinnington had reasonable populations, but today, counts can usually be done on one hand. Habitat change is the probable cause, again the loss of rabbit grazing (due to the myxomatosis virus) has caused the grass to swamp out many of the shorter wild flowers and the Common blue's foodplant, birdsfoot trefoil, likes to grow in short grass. Periodical burning of the grassland has a "catch 22" effect The foodplant grows and competes better with the grass and is able to sustain more butterflies, but the fire kills off the caterpillars so there are no butterflies to sustain. Perhaps some sort of controlled grazing is the answer. I have seen controlled grazing by cattle on the National Trust area at Ballard Down, Swanage. The grass is very short of wild flowers and butterfly numbers are down . . . but step over the fence onto the bit that is not controlled by the National Trust and it is like paradise with loads of wild flowers and insects and the only grazing is by a guy who turns a couple of horses out on the land.

The Holly blue

The Holly blue is a very uncommon butterfly in Anston Stones and until 1990 had not been seen for several years. With the good weather in 1989, it appears that the few that were present have built up into slightly better numbers and as of 1st August 1990 I have had several reports of "half-a-dozen" sighted by different people. The Holly blue has two broods each year so when conditions are favourable it should not take too long for numbers to build up and I would not be surprised to see it as a common butterfly by 1991 or 1992.

The Nymphalids

The appearance of the Painted Lady is much dependent on the weather and adult migration from North Africa and the European continent, so one cannot guarantee to see this butterfly every year. I have tried several times to get captive females to deposit eggs on thistle and nettle, without success.

The Red admiral can be seen most years in ones or twos, whereas the Small tortoiseshell is very common and can be found almost anywhere

where there are flowers to provide nectar and near the large nettle patch at the side of the sewerage works it is not unusual to see Small tortoiseshell and Peacocks in the hundreds. The Small tortoiseshell was seen on the wing in Anston Stones last year (1990) as early as 17th March. Strangely enough, last year, most of them had gone into hibernation for the winter by the end of August.

The Peacock is perhaps a little less abundant than the Small tortoiseshell and of course has only one brood per year, being on the wing afresh in late July.

Sightings of the Comma are few, but nevertheless consistent and 1989 and 1990 give indications of an increase in numbers. This appears to be the same across South Yorkshire. The Comma is one of the success stories of Anston Stones in the last few years. In 1986 only one individual was sighted and numbers have increased till this year the Comma can almost be classed as reasonably common.

For some reason (probably because the best remaining concentrations of elm are along the railway embankment), the Comma can mainly be found along the railway, although a few have been seen elsewhere in 1990. 1990 has been the best year so far for Comma in this area. I have had two on buddleia in the garden here in Dinnington and many others have been seen elsewhere in the area. In 1989 I bred more than 200 Comma from a female caught in Anston Stones and released many of these in various parts of Anston.

These "wandering" butterflies are often difficult to count with accuracy and one often gets misleading results.

The Marbled white is fairly common, although here it is well out of its range. It is the successful result of an introduction made around 1980 and is more at home further south in places such as the Chilterns or the South Downs. Numbers appear to be increasing and one wonders if it will soon be as common as the Meadow brown in Anston Stones. In numbers, Anston rivals almost any similar southern site, so well has the Marbled white accepted its new home. Numbers fluctuate slightly from year to year but remain reasonably high, despite a fair proportion of the butterflies being taken each year by local entomologists for breeding purposes. Odd wind-blown stragglers have been sighted in other parts of Anston and Lindrick and it is not inconceivable that the Marbled white could establish itself on verges and in other parts of the Anston area, especially if the hot weather continues for a few more years.

I had feared that as the grass was getting longer at Anston Stones, the Wall brown was getting scarcer, but the last two warm seasons and good springs (1989 and 1990) have allowed it to build up its ranks and in 1990 it was almost as common as the Meadow brown. In past years the Wall

could only be seen in certain areas of the Stones, the steep rock face of the railway embankment at the Lindrick end was the best spot, but now it can be found almost anywhere. Other sites in Anston have also experienced large increases in numbers, although this can partly be attributed to habitat improvement and breeding and release schemes.

The Speckled wood is a bit of an odd character in South Yorkshire. With the exceptions of Owston wood (Doncaster) and Sprotborough, it is not at all common. Several sightings of this butterfly have been made in Anston throughout the 1980s, but I have not yet found it here myself. Some recent recordings of the butterfly for this area are: Lindrick Common, 1971 and 1984; Anston Stones wood, 1982, 1985, 1988; South Anston, 1986; Kiverton Park, 1978. (For references see *Butterflies and Moths of Yorkshire*, Sutton & Beaumont 1989. ISBN 0 950 40932 4.) The Speckled wood must have specific natural requirements that are not available in Anston Stones wood, although in captivity they are very easy to breed in vast numbers.

The Gatekeeper is another butterfly whose numbers have recently seen an expansion in Anston. Normally it would only be found in one or two discrete colonies in Anston Stones, but in 1990 it was found almost anywhere in the Stones, especially near to brambles and other nectar rich plants, on which the butterflies congregate to feed.

The Meadow brown is single brooded and it appears in hundreds and specimens of the double brooded Small heath can be found in every nook and cranny of Anston Stones from May to September.

The Ringlet is present in modest numbers but is often overlooked, especially as it flies amongst hundreds of Meadow browns. If anything, it appears to be slightly increasing in numbers, but it takes a trained eye to spot it against its brown cousins. The Ringlet is, for me, one of the most interesting butterflies in Anston Stones. Although a very common butterfly in some parts of the country, it is fairly scarce in the immediate area and besides the one colony in Anston Stones, I am not aware of any other sites for this species in the immediate area. It appears to prefer the longer grass and is quite common in the grassy edges on the north side of the wood. The colony at Anston is unusual in that there appears to be an unusual amount of aberrations. In a Lincolnshire colony of thousands of Ringlets, I have checked hundreds each year without finding a single individual differing from its fellows whereas at Anston Stones I have found between two and five specimens of the form "*caeca*"* each year for several years.

*In this form, the characteristic rings are missing on the undersides of the wings, although the white dots in the centre of the wings may or may not be present. Although this aberration is not particularly rare, more than the average amount is seen at the Anston colony.

The railway line is an important link in the continued survival of many of the butterflies — indeed some species are only found along its edges and nowhere else in the Stones. The railway joins together the two otherwise separated meadow areas of the Stones and also provides an ecological link with other areas such as Lindrick, Turnerwood and Worksop. Lindrick and Turnerwood both have exceptionally good disused quarries and are on the same limestone belt as Anston Stones.

The butterflies of Anston Stones have been recorded regularly over a five year period and the results are presented in Table 2.

SPECIES	1986	1987	1988	1989	1990
Small skipper	130	70	70	42	160
Large skipper	175	210	255+	270+	270+
Dingy skipper	1m	1	1	-	-
Brimstone	2	3	3	14	15+
Large white	40+	45+	50+	60+	80+
Small white	25+	40+	40+	75+	75+
Green-veined white	50+	30+	60+	50+	75+
Orange-tip	30	30+	45+	40+	65+
White-letter hairstreak	3 ova	9 ova	-	-	-
Small copper	1	-	3	4	4
Common blue	14	16	11	7	13
Holly blue	-	-	-	-	3
Red admiral	1	2	1	5	14
Painted lady	-	-	7	-	1
Small tortoiseshell	9	31	70+	105+	230+
Peacock	5	18	40	82+	185+
Comma	1	-	-	3	23
Wall brown	22	27	35	40+	230+
Marbled white	21	100	60+	100	100
Gatekeeper	17	20	25	40	110
Meadow brown	110+	110+	170+	100+	225+
Small heath	122+	125+	255+	260+	315+
Ringlet	2	5	12	20	20+

Table 2. Relative abundance of butterflies at Anston Stones over a five-year period.

50 YEARS AGO

from AES Bulletin No. 45. April 1941

The cause of the unavoidable break since the last issue (which was June 1940!) of the Bulletin has now been surmounted, and it is intended this summer to send out lists of exchanges, members' names, addresses and interests, and brief accounts of interesting observations regularly. The subscription rate will be 2/- per annum, and it is hoped to produce six or eight issues, the majority being issued during the collecting season. The small balance carried over from 1940 has been used to buy sufficient envelopes to last for some time, so future expenditure will be cut to a minimum and the secretarial work small.

In order that no long break in our communications shall recur, it would be of great assistance if two or three members could volunteer to act as Assistant Secretaries, one preferably possessing a typewriter and able to produce Bulletins if the present Editor and Assistant Editor (A.F. O'Farrell) were unable to do so. The present active members of the Committee, who have helped in the production of the present issues, are the Hon. Secretary and Treasurer, Miss L. Smith, 13B, Furzefield Road, Welwyn Garden City, Herts, and Messrs Knight, Morton, O'Farrell and Cooper.

The long promised volume 5 Journal is now in print and delivery has been promised by the printers for a week hence. Unfortunately, owing to enemy action, the Society's books and files have been lost, together with our records of who has ordered and paid for his Journal. We hope it will not be asking too much therefore, if all members will send us a postcard stating their present whereabouts and whether they have ordered a Journal or Bulletins. Only £10 has so far been subscribed for this issue in donations and advance payments, which is costing seven times that amount in printing costs alone. It has therefore been decided to raise the price to 4/6d, post 4d, for copies sold from now on, and it is hoped that members will help us to regain the outlay by advertising among their collecting friends this our first large issue.

As for the future, we are hoping to carry on the small Wartime Exchange Sheets and keep the name of the Society in the mind of amateur entomologists, so that, when we once again resume our full activities, the difficulties in getting going again will not prove unsurmountable. A start has already been made on the next (Vol. 6) issue of the Journal, which it is hoped will be more in the style of the present issue than those of pre-war days. All contributions, short and long, will be welcomed, and particularly those on apparatus and collecting methods, especially if illustrated by line diagrams. And also notes on the habits of insects. Mr. G.B. Walsh is beginning the preparation of a

“Coleopterist’s Handbook” and will be very glad of any notes or tips on any aspect of beetle collecting or breeding, except identification, which any member can provide. Mr. Walsh’s address is: 22 Stepney Drive, Scarborough, Yorks.

B.EOWULF A. COOPER, B.Sc., A.R.C.S., HON. EDITOR,

F.J. O’Rourke (191), wishes to obtain a copy of “The Humble Bee” by Sladen, and also any papers on Social Hymenoptera.

Dr. G. Fraenkel, Imperial College Field Station, London Road, Slough, Bucks, wishes to obtain large numbers of the elytras of the cockchafer or other similar insect. The elytras should be freshly picked and not chemically treated. He is willing to pay for them. Please write, giving details, before sending.

On June 20th 1939, I collected a bunch of bladder campion stems at Bossington, near Maidenhead, Somt. On July 2nd 1940, among other emergencies, was a specimen of *D. albimacula* (White spot). J. E Knight.

On January 24th, 1936, I was shown some small insects caught on the Downs on top of snow. They resembled very small glowworms. Can anyone suggest what they were? Surely the situation was very unusual? G.C. HOLROYD (253).

The insects described were almost certainly larvae of the beetle family Cantharidae, the red Soldier Beetles to be seen in such numbers in summer on the flat heads of ragwort and Umbeliferous flowers. The larvae are predatory and feed on other insects. At the present time (22/3/41) I have a dozen or more of the larvae alive and very active in a jam jar, which they have inhabited happily for the last four or five months, living exclusively of a diet of wireworms, which they devour with great gusto in five or ten minutes, often several of the wireworms per day, although they come to no harm if starved for days and even weeks on end, provided they are kept moist. They show a marked preference for wireworms of about 10mm length. The active velvety larvae make interesting pets! Mr Van Emden says that they are known locally as “snow worms” from the frequency with which they are found crawling on snow, possibly flooded out from the ground beneath by the melting snow. They are often common in flood refuse. B.A. COOPER.

PRACTICAL HINT — REARING

by Christopher Nissen (7002)

The ova of the Yellow tail (*Euproctis similis*) take about nine days to hatch and the small larvae begin by eating the cuticle of hawthorn leaves.

100 YEARS AGO

from *The Entomologist*, April 1891, Vol. 24, page 100.

ANOTHER NAUSEOUS INSECT EATEN BY A WOODPECKER.—On the 28th of January last, I received from Mr W. Perry, of Broxton Old Hall, Cheshire, a female specimen of the great spotted woodpecker (*Picus major*, L.), which had been shot in that neighbourhood. On examining the stomach of this bird, I was very agreeably surprised to find that it contained at least four specimens of a *Coccinella*, undoubtedly the very common *Hippodamis variegata*, Goetz. (= *mutabilis*. Schrib.). In addition to these there were a number of the larvæ, and two imagines, of *Rhagium bifasciatum* (the larvæ of this coleopteron seem to be their favourite food, as I have found them in other examples that I have examined); the former almost filled the stomach, and several of them were almost digested, their heads only remaining, which proves, beyond all doubt, that they were eaten sometime before the *Coccinella*, as the latter were quite fresh at the time of my examination. This, I think, should prove of some interest to those who are at all interested in the “uses of colours in animals,” or in the Darwinian theory. In his very interesting little book (*‘Colours of Animals,’* p. 180), Mr E.B. Poulton says:— “That ladybirds are eaten by green tree-frogs in winter, when other insect-food is scarce; and also by hungry birds, although intensely disliked, and are refused (at any rate, by the frogs) if other food can be obtained.” Mr Poulton kindly informed me that these facts are based entirely upon experiments with captive animals; hitherto, nothing in a state of nature has been known to feed upon the Coccinellidæ. At first sight my observations appear to verify Mr Poulton’s statements, but the woodpecker could not have been in a state of hunger when it ate the nauseous insects, for reasons previously stated. We must also bear in mind that the woodpeckers are less affected by severe weather than any other bird, as the greater part of their food is obtained from timber, which is always available. I am, therefore, of opinion that this species of woodpeckers, and probably other members of the genus, like the cuckoo (*ante*, pp. 19, 77), will feed upon nauseous insects at any time of the year; this, however, can only be proved by the examination of birds during months when plenty of edible food is available. I hope that my very brief remarks may incite others, who have the opportunity to examine the stomachs of insectivorous birds, to do so whenever opportunity offers; curators of museums, abroad as well as in this country, could help very materially, by preserving the stomachs for any specialist who might care to examine them. Degraded as this branch of Entomology may appear to many, it is, nevertheless, of very great interest. I should be very glad to hear the opinions of others who are interested in this subject.— R. NEWSTEAD, Grosvenor Museum, Chester, March 14, 1891.

150 YEARS AGO

from *The Entomologist*, April 1841, vol. 1, page 96.

ART. XIV.—*Notice of the peculiar economy of certain Larvæ, in eating the Egg-shell which previously contained them.* By R. WARRINGTON, Esq.

[I HAVE often remarked the circumstance to which Mr. Warrington alludes, but find it by no means a universal law in the economy of the insect tribes. Many Lepidopterous larvæ, immediately on escaping from the egg, commence feeding on the leaf on which the egg was laid by the parent: others, particularly some species of Bombycæ and Arctiæ, make their first meal on the shell of the egg which contained them, precisely in the manner spoken of by Mr. Warrington. This is one of those wonderful provisions for the support and well-being of animals, in the earliest and most helpless stage of their existence, which the study of Natural History is continually displaying, thus forcibly reminding us of the constant care of the Great Creator, even for the apparently most insignificant of his creatures.—E. N.]

Percy Villa, South Lambeth,
March' 18th, 1841.

Dear Sir,

In my endeavour to obtain the egg of a Lepidopterous insect in a permanent state as a microscopic object, I was met by two great obstacles, the first arising from the shrinking of the body of the contained caterpillar drawing in the walls of the egg, and thereby destroying its beautiful markings; the second from the fact that if the caterpillar were allowed to break its way through the shell, and remain alive for a few hours, that the whole of the shells had disappeared, and only the glossy circular spots of their attachment to the leaf remaining. On closer observation I found that directly the caterpillar was thoroughly clear from the shell, its first act was to commence its work of feeding on it, until the whole had disappeared. It is my intention to follow these observations more closely the present spring.

Yours obediently,

R. WARRINGTON.

200 YEARS AGO

from A New System of the Natural History of Insects (Anonymous)

The pernicious genus of the phalaena, which contains all the different species of moths, makes still nearer approaches to man in the hostilities which it commits. No person is ignorant of the destructive quality of these insects to woollen cloth, and all kinds of fur and wearing apparel. The astonishing instinct of these animals, in providing a proper receptacle for their eggs, and food for their young, have not withdrawn that indefatigable entymologist Reaumure, from devising efficacious methods of preventing their depraudations upon woollen stuffs and furs. (Vide *Mem. de l'Acad.* 1728).

Little inferior in its destructive powers to the locust is the *Phaelaena Graminis* of *Linnaeus*, which destroys the meadows in Sweden; There the peasants are employed in cutting deep ditches in the surface to stop the progress of the larvae as they pass along; If the swarm be small, this device has the desired effect; but the numbers of these animals are often so great, that they fill up the trenches, and pass along over the dead bodies that are buried in them.

Dermestes Lardarius. This insect is of a black colour, and easily distinguished by a large transverse stripe covering the anterior part of the elytra, which is of a cinereous hue. The stripe receives this pale colour from a number of small grey hairs which grow upon it; it is irregular at the edges, and intersected through the middle by a small transverse streak of black spots, three in number, on each side of the elytra; the middle spot somewhat lower than the rest, gives the black streak a serpentine of undulating form.

This animal feeds upon cadaverous carcases, and meat verging to a state of putrification: It makes its way into the museum, and is often seen among preparations, in numbers more than sufficient to gratify the curiosity of the possessor. In fact, it is among the greatest enemies of his labours; and in the larva state, makes the greatest havock among the collections of insects. (see Barbut's *gen. insectorum*). It then assumes the form of a hairy oblong worm, which is divided into segments alternatively of a dark and light colour. In that form it is often found deeply penetrating into old bacon which it renders useless.

To counteract these inveterate enemies of man, and to relieve him of the mischiefs they occasion, ought always to be one aim of the entymologist; and no person will deny, that whoever, by the study of insects, has found the means of availing himself of the labours of such as are useful, or preventing the noxious from doing harm, hath rendered an essential service to mankind.

392 YEARS AGO

Title page of the very first insect book in English

(T.M. stands for Thomas Mouffet, author of *Insectorum Theatrum* 1634 (English translation 1658) and whose daughter sat on a tuffet and was frightened by a spider; she may have had good reason — it was probably a Black widow, much commoner in the 16th century, and known to be dangerous.)

T H E
Silkewormes, and
their Flies:

Lively described in verse, by T. M.
*a Countrie Farmar, and an ap-
prentice in Physicke.*

For the great benefite and enriching of England.



Printed at London by V. S. for Nicholas Ling, and
are to be sold at his shop at the West end of
Paules. 1599.

2736 M[OULI] ([THOMAS]) THE SILKEWORMES, AND THEIR FLIES: LIVELY DESCRIBED IN VERSE; by T. M. a countrie farmar, and an apprentice in physicke, FIRST EDITION, woodcut on title page, with the leaf before the title blank except for the signature, original paper flaw in A₃ with minimal loss, contemporary calf, rebacked [STC 17994; Grolier, Langland to Wither 180]

sm. 4to V. S[immes] for Nicholas Ling . . . 1599

OH ANTHONY WHERE ART THOU?

from an advert in "New Scientist"

Temporary Entomologist: For one year contract to work at the **** Museum on Cleopatra and Hymenoptera collections which need to be maintained and upgraded in order to promote their use as a scientific resource. (Only those whose names include Julius, Anthony or Ptolomey considered?)

THE PROFESSOR HERING MEMORIAL RESEARCH FUND

The British Entomological and Natural History Society announces that awards may be made from this Fund for the promotion of entomological research with particular emphasis on:

- (a) Leaf-miners
- (b) Diptera, particularly Tephritidae and Agromyzidae
- (c) Lepidoptera, particularly microlepidoptera
- (d) General entomology

in the above order of preference having regard to the suitability of candidates and the plan of work proposed.

Awards may be made to assist travelling and other expenses necessary to fieldwork, for the study of collections, for attendance at conferences, or, exceptionally, for the costs of publication of finished work. In total, they are unlikely to exceed £600 in 1991/92.

Applicants should send a statement, if possible in sextuple, of their qualifications, of their plan of work, and of the precise objects and amount for which an award is sought, to Dr M.J. Scoble, Department of Entomology, The Natural History Museum, Cromwell Road, London SW7 5DB, as soon as possible, and not later than 30th September 1991.

Applications are invited also from persons interested in borrowing the Wild M3 Stereomicroscope and fibre optics illuminator bequeathed to the Fund by the late Edward Pelham-Clinton, 10th Duke of Newcastle.

Loan of this equipment will be made for periods of up to six months with the possibility of extension.

PRACTICAL HINT — LARVA REARING

by Christopher Nissen (7002)

The larvae of the Pine hawk moth (*Hyloicus pinastri*) also feed on Lebanese cedar and Norwegian spruce. They should be fed on the old pine needles for if they are fed on the young shoots, they then get diarrhoea.

PRINT REVIEW

The Collector's Portfolio of Harris's Butterflies. A collection of 12 prints, quarto size, loose in folio case, with introductory leaflet. ISBN 1 85410 162 5. Aurum Press Ltd, 33 Museum Street, London WC1A 1LD. 1990. Price £16.95.

This selection of prints are taken, not from the famous *Aurelian* itself but from Harris's *original* paintings from which the plates in this book were made, and are therefore of superb quality. Indeed to my vision it is difficult to believe that some of the lepidoptera depicted are not actual photographs rather than 250 year old paintings.

The plates have been excellently printed and are far superior in reproduction to those of the recent 5th edition of *The Aurelian* (reviewed *Bulletin* 45: 198), the background being just off-white which of course was the colour of the paper they were originally painted on. There is then a double black outline frame and a light buff outer margin. The names of the insects are handwritten by Harris at the bottom. Tastes differ, but in our view these prints look best in a thin black frame. The accompanying leaflet gives an all too brief account of Harris and his work and also instructions for making a frame into which to put the prints; a bit unnecessary in our view since the publisher's advertisement states that the size of the prints is that which fits easily into ready-made frame kits!

Being originals, no plate numbers are shown on these prints which were subsequently used for plates 4, 8, 9, 11, 19, 25, 26, 28, 32, 36, 38 and 44 of *The Aurelian*. For those interested with minutiae it is interesting to compare them and note that in the final engraving for the plates there are some distinct variations from the originals.

The prints are contained in a strong and handsome portfolio which is in the style of a stationery folder, for which purpose it could be subsequently used, but this reviewer prefers to keep most of his prints in it and change the framed ones from time to time. As I have stated in previous reviews, the production of modern prints such as these should be encouraged, for they do help to take the pressure off the deplorable trade in breaking up the original books for the sake of framing the plates and at this price they are but a fraction of the cost one would have to pay for an original.

Brian Gardiner

PRACTICAL HINT — LARVA COLLECTING

by Christopher Nissen (7002)

The larvae of Broad-bordered yellow underwing (*Noctua fimbria*) are night feeders and may be found after dark feeding on the foliage of bramble.

SPAIN — A SPRING EXPEDITION — 14th MAY - 30th MAY 1989

by P. W. Cribb (2270)

In 1987 David Marshall and I had visited the Serrania de Cuenca and the Sierra de Albarracin in Central Spain during the last weeks of July, finding the whole area very rich in butterflies, both as to species and numbers. For 1989 we decided we would go back to the same areas in the spring to see what would be on the wing at that time of the year, hoping to take species which we had missed on our previous visit.

We left from Portsmouth to Caen in Normandy by the midnight boat on the 14th May and again followed the road south towards Bordeaux, camping for the night just north of Bayonne on the edge of the Landes pine forest. We crossed the Pyrenees the next morning and drove via Pamplona and Soria to the town of Alcala de Henares where we turned off through a maze of streets to Loeches to camp under the olives on the road to Campo Real. We had covered the journey in two days, approximately the same time as if we had come by boat to Santander. It was 7.30 in the evening but the sun was still very hot and we found the Western marbled white, *Melanargia occitanica*, and Chapman's blue, *Lysandra thersites*, flying round the camper while red-rumped swallows were catching flies above our heads. These were nesting in a cave in the chalk escarpment overlooking our site. We went to sleep to the call of the little Scops owl.

Next morning we woke to a blazing sun and spent the day on the dry and almost arid slopes above the olive groves. These were covered with scrub which included clumps of the bladder senna, *Colutea aborescens*, the foodplant of the Iolas blue, *Iolana iolas*, which is the largest of the European blues. There were also small groups of the legume, *Astragalus alopecuroides*, with tall yellow flowers, the foodplant of the Zephyr blue, *Plebejus pylaon hespericus*. Despite the dryness there were plenty of flowers and the meadows below the olives were covered with candytuft and large clumps of yellow crucifers but there was very little grass. We patrolled some of the *Colutea* clumps and eventually spotted an *iolas* dashing about between the bushes.

David netted a male and then I took a female. This had been ovipositing on the newly-formed bladders while dozens of Long-tailed blues, *Lampides boeticus*, were laying on the bases of the flowers or the calyxes of the pods. We gathered up some of the pods which had eggs on them, hoping to breed out some specimens. Several black kites flew overhead and a pair of bee-eaters, while across the slopes came the incessant call of a hoopoe. The slopes soon became alive with butterflies and many were what one would expect at this time of the year in Britain. Orange-tips, Wood whites, Small coppers, Common blues and the Grizzled and Dingy skippers. There were newly emerged male Meadow

browns and Wall browns flying with Small heaths. But the rest were all more exotic — Clouded yellows, *Colias croceus*, dashing across the slopes with Berger's clouded yellows, *C. alfacariensis*, seeking out the plants of horseshoe vetch and the Spring whites included the Moroccan orange-tip, *Anthocharis belia euphenoides*, Dappled white, *Euchloe ausonia* (two species appeared to be present), the Portuguese dappled white, *E. tagis*, Bath whites, *Pontia daplidice* (laying eggs on the candytuft), the Cleopatra, *Gonepteryx cleopatra* and newly-emerged Black-veined whites, *Aporia crataegi*. The big excitement was finding the Sooty orange-tip, *Zegris eupheme*. These were dashing about a field of yellow crucifers, both males and females. This large orange-tip flies very fast and was quite difficult to capture. Among the blues were the Black-eyed, *Glaucopteryx melanops* and the Green-underside blue, *G. alexis*, *L. thersites*, the Adonis blue, *L. bellargus* (a fine large form with very blue females), Brown Argus, *A. agestis crameri* and Holly blues, *Celestrina argiolus*. In a small valley we came upon a carpet of narrow-leaved field scabious plants and here there were many Spanish fritillaries, *Eurodryas desfontainii*, flying. We captured several females which subsequently laid batches of eggs on both the scabious and on teasel. The Knapweed fritillary, *Melitaea phoebe* was also just emerging and there were several males flying with the Queen of Spain fritillary, *Issoria lathonia*. One surprise was to net a perfect female Cardinal, *Pandoriana pandora* which was flying around some elm scrub, suckers from the elms which had or were about to die from the Dutch elm disease. We also netted several specimens of the Spanish festoon, *Zerynthia rumina* and found two species of *Aristolochia* growing on the slopes — both having fibrous roots and one being *A. pistolochia*.

These were quite liberally dotted with both eggs and small larvae. The young larvae on hatching migrate to the folded tip of the shoot where they lie hidden but, having learned this, we found them quite easy to locate. This butterfly is extremely common and widespread as we found it in all the spots visited in this part of central Spain. During the day we had seen three collectors around the *Colutea* clumps, their car having a Madrid registration and when we returned to our camper we met another, a Belgian, who was using his Lada as a camper and was equipped with MV lamp and generator. He had been collecting on the slopes beyond Campo Real. We spent the evening speaking a mixture of English and French — he was a member of a Belgian entomological society similar to our own.

The 18th May again produced hot sunshine and we spent the day on the slopes seeing most of the species of the previous day and capturing two male and another female *iolas*. Beyond our immediate slopes we found further groups of *Colutea* and it would appear that it is quite well spread over the hills in this area.

We disturbed several pairs of red-legged partridge and there were rabbits everywhere. We had looked for specimens of Zephyr blues in vain although I found their eggs on the *Astragalus*, laid in the floret groups. Eventually David spotted a pair of blues near one of the plants and these turned out to be *pylaon*. Later I took another female and it would seem that we were probably a little late for the species. On returning to the camper I found that my female *iolas* had succumbed without laying any eggs. It is extremely difficult to keep species alive in such intense heat and there is a need to provide moisture if specimens are not to dehydrate. Our *desfonainii* had fared better and already had provided two egg masses. These are laid in the same way as those of Marsh fritillaries, *E. aurinia*, and like them change colour fairly quickly if fertile. There was a thunderstorm that evening and rain but the next morning, the 19th, was again blazing sunshine and we drove to the town of Arganda for bread and wine. After shopping, we drove back along the road towards Loeches and drove off into the hills about two miles from Arganda. The slopes were more arid than those of the previous day and produced some new species: Spanish gatekeeper, *Pyronia bathseba*, False baton blue, *Pseudophites abencerragus*, Essex skipper, *Thymelicus lineola*, and the Marbled skipper, *Carcharodes lavatherae*, as well as dozens of *L. bellargus*. We saw one male *iolas* flying around some *Colutea* bushes and disturbed more partridge. The sun was very hot and after a mid-day snack we drove back to our previous camp site called Las Palomas — The Doves. We collected here for a short time in the afternoon and I took a pair of *iolas* in copula. Our Belgian friend returned and after exchanging addresses and farewells we left to drive towards the Serrania de Cuenca via Taracon and Cuenca. At Cuenca one turns off into the mountains towards the Ciudad Encantada and Tragacete. After climbing up into the mountains we stopped to camp in a young oak forest for the night, surrounded by the calls of Golden orioles hidden in the trees around us. In beautiful evening sunshine we were eating our supper when a shepherd appeared with his large flock of sheep and tried to engage us in conversation, to no avail.

Next morning we drove on towards the village of Una which we had found so good on our previous visit. However the slopes above the town were almost devoid of butterflies apart from one or two Orange-tips and Grizzled skippers, a marked contrast to the swarms of butterflies in July. I couldn't even find any larvae, but the poplars by the road produced some eggs of the Puss moth, *Cerura vinula*. At Una, after a beer in the inn, we drove up to the trout farm and collected for two or three hours in the valley beyond. The sun was now being regularly shaded by large cloud masses and one had to wait until it appeared again before butterflies would fly. However, when this did occur there was plenty of

interest. The very pale Mother-of-pearl blue, *Plebicula nivescens*, was flying with the Turquoise blue, *P. dorylas* and there were also *L. bellargus*, the Small blue, *Cupido minimus* and the Green-underside blue, *G. alexis*. Several worn Large tortoiseshell, *Nymphalis polychloros*, were flying along the slopes and we then took both *E. desfontainii* and *E. aurinia beckeri*. The latter is very similar to *desfontainii* and has to be captured in order to identify it. We took two females which subsequently laid egg masses on bush honeysuckle, its usual foodplant. The Green hairstreak, *Callophrys rubi*, was also present and a few worn Brimstones, *G. rhamni*. Vultures circled along the face of the cliffs which towered above and we saw a pair of eagles. Three Spanish collectors turned up and went up the valley ahead of us but the sun now vanished completely and we decided to leave and drive on to Tragacete. A few miles out of Una we saw a nice place to camp beside a pine wood and drove in. The fitful sun produced a female Swallowtail, *Papilio machaon* and several Scarce swallowtails, *Iphicles podalirius*, and we saw a Peregrine falcon on the cliff face. Across the road a fast flowing river ran and I caught a few grasshoppers and wandered over to see if there were any fish present. I soon had a trout and a small chub and then ran out of bait. The next morning I found one or two more hoppers and one of these produced a fine trout of about 1 lb. We ate the two for breakfast. Behind the camp in the pine forest we found a concrete aquaduct through which a deep fast-flowing torrent was running towards Una. We bathed our feet and then found a bridge across it to collect on the slopes which rose above it. The sun came out and many of the species which we had taken back at the trout farm were present including *E. desfontainii* and *E. aurinia beckeri*. Back near the camper David disturbed a large lizard which bolted into a hollow tree stump. The stump and its roots were rotten, completely disintegrated by termites, and we pulled it apart and found that the lizard had crawled into the hole left by one of the large roots. I managed to get hold of it and pull it out, only to be bitten. It was a large Eyed lizard, beautifully marked.

The sun disappeared and we drove on towards Tragacete, following the roadway above the Rio Jucar where we saw many fishermen fishing the pools, their cars parked by the roadside. Below Tragacete, where on our last trip we had found the meadows full of butterflies, we stopped and as there appeared to be nothing about we again caught a few grasshoppers and fished a small side stream. This was full of trout and I had four good specimens, including a large one with hooked jaws. It was now raining and we decided to go on towards Albarracin using the Puerto de Cubillo road leading to Frias de Albarracin. High up above that village we camped for the night beside a huge hole in the ground on the edge of a pine wood. Choughs were nesting in the sides of the hole, the bottom of

which was out of sight. All round the slopes were scattered with fossils — ammonites, bivalves and other relicts of a time when these mountains were below the sea.

On the morning of the 22nd, after a breakfast of grilled trout and the cloud had cleared, we were able to collect on the slopes below the hole where De Brunner's ringlet (which is really an *Erebia*), *E. triaria*, was quite common. I also netted a single specimen of the Spring ringlet, *E. epistygne*, a worn female, so we were obviously too late for this species. There were a few Queen-of-Spain also flying and the occasional Clouded yellow but it was quite cool and the clouds kept returning. Driving on we passed the source of the River Tagus which rises in the Sierra de Albarracin to flow eventually into the Atlantic at Lisbon. Coming into the lower land near Royuale we collected for a short time near the village and recorded the Osiris blue, *C. osiris*, *L. bellargus*, *G. alexis* and *L. thersites*. We camped the night at the picnic site near the village of Moscardon. A large trout pool has been made here, fed by a mountain stream running in an artificial dyke cut out of solid fossil coral. In the meadow we spent the evening catching field crickets, *Gryllus campestris*, and obtained six males and six females. These I brought home and kept them in a vivarium in the garden. They lived for about two months and hopefully will have deposited eggs. They live in little burrows about two to three inches deep and the males stridulate at the entrance. In the night it poured with rain so next morning we left the cloud-covered hills and drove down through Albarracin to Gea de Albarracin and in fitful sunshine we collected in the valley below the high cliffs, dotted with ancient cave dwellings.

There were several male Provençal fritillary, *Mellicta deione*, flying and a lot of *Z. rumina*. David found a lot more eggs on the aristolochia which grew only on one slope and I found specimens of the Chequered blue, *Scolitantides orion*, *P. pylaon hesperica*, *P. abencerragus*, *C. rubi*, Painted lady, *Cynthia cardui*, *I. lathonia*, Glanville fritillary, *M. cinxia*, and both *A. belia euphenoides* and *E. ausonia*. Clouds returned to shroud the sun and I found both *C. minimus* and *C. osiris* roosting on the grasses. We found a camp site beside the Rio Guadalaviar which was in spate, washing down vast quantities of red soil from the newly ploughed uplands. There was a strange bird calling from the reed beds beside the river, a most distinct alarm call followed by warbling rather similar to a nightingale. We eventually confirmed that it was Cetti's warbler and we found three nests amongst the reeds, one with red eggs.

The next day, the 25th, the skies were still full of cloud and there was quite heavy rain. I tried for trout in the dirty water and hooked and lost one and then we decided to leave the mountains and go south-west to try an area beyond Toledo which Howard Phelps had told me of near the

village of La Mata. We went back through the mountains via Terriente to meet the Cuenca road and at Toledo we stopped to view the city above the wide Tagus river, which smelt highly of the local sewage. South of Tarancon we stopped in hot sunshine for lunch and disturbed some Stone curlews on the stony slopes. Further on as we passed a marsh we found the whole countryside heavily cultivated with grain crops and the only areas left were one or two hilltops. We found a sunken pathway leading through the crops and here there were quite a lot of butterflies flying. There were very large *L. bellargus* which had black spots on the lower edge of the hindwing. I could not find any *H. comosa*, their normal foodplant and the only abundant legume was a yellow *Ononis*. Present were the Idas blue, *Pyronia idas*, the Green-striped white, *A. belemia*, the Brown argus, *Aricia agestis crameri*, *L. thersites*, the Spanish Marbled white, *M. ines* and very large specimens of Meadow browns, *Maniola jurtina*. The species which Phelps had found here was *P. pylaon hesperica* but I could find none on the areas which were unploughed nor its foodplant. We disturbed several pairs of partridge and I found a group of chicks hiding in the grass. There were also hares and we saw and heard the strange call of the Greater spotted cuckoo. It calls on the wing and sounds a little like a Green woodpecker. As we came back to the road we were met by a man with a gun who was apparently the local conservator. He appeared to be satisfied that we were only hunting insects. It was obvious that the habitat here has changed so dramatically that only small pockets of land were capable of sustaining any wild life. We decided that we should drive back to the area around Campo Real for the last days of our trip and unwisely took the main road into Madrid, hoping to meet up with the ring road. Traffic was chaotic with vehicles coming into the main road from the right without warning and we turned off south and skirted round this huge city, taking the long route back to Las Palomas where we arrived at 8.30pm in brilliant evening sunshine.

The next morning was heavily clouded, the mountain conditions having spread out into the lower land. There were some gaps for the sun to come through and we added the Southern white admiral, *Limentis reducta*, and the Comma, *Polygonia c-album* to the species seen here previously. We were able to explore further into the land beyond the olive groves where there were heavily shrubbed valleys with further *Colutea* bushes where we again saw *iolas*. We again heard and saw the Greater spotted cuckoo and a Green woodpecker which differed in call and brilliance from the British bird. A rainstorm started at 4.30pm and we packed for an early start on the way back home the next day. We followed the road which we had used coming down and beyond Logrono stopped in mountainous country to collect for a while during our luncheon break. There were large numbers of *A. crataegi* on the wing,

female *A. belia euphenoides* and the blues, *P. icarus*, *G. melanops* and *G. alexis*. Coming out of Pamplona we took the route via the Val Carlos and stopped about four miles up the pass to camp for the night near a little village off the main road. Wood whites, *Leptidea sinapis* and Speckled woods, *Pararge aegeria* were moving about in the evening sunshine but it started to rain again at 7.30pm. On the 29th we were away early via Aioz and the Puerto de Roncevalles where we stopped to explore the slopes above the road. There were lots of butterflies on the wing here, both sexes of *A. crataegi*, *M. cinxia*, Mazarine blue, *Cyaniris semiargus*, *C. minimus*, *P. argester*, *L. thersites*, *P. icarus*, *G. melanops* and *G. alexis*, *E. tages*, Red-underwing skipper, *Spialia sertorius*, Chestnut heath, *Coenonympha iphioides* and *C. arcania*, the Pearly heath. We had come out of the rain belt and from now on we were to enjoy hot sunshine all the way home to England where there had been a heat-wave during our absence.

We camped the night at Pons, north of Bordeaux, and on the 30th May caught the evening boat to Portsmouth.

Despite the poor weather in the mountains we had been able to see a lot of butterflies and I had been able to add pictures of three new species to my slide collection and had brought home eggs or larvae of several species for breeding out. Our big disappointment was again the great changes which are occurring in Spain. There are huge new roads being driven through the countryside and new cultivation in areas not previously ploughed are destroying many of the old habitats. The pattern is following what has happened in France and the future for wild life will rest on the mountainous areas where cultivation is most difficult to achieve. It seems that the grain mountain and wine lakes are to be further augmented at the cost of much of Europe's flora and fauna. Legislation continues to protect species while doing nothing to preserve the places where they live.

DO SMALLER SHRUBS GET LARVAE OFF TO A FLYING START?

by Roger A Wright (6598)

I have been thinking about the reason for butterfly oviposition on small shrubs rather than larger specimens of the same plant. This phenomenon was mentioned in a recent *Bulletin* and has often been commented on to me by my friends with experience of collecting in Europe. I do not know the answer to this but one possibility has struck me. I have noticed that smaller specimens of trees and shrubs often leaf earlier than their full grown counterparts. For species like the Black-veined white with overwintering larvae such early leafing may be essential.

THE HAWKMOTHS OF IRELAND

by *Tim A. Lavery (8677)*

Country Watch, Farnes, Castlemaine, Co. Kerry.

Summary

The Sphingidae or Hawkmoths, comprise a family of mostly tropical moths, represented in Ireland by five resident species, augmented by a further six migrant species. In addition there are another two species whose presence requires confirmation.

This is compared to the British list of nine resident and eight migrant species. An account of the status and distribution is given, together with maps for each species for which confirmed records exist. A checklist of Irish Sphingidae is included.

Introduction

When E.S.A. Baynes completed his *Revised Catalogue of Irish Macrolepidoptera* in 1964 and a further *Supplement* in 1970, he had produced the most important single work on the status and distribution of the Irish butterfly and moth fauna in 100 years, since the publication of Birchall's catalogue (Birchall, 1873) which was the first attempt to list the lepidoptera of the entire island.

Twenty years have elapsed since the appearance of the 1970 Supplement and much new and additional data have been collated on all Irish species; a number of new species have been recorded; many species have been re-instated as Irish; and finally a few doubtful species of "Clonbockian" status have been deleted from the Irish List (e.g. Lavery, 1989a).

In the following pages I have searched through the few literature references to the hawkmoths in Ireland, and examined a number of private and public collections in order to attempt to compile and assess all known records for the species thought to occur in the country either as residents or migrants. Data used for the production of maps was obtained mainly through the co-operation of a large number of lepidopterists here and abroad.

Mapping is based on UTM (Universal Transverse Mercator) using 50km grid square units. To my knowledge this is the first time any of the lepidoptera of Ireland have been represented using such maps, now used internationally in invertebrate records work.

Map 1 includes all records for the Family and gives a good indication of the reasonably complete national coverage except in the Roscommon/Longford regions and much of Tyrone. This absence of records does not necessarily indicate the absence of all the hawkmoths,

THE SPHINGIDAE (LEPIDOPTERA) OF IRELAND



pre-1960 : ○

post 1960: ●



All Records

Map 1



Acherontia
atropos (L.)



Deilephila
elenor (L.)



Deilephila
porcellus (L.)



Hemaris
tityus (L.)



Hyles
lineata
livornica (Esp)



Laothoe
populi (L.)



Macroglossum
stellatarum (L.)



Agrius
convolvuli (L.)



Hyles
gallii (Rott.)



Smerinthus
ocellata (L.)

but more probably shows the absence of lepidopterists from such areas. This gap in records extends into the lepidoptera families and should provide the starting point for future field-work (Lavery, 1989b).

The Irish Sphingidae

The adults of all species occurring in Ireland are illustrated in Skinner (1984) and in Chinery (1986), which also includes illustrations of all larvae. The life-history of British and Irish species is dealt with comprehensively in Heath & Emmet (1983).

For convenience, the species have been listed alphabetically. Nomenclature follows that of Bradley & Fletcher (1986). An * denotes non-resident species.

**Acherontia atropos* (L.), Death's head hawkmoth

Scarce immigrant recorded infrequently over the years in low numbers as adults and larvae (a potato feeder) mainly during the autumn, apparently unable to survive the winter here. The majority of records are coastal in the south and south-east of the country, from June to September.

**Agrius convolvuli* (L.), Convolvulus hawkmoth

Regular though scarce immigrant records vary considerably over the years, with only one sighting in 1988, at Rosslare, Co. Wexford on 12th September, whereas in 1987, 13 were reported from Counties Cork, Waterford, Wexford and Northern Ireland (Haynes, 1988/1989).

Records have been almost exclusively coastal, mostly in the southern half of the country, from June to September.

**Daphnis nerii* (L.), Oleander hawkmoth

There are only four old records of this very rare immigrant; Sandymount, Co. Dublin, September 1944 (B.P. Beirne); Donobate, Co. Dublin, 17.9.1953 (Mrs Z. Hall); Carlow town, 18.9.1953 (Scully); Belfast, Co. Antrim, 3.9.1954 (McClenaghan and W.S. Wright).

This species would be expected to reach our shores in very low numbers during years of particular abundance in Britain and the Continent.

Deilephila elpenor (L.), Elephant hawkmoth

Locally common resident, found throughout the country, it appears to be more frequent some years than others. Larvae feed on willowherb (*Epilobium* sp.) and the introduced balsam (*Impatiens capensis*) which flourishes on disturbed ground, roadsides and riverbanks (M.C.D. Speight, *pers. comm.*).

This hawkmoth has been found in most Irish counties and has few habitat preferences other than presence of an abundant supply of foodplant, which being extremely common weeds of all situations in turn increases the possible range of this moth species to many localities where it is not at present recorded.

Deilephila porcellus (L.), Small elephant hawkmoth

Resident. Records indicate this to be a very local and generally uncommon moth. The majority of records are from dunes systems around the entire coastline and inland data extends more or less across the midlands where it is associated with the sandy soil of eskers and limestone pavement. This range of distribution appears to be shared with a number of other lepidoptera such as *Cupido minimus*, *Hipparchia semele* and *Zygaena filipendulae*. A curious correlation which warrants further attention.

D. porcellus feeds on bedstraw (*Galium* sp.) which grows abundantly in such situations.

Hemaris tityus (L.), Narrow-bordered bee hawkmoth

Resident. Very local and generally scarce throughout the west and north. There is a strong population in the Burren, Co. Clare, where it is on the wing in May and June, and may be seen infrequently flying low to the ground, typically in the grassy meadows adjoining the limestone pavement, during the daytime.

H. tityus appears to be confined to very local and unimproved meadows which have virtually disappeared from all except western districts of the country. Larvae feed on devil's-bit scabious (*Succisa* sp.) which is frequently common in such meadows. The change from

traditional hay-making to silage production, along with agricultural development in general has led to a decrease in the distribution of this moth nationally, so that it is now strongly represented in only those areas of least agricultural development.

**Hippotion celerio* (L.), Silver-striped hawkmoth

Unconfirmed immigrant. There are a few mainly 19th century records from Sligo and Dublin, and there is a reputed Irish specimen in the Ulster Museum. British records extend to southern Scotland suggesting the possibility that this species could have reached Ireland, though in exceedingly low numbers, widely separated.

**Hyles gallii* (Rott.), Bedstraw hawkmoth

An infrequent and scarce immigrant, recorded from the south and east coastal counties of Kerry, Cork, Wicklow and Dublin.

**Hyles lineata livornica* (Esp.), Striped hawkmoth

Rare immigrant, recorded from widely scattered localities around the country. Years often pass without a single record, so that no *H. lineata* were seen between 1966 (Belfast, Co. Antrim) and 1985 when three specimens were recorded in April: one in Tyrone and two in Cork. This may be the earliest month that this species has been recorded in either Britain or Ireland.

Laotoë populi (L.), Poplar hawkmoth

Resident. Common particularly in well-wooded localities throughout the country and it is also frequent in many urban areas. Very common at light usually after 2.00 am. Normally bivoltine, the larvae may be found almost exclusively on poplar and aspen (*Populus* spp.) although it is also known to feed on willow (*Salix* sp.).

**Macroglossum stellatarum* (L.), Hummingbird hawkmoth

Frequent immigrant, often abundant, but numbers vary considerably from year to year. Day-flying. Records, as with most immigrant species, are mainly eastern and southern. The contrast in yearly records may be seen quite clearly when comparing 1985/86. In 1985, 122 records of this moth were reported as against only 29 in 1986 (Haynes, 1986/7).

**Mimas tiliae* (L.), Lime hawkmoth

Not resident in Ireland, and unconfirmed records most likely refer to wind-blown "stray" specimens from southern England where this moth is resident, and in general is not known to be migratory.

The scarcity of lime (*Tilia* sp.) trees in Ireland would not necessarily preclude the possibility of this moth establishing here, as it also feeds on

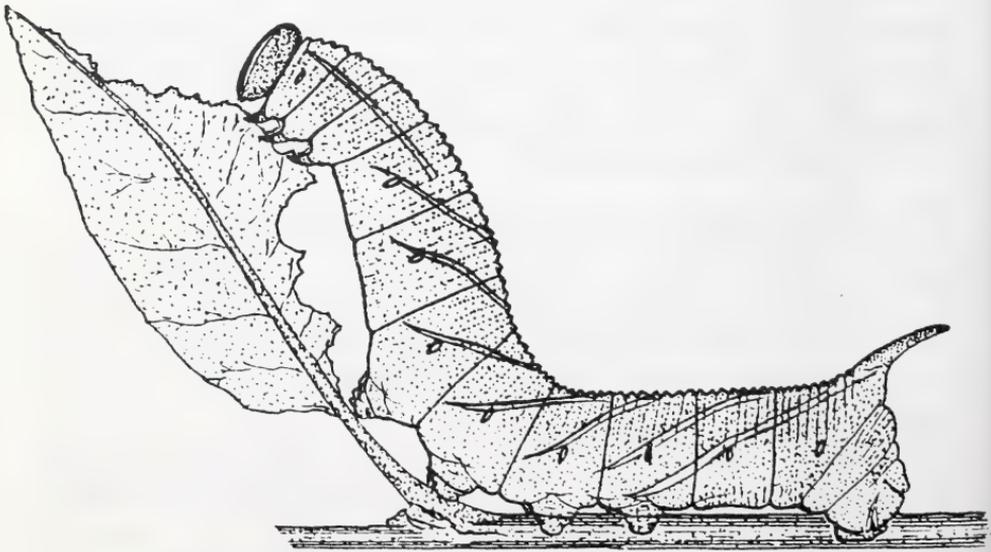
elm (*Ulmus* sp.), birch (*Betula* sp.) and alder (*Alnus* sp.), which are widely distributed and frequently common throughout the country.

Despite this, there are no positively Irish specimens, to my knowledge, in existence in any private or public collections. Apart from extremely doubtful Kerry and Galway records which have plagued the literature, the only other published record is of a wild discovered larva which was supposedly taken in the neighbourhood of Derrynane Abbey, south Kerry, and successfully bred through by a Miss O'Connell sometime previous to 1932 (Foster, 1932).

I have also received an account of an adult specimen being recorded from Portaferry, Co. Down, on 13th July 1989, by H. Richter, who was not aware of the importance of keeping the insect and having the record confirmed, and thus must remain yet another unconfirmed report.

Smerinthus ocellata (L.), Eyed hawkmoth

Resident. Moderately common, although somewhat local throughout much of the country. Most frequent in well-wooded localities with willow and poplar. Univoltine, with a partial second generation in the autumn during years of warm weather. *S. ocellata* is somewhat under-recorded in the eastern half of the country possibly due to a lack of wooded areas, although it also occurs in suburban gardens where larvae have been found feeding on apple (*Malus* sp.) and possibly other fruit trees. Fig. 1 shows a larva feeding.



Larva of the Eyed hawk moth (*Smerinthus ocellata*).

British Sphingidae not occurring in Ireland

A further six species (four resident, two migrant) are known to occur in Britain, which, apart from the migrant species, are more or less restricted to the south of the country, and would appear to be somewhat local and unlikely to extend their range to Ireland.

The unconfirmed records of *M. tiliae* and *H. celerio* from Ireland are considered under these species in the main text.

Hyles euphorbiae, occurs only rarely as an immigrant to southern England and would not be expected to arrive in Ireland.

Species known in Britain but not in Ireland:—
(migrants denoted by the symbol*).

Sphinx ligustri, *Hyloicus pinastri*, *M. tiliae*, *Hemaris fuciformis*, **H. euphorbiae*, **H. celerio*.

Acknowledgements

I am grateful to Jim O'Connor, of the National Museum, Dublin, for allowing me access to the collections and to Robert Nash, of the Ulster Museum, Belfast, for providing me with data regarding their collections.

I would like to thank Ian Rippey for providing me with much additional data and I am particularly indebted to the many people who have sent me their Sphingidae records over the past few years.

Thanks are also due to Dr Martin C.D. Speight (Wildlife Service) for additional information and helpful comments on an earlier draft of the text.

Checklist of Irish Sphingidae

Unconfirmed species are not included. Migratory species are preceded by the symbol *.

**Agrius convolvuli*

**Acherontia atrops*

Smerinthus ocellata

Laotoë populi

Hemaris tityus

**Macroglossum stellatarum*

**Hyles gallii*

**Hyles lineata* subsp. *livornica*

Deilephila elpenor

Deilephila porcellus

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A NOTE ON TEESDALE PARK

by Ian Mascall (6056)

I work at the moment in an area known as Teesdale Park which is near Middlesbrough. The land around the football field is, or should I say was, covered in Cuckoo flowers which supported the Orange-tip butterfly which I saw between May/June in quite large populations. I noticed, though, the distinct lack of the female of the species. I never in the month of observation saw one, which to me is very odd indeed. After the month's end the bulldozers came in and totally flattened the colony so I doubt if I will see Orange-tips next year unless something can be done which nowadays is very doubtful. I noticed in a certain newspaper today that sanctuaries for butterflies could be set up in all parts of Britain to save our British butterflies. I would not know how to go about this. I think it is a brilliant idea and about time too.

In the same area there is a small copse, maybe 200 yards long with all kinds of flowers, clover, trefoils, thistles, nettles etc. and I noticed during my lunchtime wandering around the park quite a number of species of butterflies, including the following: Large skippers, 2 pairs; Small skipper, 1 male seen; Small copper, 1 male; 1 pair of Common blues, and an abundance of Meadow browns, Small (the commoner) and Large whites. I also noticed Wall browns for the first time which is good to know. I also found three large colonies of Small tortoiseshell caterpillars on the nettles close to the side of the park next to the golf course and these did really well. I have, however, just found out in the last few weeks that they are going to "develop" the land, so that again means lack of butterflies for people to enjoy. When will this slaughter of natural habitat stop I ask myself. Sadly it is in the hands of Government to do something about it otherwise common butterflies like Small tortoiseshell will become very rare or endangered and we don't want that, do we? I just wish the ordinary people like us could do something about it. Any suggestions from fellow members would be grateful. I am sure I have the support from fellow members on this subject.

THE LEPIDOPTERA RECORDED IN VALDEMORO, SOUTH OF MADRID, SPAIN — APRIL-JUNE 1990

by Gareth E. King (8585)

Valdemoro is situated due south of the Spanish capital at 590m above sea level. I took to visiting it due to its proximity to Campo Real and Loeches, both well-known by European entomologists for their diversity of lepidoptera. It also provided a useful contrast to localities in the Sierra de Guadarrama, north-west of the city. There was no question of it being a contrast. The overall impression of the place was its aridity even when it was first visited in April. The area studied lay just outside the town and was apparently privately-owned and used as a shooting range. It was used by the locals as a picnic area but only a very small “wooded” area was ever seen to be in frequent use. Our visits were therefore quite problem free with hardly a soul seen.

The dominant vegetation was a shrubby plant called “Retama” (*Lygos sphaenocarpa*), a leguminous plant which grew along the tracks and covered extensive areas at the foot of the hills in the locality. It was the foodplant of *Glaucopsyche alexis*, the Green-underside blue, as well as a couple of Geometrids still to be identified. There were no trees in the area apart from those just mentioned so the “retama” provided some much needed shade. Satyrines were often seen sheltering underneath it or flying in their proximity. Other vegetation consisted of thistles, umbelliferous plants and thyme. Due to the lack of nectar plants “mud puddling” seemed to be the main source of liquid refreshment. There were two areas where this was carried out. There was a great deal of activity in what we called “El Valle Feliz” — the happy valley, a track which went between two low hills. It had a slight dip which was damp even when there had been no rain, so the water was presumably from an underground source. Our first visit in April recorded *Aricia agestis cramera*, (Southern brown argus), *Polyommatus icarus* (Common blue) and *Lysandra belargus* (Adonis blue) feeding from this spot, all very early. In May and June these were joined by other blues, browns and skippers.

The other feeding spot which was actually wet in April gradually dried out altogether, but was still frequented by butterflies in search of minerals. This bordered onto a polluted stream, although this did not appear to affect the butterflies.

The commonest butterflies were those from the Lycaenidae with eleven species seen. I was surprised to see Green hairstreaks at such low levels and under such intense heat when they were also just as common higher up. The Provence hairstreak *Tomares ballus* was frequent around the “retama” in April. This pretty insect flies very early in the year,

according to Higgins & Riley from January-April, I saw my first in March in a park in Madrid.

The skippers were represented by six species in Valdemoro. The commonest species was the Sage skipper (*Syrictus proto*). I initially found larvae on sage in late April hidden in their leaf-shelters, but the imago was often noticed as well.

As for the Satyrines, six species were recorded. *Melanargia ines*, the Spanish marbled white being very common with the first sighting in April. Its cousin *M. galathea lachesis* took over in June, also very common. This subspecies has specific form according to some Spanish authors, the type *M. galathea galathea* is not found south of the Cantabrian mountain ranges. The south-western subspecies of the Meadow brown (*Maniola jurtina hispulla*), was frequent. *M. jurtina hispulla* is quite different to the type form found in northern and central Europe, being much larger and brighter. A pity that the females caught did not lay.

Although the amount of larvae I came across did not match that found in the Sierras I did nevertheless find some fascinating species.

My first visit on 7th April produced some larvae of an unusual Lasiocampid, *Chondrostega vandalicia*. It is an endemic moth only found in Central Spain. According to Gómez de Aizpúrua the larvae subsist on *Nardus* and *Hypochaeris*, both grasses. I found a couple of larvae feeding on *Sedum album* so they were given this in captivity. Despite the attractive larvae, the imagines are nondescript, but are quite unusual in that the females are wingless. Another Lasiocampid found was *Malcosoma alpicola*, again restricted to some areas of central Spain.

Although the majority of the Thaumetopoeidae are arboreal and are often pests, there is an exception in the shape of *Thaumetopoea herculeana*. This is a common moth in central regions of Spain, the larvae spending the whole winter as larvae, looking something like *Automeris*. They do not overwinter as such but feed whenever the weather allows. I found them on *Helianthemum* (Rock Rose), but they are also associated with *Cistus* and *Erodium*. They are gregarious throughout their larval life and are easy to spot, trailing along the ground looking for food.

Due to not having a moth trap available I was not able to list more than 13 of the Heterocera in Valdemoro, those that were recorded were either of larvae or from having been flushed from the grass.

The following list details 43 species of lepidoptera falling into ten families.

PIERIDAE

- Pieris brassicae* Large white
P. rapae Small white
Pontia daplidice Bath white
Euchloe ausonia Dappled white
Colias croceus Clouded yellow

LYCAENIDAE

- Polyommatus icarus* Common blue
Lysandra bellargus Adonis blue
Pseudophilotes baton Baton blue
P. abencerragus False baton blue
Lampides boeticus Long tailed blue
Syntarucus pirthous Lang's short-tailed blue
Callophrys rubi Green hairstreak
Tomares ballus Provence hairstreak
Aricia agestis cramera Brown argus
Lycaena phlaea Small copper
Glaucopsyche alexis Green-underside blue.

NYMPHALIDAE

- Cynthia cardui* Painted lady
Nymphalis polychlorus Large tortoiseshell
Argynnis lathonia Queen of Spain fritillary
Melitaea phoebe occitanica Knapweed fritillary
Melanargia galathea lachesis Marbled white
M. ines Spanish marbled white
Hipparchia semele cadmus Grayling
Maniola jurtina hispulla Meadow brown
Lasiommata megera Wall brown
Pyronia cecilia Southern gatekeeper

HESPERIIDAE

- Pyrgus malvae* Grizzled skipper
Syrichthys proto Sage skipper

Carcharodus boeticus Southern marbled skipper
C. alcaea Mallow skipper
Thymelicus sylvestris Small skipper
T. acteon Lulworth skipper

SPHINGIDAE

- Macroglossum stellatarum* Hummingbird hawkmoth

LASIOCAMPIDAE

- Chondrostega vandalia*
Malocosoma alpicola
Lasiocampa trifolii Grass Eggar

ARCTIIDAE

- Spiris striata* Feathered footman
Ocnogyna baetica

THAUMETOPOEIDAE

- Thaumetopoea herculeana*

GEOMETRIDAE

- Aspitates gilvaria* Straw belle
Idaea ochrata Bright wave
I. serpentata Ochraceous wave
Campptogramma bilineata Yellow-shell

NOCTUIDAE

- Autographa gamma* Silver-Y
Heliothis peligera Bordered straw

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ANSWERS TO CROSSWORD

Across

1. Serrula. 2. Espinge. 3. Orange Tip. 4. Cardamines. 5. Rue. 6. Privet. 7. Old Lady. 8. Costa. 9. Pine. 10. Eucalyptus. 11. Iliia. 12. Cynthia. 13. Anthocharis. 14. Palp. 15. Feisthamelii.

Down

1. Spurge. 2. Tiliae. 3. Mariposa. 4. Symbiosis. 5. Rape. 6. Lupin. 7. Saturniidae. 8. Cremaster. 9., Pupa. 10. Eri. 11. Ligustri. 12. Apex. 13. Ricinus. 14. Donana. 16. Beckeri. 17. Nerii.

**LEPIDOPTERA OF SAN RAFAEL & GUDILLOS:
TWO LOCALITIES IN THE SIERRA DE GUADARRAMA,
CENTRAL SPAIN**

by Gareth E. King (8585)

Between May 1989 and June 1990 whilst living in Madrid, I was able to visit an area of the Sierra de Guadarrama on a frequent basis, the observations from which are recorded here.

The area in question is San Rafael and Gudillos both in the province of Segovia at an altitude of 1,200 m. Not surprisingly the climate thereabouts is continental, although there are plenty of plant species found which are also typical of a Mediterranean climate. Despite being so near to Madrid the temperature differences are often quite staggering over just 80 km. In the months of June to August temperatures in the capital often reach 40°C, whereas in the mountains readings are rarely over 32°C. For this reason the Sierras are a favourite respite for city residents in the summer. On the other hand the winters that high up are very cold, with snow falling as late as April, as was the case for 1989 and 1990.

A total of 79 species of lepidoptera were recorded from the day trips I undertook. I did not have a moth trap of any description handy so accordingly the number of the Heterocera found was quite low. I have no doubt that if a moth trap had been used the findings would have been very interesting. Nevertheless I did come across some moths that would be unfamiliar to a British entomologist. This was due to the large number of larvae discovered. Between March and May it was usual to find several species whose larvae had overwintered. This for me was the most satisfying part of the experience.

The most numerous butterflies were of the Nymphalidae with 16 species discovered. The commonest members of this family were *Aglais urticae* (Tortoiseshell), *Cynthia cardui* (Painted lady), *Vanessa atalanta* (Red admiral), *Argynnis lathonia* (Queen of Spain fritillary) and *Eurodryas aurinia* (Marsh fritillary).

The Pierids were also notable (10 species) with *Colias croceus* (Clouded yellow) easily the commonest butterfly flying between March and October. April saw *Euchloe ausonia* (Dappled white) and *Anthocharis euphenoides* (Moroccan orange-tip) in abundance, in 1989 ova of the former were collected. Following C. Gómez de Aizpúrua, I use *euphenoides* in the specific rather than the subspecific form of *belia* in this article.

Although the aforementioned author cites *Zerythia rumina* (Spanish festoon) as being found throughout the Sierra de Guadarrama, I found it in only two sites, San Rafael and Cercedilla. One example from each.

Another point of interest — two other butterflies not mentioned in the “Atlas Provisional de Madrid” were *Coenonympha iphinoides* (Spanish heath) and *Thymelicus sylvestris* (Small skipper). The latter is common, whilst the Spanish heath was seen in a meadow, in June 1990.

My stay in Madrid was punctuated by numerous requests for livestock of *Grællsia isabellae*. Everybody went without, as all I ever found was one half-eaten moth on San Rafael railway station platform in May 1990. This is despite reports of it even being common in some parts of the central Sierras, such as San Idenfonso.

Larvae provided most of the moth data from San Rafael/Gudillos. *Lasiocampa quercus* (Oak eggar) and *L. trifolii* (Grass eggar) were common on bramble and rose. However, the Arctiidae were the most numerous and fascinating.

Spiris striata (Feathered footman) was found as larvae in May in one particular meadow, but the moth was common all over the area explored in July/August. *Ocnogyna latrellei* is a very scarce moth, endemic to Spain being found on 10 scattered sites throughout the Iberian Peninsula (Four in Portugal). I came across two larvae in June 1989. Another endemic Arctiid is *Hyphoraia dejeani*, larvae were collected in late October 1989. *Arctia fasciata* is less scarce, encountered throughout northern and eastern Spain. I found two females (one in Po. de Los Leones, near San Rafael) in June which provided me with a batch of ova. I have listed *Panaxia dominula* (Scarlet tiger) under Hypsiidae according to Spanish classification. This was a locally common insect in the Area under study.

Cerura iberica was described separately from *C. vinula* (Puss moth) in 1966. Outwardly the moths of the two species are identical except for a chromosome anomaly. The larvae are also similar save the last instar *iberica* lacking the violet “saddle”. I came upon first instar larvae on the same sallow bush in Gudillos two years in succession. The only other Notodontid recorded was *Eligmodonta ziczac* (Pebble prominent), again on sallow in October 1989.

The Geometrids are an exciting group to study in Spain as there are so many endemics. *Anthroolopha pennigeraria* for example is found only in S.W. France outside Spain. I was pleased to pick up larvae of this insect on *Santolina* in March 1990. The pretty moths emerged in May, not too dissimilar from *Ematurga atomaria* (Common heath), except for their brilliant orange hind-wings. Another endemic Geometrid is *Heliothea discoidaria* which is restricted to central and southern Spain. Moths were seen in June of this year flying in the sunshine; they are unmistakable being a bright orange with dots on each wing.

The following list describes the 79 species found, divided into five butterfly families and nine moth families:

PAPLIONIDAE

Zerythia rumina Spanish festoon

PIERIDAE

Pieris brassicae Large white
P. rapae Small white
P. napi Green-veined white
Anthocharis cardamines Orange tip
A. euphenoides Morocco Orange tip
Euchloe ausonia Dappled white
Colias croceus Clouded yellow
Pontia daplidice Bath white
Gonepteryx rhamni Brimstone
Aporia crataegi Black-veined white

LYCAENIDAE

Polyommatus icarus Common blue
Lampides boeticus Long-tailed blue
Syntarucus piritheus Lang's short-tailed blue
Aricia agestis cramera Brown argus
Glaucopsyche alexis Green-underside blue
Celastrina argiolus Holly blue
Callophrys rubi Green hairstreak
Lycaena phlaeas Small copper
Heodes alciphron gördius Purple-shot copper
H. tityrus Sooty Copper

NYMPHALIDAE

Vanessa atalanta Red admiral
C. cardui Painted lady
Nymphalis polychlorus Large tortoiseshell
Inachis io Peacock
Aglais urticae Small tortoiseshell
Polygonia c-album Comma
Pandoriana pandora Cardinal
Argynnis lathonia Queen of Spain fritillary
Argynnis adippe High brown fritillary
Eurodryas aurinia Marsh fritillary
Boloria selene Small pearl-bordered fritillary
C. euphrosyne Pearl-bordered fritillary
Melitaea cinxia Glanville fritillary
Melitaea phoebe occitanica Knapweed fritillary
Melitaea trivialis ignasti Lesser-spotted fritillary
Melicta deione Provençal fritillary
Pararge aegeria Speckled wood
Lasiommata megera Wall brown
Coenonympha pamphilus Small heath
C. iphioides Spanish heath
Melanargia lachesis Marbled white
Maniola jurtina Meadow brown
Hipparchia semele Grayling
Brintesia circe Great banded grayling

HESPERIIDAE

Pyrgus malvae Grizzled skipper
P. alveus Large grizzled skipper
Thymelicus sylvestris Small skipper

SATURNIIDAE

Gräellsia isabellae Spanish moon moth

SPHINGIDAE

Smerinthus ocellata Eyed hawk
Hyloicus pinastri Pine hawk
Macroglossum stellatarum Hummingbird hawk

LASIOCAMPIDAE

Malocosoma franconica
Lasiocampa quercus Oak eggar
L. trifolii Grass eggar
Dendrolimus pini Pine lappet

ARCTIIDAE

Arctia fasciata
Arctia caja Garden tiger
Spiris striata Feathered footman
Diacrisia sannio Clouded buff
Ocnogyna latreillei
Hyphoraia dejeani
Tyria jacobaea Cinnabar

HYPSIDAE

Panaxia dominula Scarlet tiger

LYMANTRIDAE

Euproctis chrysoorrhoea Brown-tail

NOTODONTIDAE

Cerura iberica Spanish puss moth
Eligma ziczac Pebble prominent

NOCTUIDAE

Autographa gamma Silver Y
Acrionicta rumicis Knot-grass
Cucullia verbasci Mullein
Euclidia glyphica Burnet companion

GEOMETRIDAE

Anthrolopha pennigeraria
Aplocera plagata Treble bar
Campogramma bilineata Yellow shell
Heliotheca discoidaria
Idaea ochrata Bright wave
Rhodostrophia vibicaria
Semiothisa liturata Tawny-barred angle

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BOOK REVIEW

A Review of Butterfly Introductions in Britain and Ireland by M.R. Oates and M.S. Warren. World Wildlife Fund, 1990. A4 paperback. 96pp. Price £8.50.

The subject of the introduction or re-establishment of butterfly species has for many years been a controversial one, with purists objecting to man's intervention in the "natural" sequence of events. The decline and any losses among our native species have been almost totally the result of man's destruction and interference with habitat and the only way of ensuring that many species will be there for posterity is to secure stable conditions for existing colonies and re-establish others in suitable sites by introduction. Nothing has been done in the past to co-ordinate such introductions or to monitor them subsequently with any accuracy but this new publication goes a long way towards redressing this. The authors are to be congratulated. They have painstakingly researched the subject, reviewing its history as far back as the 1840s, and have considered all the species on the British lists as well as "foreign" introductions. They list the attempts made, in the main, by individual amateur enthusiasts and relate, where known, the successes and failures, with an in-depth study of those carried out in the county of Hampshire.

The findings are discussed and recommendations for the future are proposed. The appendices include provisional advice on butterfly introductions for conservation purposes, the JCCBI Code for Insect Re-establishment, the BBCS Code and its policy on the same subject and a list of addresses of advisory organisations.

The whole makes fascinating reading for anyone interested in our butterfly fauna and it points the way forward for those who wish to redress the wholesale destruction of so much of our suitable butterfly habitat. Every member interested in the possibilities should acquire a copy. It will make a useful adjunct to our own new publication on *Habitat Conservation for Insects*.

P.W.C.

A NOTE ON THE BLOOD-VEIN MOTH

by Jan Koryszko (6089)

On 3rd July 1990 I paid a visit to Barlaston Rough Close Common, Staffordshire. Over the winter months pipe laying had taken place around the common. In these areas an abundance of dock and sorrel had spread in.

While walking through these weeds, I put up a Blood-vein moth, *Timandra griseata*, which I netted. This is its first record from the common. I searched for others but none were found.

The Blood-vein is quite an uncommon species in my part of Staffordshire. In R.G. Warren's *Lepidoptera Atlas for Staffordshire*, it is said to be rare and local, recorded in the Victoria County History from Stoke-on-Trent, Tatenhill, Henhurst, Rugeley and from Madeley by H.W. Daltry. Later records are from Needwood Forest and Trentham, where it was more frequent in early 1950s, then becoming scarcer again. It is a lowland species, well established in the south but recorded no further north than Denstone in the Churnet Valley.

After a number of good summers, maybe this species is beginning to spread through to more northern areas? It is well worth watching out for in future years.

MUCH ADO ABOUT NOTHING

(apologies to Will Shakespeare!)

After dark, in summer-time,
kitchen lights aglimmer,
Pen and paper, jars in line
and my trusty "Skinner".
Moths upon the window-pane,
golly what a whopper,
Rush outside with card and jar,
trip and come a cropper.
Dash! The big one's got away,
flown with agile cunning,
Positive that it was rare,
through "Skinner" I am thumbing.
I think, perhaps it's this one
or maybe it is that,
Identified? It can't be done,
unless that moth flies back !!!

Diane A. Lavery (9156)



(Illustration by Diane and Tim A. Lavery)

THE DAY OF THE JASPER

by Don McNamara (5537)

One man's glorious summer is another man's drought, but if some appear unenthusiastic at least, *Vespula vulgaris*, the Common wasp, seems to be pleased, judging by the population explosion in 1990 and the frantic activity from early on in the year until early November.

Discussions among enthusiasts and the numerous articles in entomological journals suggest that this was widespread and no doubt due to favourable weather right across the British Isles.

However, these busy predators have wrought havoc among most of the life-forms that they have been able to get their jaws around, particularly various sorts of larvae.

A couple of incidents involving "Jaspers" may be of interest. A wasp got into an insect cage in my West London garden, attacked and carried off a troublesome spider, which pleased me no end, but had to be discouraged together with its compatriots, from returning to do the same to some larvae of *Polyommatus icarus* (Common blue). However, I was quite surprised, whilst searching a local field for larvae of *Aglais urticae* (Small tortoiseshell) at the extent of wasp predation. This particular field is used for silage, the farmer cropping it at the end of April/beginning of May and the beginning of August, thereby incidentally creating many fresh batches of nettles just when many of the Vanessids, particularly Small tortoiseshell, are laying. Always there are dozens of egg-masses and silken tents of small larvae in the terminal leaves of nettle-stems.

Every year I take several egg or young larval batches into "protective custody" in order to obtain the "one in a thousand" aberration — releasing hundreds of them in the same area. (Thereby denying a host of predators an easy meal.) But to my dismay a good half of these had been "got at" — by whom I didn't know. It soon became apparent, however, on closer inspection of the nettles. In the canopy were dozens of single wasps seeking out the larval nests, cutting them open and "gobbling" the contents. Methodical, systematic and quite ruthless.

There seemed to be a definite pattern of "search and destroy", the wasps appearing to know what they were looking for and ignoring what one would have thought of as more obvious prey, spiders half exposed in leaf-curles or fat aphids clustering around the softer stems. Whether "learning" or "communication" was involved or not, certainly "method" was apparent. They hovered close to the bulge in the leaf-tent and cut straight into the side, scooping out the larval contents — you could even see tiny larvae hanging from their jaws.

Seven of these "tents" were removed at about 2.00 pm (7th September 1990) and were transferred to nettles in the garden. There were also many larvae of *Vanessa atalanta* (Red admiral) in the field, obviously unharmed, and no signs of forced eviction in any of their leaf-purses.

By five o'clock only three of my Tortoiseshell masses were left with wasps hovering ominously close. These were put under netting on potted nettle. No aberrations eventually emerged and they were released back into the field.

This year, according to many people's observations, Small tortoiseshells have been much less frequent, despite the apparently favourable conditions. No doubt other "checks and balances" have appeared to minimise Tortoiseshell expansion, Tachinid flies, possibly also birds, but I'm sure that my experience with the wasps was not unique and nationwide they must have accounted for a considerable number of larvae.

THE SPREAD OF THE SPECKLED WOOD BUTTERFLY IN STAFFORDSHIRE

by Jan Koryszko (6089)

On September 13th 1990, I was beating for moths in Weston Sprink Wood, when I came across a worn Speckled wood butterfly (*Pararge aegeria*) flying through the wood. It is the first time I have seen this species in this wood. The last specimen I saw in Staffordshire was in the early 1980s when one turned up in my garden at Meir, and my first Staffordshire records, both in 1967, were Barlaston Rough Close Common, and again in my garden at Meir, both single examples. It has also recently been recorded from Meaford and Uttoxeter, where it was mainly seen in gardens.

In the past this species was established for many years in the Kinver/Enville district of south Staffordshire. A spread into the central and northern parts of the county commenced after 1940, with butterflies at Aqualate in 1943; Burnt Wood and Madeley, 1948; Meir, 1950; Silverdale, 1951. However, they have failed apparently to become established in any of these places. In the Needwood Forest it was first reported in 1947, is still present and well established there, and single examples have been recorded in Trentham Gardens, 1960 and Hamstall Ridwäre, 1971.

Evidence of a further spread up the Churnet Valley, again single examples, are sightings at Denstone, 1972 and Coombes Valley, 1974.

These records are from the Lepidoptera Atlas of Staffordshire by R.G. Warren. It is hoped that these recent records will produce more established colonies in the county. In most butterfly books it is said to be found in shady lanes, borders of woods, etc. but few books mention that it can also be found quite frequently in gardens.

BUTTERFLIES AND DRAGONFLIES IN NORTH WARWICKSHIRE

by Brian Mitchell (8068) (*Recorder, Alvecote Pools*)

The Year 1990 saw penetration of Holly blues in good numbers into North Warwickshire, where previously they have been scarce. Surprisingly, I recorded the first in the 31 year history of Alvecote Pools Nature Reserve (SSSI) on 2nd May, making the 22nd species of butterfly to be recorded there (although two more were to be added later in the season). A peak of seven second brood Holly blues were counted there by myself on 26th July. Furthermore, I noted one or two second brood Holly blues at Whitacre Heath Nature Reserve (SSSI) in late July, the first in its five year history and its 22nd species.

Purple hairstreaks were also noted for the first time on 13th July at Alvecote Pools and I later found them to be more widespread on the reserve — on stunted oaks and around mature ash. Yet another surprise was the sighting of a single Purple hairstreak possibly on 31st July but definitely on 4th August at Whitacre Heath. There is a distinct lack of mature oaks on the reserve but the individuals were seen around small ash trees in the hedgerow on the boundary of the reserve. A mature oak, however, grows over the road *outside* the reserve. Over the past two years a number of new sites for this species have been found in North Warwickshire.

The long-awaited sighting of a Ringlet on 22nd July at Alvecote Pools was reported to me by H.C. Morrall who identified it after it was noted by J. Davis. This made the third new species to the reserve in 1990 and the 24th on its list.

Two new species were added to the Odonata at Alvecote Pools in 1990. On 23rd May I observed a Red-eyed damselfly female at rest on Japanese knotweed in the Priory and on 26th July I watched a male picking smaller insects off bracken along the canal. Many probable Red-eyed damselflies were seen flying low over one of the pools. The second species was the Ruddy darter, first noted resting low down in a glade on the evening of 31st July by myself (in company with H.C. Morrall and M.W. Painting). Others were noted in the same area and a maximum four on 30th August.

I would be pleased to receive any Odonata records for the Tame Valley wetland complex or butterfly records for any sites in the Borough of North Warwickshire, particularly the parishes in grid SP28 for which hardly any records appear to exist. Significant records for sites in the north would also be welcomed, particularly Kingsbury Water Park and the Coleshill area.



PRINT REVIEW

British Dragonflies by Roderick Dunn. A second series of four signed colour prints (34 x 29 cms), in a limited edition of only 100. Available direct from R. Dunn, 4 Peakland View, Darley Dale, Matlock, Derbyshire DE4 2GF. Price £32.00 post free.

We reviewed Mr Dunn's first series of Dragonfly prints in *Bulletin* 44: 38 and the remarks we made therein still apply to this second series.

Superbly drawn, coloured and printed, with foliage included, they are as good as, or better than, many other dragonfly illustrations I have seen including those of Charpentier's *Libellulinae Europaeae descripta et depicta*. While one cannot compare modern colour printing on glossy machine-made paper with hand-colouring on matt hand-made paper,

they are, after all, produced from originals on such paper and although I have not seen them, I have the impression that Mr Dunn's originals must be well up to the same standard as the illustrations of Curtis or Harris.

The dragonflies depicted in this second series are *Calopteryx virgo*, *Libellula depressa*, *Coenagrion hastulatum* and *Aeschna juncea* (see illustration). One has to admire Mr Dunn's dedication, patience and steadiness of hand in getting all the very intricate wingveins accurately in.

Brian Gardiner

FIRETHORN LEAF-MINER: HELP WANTED

The Firethorn leaf miner (*Phyllonorycter leucographella*) is a minute golden-brown moth, whose caterpillars mine the leaves of the common garden shrub firethorn (*Pyracantha*). The caterpillars hatch from eggs laid on the upper side of the leaves, and tunnel through them until they pupate, hence the name "leaf-miner". The Firethorn leaf-miner is not a pest, and does not do any permanent damage to the firethorn bushes that it infests.

The Firethorn leaf-miner was first discovered in Britain in 1989, and has been spreading ever since. It has rarely been possible to chart the progress of an invading species from its earliest stage. In order not to miss this unique opportunity, the Department of the Environment are funding a research group at Imperial College to monitor the spread of the Firethorn leaf-miner over the next few years.

However, to carry this out effectively we are asking for your help.

If we can get as many groups as possible to check firethorn plants for the leaf-miner, then we will be able to build up a very detailed record of its current distribution in Great Britain. By repeating this each year we will be able to follow the course of the invasion.

There is little detailed information on the spread of any insect in Britain, and the data we obtain for the Firethorn leaf-miner will allow us to understand and predict the spread of other species in Britain. In the future this might include such things as genetically engineered organisms, and the insects released as biological control agents of pests and weeds.

The mines of the Firethorn leaf-miner go through a number of stages. After hatching from the egg, the caterpillar eats its way along the mid-rib of the leaf, leaving a reddish-brown trail. The mines are often difficult to see at this early stage.

The caterpillar then eats its way outwards from the mid-rib, and produces a "blister" on the leaf. This is silvery and translucent, and the white caterpillars can sometimes be seen moving beneath the blister.

Finally, the caterpillar draws the edges of the leaf together to form a "pod" which largely hides the blister (although it can still be seen by looking down the ends of the leaf). The caterpillar pupates within the podded leaf and just before the adult emerges the chrysalis often pokes out from the end of the leaf.

At present, the moth is known from southern Essex, from the Thames to Colchester and west to the Hertfordshire border. It is found in some areas in the North and East of Greater London, but it may occur in other areas of the country where it has not been discovered yet.

If you find the Firethorn leaf-miner on bushes in your area, we would like to know about it, particularly if you find it outside its currently known range.

Any information that you can supply us with would be useful, even if it's just to confirm that you haven't found the moth on firethorn in your area. While we will be checking as many areas as possible ourselves, we obviously won't be able to cover the entire country.

You can contact us at the following Freepost address:—
Dr David Nash, Centre for Population Biology, FREEPOST,
Imperial College at Silwood Park, Ascot, Berkshire SL5 7BS. Or
telephone: Ascot (0344) 294365.

INSECTS AND THE RAIN FORESTS OF SOUTH EAST ASIA (WALLACEA)

The PROJECT WALLACE Symposium has now been published at a retail price of £29.50. However, Fellows of the Royal Entomological Society and Project Wallace participants may purchase a copy at a special discount price of £20.00. £2.50 (home) or £4.00 (overseas) should be added to all orders for postage and packing.

The 343-page volume comprises 31 chapters covering papers presented at the Symposium on biogeography, ecology and human impact, including the text of a discussion on Wallacean Biogeography.

Should AES members wish to purchase a copy, please send your remittance, in sterling, made payable to the Royal Entomological Society, to the Registrar, 41 Queens Gate, London SW7 5HU.

PRACTICAL HINT — OBTAINING VARIETIES

by Christopher Nissen (7002)

The var. *nigrina* of the White admiral, *Ladoga camilla*, can be produced artificially by keeping the pupae in a refrigerator.

CHINESE-GERMAN SOCIETY FOR RESEARCH OF CHINA'S INSECT FAUNA

by Ulf Eitschberger, Hou Tao-Qian, Hans Muhle, Heinz Peks and Fy Yi-Ling

Translation from *Entomologische Zeitschrift mit Insektenbörse* No 21.
2nd November 1990 by Jamieson C. Little (8460)

The object of this newly founded society, with headquarters in Peking (Chinese Academy) and Markt-leuthen (Eitschberger Entomological Museum), is to gain as soon as possible a comprehensive knowledge of all the species of insects in China. It is an urgent matter as every day large and intact natural areas are made 'useful' and thus destroyed by man's inroads. In the shortest time, therefore, more unknown species and subspecies die out than are being discovered and described scientifically. A further object is the establishing of a sound contact between entomologists of China and Germany as well as those of the other western lands.

As it has been shown that official authorities in Germany are not ready to support this programme (or only insufficiently and in a long drawn-out bureaucratic way), all entomologists who are scientifically interested (none with commercial interests) are called upon to travel to China in order to collect and study scientific material. The Chinese-German Society guarantees that, in accordance with an agreement with the Chinese Academy, all may move around freely in the entire land, and can observe and collect there. Entomologists of the Chinese-German Society will work together with experts from the Chinese Academy. Those taking part must bear costs of travel to China and of equipment. Everything else in the country itself (food, car, accommodation etc) will be borne by and organised by Chinese experts. Results of the investigations are to appear in a series of books, *Insects of China*, as the information becomes available.

It is naturally understood that a part of the material studied must be deposited in the collection of the Chinese Academy. With new descriptions, the holotype must certainly be deposited there.

Those people who are interested, not only from Germany but from all western countries, should contact Professor Hou-Tao-Qian, Institute of Zoology, Academia Sinica, 7 Zhongguancun Lu, Haidian, Beijing (53), China 100080, or Dr Ulf Eitschberger, Entomologisches Museum, Humboldtstrasse 13A, D-8688 Markt-leuthen, Germany.

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The Scientific Names of the British Lepidoptera – their History and Meaning

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with a foreword by Professor Sir Richard Southwood, FRS

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Colonel Emmet is not only one of Britain's leading lepidopterists but also a classical scholar. This fascinating and erudite work will be of great interest and value to students of entomology or scientific nomenclature worldwide and is certain to become a classic.

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CONTENTS

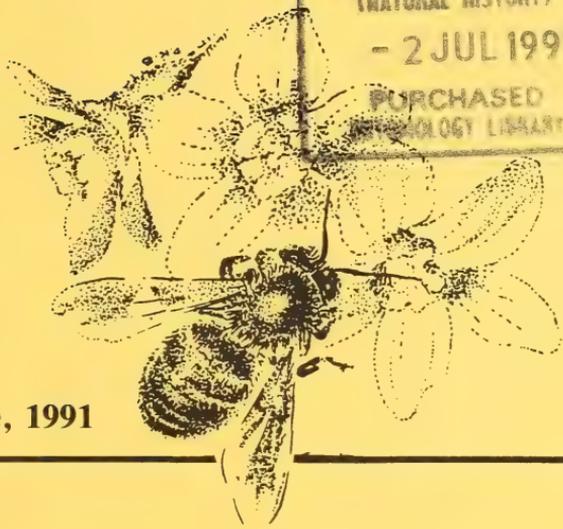
Annual general meeting	49
Butterflies of Anston Stones, <i>by Paul W. Batty</i>	51
Butterflies and dragonflies in north Warwickshire, <i>by Brian Mitchell</i>	92
Chinese-German society for research of China's insect fauna, <i>by Ulf Eitschberger et al.</i>	96
Day of the jasper, <i>by Don McNamara</i>	90
Do smaller shrubs get larvae off to a flying start? <i>by Roger A Wright</i>	72
50 years ago, <i>from:— AES Bulletin No. 45</i>	58
Firethorn leaf-miner: help wanted	94
Hawkmoths of Ireland, <i>by Tim A. Lavery</i>	73
Insects and the rain forests of south-east Asia	95
Lepidoptera recorded in Valdemoro, south of Madrid, Spain, <i>by Gareth E. King</i>	81
Lepidoptera of San Raphael & Gudillos: two localities in the Sierra de Guadarrama, <i>by Gareth E. King</i>	84
Letter to the Editor, <i>by Roger A. Wright</i>	49
Much ado about mothing, <i>by Diane A. Lavery</i>	88
Note on Teesdale Park, <i>by Ian Mascall</i>	80
Note on the Bloodvein moth, <i>by Jan Koryszko</i>	88
Oh Anthony where art thou? <i>from:— The New Scientist</i>	64
100 years ago, <i>from:— The Entomologist vol. 24</i>	60
150 years ago, <i>from:— The Entomologist vol. 1</i>	61
Practical hints, <i>by Christopher Nissen</i>	61, 64, 65, 95
Professor Hering memorial research fund	64
Reviews	65, 87, 93
Spain — a spring expedition, <i>by P.W. Cribb</i>	66
Spread of the Speckled wood butterfly in Staffordshire, <i>by Jan Koryszko</i>	91
392 years ago, <i>from:— the first insect book in English</i>	62
200 years ago, <i>from:— A new system of natural history</i>	62
Unusual occurrence of ichneumon emergence from a Cabbage white larva, <i>by Jan Koryszko</i>	50

36 A

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Volume 50, No. 376, June, 1991

The Bulletin of the Amateur Entomologists' Society

EDITOR

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

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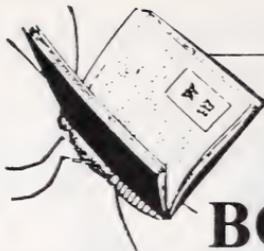


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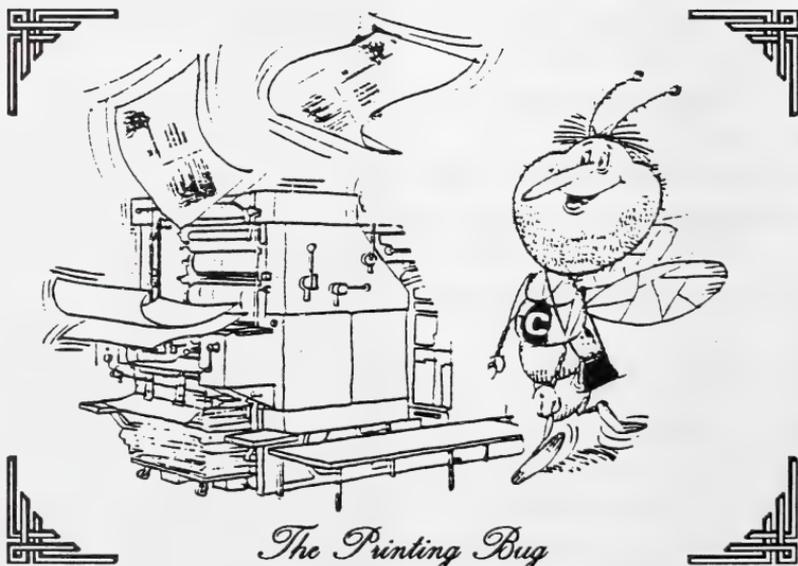
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AES BULLETIN

No. 376



EDITORIAL

Pressure is being put on the Department of the Environment to ban the breeding in captivity (except by licence) of the 22 butterfly species on Schedule 5, Section 9 (5) of the Wildlife & Countryside Act. The main argument for doing this appears to be the belief, mistakenly in my opinion, that dealers are continually catching and selling the offspring of the butterflies. I have yet to be presented with or to see any concrete evidence supporting this view.

As editor I have received several objections to this proposal and as a purely personal view, with which some AES members may well disagree, it is my opinion that to ban the rearing of these species would be counter productive and will result in far greater pressure on the collecting of them in the wild, for even though this is illegal it will take place; policing such activity is virtually impossible. It is unfortunate but true that there will always be customers in the market, as there are for many other illegal activities and there will always be unscrupulous dealers who will break the law and trade in such species. It will then go underground instead of being open and above board as it is now at the numerous trade fairs. This illegal capturing of wild specimens, with the risks involved (a small fine?), will of course also result in a considerably enhanced price to those currently being asked for bred examples. That this illegal activity goes on with endangered birds' eggs and orchids is all too obvious from reports both on Television and in the Press where successful prosecutions have been reported and accounts of the illegal activities described.

One of the most telling reasons for keeping stocks in captivity is the example of the Large copper (*Lycaena dispar batavus*), an easy enough species to keep in captivity, once one has gained in experience of breeding insects and which is now kept by a number of people. This species has only been maintained on Woodwalton fen since 1928 by being bred in captivity and released onto the fen from time to time. Not the

other way round. Should some unexpected disaster strike one or other of the presently "endangered" species, how nice it will be to know that there are stocks of them being safely bred in captivity.

Similarly the Silkmoth *Bombyx mori* only exists in captivity and not in the wild. It is quite illogical to ban the keeping of Large coppers, which is one of the proposed 22 species, but not the Silkmoth, for both are extinct in the wild and only exist through the dedication of those who rear them.

Consider the Clifden nonpareil (*Catocala fraxini*). In the 1930s its price was £5.00, the equivalent today of about £250.00. Twenty years later, in the 1950s I could not give them away because so many people were breeding them and today they may still be had for only a pound or two. It is still being maintained in captivity many years after it has died out in its only known locality due to the forestry interests having replaced its foodplant, aspen, with conifers.

Captive breeding is much cheaper and more reliable than taking from the wild. I have personally bred butterflies at the rate of up to 4,000 per day. Is it possible for anyone, anywhere, to catch them from the wild at that rate? I had this species in captivity for 40 years without the introduction of any fresh wild-caught stock. Many other species have been similarly maintained, one tropical insect since 1907 without ever the necessity of introducing fresh wild stock. Indeed it is fairly well established that it takes several generations and much very hard work to establish and adapt a captive stock and to continue to supplement it from the wild, which some people believe happens on a regular basis, is only to ask for trouble, running the enormous risk of re-introducing disease one has just got rid of and having all the hard work over again. Several hundred insect species are maintained in captivity year upon year and many hundreds of papers and a few books have been written concerning them. It is note-worthy that practically all these stress the importance of keeping captive stocks in genetic equilibrium and in a sterile and disease-free environment and on **NO ACCOUNT TO BRING IN FRESH STOCK FROM OUTSIDE.**

There are a number of examples, from outside the insect world, where captive breeding has helped to preserve species. From the plant world we have the case of the Cycads. These became popular in gardens with the result that they began to be endangered in the wild. A captive breeding programme was put in hand and produces sufficient cheap specimens to satisfy the demand and makes it un-economic to go to the trouble of pilfering them from the wild. A recent (April 1991) Natural History programme on television which investigated the illegal trade in birds' eggs, produced evidence from a falconer (legally licensed) who said that breeding some falcons "was a doddle" and showed the proof of this.

She went on to say that as a result of this breeding their price had been halved. One does wonder that if the breeding of some other species, such as the Red Shrike had been allowed, its future in the Breckland, where it is now almost extinct as a result of egg collecting, would have been assured. More controversial, particularly to those against blood sports, is the large-scale breeding, in Texas, of large mammals such as Zebra and Antelopes. The cost is recovered by selling shooting rights and, note this, enough surplus animals are produced both to supply restaurants and to re-stock their natural habitat where they are in danger of becoming extinct.

When the Act banning the breeding and sale of our British Swallowtail (*Papilio machaon britannicus*) came into force, some 10,000 specimens being bred in captivity had to be destroyed. Is this now to happen again?

Do we, I wonder, want to risk the destruction of the many captive stocks of the 22 "endangered" species as a result of legislation? Having obtained a prohibition on over half our butterfly species will not the ill-informed then try and get the ban extended to cover all insects; then all other invertebrates followed by fish and other marine life (keeping of aquaria is an even more popular hobby than entomology I believe). To take things to their logical conclusion the keeping of any pet for any reason should be banned. *Reductio ad absurdum*. Bans and restrictions confuse the issue and take attention away from what is the real problem, the destruction or disturbance of habitat. It is control over that problem to which attention should be focussed.

It is becoming quite clear that "BUTTERFLIES" are a very emotive issue. There are some 20,000 insects in Great Britain of which only some 69 are butterflies, so why should some 40 per cent of these be subject to legislation but only a fraction of one per cent of the other insects. To be equitable several thousand of the other insects should also be included for many of them are equally at risk, but then who will take the chance of proposing to have the plague flea (*Xenopsylla cheopis*) protected by law! It has equal merit, in view of its rarity, to be considered as any colourful butterfly.

A NEW IRISH LOCALITY FOR THE PURPLE HAIRSTREAK

by John W. Lavery (7469)

On trips between 5th and 20th May last year to Derrycunihy wood, Killarney, Co. Kerry, and using a beating tray, I discovered in various stages of development larvae of the Purple hairstreak (*Quercusia quercus*). From the lower branches of pendunculate oaks (*Quercus robur*) over 76 larvae were dislodged.

BOOK REVIEW

A selection of the Butterflies of Sri Lanka by John and Judy Banks. Crown quarto, pp.40, 16 coloured plates. Lake House Investments Ltd, 41 W.A.D. Ramanayaka Mawatha, Colombo 2, Sri Lanka. 1985. (Price about £3.50.)

“We most sincerely hope that in producing this book, we will not be aiding, abetting or encouraging those destroyers of nature who kill these beautiful creatures and stick pins through their fragile bodies” write John and Judy Banks in *A selection of the Butterflies of Sri Lanka*. They qualify this regrettably all-encompassing statement with “it is inevitable that (in Sri Lanka) there have been changes in the availability of the foodplants on which each specie (*sic*) of butterfly depends for survival, with consequent repercussions on specie populations.”

The booklet has some strange terminology e.g. “specie” instead of “species”, “Upper wing” and “Under wing” instead of ‘Upperside’ and ‘Underside’. Again, although intended for “butterfly watching” there is no mention of any foodplant, so that the reader is hardly encouraged to search for the early stages of these insects and thereby improve his/her understanding of the place they occupy in the ecosystem. There would have been ample room for this inclusion on the text pages, while the last two pages in the book are blank. Secondly, even the most ardent butterfly watchers will find it difficult to identify some of the “blues” without a net.

Having said that, I want to state categorically that this is a superb booklet! Printed on glossy paper in 19 x 25.5 cm landscape format (meaning that you can open the pages without having them flip back into place again), this is the kind of book every entomologist hopes to find in a bookshop on a visit to a tropical country. John Banks’ illustrations are beautifully executed and the couple’s calibre and devotion is obvious in their introduction to the revision of the companion volume on Sri Lankan birds, viz: “This revision was made necessary by the loss, somewhere in the United Kingdom, of all the original illustrations, but that was, perhaps, a blessing in disguise because the loss has forced us to embark on a completely new set of illustrations” The butterfly and animals (mammals and reptiles) booklet followed the bird book, the Banks being ornithologists.

I found stacks of all three booklets in the Lake House Book Shop, Colombo, which is virtually the same as the publishers. At Rs 225-00 (in Sri Lanka’s depressingly poor economic state, now approximately £3.50) a copy of each booklet should be on the bookshelf of everyone interested in tropical natural history.

Leigh Plester

THE PROBLEMS OF THE DAPPLED WHITE'S NAME AND STATUS

by Peter W. Cribb (2270)

There seems to be considerable confusion over the correct nomenclature and status of the Dappled white group (*Euchloe ausonia*), a butterfly of Southern Europe. Examples are shown in Colour Plate A.

In 1884 H.C. Lang listed the Dappled white as *Euchloe belia* Cramer (= *crameri* Butler) and described three forms — *belia*, and *ausonia* Hübner and *simplonia* Freyer. *Ausonia* he stated had yellower markings than the typical *belia* and *simplonia* was the alpine form from Switzerland and the Pyrenees. Seitz (1909) described *Euchloe belia* Cramer as being with an underside hindwing with regular yellow-greenish markings and having two generations. He named the second generation (summer form) *ausonia* Hübner (= *belia* Esper) with lighter u/s markings and a ground colour of white rather than silvery-white as in the first generation. He described another race, *simplonia* Freyer, from Valais, Piedmont and the Pyrenees where the forewing upperside central spot is joined to the black front costal margin, stating that Dr A. Spuler considered it a distinct species with the larva being dotted with black.

In 1903, Revd George Wheeler referred also to *Anthocharis belia* Cramer (= *A. crameri* Butler) from the Bases Alps and Mediterranean littoral which occurred in two generations, the second being referable to *f. ausonia* Hübner. He also described *A. simplonia* Freyer from the high Alps as a single generation in July/August, being generally larger than *belia*, without silvery-white underside and with the upperside black markings more intense and with dark shading at the wing bases.

Forster and Wohlfahrt (1955) refer to *E. ausonia* Hbn. (= *simplonia* Freyer) from Valais, Ticino and the high Alps as having a single generation spread over a period from April to August, depending on altitude and locality. They also refer to *E. orientis* Brem. (= *belia* Cramer) as being from the south and west of Europe. From these authors the general opinion would appear to be that there are possibly two species present, one univoltine and living at high altitudes, the other bivoltine at lower altitudes. The former is *E. simplonia* Freyer, the other *E. belia* Cramer (= *crameri* Butler = *ausonia* Hübner.) having two dissimilar generations.

Then to confuse the issue, Higgins in 1975 described *E. ausonia* Hübner as being the single-brooded species of the high mountains and *E. crameri* Butler as the lowland species with two generations (?) in Southern Europe, North Africa and Western Asia. The genitalia and chromosome

numbers of both species he stated to be identical in the specimens he examined. However, he then confused the issue further in the 4th Edition of *A Field Guide to the Butterflies of Britain and Europe* (Higgins & Riley 1980) by calling *E. crameri*, *E. simplonia* Freyer (1829) with the type locality as Croatia. One might assume that the use of the name *simplonia* was derived from the Simplon Pass on the Swiss/Italian border where the single generation species is common.

Kudrna in 1986 lists *E. ausonia* Hübn., *E. crameri* Butler and *E. simplonia* Freyer but comments that classification of the group requires a taxonomic revision, taking into account all stages of the species' involved. In many ways the group presents similar problems to those of the *Pieris (Artogetia) napi* group with its uni- and bivoltine lowland and mountain forms.

In Spain, in May 1989, the problem was accentuated as in one locality near Alcala de Henares we netted many specimens of *Euchloe* which clearly seemed to include three species — *E. tagis* Hübn., and two species, one of which is like what Higgins described as *E. crameri* Butler (*belia* of Cramer) and the other slightly smaller with more rounded wings and a bright silvery-white underside with distinct green markings. Both were fresh and laying eggs on crucifers, mainly *Biscutella*, and were quite easy to differentiate between even on the wing.

On previous trips to Provence in the south of France, I had taken these two latter species which puzzled me. The late R.F. Bretherton suggested that the species with the silvery-white underside and distinct green spots was *E. tagis f. bellezina* Boisduval. However, here in Spain *E. tagis* was present in numbers and is clearly quite distinct from the queried specimens, being smaller and differently marked. It would appear that there are possibly two species involved in the lowland bivoltine *Euchloe crameri* Butler (or *E. simplonia* Freyer according to Higgins and Riley).

Previous authors appear to have attributed these two as being the first and second generations of one species. In literature on the Spanish butterflies Manley and Allcard (1970) refer to *E. ausonia* Hübn. (= *belia* Cramer) as a species found throughout Spain and *E. simplonia* Freyer as occurring as a single brood in the Pyrenees and Cantabrian ranges at 5,000 ft and above. For *ausonia* they refer to the difference between the first generation (*f. decolorata* Catherine), having deep green underside markings and the second generation (*f. rothschildi* Verity) with light yellow-green markings. This last description might apply to the two "*ausonia*" species we captured but the likelihood of their being two generations is, in my opinion, highly improbable as flying with them were newly emerged *A. cardamines*, *A. belia euphenoides* and other

spring butterflies including *C. pamphilus*, *L. phlaeas*, *P. malvae* and *E. tages*, all in a newly-emerged state. Central Spain is 3,000 ft plus above sea level with cold winters and it would seem inconceivable that a second brood could be produced in the time scale and be flying with a first brood in perfect condition. Much more logical is to assume that there are two species present which we might agree should be called *E. ausonia* Hübn. and *E. crameri* Butler.

Fernandez Rubio (1976) figures only the genitalia of *E. ausonia* Hübn. as occurring in Central Spain and gives *simplonia* Bvd. as a synonym.

French literature tends to be confusing in its use of names, particularly for genera, but in "Alexanor" (Tome 14.Fsc.7 1986) there is a list of the vernacular names of European butterflies and listed under the Pieridae are:—

Euchloe ausonia Hbn. = La Pieride de la Roquette.

Euchloe simplonia Bvd. = La Pieride des Biscutelles or
La Pieride alpine.

which clearly indicates that the French consider there are only two species and *E. simplonia* is the mountain univoltine race. E. Bodi (1985) mentions only *E. ausonia* Hbn., figuring the larva which has black dots scattered over the whole body. In Spain we found several larvae similar to that figured. These were in their second instar on *Biscutella*. The general ground-colour is pale yellow with two dorsal black lines and one on each side above the legs, the whole surface being liberally scattered with black spots. Seitz described the larvae of his *E. belia* Cramer (*ausonia* Hübn.) as "larva similar to that of *cardamines*, greenish with three stripes of white and white stigmata, on Cruciferae" — obviously not the same. (A larva is shown on Plate C, Fig. 2.)

The only way to settle the matter is for a complete breeding programme of representatives of the *E. ausonia* group in Spain and in South France. Attempts to do so by British entomologists are difficult due to getting the material home in a suitable condition. All the eggs which we were able to collect had gone mouldy by the time we reached home due to high temperatures and humidity in the containers. Perhaps one of our Spanish and French members would be prepared to undertake the task and let us have the results, so clearing up the matter to the satisfaction of all.

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A WALK ON THE SURREY DOWNS

by P. W. Cribb (2270)

In the second week of August, 1990, Colin Davies (8305) and I took a walk along the downland above Dorking, enjoying the blazing sun and watching the butterflies on the wing. Most of this land is managed by the National Trust with sheep grazing and occasionally a few horses. The flowers were at their peak with marjoram, clumps of fleabane and rosebay willowherb and the downland species nestling in the short grasses. Chalkhill and Adonis blues seemed to have had a good season and they were everywhere on the slopes, flying with Common blues and a few Brown argus. Marjoram seemed to be the main attraction for feeding and several clumps had a liberal sprinkling of the species. Meadow browns and Small heaths and an occasional Wall brown flew up as we walked but the Marbled white, introduced to this area some years ago, was now over, having emerged early due to the hot weather.

Where the pathway entered woodland we saw Speckled woods and a few Commas and then, on some teasel heads, two female Silver-washed fritillaries, both the worse for wear. Other nymphalids were the Red admiral and Peacock sunning themselves along the pathway. We also saw Large, Small and Green-veined whites and back on the grassy slopes a single second-brood Dingy skipper and the occasional Small copper joining the ever-present blues. We headed for an area which I had visited many years earlier where, with Peter Taylor (350), I had observed a colony of the Silver-spotted skipper. Immediately on our arrival we observed both male and female specimens dashing about over the clumps of marjoram, settling there or on the bare pathway. The habitat is not large due to invading thorn scrub but from the numbers present it seems that the colony is holding its own. On our way back to the car we met a fellow enthusiast who was photographing the blues and he told us that he had just observed a male Clouded yellow.

In a countryside of fast diminishing habitats it was good to see so many species on the wing in a single afternoon walk. The fine summers of the last two years have shown that our butterfly populations are capable of resurgence provided that the habitat they need is present and managed in a favourable manner.

A HOLLY BLUE OVIPOSITING ON *CORONILLA VARIA*

by P. J. C. Russell (8977)

I noted with interest the recent article by Arthur Cleverly in the *Bulletin* and concur that 1989 and 1990 were particularly good years for the Holly blue (*Celastrina argiolus*), at least in West Sussex. Holly blues are invariably present in our garden; even in bad years I have never failed to see at least one, but in July 1990 they were exceptionally abundant.

One afternoon a particular individual caught my eye as it appeared to visit repeatedly a specimen of the yellow flowered *Coronilla varia* tied against a pergola. I watched closely to confirm this, as there is a bay tree (*Laurus nobilis*) close by which always attracts Holly blues, particularly when it is in flower in the spring. The individual in question was a female and I observed her ovipositing on the folded young leaflets at the tips of a number of different branches of the *Coronilla* bush; it was not in flower at the time and a few seed pods which were present were not chosen as sites for the ova. The female (I am almost sure it was the same individual) returned and repeated the process on at least three further occasions during that afternoon.

I had never seen *C. varia* reported as a foodplant for the Holly blue and thus decided to follow the progress of the ova. Since they were quite well camouflaged, I marked their positions after each visit of the female with pieces of wool tied around the stems at the tips of which the ova had been laid; this enabled me to relocate them quickly each day. After about a week some of the ova had hatched and the small larvae could be seen on the leaflet next to their empty shells. Fearing that the larvae would soon move around the bush and I would be unable to follow their progress, I removed six darkened ova on their leaflets to a small plastic box. They all hatched but during the following day or so the larvae only marked the leaflets in one or two places with their samplings of the pabulum before five of them died. The sixth larva however did last three days, during which time it consumed a small amount of two leaflets, before it too finally died. On the following day I examined the bush very carefully but could not locate a single larva although the empty egg shells were still visible; I was now convinced that the female had chosen a totally unsuitable "foodplant" upon which to oviposit.

Unusual foodplants have often been recorded for many of our butterflies but from the above observations it is clear that the mere fact of female oviposition on a particular plant does not always confirm that it is a "foodplant" for that species. However the fact that females usually lay their eggs on the plant generally regarded as their foodplant must indicate that they are able to positively identify that plant species from others nearby. Despite the many recorded observations of females

testing plants for their suitability before oviposition, which they undoubtedly appear to do, they are perhaps not infallible; or alternatively it could be that, particularly in years of great abundance, females positively test the potential of different plants as "foodplants", stimulated perhaps by their inability to locate a specimen of their usual foodplant free from ova laid by earlier hatching females. For the species as a whole this would have two obvious advantages; firstly allowing it the possibility of a future extension of its range into areas where its more usual foodplant does not grow and, secondly, reducing the number of ova laid on its usual foodplant, which may not be too common in a particular area, would assist in preventing its defoliation before the larvae reach maturity.

I would be most interested to hear from any other members who have observed, in the wild, butterflies ovipositing on a plant which later proved to be unsuitable as a foodplant for their larvae.

AN UNUSUAL CHOICE OF FOODPLANT BY THE HOLLY BLUE

by P. W. Cribb (2270)

Our member, Alan Leech (4430), reports a marvellous season for the Holly blue (*Celastrina argiolus*) in London during the summer of 1990; the best he has recorded for sixty years. Second-brood females were observed by him laying quite heavily on the buds of *Wisteria sinensis* (Fig. 1). The buds dropped either before or just after the eggs hatched, presumably due to the dry weather, so that it is not certain that the larvae survived. He had observed the same phenomenon in 1989. Both summers were very hot and the flower buds of Ivy *Hedera helix*, developed late in the London area so this may have encouraged the females to search out alternative plant buds to lay on.

On downland I have observed second-brood females regularly laying on buds of bramble, *Rubus* spp., and dogwood, *Cornus sanguineum*, in the absence of flowering ivy. Readers may have observed other alternatives. (In my Cambridge garden I have observed them laying on *Pyracantha*. In both 1989 and 1990 Holly blues were exceptionally common in and around Cambridge — Editor.) The first brood appears to use only holly, *Ilex* spp., flower buds and I have no record of alternatives for this brood.

In both 1989 and 1990 larvae of the second brood were heavily parasitised, the pupae producing single black braconid wasps; last year the infestation of my pupae from collected larvae was 100%. Mr. Leech also records a pupa half the size of normal specimens (Fig. 2). In my experience this is caused by food shortage and can be induced by underfeeding the larvae in captivity. The imagines are perfect but very small.

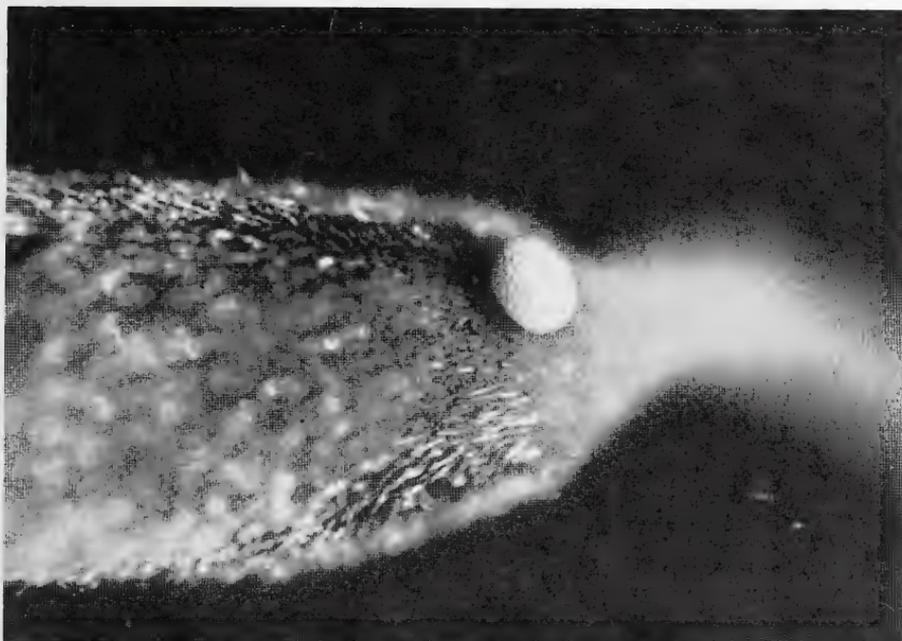


Fig. 1. Ovum of Holly blue on *Wisteria* bud.



Fig. 2. Natural size and small pupae of Holly blue.

THE HOLLY BLUE — ALTERNATIVE FOODPLANTS

by W. E. Rimington (5269)

Arthur Cleverly (*Bulletin* 49: 275) mentions the abundance of Holly blues (*Celastrina argiolus*) in southern England in 1989 and 1990 and raises the matter of alternative foodplants quoting, in particular, *Senecio*. This does not surprise me for the "polyphagous" habits of *argiolus* are well known and a few years ago I had observed egg-laying on the wayfaring bush (*Viburnum lantana*).

I was, however, most surprised to observe oviposition occurring on heather in Ashdown Forest in July 1990. The butterfly was flying freely in areas where I hoped to see some Common blues (*Polyommatus icarus*), but was disappointed, and she was displaying interest in the heather. I delayed my departure in order to observe and was rewarded quite soon by seeing eggs laid. This took place in both sheltered and totally exposed situations. With such a diverse appetite it is perhaps a little surprising that *argiolus* like the Green hairstreak (*Callophrys rubi*) is so often absent from seemingly suitable spots.

The Holly blue has certainly increased dramatically in the south and in 1990 gained ground at Doncaster. In July I observed at least thirty specimens in the well-wooded areas about the Don Valley and heard of more. Prior to 1990 only very occasional examples had been seen since 1948 when, according to my late dear friend George Hyde, larvae swarmed on the ivy about Sprotborough on the Don banks in a massive population explosion.

I am also pleased to report that the Comma butterfly (*Polygonia c-album*) is also increasing in the Doncaster area.

EXTRA FUNDING FOR ENDANGERED SPECIES

from habitat

David Trippier, Minister for the Environment and Countryside, announced on 4th January that £20,000 extra Government funding would be made available for a joint international initiative with the World Wide Fund for Nature to help conserve endangered species. A scheme is being set up to monitor the effectiveness of the controls on trade in endangered species and an Investigations Officer has been appointed to the Lausanne-based Secretariat in Endangered Species (CITES). The Investigations Officer will look into problems experienced by countries party to CITES in implementing the Convention and will provide practical advice and assistance in trying to resolve them.

PHOTOGRAPHIC COMPETITION WINNERS

by Terence F. Knight (7611)

The 1990 photographic competition, organised by the AES in conjunction with ICI Agrochemicals at Jealott's Hill Research Station at Bracknell in Berkshire, attracted considerably more entries than those received in 1989, with several members submitting a number of different prints.

The theme was left open in order to allow entrants to send whatever they chose, providing, of course, it was of an entomological subject. There were two sections, one for junior members, and one for ordinary members, with a £50 prize, or the equivalent value in books, and a chance to visit Jealott's Hill, going to the winner of each section.

The winner of the junior section was Caroline Willmot, of 5 Brook Vale, Bewdley, Worcestershire, with a colour print of a male Orange-tip butterfly (*Anthocharis cardamines*). The winner of the senior section was Martin Askins, of 47d Upper Court Road, Epsom, Surrey, with a colour print of a male Mottled grasshopper (*Myrmeleotettix maculatus*). These prints, together with all the other entries, were on display at the AES annual exhibition in October.

Caroline's winning entry is shown on Plate B, Fig. 2.

BOOK REVIEW

The Biological significance of Conservation of Hymenoptera in Europe by I.D. Gauld, N.M. Collins & M.G. Fitton. Pp.47, 8 figs, A4 paperback. Nature & Environment Series No. 44. Council of Europe, 1990. Price not stated.

An interesting summary of the conservation and biology of the Hymenoptera (bees, wasps, ants and allies). Included are chapters on Hymenoptera and mankind: an historical perspective, a brief account of the order, beneficial and pest species, research trends and conservation.

The latter includes a very useful list of National and International conservation databases and legislation, which will be of particular use to those entomologists collecting this group in Europe. The publication also summarises the source of threats and conservation measures for the Hymenoptera.

Overall a very informative publication which is easy to read and so accessible to both amateur and professional entomologist alike.

D.M.

LOCUSTS FOR SUPPER

(Not for the squeamish - Ed.)

by Duncan Reavey (6934)

Eastern Sudan, winter 1985. Watch out if you are ever invited for a meal during a locust outbreak. Or at least go along with an open mind and a mug of water.

First the children disappear to stalk supper. Most locusts are pretty easy to catch — either approach them slowly from behind and grab them by the hind legs, or, if impatient, find a cut, leafy, five foot long stem of sorghum straw and use it like a fly swat. They return after half an hour with rows of adult locusts impaled through the sides of the thorax on millet stems. Checking their catch is a lazy way of sampling the locust species that are around — about 90% African migratory (*Locusta migratoria*) and 10% Desert locust (*Schistocera gregaria*): Tree locusts (*Anacridium melanorhodon*) are rarer and virtually impossible to catch, a pity as they are larger and could well be lean and juicy (Plate B, Fig. 1).

Next comes the cooking. Heat up some cottonseed oil in an enamel dish. Because there is the danger that the locusts will jump out of the pan, the hind legs and wings must be removed by hand and discarded. The locusts are then dropped into the hot oil and fried for ten minutes, turning occasionally, until deep golden red (Fig. 2).



Fig. 2. Tasty fried delicacies ready for starters.

Then comes the eating. Most important, keep a beaker of water handy, because the remaining legs can get stuck in the throat. Take a locust in your hands and pull the head away from the thorax. The gut should come away with the head - pinch off the gut and discard it. Pop the head into your mouth, then the thorax/abdomen, and get chewing. The first two or three are a novelty; with a little imagination the taste might resemble overdone beef sausages. Something more than a vivid imagination is essential when you see the other hundred locusts in the bowl and your host insists that they are all specially for you. Unfortunately they are not good in sandwiches the next day. (We tried.)

While locusts are readily available in British colleges and schools, I somehow doubt that "Locust Crunch" will ever rival sausages on sticks or cheesy wotsits at receptions and cocktail parties.

(Editor's note:— Quite clearly using locusts as food can help solve the problem of the destruction they cause by devouring crops when they become a plague, for, as reported in the *Oxford Mail*: "Two students, who each devoured more than 2 lbs of fried locusts in five minutes, carried off the first prize in a contest to promote pest control and protect crops".)

AN EARLY SMALL TORTOISESHELL IN HERTFORDSHIRE

by S. Pittman (9135)

During the recent arctic conditions I had to visit the old Ashwell village brewery site on the 14th February 1991. No, I had not called in for a drink but to deliver supplies to the local youth club inhabiting the premises.

The early afternoon sun was at its zenith and as I strolled the courtyard I was amazed to find a Small tortoiseshell (*Aglais urticae*) butterfly sunbathing on a snow ridge. Obviously tempted out of hibernation by the warm atmosphere it began vibrating its wings in order to attract the maximum sunlight.

Having absorbed enough energy it took flight to land high up on the roof of a derelict hop store. Here it continued to bask on the wooden ventilation slats of a chimney. I suspect it was in this ventilation shaft it had overwintered.

It continued to flit between the two chimneys of the old brewery always adjusting the wings to the best sun angle.

This is my earliest ever sighting of a butterfly in Hertfordshire, but the record is still held by a specimen recorded on 7th January 1940.

MY GARDEN IN CHARENTE

by Stella Smith

The northern limit is a crescent of limestone rock rising at its highest point to a majestic 150 ft, the various layers of age clearly visible. The southern boundary is marked by the river Agentor, looping into the much larger Charente from which this region of south-west France takes its name and in turn empties into the Atlantic at Rochefort. Between these two points lie 25 acres of woodland and wild flower meadows.

It was these acres, along with an old barn and adjoining cottage we bought in 1989. The old stone barn has now been converted into our home and the adjoining cottage a self-contained, two double bedroomed unit for holidays. The 25 acres are our own private nature reserve which is proving far richer with its variety of habitats than we had originally foreseen when we first stood looking down and across the undisturbed valley with a Scarce swallowtail floating up towards us from the wild flower meadow opposite and a pair of Buzzards effortlessly soaring in the hot flow of air currents high above. How many other butterflies, we wondered, would we find in the meadows? Not only have we been surprised by the number of species, but by the quantities of these species and the pleasure on a hot day of watching a Scarce swallowtail search out her foodplant and lay her eggs, of seeing those curious sluglike caterpillars feeding on the blackthorn, or the delight of seeing our first European swallowtail caterpillar, fat and healthy on the wild carrot. Last year I was able to recognise and identify 31 species, but this list I'm sure, will rise to over forty as those browns, blues, fritillaries that are so difficult to identify, I did not add to my growing list.

I await the verification of our holiday guests, the expert or keen amateur, to ascertain the difference between the blues, Pearl-bordered fritillary and Small pearl-bordered fritillary and others. Such an expert guest has been Clive Farrell, author of *The Butterfly Gardener*, and creator of the tropical butterfly exhibitions, especially the excellent one at Stratford-upon-Avon. "It's like Britain must have been 100 years ago" he said, "There are so many butterflies it's like an open-air butterfly farm." I can't speak for 100 years ago but I do know that the only place I have seen as many butterflies is at the butterfly exhibitions. It was this guest who, one late summer night, while nursing a bottle of red wine, alerted us to expect a visit from the Colvolvulus hawkmoth. Sure enough as it darkened and before he finished his bottle, the night visitor was probing the sweet scented *Nicotiana*.

Of course, butterflies are only a part of the varied wildlife we are becoming accustomed to — Hummingbird hawkmoths have already been spotted and it is still only mid-March. Damsel and dragonflies

abound in great numbers, skirting the water's edge in their multi-colours and sizes, beetles of many types, bees and large grass snakes are to be seen. The bird life also is rich and varied and in April the valley echoes with the song of the nightingales. Late spring to late autumn, the crickets lend their summer sound, reaching a crescendo in July and August.

To help maintain the rich diversity of insect, bird and plant life, we are making paths, woodland rides and little glades to encourage the plant life and create more habitats. Water that was once only a sound gurgling and rushing has been found under a tangled mount of blackberry bushes, the stream opened up and traced back to its source, a spring gushing forth from the foot of the limestone crescent. Another hidden stream emerges from the rocks, providing spring water which, having had it analysed and pronounced safe, is the only water which we now drink. The only sadness is knowing what man has destroyed and continues to destroy in his urge to control nature. Here I try to work with nature, including the creation of a large organic vegetable garden, still being expanded, from which our holiday guests can taste the produce available.

We have many seasonal delights: the Snake's-head fritillary by the hundred, in spring a blanket of cowslips, the summer meadows of knapweeds, scabious, bird's-foot trefoil, orchids and many other plants too numerous to mention. Our particular delight is the twice yearly generation of Adonis blues. This brilliant spectacle is to us a sign that in this little untouched corner, nature survives and summer arrives.

Since our aim is to protect and encourage as many species of butterfly as possible, no collecting is permitted within our grounds although we hope that visitors will come armed with their cameras, rather than nets.

CORRECTION OF ERRORS

Clifden nonpareil is extinct (page 36)

Chalkhill blue not a Common one (page 46)

The editor regrets that he failed to spot two gremlins that played fast and loose in the February issue of the *Bulletin*. On page 36, under PRACTICAL HINT — SUGARING, "Faggs or Long Rope Wood are good localities" should have read "Faggs or Long Rope Wood were good localities." The Clifden nonpareil moths were last seen there in 1964, dispossessed no doubt by their foodplant, aspen, having been largely replaced with conifers. Members' attention should also be drawn to the fact that Mr Nissen sugared in Faggs Wood a good many years ago and that it is now a Reserve and a permit would be required to visit.

On page 46 the captions to Figures 1 and 2 should have read Chalkhill blues, not Common blues.

THE BUTTERFLIES AND HAWKMOTHS OF THE TURKS AND CAICOS ISLANDS

by R.G.T. St. Leger, O.B.E., F.R.E.S. (6930)

"Beaumont", Hollesley, Suffolk IP12 3QU.

The Turks and Caicos Islands, one of the five remaining British dependencies in the Caribbean, lie to the south of the Bahamian archipelago and north of the divided island of Hispaniola. Geographically speaking the islands belong to the Bahamas and their political separation can be ascribed to historical accident. From 1874 to 1972 the islands were a dependency of Jamaica, but when that country gained its independence the Turks and Caicos (with the Cayman Islands) reverted to direct British rule, and have remained so ever since.

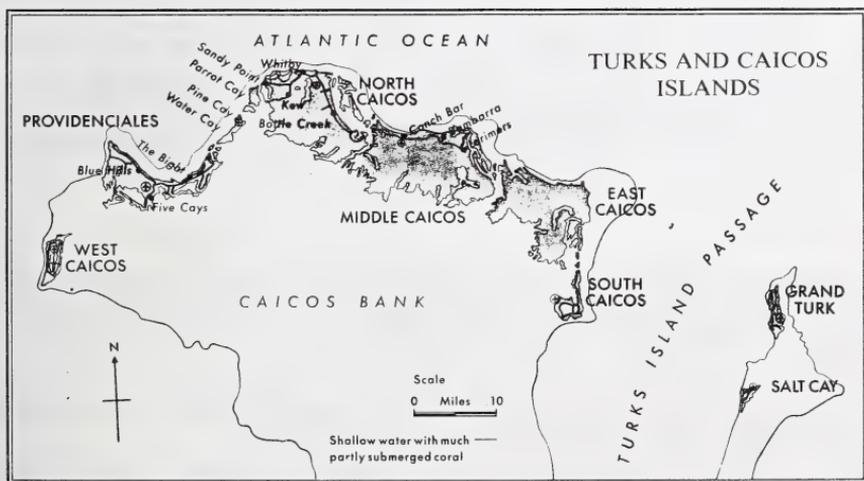
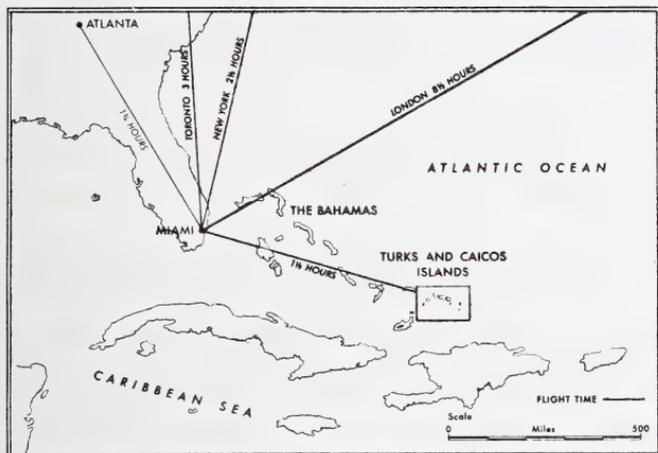
The territory consists of six major inhabited islands (four in the Caicos group and two in the Turks) and numerous smaller islands and cays. The two groups are separated by the Turks Island Passage, which is roughly the same width as the English Channel.

From the naturalists points-of-view the islands can be divided into two groups: the three "salt islands" of Grand Turk, Salt Cay and South Caicos and the three outer Caicos Islands of Providenciales, North Caicos and Middle Caicos. (East Caicos consists largely of mud flats and is uninhabited.) The three salt islands are urban in character, each containing a town, and were at one time dependent on the solar salt industry. Most of the trees were cut down in the past and through overgrazing and the consequences of hurricanes little will now grow there other than scrub, including introduced African Acacia bushes.

The outer Caicos Islands in contrast are covered in woodlands and the people live in small rural "settlements" (villages). In North and Middle Caicos some agriculture is still practiced although the land is stony and infertile. North Caicos still retains some of its original tree cover, particularly around the settlement of Kew where the government farm, a sort of market garden, is located.

I spent five years (1980-1985) in the Turks and Caicos living in the capital, Grand Turk, which is just a dot in the ocean. Having just come from West Africa I expected (and found) a much better climate, but did not expect to find so many butterflies — two groups of small arid and wind-swept islands far from any land mass are hardly ideal for lepidoptera, and as I had expected, a high proportion of those recorded are at least partial migrants. Surprisingly, although the predominant wind is from the east (the Trade Winds), most species recorded appear to have reached the islands from the north-west and many of these are found in Hispaniola but in different sub-species, which shows the populations do not mix.

TURKS AND CAICOS ISLANDS



During my stay I recorded a total of 37 species of butterflies and seven species of hawkmoths, and most of these did turn up, at least occasionally, in the tiny island of Grand Turk.

Most resident species can be found throughout the year but are much commoner when there has been a bit of rain. There is no clear rainy season in the islands, but there is usually more rain in the late summer and autumn, especially if there have been any hurricanes in the vicinity. November can sometimes be a relatively wet month too.

Lycaenidae attracted to mangrove blossom occur mainly in March and April when the Mangroves bloom, but they may well occur at other times as *S. columbella cybira* clearly does, but are not then so conspicuous.

The following species were recorded:

PAPILIONIDAE

Battus polydamus lucayus (Polydamus swallowtail): I saw, but did not catch, two examples of this species when making a working visit to the western island of Providenciales, alas without a net. They must have been blown over from the southern Bahamas. I never saw any again despite making many visits to this beautiful island.

Papilio andraemon bonhoti (Bahamian swallowtail): a common species in the outer Caicos Islands wherever citrus is grown. Specimens from the Caicos Islands are identical to those from Nassau in the Bahamas.

Papilio aristodemus bjordalae (Dusky swallowtail): this rare sub-species described from the Bahamian island of Great Inagua, has only been recorded from two places near Kew in North Caicos, but probably occurs elsewhere in the Caicos Islands. It flies low in the shade and seems reluctant to settle, and therefore is difficult to catch. This sub-species appears to be bivoltine, flying mainly in April-May and September-October.

PIERIDAE

Ascia monuste (Great southern white): this is the common garden white of the Caribbean but in the Turks and Caicos Islands it is only an occasional immigrant having been recorded in Grand Turk and North Caicos.

Eurema dina helios (Bush sulphur): very common throughout the Caicos Islands, but only an occasional visitor to Grand Turk.

Eurema chamberlaini (Chamberlain's sulphur): flies with the last species in the Caicos Islands.

Eurema lisa (Little sulphur): a common migrant which has become established in the Caicos Islands, and following a massive insect migration in June, 1983, has occurred in Grand Turk.

Eurema elathia (False barred sulphur): this species which is common in Hispaniola, is found in the south of Grand Turk island near the dock, and may have reached the island through human agency. It is also found on the Government farm in North Caicos.

Eurema nicippe (Black-bordered orange): recorded once in Grand Turk during the June 1983 migration referred to above.

Kricogonia lyside (Guayaéan sulphur): much the commonest Pierid in the islands. A migrant, which has become well-established on all the major islands.

Anteos maerula (Giant brimstone): a regular migrant occurring mainly in the late summer in singles, but in June 1983 a huge migration of these butterflies took place and it was then common throughout the islands.

Phoebus sennae (Cloudless sulphur): a common species found throughout the Caicos Islands. In the Turks Islands it is a migrant whose appearance is erratic but usually in fairly large numbers.

Phoebus agarithe antillia (Large orange sulphur): the position is similar to the last species except that it is not so common and only occasionally reaches the Turks Islands.

DANAIDAE

Danaus plexippus (Monarch): the Monarch butterfly has become established in the Caicos Islands and in North Caicos I have found the smaller sedentary form *megalippe*. In the Turks Islands it is migratory, occurring mainly in the early months of the year.

Danaus gilippus berenice (The queen): this is a common species in the Caicos Islands and appears to have gained a foothold in the south of Grand Turk. It is noteworthy that a very different sub-species occurs in Hispaniola.

NYMPHALIDAE

Anaea intermedia (Turk island leaf butterfly): this species was described from Grand Turk in 1972. It occurs commonly throughout the Turks and Caicos Islands all the year round. Although a rather unstable species I can find no constant difference between specimens taken in the Turks Islands (where it is especially common) and the Caicos Islands.

Junonia evarete zonalis (Caribbean buckeye): a common species in the Caicos Islands. In Grand Turk it is found in two separate and sedentary populations at both ends of the island.

Anartia jatrophae (White peacock): I found a single specimen of ssp. *guantanamo* in North Caicos in September 1984. Then, in November 1984, there was a sudden emergence of the smaller and brighter ssp.

saturata, which is very common in Hispaniola, around the dock in Grand Turk. These butterflies which remained in the area for some two weeks, may have reached the island through human agency. *A. jatrophae saturata* was also recorded in the North Caicos at this time, just a single specimen (Plate D, Fig. 1)

Eunica monima (Dingy eunica): I took a single specimen of this migratory species in Grand Turk during the great insect migration of June 1983, already mentioned.

Euptoieta hegesia (Mexican fritillary): although a common species in the Bahamas this species in our area is seemingly confined to the island of Middle Caicos where it is locally quite common (Plate D, Fig. 3).

Euptoieta claudia (Variegated fritillary): this species is said to be uncommon in the Caribbean, yet in June 1983, during the aforementioned insect migration, I caught two fresh specimens in Grand Turk.

Vanessa cardui (Painted lady): during my stay in the islands, this well-known migrant appeared only once, but in fairly large numbers, in September 1982, flying in the Caicos Islands a week before reaching Grand Turk.

HELICONIDAE

Dione vanillae (Gulf fritillary): the Gulf fritillary is much the commonest large butterfly in the islands, occurring everywhere the year round (Plate D, Fig. 2).

LYCAENIDAE

Strymon martialis (Cuban grey hairstreak): this woodland species occurs locally in North Caicos and Providenciales.

Strymon acis (Drury's hairstreak) : Clench and Bjorndal reported this species from the Turks and Caicos Islands but do not state in which island it was recorded. I did not see it but it could be expected to occur in the Caicos Islands.

Electriostrymon angelia dowi (Fulvous hairstreak): I took a single specimen of this butterfly in woodland near Kew in North Caicos in December 1984.

Chlorostrymon maesites (Clench's hairstreak): this beautiful little butterfly has only been recorded on mangrove blossom in March/April in Grand Turk.

Hemiargus hanno filenus (Hanno blue): a very common species in Grand Turk, which also occurs in the other major islands.

Hemiargus ammon (Lucas's blue): a bright blue butterfly that is partial to mangrove blossom in Grand Turk, but has not yet been recorded elsewhere.

Leptotes cassius theonus (Cassius blue): a very common species in the Caicos Islands, but in the Grand Turk it is confined to the north of the island.

Brephidium exilis isophthalmia (Pygmy blue): a common species in Grand Turk and probably elsewhere in the islands.

HESPERIDAE

Epargyreus zestos (Zestos skipper): occurs commonly in the woodlands of North and Middle Caicos.

Urbanus proteus domingo (Common long-tailed skipper): a migrant recorded commonly in North Caicos and Providenciales.

Ephyriades brunnea (Jamaican dusky wing): a common migrant recorded in North Caicos and Grand Turk.

Hylephila phylaeus (Fiery skipper): a common brown skipper that occurs throughout the islands.

Wallengrenia otho druryi (Broken dash skipper): recorded in Grand Turk and North Caicos. Surprisingly it is the Hispaniolan rather than the Bahamian sub-species that is found in the Turks and Caicos.

Panoquina panoquinoides (Obscure skipper): a common small grey skipper that is found in all the major islands. Riley declares it is a recent arrival from Florida.

SPHINGIDAE

Agrius cingulatus: a single record only at the lights of Grand Turk hospital in September 1981.

Manduca sexta jamaicensis: very probably a regular migrant. Recorded on a number of occasions in Grand Turk.

Pseudosphinx tetrio: a single record from Grand Turk in January 1982. Huge *Sphingid* larvae which devour the frangipani in large numbers in the gardens of Government House are probably of this species.

Erinnis ello: a very common species found throughout the islands all the year round.

Erinnis guttularis: another common and well-distributed species.

Aellopos tantalus: a diurnal migrant recorded in Grand Turk at the time of the June 1983 migration and also recorded earlier in North Caicos.

Xylophanes tensa: a single record in Grand Turk in March 1984.

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SPIDER RECORDING SCHEME*from habitat*

The Spider Recording Scheme (SRS) has been in operation since 1987 with the ultimate aim of producing *An Atlas of Spiders* in 1997. Competent recorders are still needed to help and readers possessing British spider records are urged to submit them to the scheme. Every record submitted is checked at least twice before it is accepted for publication. Offers of assistance to Clifford Smith, 7 Malton Way, Clifton, York YO3 6SG.

THE LARVA OF ZERYNTHIA RUMINA*by Peter W. Cribb (2270)*

This larva, illustrated on colour plate B, was found and photographed on my Spanish trip in 1989. See pages 66-72 in the April last issue of the *Bulletin*.

Plate A. Illustration to Peter Cribb's article, page 101.

ROW 1.

1. *E. crameri* Butler*. Central Spain. 26.5.1989.
2. Ditto.
3. Ditto.
4. *E. ausonia* Hübn.* Var. S. France. 4.5. 1986.
5. Ditto.
6. *E. ausonia* Hübn.* Central Spain. 26.5.1989.
7. Ditto.
8. *E. simplonia* Freyer*. Col du Lautaret, France. 27.7.1979.
9. Ditto.
10. Ditto.

ROW 2.

1. *E. crameri* Butler*. Sounion, Greece. 12.4.1973.
2. Ditto.
3. *E. tagis* Hübn. Central Spain. 20.5.1989.
4. Ditto.
5. Ditto.
6. *E. belemia* Esper. Central Spain. 25.5.1989.
7. Ditto.

*Assumed nomenclature as proposed in the text of this article.

The larva is shown on plate C.

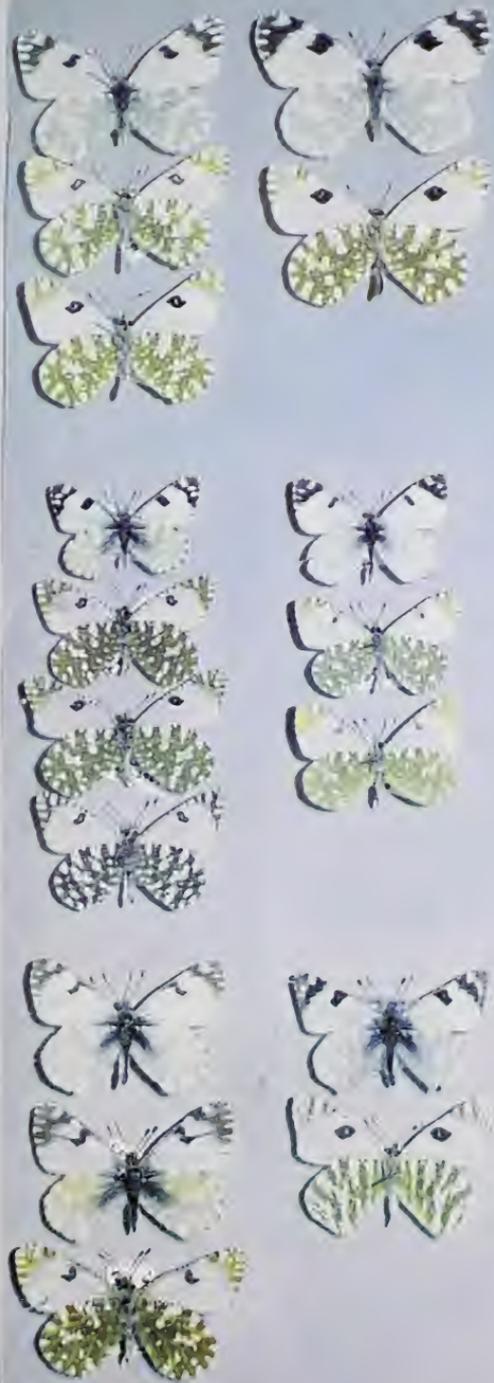


PLATE A. Dappled Whites, captions opposite.



Fig. 2. Caroline Willmot's winning entry of Orange-tip, page 109.



Fig. 3. Larva of *Zerynthia ranina*, page 120.



Fig. 1. Kebabbed locusts prepared for sale and ready to cook, page 110.



Fig. 1. Sawgrass grasshopper.



Fig. 2. Larva of *Eucloë aukonia*, see pages 101-103.



Fig. 3. An unidentified West Indian ormithopteran.



Fig. 4. An unidentified West Indian dragonfly



Fig. 1. White peacock, *Anartia jatrophae*.



Fig. 2. Gulf fritillary *Dione vanillae*



Fig. 3. Mexican fritillary, *Euptoieta hegestia*.



Fig. 4. Red anartia, *Anartia amathea*

BUTTERFLIES OF THE WEST INDIES

by A. R. D. Whitlock (9077)

23, Lancaster Gardens, Earley, Reading, Berkshire RG6 2PA

Summer was very short for me, as I sailed on the 16th July for a short duty as West Indies Guardship. Being in the Royal Navy you tend to leave the British shores at very odd times, and being a keen Lepidopterist, July was not the ideal month for me, so I determined to make up for it on my excursion around the West Indies and the United States.

The first stop was Nassau, and after getting totally bored with sitting on a beach all day, I decided to do a bit of spotting. With the weather being in the upper reaches of the eighties, I found a patch of scrubland outside the capital, next to the ancient Fort Charlotte — this seemed to be ideal butterfly country. It was probably one of the best sites on the whole trip — fourteen species being seen in the first hour. It was too hot to stay out in the open for too long, and I suppose the species count would have been twice that if you could stand the heat and the flies and mosquitoes!

The most interesting species seen was the Mexican fritillary (*Euptoieta hegesia*) which was very common with male and females sampling the delightful wildflowers that abounded the slope of scrubland. Also common was the Orange-barred sulphur (*Phoebis phileae*) a form of Clouded yellow, which was seen laying her eggs on the herbaceous legumes dotted around the rockier parts of the area. One of the trip's highlights was the beautiful Gulf fritillary (*Dione vanillae*) which was quiet common on most of the islands and on the mainland of South America and Florida. With its very graceful flight, and exceptional patterns underneath its wings, it was a delight to see.

I took with me a very useful book called *The Audubon Society field guide to North American Butterflies* which turned into a most valuable reference book which describes most of the butterflies to be seen in very good detail. One of these was the smallest butterfly I have ever seen. The Cassius blue (*Leptotes cassius*) which again was very common on all the islands, but it is so small, only $\frac{1}{2}$ to $\frac{3}{4}$ inches in wingspan, which probably makes it one of the smallest butterflies in the world.

Puerto Rico is a jungle paradise, not only for insects, but for all forms of wildlife. I visited the "El Bosque Nacional del Carribe" in the middle of the island and the Zebra longwing (*Heliconius charitonius*) and the Mimic (*Hypolimys misippus*) were quite common, being seen in the tall jungle understory.

The highlight of the trip was the trip to Angel Falls in Venezuela, which is an Entomologist's heaven! The hotel we stayed in was

surrounded by jungle and it wasn't long before I was seeing butterflies that unfortunately I could not identify. At 6.30 am on the second day of the visit I saw a roosting Thoas swallowtail (*Papilio thoas*), which, when it decided to fly, resembled a bird in flight. The Coolie butterfly was also common in the grounds of the hotel and several others, but my book did not extend this far!

This trip is well worth the expense. You need at least a week here but the Navy only granted us two days — certainly not long enough to explore this vast and extremely beautiful country. A fearsome-looking grasshopper was spotted in the hotel grounds, being six inches in length, roosting in a bush. It stayed totally motionless during my thorough inspection and camera call.

Many species of butterflies were seen on beach headlands, on a lot of the islands, and one very aloof and shy species was the West Indian buckeye (*Junonia evarete*). In Tortola many were flying around in the heat of mid-day and were very difficult to see close up without disturbing them. In the West Indies around 3 to 4pm you can always guarantee a short shower, and it was on this occasion that I managed to get close to one of these insects. Although the showers can be heavy at times some of the species were still flying around.

I have been a lepidopterist now for about ten years, but I have to take my hat off to a very unusual place where we stopped overnight to get some fuel.

Guantanamo Bay is an American military base in the south-eastern side of the Island of Cuba. Unfortunately being a military base, I wasn't allowed to take my camera ashore and photograph the extraordinary events I was to witness. Clouds — and I do mean clouds — of butterflies were flying about inside the Dockyard — albeit they were only “whites”. On board there were comments from people not remotely interested in butterflies saying things like “Did you see all those butterflies?” In a ditch which drains off the heavy flood water, where it leaves small patches of damp earth, there were mud puddling whites in numbers impossible to count. When they flew off it was just like confetti. A very extraordinary place indeed.

The Everglades again proved to be an insect haven, in a reserve called “Loxa-hatchhe”. The Monarch (*Danaus plexippus*) was very common on the canal banks feeding avidly in threes and fours. On the scrubby areas which bordered the canals many different types of grasshoppers and dragonflies were seen.

Altogether about 40 species were actually seen to be identified, but many more boosted the numbers in the jungle around the Angel Falls.

The butterflies seen in the jungles of Venezuela remain unidentified as I never obtained any photographs of them.

This excursion almost made up for the short season in Britain, but all-in-all I would say that one minute in the company of the *Apatura iris* in a wood in Northern Hampshire just before I sailed was more thrilling than anything the Tropics have to offer!

Two orthoptera species, a dragonfly and a selection of the butterflies which I photographed are shown on colour plates C and D.

(Three of these photographs by Mr Whitlock, Plate D, Figs 1, 2 and 3, also serve to illustrate species discussed by Mr St. Leger in his article on the Turks & Caicos Islands pages 115-120.— Editor.)

SECURING A FUTURE FOR BRITISH BUTTERFLIES

from habitat

Colonies of butterflies introduced by man are more likely to survive than natural ones, reveal the World Wide Fund for Nature (WWF UK) in a new study released last November. The publication *A Review of Butterfly Introductions in Britain and Ireland*. Price £8.50 from WWF UK, Panda House, Weyside Park, Godalming, Surrey GU7 1XR, funded by WWF UK represents the first major survey of attempts to stem the steady decline in butterfly populations by recolonisation.

The deliberate release of butterflies to establish new colonies in the wild has a long history in the British Isles, stretching as far back as the 1840s to Darwin and enthusiastic Victorian amateur naturalists. Whilst there have probably been more releases of butterflies and moths than other species, poor monitoring and documentation have made it impossible to identify successes. Without such records a potentially valuable management practice becomes a meaningless exercise contributing little to the future conservation of butterflies.

Only 55 resident species of British butterfly survive today and once familiar species such as Adonis blue and the Camberwell beauty (See page 124— Editor) have almost disappeared through a combination of habitat loss and decline of management for nature conservation.

The 96 page report produced by the Joint Committee for the Conservation of British Insects (JCCBI) makes 13 key recommendations. Most importantly it calls for a national strategy to regulate the artificial establishment of butterfly populations in order to identify both the species and the geographical areas which would benefit most from this conservation measure.

LETTER TO THE EDITOR

Dear Editor,

Your note on the "rare wood-cricket in Devon: errors corrected" in the February issue of the *Bulletin* brought to mind a short article I saw in the January 1991 issue of the *World Wide Fund for Nature News*, concerning re-colonisation plans for butterflies in the United Kingdom.

It said, of our native butterflies, "... only 55 species survive today. The once familiar Adonis blue and Camberwell beauty have almost disappeared, reflecting the loss of traditional habitat... over the last 40 years . . .". One cannot help thinking that a little simple research just might have established that the Camberwell beauty has never been what you might call a familiar sight - at least not in this neck of the woods. Perhaps the article was written by an extremely old Camberwell stage coach driver!

Yours sincerely
John Tennent (7756)

ASUNTA'S HAWKMOTH RECOGNISED

by John Tennent (7756)

I was most interested to see Leigh Plester's account of an undescribed hawk moth, complete with photograph, in the February *Bulletin*. Regrettably, I think it has already been described. It looks remarkably like *Aprilicus foollii* L., although autumn would be a late date for this species, usually confined to early in the first week of April. The Type Locality is Paignton in Devon; the holotype resides in the Royal Air Force Museum at Henley.

ASUNTA'S HAWKMOTH - PILTDOWN RIDES AGAIN

by Leigh Plester (2968)

The secret of Asunta's hawkmoth has now been revealed. Give him his due, he nearly had a fit when I told him I had sent the photograph out into the great wide (entomological) world. The photo had been on my table for almost a year.

What apparently happened was that Asunta, being a skilled artist and occasional practical-joker, actually *made* the moth out of thin card and other materials which he then carefully painted. You can judge the calibre of the forgery yourself. He then placed his masterpiece in a position where it was sure to be noticed in the UN forces' camp.

It should be pointed out that Asunta's colleague had only started moth collecting after his arrival in Cyprus, so his experience was severely limited.

Asunta reports that the collector's hands shook as he removed the lid from his killing bottles. As the luckless bug-hunter tried in vain to dislodge the "moth" from the tree trunk to which it was attached, Asunta made good his escape — knowing it was practically impossible to remove the "moth" stuck on as it was with well-chewed Wrigley's Spearmint.

The forgery unfortunately does not easily reveal itself in the photo, even to the expert eye, as in the early 1960s cheap camera lenses were, to say the least, not very sharp.

I might add that Asunta also hunts elk. A few years ago, when the whole "lodge" was out hunting, he carved two pieces of wood into giant-sized elk hooves with which he then proceeded to lay juggernaut elk tracks in front of the advancing party. The latter practically fell over themselves as they rushed from print to print, eyes a gleam, sweat pouring down their faces. . . . The carvings were eventually discovered by a young boy, propped up in full view against a tree. I understand that on this occasion throwing Asunta into a lake was seriously considered.

Personally I feel that Asunta ought to take up the study of dung flies, as he is likely to have a more serious encounter with a manure heap in the near future.

RECORD OF RARE SMALL QUAKER MOTH IN IRELAND

by John Lavery (7469)

On 12th March this year a pair of the Small quaker moths (*Orthosia cruda*) emerged, which had been found by me as larvae in May 1990 in Derrycunihy wood, Killarney, Co. Derry, feeding on oak. I can find only one other record in the literature for this county and Skinner mentions that it is less frequent in Ireland than in Britain.

CLOUDED YELLOWS AND CONVULVULUS HAWKMOTH MIGRANTS TO CO. KERRY

by John W. Lavery (7469)

The following migrants were recorded by me in Ireland, all in Co. Kerry:—

Colias croceus (Clouded yellow). A large female on 18th July on the Keel road, near Inch beach. A male on 25th August at Brennans Glen, Killarney road.

Agrius convolvuli (Convolvulus hawkmoth). A specimen came to light at Dennehy's Garage, Castlemaine road, Tralee.

WILTSHIRE BUTTERFLY MAPPING SCHEME

This scheme was started in 1982 with the objective of producing an Atlas of Distribution Maps to a tetrad base for the Wiltshire butterflies by the end of the 1980s. Forty eight species were thought to breed in the county (including the three immigrants, the Red admiral, Painted lady, and Clouded yellow), although proof of breeding for the Large tortoiseshell has not yet been proven.

During these last ten years, many thousands of records have been received and entered onto the county maps, and for many species their status and distribution in the county has been determined, important habitats identified, which are, or hopefully in the near future, will be protected and suitably managed. Sadly probably three species have become extinct in Wiltshire over the last few years, albeit all were very rare at the start of the mapping scheme. The Large tortoiseshell was only ever recorded as a singleton and has not been seen since 1987. The one and only known Wood white colony was lost in 1986, and the High brown fritillary, once a common woodland insect, is believed to be extinct. Seven other species survive in less than a dozen locations and it is unlikely that additional colonies will be discovered. These depressing statistics have a brighter side. It has been found that Wiltshire is probably a stronghold in Britain for at least six species — the Adonis blue, Small blue, Chalkhill blue, Duke of Burgundy, Marsh fritillary, and Dark green fritillary. We probably have more colonies of these six species than any other county, thanks mainly to the extensive army ranges on Salisbury Plain. (We have even legally exported Adonis blue to assist in a re-establishment project in Gloucestershire.)

Many other facts and figures have been obtained from the mapping scheme, and the important task now is to complete the recording and produce the long overdue final atlas as soon as possible. There are still, even after nearly ten years of recording, several areas of the county where even the common "Whites" and the Small Tortoiseshell are "unknown", the latter for example is only recorded from 715 (75%) of the 950 tetrads that cover the county. The Holly blue, so common in 1989 and 1990 and probably occurring in every tetrad, is only recorded from 345 (36%). Ironically it is mainly the commoner species whose maps are most incomplete.

Many thanks are due to all those who have contributed so far and I am now appealing for any further records in the coming season, prior to publication of the final atlas. *ALL* records will be most welcome, and should be sent to me at the end of the season. The form of submission is not important as long as the date, location, and grid reference are given. Any additional interesting observations or comments will also be welcome.— Mike Fuller, 6 Methuen Close, Bradford on Avon, Wilts BA15 1UQ.

ANDORRA REVISITED — 1990 — AN APOLOGY

by P. W. Cribb (2270)

In 1988, David Marshall and I had visited Andorra briefly and in my account of our trip for that year in the *Bulletin* (48: 197-204; 219-226) I gave the country short shrift for its butterfly content. I subsequently received a very kind letter from our life member Dr Patrick Roche, who lives in Andorra, enclosing a list of species of butterflies recorded by him in Andorra, indicating the presence of a very high percentage of the butterflies on the European list as resident in the country. David and I therefore decided to include this small Pyrenean principality in our European venture for 1990. On the 16th July we again travelled via Caen and the Dordogne in my camper van. We drove through vast acres of sunflowers, enough to give van Gogh nightmares, and south of Riberaç we made a brief stop in downland where the Scarce swallowtail, *I. podalirius*, was flying and laying eggs on the bushes of *Prunus mahabel*.

Also present were *E. tages*, *C. alfacariensis*, *S. cordula*, *M. galathea*, *B. circe*, *E. argiades*, *O. venata*, *P. tithonus* and *P. icarus*, but already here the pasture was parched and foliage was withering. We reached the foothills of the Pyrenees on the 18th and drove via Bagneres de Luchon up the Col de Portillo which leads from Luchon in France into Spain and the Val d'Aran. On the way up the pass we stopped to search the flowery alpine meadows where there were hundreds of Black-veined whites, *A. crataegi*, laying their eggs on sloe and hawthorn. Large specimens of *M. jurtina* were flying with *M. athalia*, *H. virgaureae* and a few *C. croceus*. We did not see any of the *P. apollo* which we had observed here on our previous visit.

We decided to camp again at Beret in the Val d'Aran which had proved so interesting in 1988 and we arrived there to find new hotels being erected on the road up to the high slopes and when we eventually came to the car park below the scree there were large lorries and equipment with gangs of workmen. On the scree and in the valleys below there were four huge bulldozers working, forming new ski pistes by shifting scree and rocks and flattening the slopes. Those that had been completed had been covered with soil and straw into which had been sown grass-seed, Chewings fescue according to the seed bags, an alien grass. The scree which had been alive with *Erebia lefevrei* and *E. gorge ramondi* on our previous visit were being worked upon by the machines and we saw neither species. We spent a day and a half in the adjacent valleys on the untouched slopes where we found *E. meolans* fairly common, flying with *E. epiphron* and a few *E. gorgone*. Other species were the three coppers, *H. virgaureae*, *P. hippothoe* and *H. alciphron gordius*, the blues *C. semiargus*, *L. idas*, *P. eros*, *P. argus*, *M. arion*

obscura, *A. artaxerxes montensis*, also *E. oeme*, *E. eurale*, *P. aegeria*, *P. malvae*, *C. lavatherae*, and the fritillaries *B. euphrosyne*, *B. selene*, *M. didyma* and *M. parthenoides*. Probably the commonest species flying was *Colias phicomene* and we watched females laying their eggs on birdsfoot trefoil, *Lotus corniculatus*. In one valley we found a large number of *P. apollo* on the wing, flying up and down the valley on the thermals. After netting and releasing a large number of males, David at last caught a female which subsequently laid a fair number of eggs. There is obviously a large amount of money being spent on providing skiing facilities, resulting in habitat destruction, and we learned later in Andorra that during the winter there had been no snow on the ski slopes there and it had been necessary to make snow which melted by mid-day, restricting skiing to the mornings. If there is a change in the climate, there may be a lot of money wasted.

While in the valleys we were able to watch the wonderful aerial prowess of a family of choughs, like the British race with red beaks, which dived at great speed into the rocky gorge in the valley bottom.

We also watched Lesser kestrels which were nesting on the crags and Rock thrushes feeding their young on grasshoppers. There were trout in the mountain pools and dozens of large frogs.

The presence of the working gangs and their disturbing activities made us decide to move on and on the 20th we drove on into Spain, climbing up the Col de Bonaigua where we stopped at the summit to have a look at the slopes above the pass. These were heavily grazed but in the boggy bottom where a stream trickled down there were *E. epiphron* and a number of *B. selene*. We then drove down the pass, following the river Noguera course, towards Sort. On the foaming river were several groups rafting the rapids together with canoeists, an exciting sport. At Sort we took the road leading eastwards to Andorra via the Col de Canto. The road was very bad as it is being widened and resurfaced and long stretches were rubble with continual obstruction from construction machinery and lorries. At the top of the Col I found the sloe bushes spattered with the egg masses of *A. crataegi* and there was a fair number of species on the wing, including *M. galathea lachesis* which was flying with typical *M. galathea*, an unusual occurrence. We entered Andorra about mid-day and at St. Julia de Loria we stopped to do some shopping, wine and bread, but were unable to make contact with Dr. Roche. In blazing sun we drove on to Andorra de Viella and took the road to El Serrat. The spot where we had camped before near the head of the valley was fenced off but we spent the afternoon on the slopes which produced a large number of species, mostly flying along the edges of a stream which tumbled down a gulley into the main stream below.

The *Erebia* present were *E. oeme*, *E. epiphron*, *E. meolans* and *E. euryale*. The fritillaries were represented by *A. aglaia*, *M. parthenoides*, *B. selene* and *B. euphrosyne* but there were no *P. eunomia*. On the geranium clumps there were a number of *E. eumedon* and other Lycaenids were *P. hippothoe*, *H. virgaureae*, *L. coridon* (very small males), *P. argus* and *P. icarus*. In the evening we went down to just above El Serrat and camped beside another stream which I managed to fall into, slipping off one of the rocks. The wine, cooled in the stream, helped wash down the evening meal.

Next morning we purchased a large-scale map from the Syndicat d'Initiative, or its Andorran equivalent, at Massana and were able to pinpoint the localities kindly provided by Dr. Roche.

We decided on visiting the valley high above Encamp where the stream Cortals flows but had some difficulty in finding the road leading to it. The road was steep and winding and with the high temperatures and the loaded van we quickly overheated and had to stop on an awkward hairpin bend.

After cooling down and retopping the radiator we drove on to where the road ends beside a small restaurant. Lower down there was a picnic site and a track which led behind it to a higher slope where there was a group of young people camping in tents. The track proved too much for our camper and we pulled off into a small clearing under the pines. We spent some time in the valley below the road which was deep in the grass and the flowers with the stream running at the bottom. Deep blue iris, *Astrantia*, *Sanguisorba*, *Polygonum bistorta* and the great yellow gentian covered the slopes and we quickly found *Proclissiana eunomia* flying with *B. selene*, *B. euphrosyne* and *B. ino*. The foodplant of the last named here appears to be *Sanguisorba officinalis*. In the hot sunshine the fritillaries flew vigorously and one had to net them for identification purposes. The male *P. eunomia* were passed their best but I was able to net a female which later laid several eggs on the upper surface of bistort leaves, the eggs spherical and shining creamy-white. Also present were *M. cinxia*, *M. didyma*, *M. aglaia* and *B. pales*. Blues were present in good numbers and I took a single male *M.alcon* among the yellow gentians and there were plenty of *P. icarus*, *A. montensis*, *P. argus*, *C. semiargus*, *P. dorylas*, *C. minimus*, *L. coridon* and odd specimens of *P. amanda*, *A. glandon* and a single male *Pseudaricia nicias*. All three coppers, *P. hippothoe*, *H. virgaureae* and *H. alciphron gordius* were also dashing about among the flowers. The *Erebia* again included *E. meolans*, *E. epiphron*, *E. euryale* and *E. oeme* and we saw *G. rhamnii*, *C. croceus* and several female *C. phicomone* and one or two *L. sinapis*. Later I wished I had netted these and examined them as one of

our members, Michael Dawson, was that week collecting in similar meadows at Pal above St. Julia where he took what he had identified as *L. duponcheli*.

Cloud started to build up and in the evening we were joined by a Dutch couple in their camper who drew in beside us. They lived in Malaga and were on their way north to Holland to visit family and knew of this valley from friends living in Encamp. Among the pines there was feeding a large flock of crossbills and in the stream below we had seen dippers. Sheep were penned by some old stone houses on the far side of the stream but their grazing seemed to have had no harmful effects on the vegetation or insect life and was obviously at a low density.

On the 22nd we were greeted with hot sunshine again and with luncheon in our packs we climbed up the track leading along the stream side towards the end of the valley. This passed through flowery alpine meadows towards lakes higher up. The scenery was impressive and we climbed up above the valley and had a good view of the surrounding terrain. Rock pippits, yellow-hammers, grey and pied wagtails, and dippers made up the bird population but butterflies were everywhere; all the species we had seen the previous day with *P. eunomia* well represented, flying only over the areas where the bistort grew, visiting its flowers for nectar. Later in the day we made our way back to the camper to sort out our livestock and write up the notes. Our Dutch neighbours invited us to supper which was washed down with wine while our host demolished a bottle of Spanish brandy, helped a little by David. In the midst of the meal a storm broke with thunder and lightning and large hailstones. Groups of picknickers who had been holding a party nearby left in a hurry and the valley was ours again.

By morning the storm had gone and another hot day began. We drove down to Encamp and then took the road towards France to stop at the entrance to the Val d'Incles. A rough road leads up the valley to a church and dwellings and above and below this were meadows with a stream at the bottom of the valley. We walked up the track and found that a large number of the slopes had been mown for hay and cattle were grazing by the stream. The mowing and removal of the vegetation for hay inevitably reduces the insect fauna and most can only survive where the crop is not taken. In the damp areas by the stream where the cattle grazed it appeared that mowing did not take place and here I found *P. eunomia*, again flying with *B. ino*, *B. euphrosyne* and *B. selene*. *P. hippothoe* was present and there was an additional *Erebia*, *E. cassioides*, presumably replacing *E. hispania* here. On our walk, cars continually passed us on the track and at the end of the valley we found coaches and large groups of young people ready to walk on into the valleys beyond. It all seemed a bit crowded and after exploring all along the stream we walked back to

the camper and drove over the Port d'Envalira where we observed fairly extensive work taking place on the slopes used for skiing.

Having satisfied ourselves that Andorra has a lot to offer the entomologist, provided he or she can get into the remoter valleys which are not being developed, we decided to drive on over the pass into France. Just below the junction with the Col de Puymorens we stopped for lunch and explored a deep valley off the road where a mountain stream tumbled. There was *Sanguisorba* and bistort present and we again observed *P. eunomia*, protected in France, *B. selene*, *B. euphrosyne* and *I. lathonia*. The *Erebia* were represented by *E. epiphron* and *E. euryale* with a new addition, *E. manto constans*, the males being completely black. *L. sinapis* was a surprise at this altitude and again should have been examined more closely. On groups of figwort we found a number of larvae of the Water betony shark, *Cucullia scrophulariae*, in all stages.

In the afternoon we left the Pyrenees via Ax les Thermes and Carcassone. South of Mazarmet we camped on high ground in the midst of garigue, thick with lavender coming into flower.

There were a lot of bushes of *Rhamnus alaternus*, the foodplant of *G. cleopatra*, with its still glossy leaves and black berries. looking rather like butcher's broom, *Ruscus*. We did not see Cleopatra but David took a female *B. circe* for egg-laying and we saw several *I. podalirius* before a storm loomed up with thunder and lightning all around us but no rain. We have found *B. circe* a problem, failing to obtain eggs on several occasions, either on grass or on tree bark. All the other large Satyrs are easy and *H. alcyone* which so often flies with *B. circe* lays eggs on every and any thing in the cage.

On the 24th we drove north-east via Castres to Lacaune over fairly high passes through fir forests edged with beech and mixed deciduous trees. We stopped on several occasions to sample the forest/roadside edge, which insects treat as rides. It is disappointing that so much of French forest is devoid of rides and most of the woodland is dense and often impenetrable. However, at these stops we observed *I. podalirius*, *P. machaon*, *A. paphia*, *A. aglaia*, *L. camilla*, *L. reducta*, *H. virgaureae*, *P. c-album*, *L. sinapis*, *A. levana*, *M. galathea*, *A. hyperantus*, *P. aegeria* and newly-emerged *G. rhamni*. That night we camped south of Mur de Barrez in a sunflower field where we heard quail calling and watched buzzard and red kite hunting. We found both these species of raptors commonly on our journey northwards.

We were now into the Massif Central and on the 25th we drove via Raulhac to Le Lioran below the Plomb de Cantal. We had been here many years back with Russel Bretherton and Ron Dyson and thought we would like to see if things had changed. Inevitably they had.

The valley where we had found *Erebia sudetica liorana* in abundance was still there but some thirty chalets had been built on the spot where I had found the concentration of the *Erebia*. A ski lift blocked the entrance to the valley which we had used on our previous visit and the slopes at the end of the valley had now become ski pistes with another lift running up the slope. We found only a small colony of *sudetica* on the north-facing slope near the entrance to the valley, flying with a few *E. ephron* and *E. euryale*. Horses were grazing the slopes which below the pistes were almost devoid of butterflies.

There were odd specimens of *P. hippothoe* and *H. virgaureae*, *E. tages* and *M. parthenoides*. Altogether it was disappointing — perhaps one should not go back.

In the afternoon we by-passed Clermont Ferrand to the east, observing a huge “smog” haze over the town, and stopped for a brief while by the river Allignan where we watched trout and minnows feeding on newly hatched may-flies and recorded *B. daphne* and *L. reducta* flying over the brambles by the riverside.

We camped the night in a lay-by south of Ferriers. We decided we would go and have a look at the National Park of Les Montagnes de Morvan on the next day. These mountains are heavily wooded with beech and fir and small roads cross the area giving access to most parts. Again rides seem to be few and the insects rely on the roadsides for flight areas. Almost in the centre of the Park we found a camping site, unofficial, beside a clear stream and spent the last part of the day exploring. Beside the stream there was a water meadow which had not been grazed, all contiguous ones having been eaten down to the bare soil by cattle. I clambered over a fence and the first butterfly seen was a male *M. alcon*. I have observed this species previously in many differing habitats but always associated with gentians. The two species of my previous encounters had been *G. cruciata* and *G. lutea* (the one growing at Encamp). I immediately started to search for gentians guessing that they might be *G. pneumonanthe*, the Marsh gentian, and fairly soon found odd plants. Each had eggs dotted on the flower heads or on the leaves just below the calyx of the flower. Both sexes of the butterfly were on the wing. Higgins & Riley (1980) refer to the race using *G. pneumonanthe* as *M. alcon alcon* and those using *G. cruciata* and presumably *lutea* as *M. alcon rebeli*, suggesting that they may be different species. There seems to be no case for the last suggestion as, while the females of all those I have seen and the males vary in the shades of blue, there is no clear difference other than foodplant. There is more difference in the races of *M. arion* and they also use differing foodplants, thyme and marjoram. This small habitat, less than two acres, is obviously very vulnerable for although the species is protected in France,

its habitat is not. Cattle in this meadow would quickly destroy the habitat and there is no adjacent area from which colonisation could occur.

In the evening I wandered along the edge of the forest adjacent to the meadow and on a goat willow found a single egg of *A. iris*. Further searching produced no more but David had taken several *A. levana* on the nettles by the stream and a male *P. machaon*. We paddled in the stream and I tried to entice some of the small trout in the stream to provide us with breakfast, to no avail.

On the 27th we spent a short time in the meadow taking some photos of *M. alcon* and its eggs and I netted a female *P. machaon* which obligingly laid eggs on the flower-heads of wild carrot (*Daucus carota*) in the following days. We then drove on out of the Park towards Chaumont, making for Bar sur Aube and by evening had reached the Forest of Clairveaux near to the famous monastery and camped for the night at the entrance to a wide ride which went up into the forest. Next morning we were awakened by the arrival of a hunter who parked his car near us and walked off into the forest with his rifle. After our breakfast he returned and told us that he had been after stags of roe deer and had only seen hinds. When the sun was up we walked up the ride where we found *A. paphia* to be quite abundant, flying with *A. levana*, *L. sinapis*, *A. aglaia*, *L. camilla*, *L. argyrognomon*, *A. hyperantus* and *P. aegeria*. The willows had been badly cut about to widen the ride but on a patch of nettles we found several egg masses and groups of larvae of *A. levana*. The eggs are laid in hanging chains from the underside of the leaves and are fairly easy to find once one has got one's eye in. Later in the day we reached Bar where we camped in the Municipal camp site where we had stayed previously with Russell Bretherton and Martin Gascoigne-Pees. In the evening we started the journey back across France south of Paris to Caen and the boat home.

We drove some 250 miles without ever getting out of heavily cultivated land, apart from the forests which again offered the same dense and almost impenetrable face to us. The roadsides, which used to offer a haven for many insects, were being heavily cut by machinery and we watched four mechanical cutters working together, two each side of the road, one to cut the road verges and the other the banks of the adjacent ploughed fields, an apparently pointless exercise but costly in labour, machinery and fuel. Quite clearly the conservation message has not yet reached the French authorities.

We caught an early ferry back to Portsmouth, having covered nearly 2,000 miles in our wanderings, enjoying excellent weather for a change and having experienced a fortnight of continual interest.

Glossary of vernacular names

<i>Eumedonia eumedon</i>	Geranium argus	<i>Eumedonia eumedon</i>	Geranium argus
<i>Everes argiades</i>	Short-tailed blue	<i>Everes argiades</i>	Short-tailed blue
<i>Gonepteryx cleopatra</i>	Cleopatra	<i>Gonepteryx cleopatra</i>	Cleopatra
<i>Gonepteryx rhamni</i>	Brimstone	<i>Gonepteryx rhamni</i>	Brimstone
<i>Heodes alciphron</i>	Purple-shot copper	<i>Heodes alciphron</i>	Purple-shot copper
<i>Heodes virgaureae</i>	Scarce copper	<i>Heodes virgaureae</i>	Scarce copper
<i>Iphiclidus podalirius</i>	Scarce swallowtail	<i>Iphiclidus podalirius</i>	Scarce swallowtail
<i>Ladoga camilla</i>	White admiral	<i>Ladoga camilla</i>	White admiral
<i>Leptidea duponcheli</i>	Eastern wood white	<i>Leptidea duponcheli</i>	Eastern wood white
<i>Leptidea sinapis</i>	Wood white	<i>Leptidea sinapis</i>	Wood white
<i>Limentis reducta</i>	Southern white admiral	<i>Limentis reducta</i>	Southern white admiral
<i>Lycaeides argyrognomen</i>	Reverdin's blue	<i>Lycaeides argyrognomen</i>	Reverdin's blue
<i>Lycaeides idas</i>	Idas blue	<i>Lycaeides idas</i>	Idas blue
<i>Lysandra coridon</i>	Chalk-hill blue	<i>Lysandra coridon</i>	Chalk-hill blue
<i>Maculinea alcon</i>	Alcon blue	<i>Maculinea alcon</i>	Alcon blue
<i>Maculinea arion</i>	Large blue	<i>Maculinea arion</i>	Large blue
<i>Maniola jurtina</i>	Meadow brown	<i>Maniola jurtina</i>	Meadow brown
<i>Melanargia galathea</i>	Marbled white	<i>Melanargia galathea</i>	Marbled white
<i>Melitaea cinxia</i>	Glanville fritillary	<i>Melitaea cinxia</i>	Glanville fritillary
<i>Melitaea didyma</i>	Spotted fritillary	<i>Melitaea didyma</i>	Spotted fritillary
<i>Mellicta athalia</i>	Heath fritillary	<i>Mellicta athalia</i>	Heath fritillary
<i>Mellicta parthenoides</i>	Meadow fritillary	<i>Mellicta parthenoides</i>	Meadow fritillary
<i>Ochlodes venata</i>	Large skipper	<i>Ochlodes venata</i>	Large skipper
<i>Palaeochrysothamus hippothoe</i>	Purple-edged copper	<i>Palaeochrysothamus hippothoe</i>	Purple-edged copper
<i>Papilio machaon</i>	Swallowtail	<i>Papilio machaon</i>	Swallowtail
<i>Pararge aegeria</i>	Speckled wood	<i>Pararge aegeria</i>	Speckled wood
<i>Parnassius apollo</i>	Apollo	<i>Parnassius apollo</i>	Apollo
<i>Plebejus argus</i>	Silver-studded blue	<i>Plebejus argus</i>	Silver-studded blue
<i>Plebicula dorylas</i>	Turquoise blue	<i>Plebicula dorylas</i>	Turquoise blue
<i>Polygonia c-album</i>	Comma	<i>Polygonia c-album</i>	Comma
<i>Polyommatus eros</i>	Eros blue	<i>Polyommatus eros</i>	Eros blue
<i>Polyommatus icarus</i>	Common blue	<i>Polyommatus icarus</i>	Common blue
<i>Proclissiana eunomia</i>	Bog fritillary	<i>Proclissiana eunomia</i>	Bog fritillary
<i>Pseudaricia nicias</i>	Silvery argus	<i>Pseudaricia nicias</i>	Silvery argus
<i>Pyrgus malvae</i>	Grizzled skipper	<i>Pyrgus malvae</i>	Grizzled skipper
<i>Pyronia tithonus</i>	Gatekeeper	<i>Pyronia tithonus</i>	Gatekeeper
<i>Satyrus cordula</i>	Great sooty satyr	<i>Satyrus cordula</i>	Great sooty satyr

HAIRSTREAK

A swift reconnaissance
She circles twice
Out of the sun

No fly-by-wire for her
Instinct more direct
The guiding lasers

Compound eyes compute
The scene quartering
Time distance type

Her pseudo-tails
Designed to thwart
An enemy thrust

On landing tapped
Thrice the twigs
With smart antennae

Locked-on with
Pin-point skill
She lays her eggs on target.

Don McNamara (5573)

BOOK REVIEW

Rainforests: A guide to research and tourist facilities at selected tropical forest sites in Central and South America by James L. Castner. Paperback, 381 pp., illustrations include black and white photographs. Feline Press, P.O. Box 7219, Gainesville, FL32605, USA \$21.95 plus postage (\$3.50 to Europe and United Kingdom).

Trips to the tropics for naturalists have become increasingly popular in recent years, and for those who enjoy birdwatching, insect hunting or wildlife in general, a base in the jungle for at least part of the holiday, is ideal. I specialise in stick-insects and a base near jungle is essential to hunt for these insects by torch-light at night. This book will usefully serve tourists and researchers who wish to make arrangements with proprietors in advance and gain a basic background information.

The author currently works as a scientific photographer for the Entomology Department, University of Florida and writes enthusiastically about the subject, with an excellent appreciation of what the naturalist wants.

The main section of the book (Chapter 1 - 212 pages) covers each country included (Peru, Ecuador, French Guiana, Venezuela, Trinidad, Costa Rica and Panama), by looking at the following aspects:

- each site selected: contact name and address, description, location (including, in some cases, the great difficulties likely to be encountered in reaching the chosen site), brief notes on the seasons and facilities available at each site, along with an indication of the cost.
- general information and map
- comments on the Country
- a list of books and where to obtain maps
- details of tourist information sources, conservation organisations and scientific organisations, institutions.

Many of the sites included are somewhat run-down, but often illustrated by a black and white photograph, and perfectly adequate for field biologists or serious naturalists and birdwatchers. Well-known sites have been included and many of these are represented by specimens in my stick-insect collection.

Whilst there is a brief indication of the type of wildlife to be found, I was a little disappointed to find this aspect only very briefly covered.

Section two of the book looks at "Rainforest Information Sources" and includes a partially annotated bibliography of over 200 titles dealing with tropical jungles and wildlife. These are sectionalised and the main entomological interest is the list of butterfly books on pages 263-264.

Book dealers listed include E. W. Classey Limited, but sources, including conservation organisations, are often USA addresses. This also applies to Chapter three "Hands-on" Organisations which allow laymen and biologists to work and study in the field together.

Chapter four discusses "Sources of Funding" — again, USA orientated and mainly of use to biologists conducting research in rainforest habitats.

Appendices include sections on Travelling and Travel Agents (USA orientated, omitting the organisations which advertise in the AES, such as Transworld Butterfly Company), a list of selected biologists, selected zoos, and a list of specialised vocabulary in Spanish and English.

Whilst facilities and addresses change, the book will certainly prove invaluable for anyone considering travelling to Central and South America, a popular choice for biologists. Habitats are varied and countries are often rich in animal life.

The book contains 416 pages (including a 36 page introduction), 35 black and white photographs, 32 line drawings and nine maps. The wildlife sketches of interest to entomologists are p. 143 Hercules beetles, p. 350 Harlequin beetle, p. 378 Lantern fly and p. 379 Leaf insect (*not* a true *Phyllium* species, but a bush cricket!). All these drawings are from an old publication, I think, the name of which escapes me!

Paul D. Brock

THE COCKAYNE RESEARCH FELLOWSHIP

Studies on variation in British Lepidoptera

The *Cockayne Trust*, founded by E. A. Cockayne in 1951, was set up for the promotion, encouragement and study of entomology by making improvements to and furnishing information about the Rothschild-Cockayne-Kettlewell Collection. The "RCK", devoted solely to the study of British Lepidoptera, is part of the Natural History Museum at South Kensington. Within the spirit of the original *Cockayne Trust* Deed, the Trustees have now set up *The Cockayne Research Fellowship*, a separate charity linked to and supported by the Cockayne Trust, to stimulate new work on British Lepidoptera.

Applications are invited to *The Cockayne Research Fellowship* for awards to support original research on variation in British Lepidoptera. Awards are limited to a maximum of £1,000 per year and, depending on progress, may be renewable annually for a maximum of three years. Applications are welcome from amateur and professional lepidopterists alike.

Projects must concern original research on variation (genetic, phenetic, taxonomic, geographical, or phenological) affecting one or more species of Lepidoptera within the British Isles. Successful applications are likely to involve proposals to work on early stages in addition to adults, and at least some breeding or experimental investigations. Projects should, at least in part, be based on, re-interpret, or otherwise take into account information already stored in the RCK collection, and will be expected to add new material to it. A yearly report will be required by the Trustees, on which any consideration of renewal will also depend. At the end of the project (maximum three years), a final report will be required and publication of the results will be expected, if appropriate. A further grant could be requested to assist with publication, if required.

Anyone interested should obtain an application form by writing to the Trustees of the Cockayne Research Fellowship, c/o the Keeper of Entomology, The Natural History Museum, Cromwell Road, London SW7 5BD. The Trustees of the Fellowship have sole responsibility for all matters, including choice of candidates, levels of award and renewals, will be final. Applications should be received by 1st March each year.

Donations, or other contributions, to either the *Cockayne Trust* or *The Cockayne Research Fellowship* are also invited; enquiries about contributions should be directed to the Keeper of Entomology, at the same address.

INSECTS IN EDUCATION WORKSHOP

by *Phil Bragg (8737)*

On Saturday 6th April 1991 a Workshop on "Insects in Education" was held at Bath University. As I am also a teacher, it seemed too good to miss! Organised by the Royal Entomological Society as part of their Young Entomologists' Scheme (YES), the Workshop took the form of practical examples of how insects can be used in teaching and discussions on the problems and solutions associated with the use of insects.

The YES was set up to promote the study of insects amongst children and is co-ordinated by Dr. Clive Betts of Exeter University. The scheme, which is still in the early stages, is currently running in the south-west of the country. Part of the scheme is aimed at encouraging the study of insects in schools by providing ideas for teachers to incorporate the use of insects into their teaching.

Talks and demonstrations during the day included:

1. Using pond skaters in ripple tanks to teach physics students about surface tension and the properties of waves.
2. Studying butterflies as a way of measuring populations and isolation of populations for A level biology.

3. A review of some initiatives being tried in the USA, including the production of various types of resources for teachers.
4. Using ladybirds as a practical alternative to fruit flies for genetics experiments.
5. A video presentation showing just how easy it is to set up your own colony of ants for study.
6. The results of a survey into the ways in which teachers in Gwent currently use insects in their teaching.

The results of the Gwent survey were depressing. Primary schools seem to make wider use of insects, perhaps because the teaching style is determined more by the interests of the children rather than an exam syllabus. Although most secondary schools seem to make some use of insects in their teaching, it is often limited mainly to classification, usually using a few dead insects.

As the day progressed it became clear that one of the outstanding problems, even for those who are reasonably familiar with using insects, is a shortage of information. It was generally felt that time to look after the insects is only a problem if inappropriate insects or methods are used. The choice of insects to keep is a problem for teachers who know little about insects. Frequently difficulties are experienced in finding information and new ideas, often teachers have too little time to research into a topic that they know little about. As a result, teachers fall back on the insects associated with schools, locusts and phasmids, or else they do nothing with insects. If teachers are to be encouraged to make better use of insects they need to be provided with easier access to ideas and information which is aimed at non-entomologists.

The YES hopes to alleviate some of these problems by producing resource materials for teachers in the future. Clearly this will take some time but the Workshop provided a useful interchange of ideas between the teachers and entomologists present and there are plans to hold a second workshop next year. Hopefully in the near future we will see some publications produced as a result of this initiative which will be extremely useful to both teachers and amateur entomologists alike.

THE K. C. GREENWOOD COLLECTION

Herbert Art Gallery and Museum, Coventry

by Dean Warren (7759)

Lepidopterists in the West Midlands, particularly in the Coventry area, may be interested to hear of the bequest to the Herbert Art Gallery and Museum of the Collection of the late Dr. K. C. Greenwood.

On retiring early due to ill health Dr. Greenwood turned to his boyhood interest in Entomology to provide him with a pastime. That this

should have rapidly become an all consuming passion will come as no surprise to the many members of this Society equally seriously afflicted. Within ten years Dr. Greenwood has amassed not only an impressive collection of tropical butterflies, but also a comprehensive collection of British moths, particularly important locally for its wealth of Warwickshire material. As well as purchasing specimens of tropical butterflies Dr. Greenwood travelled and collected widely in South and Central America. His foreign collection is notable for its richness in Papilionidae, Ornithoptera, Morphidae, Heliconidae, Ithomidae, and Neotropical Nymphalidae.

Since the acquisition of the collection early in 1990 work has been in progress housing specimens not already in cabinets, and a start has been made on setting the vast remainder of papered specimens which accompanied the collection.

Appointments to view the collection can be made with the Natural History Staff, Adam Wright or Steven Falk, of the Herbert Art Gallery and Museum Coventry.

BUTTERFLIES IN CYPRUS

by Rob Parker (5247)

Anyone with an interest in the butterflies of Cyprus will wish to know that the December 1990 edition of *Linneana Belgica* is totally given over to an article entitled *Les Rhopalocères de Chypre* by Dr Luc Manil, with the active collaboration of Ronny Leestmans, Rob Parker and Pierre Meerts. Rob Parker's monograph *The Butterflies of Cyprus* published in the *Entomologist's Gazette* (Vol. 34) in 1983 has been thoroughly updated and improved. The distribution maps have been reissued and now incorporate the records of many AES and BENHS members in personal communication. Excellent colour photography has been added, both of cabinet specimens and from nature. All the endemic species (2) and subspecies (7) are illustrated in colour, with some comparative pictures of related subspecies from Greece and Turkey. The text runs to 90 pages, mostly in French, but including an abstract in English. Illustrations of landscapes and type-biotopes add depth to the sections on geomorphology and flora. The systematic listing adds *Colias erate* and fills out other entries with records made in recent visits, notably by Hoffman and Rose, Tennent, Brock and Dr Manil himself. All in all, this is an authoritative production which is likely to stand for many years as the definitive work on Cyprus.

Linneana Belgica Pars XII No. 8 December 1990 is available to non-subscribers at a cost of BF350 (about £6.00) from Dr L. Manil at Rue du Parc 5/052, B-4020, Liège, Belgium.

BOOKS NOTICED

by *The Editor*

A number of interesting books that have lately been published on insects have come to my attention in one way or another and my personal opinion on them is detailed below. It is hoped to be able to publish more critical reviews of at least some of them in due course (depending on whether the Society will be sent a review copy). After writing the text below it struck me that Mr Lewis (page 144) is not only right about there being a lack of affordable beetle books, but with all those butterfly books that keep being published, why oh why do none of them include the dayflying moths? The only one so to do that springs to mind is by Manley & Allcard, but that is on Spanish butterflies and the dayflying moth section only includes the burnets. Perhaps more than 10% of our moths can be "put up" in the daytime even if they do not normally fly then. Many are, however, true dayfliers and it would seem there is scope for a separate book entirely on this group. With the now several thousand people who regularly go out to spot butterflies and who must wish they could identify the moths they also come across there must surely be a substantial market for such a book.

Collin's *New Naturalist* series, which has produced some 80 volumes in nearly 50 years, has still not done anything on either beetles or pond life, both of which subjects have a considerable following, with quite a few minor books about them published and I would have thought there would have been more than enough potential demand. Dragonflies, part of pond life, however, have been fairly well catered for over the years, with a sudden extra flurry of books about them recently. Warne's extremely useful *Wayside & Woodland* series could also do with a few new editions, but since the firm no longer exists there seems little chance. I wonder who owns the copyrights? In particular *Land & Water bugs*, now a very hard to come by book and very expensive as a result, as is Linsen's two volumes on beetles, are particularly required. So many books are now reprinted, often quite cheaply (and sometimes poorly), that one wonders just what factors govern the choice of those that are done.

I think it entirely probable that the lack of new books on some subjects may not be the fault of publishers, but the great difficulty they have in getting an author with enough knowledge, time and inclination to write them a book. As an editor I sometimes find the greatest difficulty in getting anything out of an author whom I have asked to send me an article, review a book, or referee another's paper. Lack of time is the usual problem. Those who have the time and the inclination send me articles willingly and without being asked. To them I am grateful, but if

one is to try to obtain a balance in a journal, it is necessary from time to time to solicit an article or two on a particular subject which is not coming in voluntarily. An article is one thing; an entire book, thoroughly researched is another matter entirely.

The scientific names of the British lepidoptera: their history and meaning by A. Maitland Emmet. 8vo. pp.288, 8 black and white plates. Harley Books, 1991. Price hardback £49.95; paperback £24.95.

This erudite tome is from the well-known stable of Harley Books and the author is the chief editor of *Moths & Butterflies of Great Britain & Ireland*, who, while he needs no introduction as an entomologist, perhaps does as the remarkably well-informed classical scholar that he also is. Perhaps too few of us when identifying a specimen give any thought as to why it was named and it is remarkable just how many taxonomists in the past have given appropriate classical derivatives to insects. Perhaps because they, like so few of us today, could converse in Latin and Greek. This book gives all the reasons as to why specimens were so named and it is incredible that of the 2,000 British lepidoptera the derivation of only some half a dozen could not be tracked down.

A Complete Guide to British Moths by Margaret Brooks. Hardback quarto, pp.248, 25 coloured plates, numerous coloured illustrations. Published by Jonathan Cape, 1991. Price £19.99.

This companion to her *British Butterflies* is in our opinion a better book even though it covers considerably more species; all the macro-lepidoptera are illustrated in the 25 plates by David Wilson. These are similar to and of the same high standard as those by him illustrating Bernard Skinner's *Colour identification guide to moths of the British Isles* but the captions to the figures usefully carry abbreviated information concerning the distribution, habitat and time of appearance of the moth. The main part of the book is, however, taken up with a selection of the more common species. Their life histories are described and all stages are illustrated with colour photographs of them in their natural habitat.

Las Mariposas entre los Antiguos Mexicanos by Carlos R. Beutelspacher. Pp.103, 308 coloured and black and white illustrations. Hardback Quarto. Fondo de Cultura Economica, Tezontle 1989. Price not stated.

Beautifully illustrated in colour and half-tone this book describes the lepidoptera in the art and mythology of Ancient Mexico. For those with an interest in art or mythology it is a must, but a reading knowledge of Spanish will be a distinct help. Unfortunately I cannot suggest a supplier,

as it was presented to me, but a bookshop dealing with foreign language books should be able to obtain it, otherwise enquire of the Mexican Embassy in London.

Coppiced woodlands: their management for wildlife by M. S. Warren & R. J. Fuller. Pp.32, illustrated and with 6 colour plates, A5 paperback. ISBN 0 86139 634 0. Nature Conservancy Council 1990. Price £2.50.

Woodland rides & glades: their management for wildlife by M. S. Warren & R. J. Fuller. Pp 31, illustrated and with 6 colour plates, A5 paperback. ISBN 0 86139 635 9. Nature Conservancy Council 1990. Price £2.50.

These two booklets from the NCC are a useful introduction to the subject of woodlands and how they should be managed for the benefit of the wildlife that inhabits them. Illustrated with graphs and diagrams as well as coloured views of the woods and some of their wildlife inhabitants they give an example of the various stages in the coppice cycle which are preferred by different species. Complementing each other they describe how coppicing should be done and rides and glades maintained. For those desiring more information the most relevant bibliographical references are given. Although not entomological in the strictest sense, for they cover all animal and plant life, butterflies and moths get a good airing and to anyone with any interest in preserving a bit of woodland, large or small, or the insects therein, they are a very useful pair of booklets indeed.

Grasshoppers & Mantids of the World by Ken Preston-Mafham. Pp.192, 104 coloured and black and white illustrations. 8vo. Blandford 1990. Price £16.95.

Although published at the above price, we found this book being offered at half this at a book fair. The book is superbly illustrated in both colour and halftone and these illustrations show the enormous variety of these insects that occur. It makes one's mouth water to see them. Oh that we could obtain some of them for rearing purposes instead of those common dull and pedestrian species as American roach, Hissing cockroaches, desert locusts and MacLeay's spectres! Come on you dealers, see what you can do. In spite of the title, cockroaches, stick insects and crickets are included. The yellow-spotted roaches on plate 63 and the blue (yes *blue*) cricket from Kenya on plate 73 positively make me drool with envy. Apart from the photographs, the text is full of useful information about these creatures and should be considered a must for those interested in these groups.

The Butterflies of Britain and Ireland by Jeremy Thomas & Richard Lewington. Hardback square quarto, pp.224, numerous coloured illustrations. Published by Dorling Kindersley & The National Trust, 1991. Price £16.99.

As mentioned by member K. C. Lewis on page 144 of this issue, YES, this is yet *another* butterfly book! One I think with a difference. Not a re-hash of descriptive detail, re-describing yet again what an adult butterfly looks like but a mass of what is best described as real "Natural History" in the same sense that under each species is given an account of its biology, its history, its conservation problems, its colour forms, its decline (or spread), some ecology, attacks by parasites, conservation. While the text to each species occupies two or three pages, every butterfly has a full page of colour illustrations by Richard Lewington. These, like Frowhawk before him, illustrate all stages in the life history, together with in most cases some of both the larval foodplant and the adult's nectar choice. A number of varieties and in a few cases the parasites of the larvae are also illustrated. Distribution maps and a clearly understandable histogram showing the times of appearance of all stages is also present. This is an extremely well-produced book which, being widely available through the National Trust and being presented in a very attractive cover of colourful butterflies, is going to appeal to and find itself in the homes of many non-entomologists. For the entomologist and also the conservationist, it should be a must.

Ponds and streams: a nature guide by John Clegg. A5, pp.128, coloured and halftone illustrations. Crowood Press, paperback edition 1989. Price (full) £3.95 (remaindered) £1.50.

John Clegg's *Pond Life* in Warne's *Wayside & Woodland* series has now become so expensive second-hand that a book by him, albeit a shortened form to that work is to be welcomed, particularly if it may be found in a shop such as Booksave (where I found my copy), Dillons, or Watermans at the remaindered price. It seems to me that pond life is a much neglected subject these days. It played a goodly part in my own early entomology for my early teenage diaries keep mentioning ponds! Apart from a couple of articles on aquatic beetles in an aquarium I do not recall any pond life articles having been published in the *Bulletin* for many years. Why is this I wonder? On some of the few field trips I still attend, some pond-dipping is regularly done. Be that as it may, this book is an excellent and cheap guide to the subject and treats of all pond life, not just the insects.

Moths in the memory: a postwar spring by James Birdsall. 8vo, pp.168, illustrations. Pavilion Books Limited 1990. Price (full) £12.99; (remaindered) £2.95.

A light-hearted account of a boyhood during and just after the last war by an author who had an interest in entomology. For those who like a bit of biographical writing and wish to hear about other peoples' experiences as they grew up and developed their interests this is quite an amusing book to read and, certainly for me, it brought back memories of those years. Perhaps to the younger generation it may not, but it does ring true from time to time. Worth it at the remaindered price, but try the library if not. The line drawings illustrating the start of each chapter are mainly of a moth or the caterpillar of one. Another book by James Birdsall is *The boys and the butterflies*, but this I have not seen. It has, however, been recommended to me as a "good read."

A basic care guide to tarantulas by Guy Tansley. A5, pp.41, two coloured plates, black and white illustrations. Privately printed. Price £5.00 post free from the author, 14 Hotchpudding Place, Newcastle-upon-Tyne, NE5 2AU.

This booklet appears to be a useful guide for the beginner who has become interested in this popular group of invertebrates. Printed in a larger than normal sans serif type point-size, well spaced.

BEETLE BOOKS A PUBLISHING DESERT

by K.C. Lewis (3680)

I hope members of the Butterfly fraternity will not be offended when I say that if I see one more book published on British Butterflies in bookshops I will tear out my hair (and I haven't much left). Can I ask when will a publisher print a set of books on the Beetles of the British Isles at an affordable price. I am aware of a series of first class books but the price of one is £109.00 and this for a book that contains many beetles not found in the British Isles. Even the last two books found on the shelf were translations, one by Octopus Books 1984, and the other by Treasure Press 1990.

Last year I wrote to Collins, of Grafton Street, asking if it would be possible to publish a book/books on beetles in the style of the two books by E. F. Linssen (1959 two Volumes). Although I enclosed a stamped addressed envelope, they did not have the courtesy to reply to my letter. I find it hard to believe it is all down to economics, as only last week in a London bookshop I found a book on The Mosquitoes of the north of Scotland. So I would ask all coleopterists to lobby publishers in a reasonable way and maybe a start could be made with Octopus Books Limited, 59 Grosvenor Street, London, W.1.

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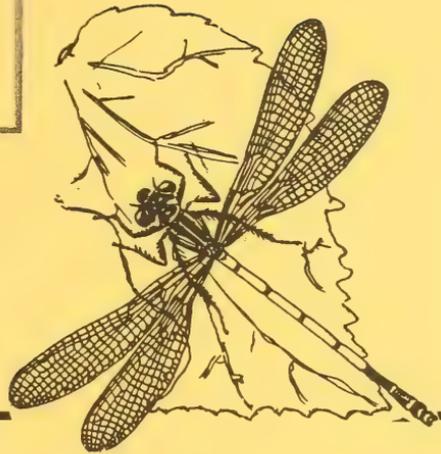
CONTENTS

Andorra revisited — 1990 — an apology, <i>by P. W. Cribb</i>	127
Asunta's hawkmoth recognised, <i>by John Tennent</i>	124
Asunta's hawkmoth — Piltown rides again, <i>by Leigh Plester</i>	124
Beetle books a publishing desert, <i>by K. C. Lewis</i>	144
Book reviews	100, 109, 135
Books noticed, <i>by The Editor</i>	140
Butterflies and hawkmoths of the Turks and Caicos Islands, <i>by R. G. T. St. Leger</i>	115
Butterflies in Cyprus, <i>by Rob Parker</i>	139
Butterflies in the West Indies, <i>by A. R. D. Whitlock</i>	121
Chalkhill blue not a common one	113
Clifden nonpariel is extinct	113
Clouded yellows and <i>Colvolvulus</i> hawkmoth migrants to Co. Derry <i>by John W. Lavery</i>	125
Cockayne research fellowship	136
Correction of errors	113
Early Small tortoiseshell in Hertfordshire, <i>by S. Pittman</i>	111
Editorial	97
Hairstreak, <i>by Don McNamara</i>	134
Holly blue ovipositing on <i>Coronilla varia</i> , <i>by P. J. C. Russell</i>	105
Holly blue, unusual choice of foodplant <i>by P. W. Cribb</i>	106
Holly blue, alternative foodplants of, <i>by W. E. Rimmington</i>	108
Insects in education workshop, <i>by Phil Bragg</i>	137
K. C. Greenwood collection, <i>by Dean Warren</i>	138
Larva of <i>Zerinthia rumina</i> , <i>by Peter W. Cribb</i>	120
Letter to the Editor, <i>from John Tennent</i>	124
Locusts for supper, <i>by Duncan Reavy</i>	110
My garden in Charente, <i>by Stella Smith</i>	112
New Irish locality for the Purple hairstreak, <i>by John W. Lavery</i>	99
Photographic competition winners, <i>by Terence F. Knight</i>	109
Problems of the Dappled white's name and status, <i>by Peter W. Cribb</i>	101
Record of rare Small quaker moth in Ireland, <i>by John Lavery</i>	125
Securing a future for British butterflies, <i>from habitat</i>	123
Spider recording scheme, <i>from habitat</i>	120
Walk on the Surrey downs, <i>by Peter W. Cribb</i>	104
Wiltshire butterfly mapping scheme, <i>by Mike Fuller</i>	126

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The Bulletin of the Amateur Entomologists' Society

EDITOR

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

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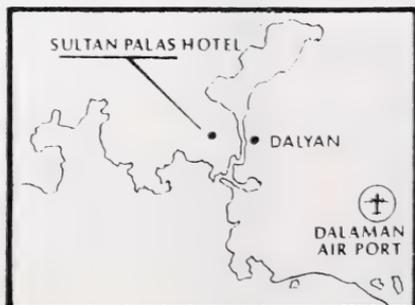
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THOMSON, GEORGE. Possible thermoregulatory wing markings in *Maniola* butterflies detected by infra-red reflectance photography.

SMYLLIE, BILL. The Brown argus butterfly in Britain — a range of *Aricia* hybrids (with four coloured plates).

The Subscription rate is £21.00 (£22.00 overseas) and should be sent to Mr G.G. Bentley, Registrar,

ROYAL ENTOMOLOGICAL SOCIETY

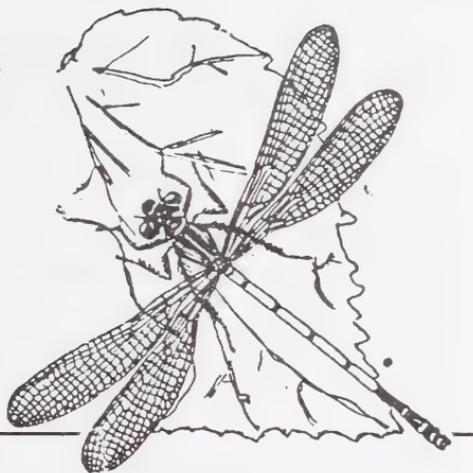
41 Queens Gate, London SW7 5HU

CONTENTS

Admirals at sea	191
Annual exhibition — help wanted	149
Annual exhibition — trade restrictions	149
Annual reports for 1990 of the Society	151
Aspects of the Clouded yellow, <i>by Don McNamara</i>	150
Book reviews	168, 170, 181-184
Books noticed, <i>by the Editor</i>	190
Brown-tail moth strikes again, <i>by the Editor</i>	190
Bumblebee nest survey	189
Editorial	145
Great European stag beetle — its past and its future, <i>by George Mamonov</i>	157
Holly blue laying on firethorn, <i>by Trevor Peach</i>	173
Monarchs and Plain tigers in Spain, <i>by Paul Sokoloff</i>	191
Non-insect fauna associated with sugar-baited trees, <i>by Thomas Seabolt</i>	171
Notes on <i>Lampides boeticus</i> in Spain, <i>by Gareth King</i>	156
Practical hints, <i>by Christopher Nissen</i>	180, 188
Practising biological control in my greenhouse, <i>by John Gale</i>	165
Protected British butterflies: interpretation of Section 9 and Schedule 5 of the Wildlife & Countryside Act 1981, <i>by Alan Stubbs</i>	147
Report of, and exhibitors at, the Annual Exhibition, <i>by Roy McCormick</i>	174
Small influx of the Long-tailed blue, <i>Lampides boeticus</i> , at S'Albufera Natural Park, Mallorca, <i>by Nick Riddiford</i>	164
Strange behaviour, <i>by Alan Butler</i>	192

AES BULLETIN

No. 377



EDITORIAL

No sooner had my editorial in the last issue of the *Bulletin* been printed, than I received a circular, sent to all Journal Editors, from Alan Stubbs, Chief Scientist Directorate of the Nature Conservancy Council (now called English Nature) interpreting the Wildlife and Countryside Act 1981. This is printed in full in this issue.

This interpretation puts rather a different aspect onto the matter than many of us had previously understood or been led to believe and does clear up the past confusion on the issue. For instance it is now seen to have been quite unnecessary for the many Swallowtails that in 1981 were being bred in captivity to have been destroyed. It would have been perfectly legal to go on breeding and selling them. Even my licence to sell the umpteenth generation of bred ones from the 1960s was unnecessary. In fact a licence has only been necessary to sell them if directly taken from the wild. It has been and is quite legal to catch other than the three "fully protected" species and freely breed, sell or otherwise dispose of their offspring, but not them, unto the umpteenth generation.

This interpretation, however, does not lessen the impact of my arguments in my previous editorial that extending the number of "Fully Protected" species will be an ill-judged move and cause more problems than it solves for, even if the breeding of them is not made illegal, obtaining the initial "mother stock" will be.

Under the quinquennial review of the Act it is proposed to add a number of other species, including beetles, moths and molluscs, and while some provisions proposed are designed to protect a very local habitat, others will make it illegal to even possess specimens which have come from Victorian or other old collections and which were taken

before the coming into being of the present legislation. The onus of proving they were not recently caught will lie with the possessor.

The protection of species so local that they only occur in one locality, perhaps a dead tree or a pond somewhere, we can understand, but the original inclusion of 22 butterfly species onto Schedule 5 was "as a result of widely expressed concern over the scale and nature of trading." Who and how many, I ask myself, were expressing such concern? Where is the evidence and where has it been published. Not in the entomological journals insofar as I am aware. It would be very informative to have information on the "scale and nature of trading" from the legislators or the Department of the Environment and these pages are open for their comments.

With it being made illegal to even catch over half our resident butterflies, as well as a number of other invertebrates, how is their presence to be *reliably* monitored? Most of the recording is done by amateurs, many of whom are also responsible collectors. To place almost insuperable conditions and obstacles in their way will ultimately result in the drying up of the supply of youngsters coming forward with an interest in entomology and this will then leave many habitats, particularly SSSIs, unprotected, for the professionals are very unlikely to be given the resources by government to do the job and the land-owners, who have already won a significant victory in demanding that SSSIs have their status reviewed every few years, will have a strong case for de-regulating them if there are no recent records available to substantiate their continued designation.

It is now clear from the interpretation of the Act that the same rules apply to foreign stock. The legislators have not taken into account that while a species may be rare and endangered in Great Britain, it may be common, even a pest, on Continental Europe or elsewhere. It is very irritating, for instance, to have the sale or exchange of European Swallowtails banned when it is known to be a pest of carrot crops abroad and to know that pesticides are being used to control it where necessary. Also both irritating and frustrating is the knowledge that while it is illegal to *catch* a protected species, it is not apparently illegal to *kill it*. This does not have to be done by catching. Ploughing, drainage, road-building, pesticide spraying, flail mowing and similar activities are equally effective as any cyanide killing bottle and come under the term of "accidental killing", not "purposeful killing" and are therefore perfectly legal. A curious state of affairs indeed.

PROTECTED BRITISH BUTTERFLIES: INTERPRETATION OF SECTION 9 AND SCHEDULE 5 OF THE WILDLIFE AND COUNTRYSIDE ACT 1981

by Alan E. Stubbs, Chief Scientist Directorate, Nature Conservancy Council.

The Conservation of Wild Creatures and Wild Plants Act 1975 gave full protection to the Large blue butterfly. There was no ambiguity. Taking, killing or injuring of specimens in the wild or any form of trading was illegal unless authorised by means of a licence issued by the Department of the Environment who consulted the Nature Conservancy Council before issuing licences.

This Act was succeeded by the Wildlife and Countryside Act 1981 which gave full protection to a wider list of invertebrates listed in Schedule 5. The Large blue was joined by the Heath fritillary, the Chequered skipper and the Swallowtail. As a result of widely expressed concern over the scale and nature of trading, NCC subsequently recommended in its Quinquennial Review of Schedule 5 in 1986 that the trade in twenty-two scarce species of native butterflies be permitted only under licence. The purpose was to monitor the trade, without affecting an individual's wish to take animals for personal study. The same review recommended that the Chequered skipper should no longer be afforded full protection. Instead it was placed on the list of species requiring a licence before being sold. This demonstrated that flexibility of the legislation to afford species only the legal protection which their status in the wild warranted.

The recommendation relating to these 22 species had to be implemented through an Order made by the Secretary of State for the Environment which came into effect on 28th June 1989. Implementation is carried out by the Department of the Environment's Wildlife Division in Bristol.

There have been many doubts, and some inconsistencies, in the interpretation of the 1981 Act in relation to both the fully protected butterflies and the additional 22. In order to clarify the position DoE wrote to NCC on 25th September 1990. The following extract from this letter should help clarify the situation for everyone.

- “1. Except for those which are captive-bred, all specimens of species of butterflies listed on Schedule 5 to the Wildlife and Countryside Act 1981 are covered by the relevant provisions of the Act regardless of age or country of origin.
2. Consequently, sale of any specimens of the 22 partially protected and three fully protected species is illegal unless:

- a. the specimens were bred in captivity or
- b. a sale licence issued by the Department is held"

The following points need emphasis.

- It is illegal to take in the wild (even to net and immediately release) the three fully protected species without a licence. It is legal to *capture* all other British butterflies but responsible entomologists will of course recognise the need not to damage wild populations in doing this.
- "Wild" butterflies, i.e. those whose sale is restricted, are defined as butterflies which were, before they were taken, living wild. Note that this applies to wild-taken eggs, larvae and pupae as well as adults and to any bred on stage of a wild caught individual (but not to its offspring).
- No licence is required to sell captive-bred stock.
- It is the full nominate species that is covered by the Act. Foreign wild caught specimens require a licence to trade even if they are of a non-British sub-species.
- In any prosecution, the butterflies would be considered to be "wild-taken" unless *the trader* can show irrefutable evidence to the contrary. The maximum fine per specimen (even an egg) is £2,000.
- The word "sale" includes hire, barter, exchange etc.
- The exact wording of the relevant part of the Wildlife & Countryside Act (Section 9 (5)) is as follows:
 "if any person—
 Sells, offers or exposes for sale, or has in his possession or transports for the purpose of sale, any live or dead wild animal included in Schedule 5, or anything derived from such an animal;
 or
 publishes or causes to be published any advertisement likely to be understood as conveying that he buys or sells, or intends to buy or sell, any of those things
 he shall be guilty of an offence".

In conclusion, this legislation has two purposes. First to ensure that wild populations of the three fully protected species remain safe from any collecting or trading. Secondly to monitor trading of the 22 scarcer species. Examples of unscrupulous exploitation may be few, but those that do occur need firm action. Responsible traders have no cause for alarm, indeed through the licensing system their critics will be fairly answered. It is the unacceptable elements of trading which will be most affected by the law.

NCC is confident that the vast majority in the entomological community will abide by these controls and help to ensure that others abide by them also.

This note has been agreed by DoE and is published so that all concerned have the same set of guidelines.

December 1990

LIST OF BUTTERFLIES ON SCHEDULE 5 OF THE WILDLIFE AND COUNTRYSIDE ACT 1981 WITH RESPECT TO THE PROVISIONS OF SECTION 9(5) (SALE ETC) ONLY

Argus, northern brown	<i>Aricia artaxerxes</i>	Fritillary, pearl-bordered	<i>Boloria euphrosyne</i>
Blue, adonis	<i>Lysandra bellargus</i>	Hairstreak, black	<i>Strymonidia pruni</i>
Blue, chalkhill	<i>Lysandra coridon</i>	Hairstreak, brown	<i>Thecla betulae</i>
Blue, silver studded	<i>Plebejus argus</i>	Hairstreak, white letter	<i>Strymonidia w-album</i>
Blue, small	<i>Cupido minimus</i>	Heath, large	<i>Coenonympha tullia</i>
Copper, large	<i>Lycaena dispar</i>	Ringlet, mountain	<i>Erebia epiphron</i>
Emperor, purple	<i>Apatura iris</i>	Skipper, chequered	<i>Carterocephalus palaemon</i>
Fritillary, Duke of Burgundy	<i>Hamearis lucina</i>	Skipper, Lulworth	<i>Thymelicus aeteon</i>
Fritillary, Glanville	<i>Melitaea cinxia</i>	Skipper, silver-spotted	<i>Hesperia comma</i>
Fritillary, high brown	<i>Argynnis adippe</i>	Tortoiseshell, large	<i>Nymphalis polychloros</i>
Fritillary, marsh	<i>Eurodryas aurinia</i>	White, wood	<i>Leptidea sinapis</i>

FULLY PROTECTED BUTTERFLIES ON SCHEDULE 5

Blue, large	<i>Maculinea arion</i>
Fritillary, heath	<i>Mellicta athalia</i> (Otherwise known as <i>Melitaea athalia</i>)
Swallowtail	<i>Papilio machaon</i>

ANNUAL EXHIBITION — HELP WANTED

Our Annual Exhibition will again take place this year at Kempton Park Racecourse and will be held on Saturday 5th October. The organisers would greatly appreciate help in setting up the tables etc on Friday 4th at around 19.00 hours. If any members live near enough and feel they would like to contribute to the success of the Exhibition, would they please get in touch with Roy McCormick, 125 Brocks Drive, North Cheam, Surrey SM3 9UP, telephone 081-644 2428.

ANNUAL EXHIBITION — TRADE RESTRICTIONS

In order to comply with the law, and to avoid any ambiguity, the sale of the following species, which are covered either by CITES regulations or the Wildlife & Countryside Act 1981, are banned from sale at our Annual Exhibition under any circumstances — even if a “Licence” is held.

Butterflies: All Birdwings, *Ornithoptera*, *Trogonoptera* and *Troides*; The Glory of Bhutan and relations, *Bhutanitis*; the following Swallowtails, *Papilio chikae*, *P. machaon*, *P. homerus*, *P. hospiton*; all forms and races of the Apollo, *Parnassius apollo*; the Large blue, *Maculinea arion* and the Heath fritillary, *Melitaea athalia*.

Moths: Barberry carpet, *Pareulype berberata*, Black-veined, *Siona lineata*, Essex emerald, *Thetidea smaragdaria*, New Forest burnet, *Zygaena viciae*, Reddish buff, *Acosmetia caliginosa*, Vipers bugloss, *Hadena irregularis*.

Beetles: Rainbow leaf, *C. cerialis*, Violet click, *L. violaceus*.

Spiders: Fen raft, *D. plantarius*, Ladybird, *E. niger*.

Sale of all the species in Section 9(5) of the Act as listed on page 149 will be permitted only if a Licence to do so, or a signed affirmation that they have been captive bred for at least two generations is prominently displayed. As stated in the Act, the onus will be on the dealer to prove that they have been bred if called upon so to do.

ASPECTS OF THE CLOUDED YELLOW

Think of her in terms of space, of time,

Whose

Outward urge negotiates the hills, the seas.

She sweeps the starstruck meadows' silken sway—

I see her now with thoughts of spring

And spring am I.

Think of her in terms of stars, of sky,

Who

Heaven-quitting flies above these mortal fields—

Has caught the colours of the sun

With secret Glyphs and printed signs,

Each wing a mirrored symmetry.

Think of her in terms of childhood days

Whose

Angelic touch has fixed my early dreams

With yellow blossoms' fiery tides that draw

The breathless child's enraptured gaze.

Think of her in terms of winter's passing by,

Who

Charms now the sleep behind the lidded eye

And flies the clovered universe within the mind.

I see her now, the earth is spring.

And spring am I.

**THE
AMATEUR
ENTOMOLOGISTS' SOCIETY**



**ANNUAL REPORTS FOR 1990
OF THE SOCIETY AND ITS ASSOCIATED BODIES**

OF THE COUNCIL

Membership of the Society as at 31st December 1990 was 1815 members. This comprised 9 Honorary, 53 Life, 26 Associate, 10 Exchange, 1621 Ordinary and 96 Junior members.

This means that 1990 has shown an overall loss in membership of 23 members. The turnover of members each year creates a high workload for our Registrar, Mrs Cribb, and we are all very grateful for her efforts.

The continuation of six *Bulletins* a year appears to be well received amongst the membership. The Council met on four occasions during the year at the Central Hall, Westminster. The Annual General Meeting was held at the rooms of the Royal Entomological Society on the 21st April. The Meeting was chaired by the President, A.E. Stubbs, who gave a thought-provoking lecture entitled "The Amateur Entomologist — his survival, or will collecting and trading cause his extinction in the 21st century".

The Annual Exhibition was again very successfully held at Kempton Park Racecourse.

The Council reports with regret the death of several members during the year, including D. Gaunt and D.T. Rose.

M.J.R. Jordan
Honorary Secretary

OF THE TREASURER FOR 1990

As expected, the Society's financial results for the year ended 31st December 1990 show the impact of rising inflation, with General Fund expenditure increasing by £1,308. Fortunately this was largely offset by

additional investment income from higher interest rates resulting in an increase in income of £1,099. Subscription income remained at about the same level as the previous year. In consequence the Society maintained a small surplus of £725. However, with interest rates now falling and the impact of inflation continuing, the Society is likely to move into a deficit in 1991 or 1992 which will necessitate an increase in subscription rates unless we can attract and maintain a higher membership. It is disappointing that the improvements made to membership services, coupled with very competitive subscription rates, have not reduced the turnover in membership.

The results shown by the Publications Trading account are rather more encouraging, with sales increasing from £4,473 to £5,757, resulting in a trading surplus of £1,748. We can look forward to an even better year in 1991 with two new publications due and several revisions/reprints in the pipeline.

R.A.Fry

Honorary Treasurer

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

Committee meetings and organisation

The AES Conservation Committee held no general meetings in 1990, but held an *ad hoc* meeting to select illustrations for the new handbook on habitat conservation. The positions of Field Meetings Secretary and Exhibitions Organiser remained vacant. Dr D. Lonsdale, our JCCBI Representative, attended that committee's two meetings in May and November, as well as meetings of its Executive Subcommittee in June, October and November. Mr S. Brooks, JCCBI's representative on Wildlife Link attended all the relevant Link meetings, and, in contrast to the situation in 1989, his task was made much more effective by the re-activation of the Executive subcommittee. This is very important, because it gives entomologists a voice within the conservation movement which can reach the ears of government. Another welcome development was the appointment of the JCCBI Conservation Officer following the resignation of the first appointee in 1989. The new appointee, Ms Helen Smith, settled in very well and began to do a highly effective job.

Local representation

Dr C.R. Betts, our Habitat Conservation Officer, extended his list of local volunteers to fifteen, and it is hoped that they can all be brought into action during 1991, once the committee has produced a set of guidance notes.

**INCOME AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED 31st DECEMBER 1990**

EXPENDITURE			INCOME		
1989	1990		1989	1990	
£	£	£	£	£	£
Bulletin Costs:			Subscriptions:		
246	Editorial	413	10019	Ordinary and Affiliate	10082
7096	Printing	8283	472	Junior	384
3701	Despatch	4044	288	Life Membership Fund	306
190	Indices	<u>204</u>			
		12944	1061	Donations:	10772
Membership Services:			327	Enrolment Fees:	1084
354	Entomologists' Directory	—			
540	Membership List	409			
255	Wants & Exchange Lists	<u>306</u>			
		715			
Administration etc:				Investment Income (Gross):	
497	Stationery and Notices	577	2583	National Savings and Midland Bank Accounts	3454
204	Postage and Carriage	188			
1100	Registrar's Fees	1247			
780	Meetings Expenses	768			
25	Study Groups Support	—			
823	Depreciation	658			
283	Insurance	288			
189	Sundry Expenses	<u>215</u>			
		3941			
297	Conservation:	<u>288</u>			
16580		17888			
934	Surplus Income to General Fund:	725			
<u>17514</u>		<u>18613</u>	<u>17514</u>		<u>18613</u>

**PUBLICATIONS TRADING ACCOUNT
FOR THE YEAR ENDED 31st DECEMBER 1990**

EXPENDITURE		INCOME	
1989	1990		1990
£	£	£	£
New and Revised Publications Costs:		4473 Sales (Gross)	
170	Editorial etc.	275	5757
990	Printing	1500	
			— Increase in value of stocks:
264	Decrease in value of stocks:	—	69
1789	Selling and other expenses:	2303	
1260	Trading Surplus to Publications Fund:	<u>1748</u>	
<u>4473</u>		<u>5826</u>	<u>5826</u>

R. A. Fry, Dip.E.E., C. Eng., M.I.E.E.
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 1990 and of the Income and Expenditure for the year ended on that date.

A. J. PICKLES, F.C.A.

**AMATEUR ENTOMOLOGISTS' SOCIETY
BALANCE SHEET AS AT 31st DECEMBER 1990**

1989		1990		1989		1990
£		£	£	£		£
	General Funds:				Fixed Assets:	
26861	Balance at 1st January 1989	27795		4113	Office Equipment at cost	4113
934	Add: Surplus income (deficit) for year	725		823	Less: Total depreciation	1481
27795		28520		3290		
4819	Life Membership Fund:	5722			Investments at cost:	
281	Ansorge Award Fund:	307		660	£712 Treas. 12¼% 1995	660
60434	Crow & Hammond Trust Fund:	76468		1260	£1470 Treas. 9½% 1999	1260
	Creditors:			150	109 M&G Charifund Income Units	150
3048	Advance Subscriptions	3681		85140	NSB and Midland Bank Investment accounts	106007
302	Advance Donations	400	4081			
					Current Assets:	
				342	Stocks at cost	304
				820	Sundry debtors	925
				4967	Cash at Bank Current Account	3110
				50	Cash in Hand	50
<u>96679</u>		<u>115098</u>		<u>96679</u>		<u>106007</u>

PUBLICATIONS FUND AT 31st DECEMBER 1990

1989		1990		1989		1990
£		£	£	£		£
37811	Balance at 1st January 1989	41125			Investments:	
1260	Add: Trading Surplus for the year	1748		21935	NSB and Midland Bank Investment accounts	
2054	Interest — NSB and Midland Savings Accounts	3363			Current Assets:	
41125		46236		16000	Stocks at lower of cost or valuation	16000
1789	Creditors:	2303		4461	Sundry Debtors	5701
42914		48539		518	Cash at Bank	46
<u>42914</u>		<u>48539</u>		<u>42914</u>		<u>46</u>

acct-5

STUDY GROUPS' FUNDS

1989		1990		1989		1990
£		£	£	£		£
381	Balance at 1st January 1989	360			Current Assets:	
(21)	Add: Surplus Income for year (Deficit)	39		295	Cash at Bank	
360		399		65	Cash Floats	
<u>360</u>		<u>399</u>		<u>360</u>		

The Nature Conservancy Council

The decision to split the NCC into three national bodies was confirmed during the year, and was the subject of much discussion by the JCCBI. One problem was the need to set up three separate versions of Wildlife Link, with the need for additional representation and, unfortunately, subscriptions from the AES and other societies. It became increasingly clear that the specialist expertise of NCC entomologists would, at least to some extent, be retained within the central advisory body to be known as the Joint National Conservation Committee. Despite the need for entomologists in the national bodies, it was announced that the Scottish one would have none on its staff.

Sites and species of interest

The JCCBI received reports on the following rare or endangered species during the year: Large blue butterfly, Chequered skipper, New Forest burnet, Netted carpet moth, Kentish glory moth, Marsh fritillary, the Manx grasshopper, and the robber fly *Asilus crabroniformis*. The Manx grasshopper was concerned in a site campaign, supported by the JCCBI and the AES, in which the habitat of this species was threatened by a golf course development in the Langness Peninsula. Dr Betts has also written letters expressing concern about proposed developments at Lurcher's Gully in the Cairngorms, the route of a proposed North Exeter link road, Chudleigh Knighton Heath (the home of the ant *Formica exsecta*) and Oxleas Wood in Greater London.

Exhibitions and publications

In the absence of an Exhibitions organiser, efforts were confined to the Society's own annual exhibition, where the theme was a display of illustrations from the draft of our new conservation handbook. The final stages of drafting the handbook were completed, ready for printing early in 1991. This was the highlight of the year, since it promised to be a very successful publication, but, as in 1989, the resulting workload on the editor of Insect Conservation News, prevented publication in 1990, contrary to expectation. However, parts of the next issue were drafted, with a view to resuming normal production in 1991.

Conservation field meetings

In the continuing absence of Field Meetings Organiser, we depended once again on Mr J.E. Cooper, who kindly held another of the successful "Huntingdon meetings" on 30th June.

D. Lonsdale
C.R. Betts

NOTES ON *LAMPIDES BOETICUS* IN SPAIN

by Gareth King (8585)

I was interested to see the contributions by Brian Wurzell and J. Smith in the December issue of the *Bulletin* on the Long-tailed blue breeding in north London. This was due to the unusually high temperature associated with last summer.

I have never seen this species in Britain, but can comment on its distribution in Spain, especially in and around Madrid. According to Gómez de Aizpúrua it is found throughout the province as well as in the bounds of the city itself.

This would include the Sierra de Guadarrama and the plains of Castilla-la Mancha to the south. I have come across it in Valdemoro, San Raphael and La Casa de Campo. However, it seemed most frequent in the summer months flying near to the Acacia trees which are often to be seen in the north of the city. The trees flower in June so the butterflies must take advantage of the flowers to breed. Outside in the country the insect is to be found around the vetches growing alongside country lanes. That it is a common species in Madrid does not mean it is a permanent resident. Madrid lies at 649m above sea level and can be very cold in the winter, probably more so than in London. It must therefore migrate up from the milder regions in the south of the country where there is no chance of frost. Extreme cold occurs in Madrid between November and April, being most frequent between December and March. Although it can still feel pleasantly warm at midday even in January, there is often a difference of 20°C in a mere 24 hours. Under these temperature variants the butterfly would be killed.

The butterfly is probably resident, breeding all the year round to the west of the city, in Estremadura, southwards to Huelva, Seville, Málaga and Almería and then northwards along the Mediterranean coast. In these regions the January low is 6°C with February and March being mild enough for breeding. In some parts of the south as well as in the capital the July/August maximum would be in excess of 40°C providing ideal climatic conditions for the butterfly.

Bearing these details in mind it would be highly improbable that *L. boeticus* could be a permanent feature of London, even allowing for the absence of severe frosts. The summer temperatures are normally too low as well as there being a general dearth of sunshine.

REFERENCES

- Gómez de Aizpúrua, Carlos, (1987). *Atlas Provisional Lepidopteros de Madrid*. Comunidad de Madrid.
- Tamames, Ramón (1989). *Introducción a La Economía Española*. Alianza Editorial 18° Edición.

THE GREAT EUROPEAN STAG BEETLE — ITS PAST AND ITS FUTURE

by *George Mamonov*

252208 Kiev 208, ul. Vasilisa Porika Street, 3a—Flat 70, USSR

The largest of the European beetles is *Lucanus cervus*, variously known as Xuk-aliei (?) (= Deer-beetle in Russian), Stag (English), Cerf-volant (French), Hirschkafer (German), Szarvasbogar (Hungarian). This beetle is well known in Europe among the other insects not only by entomologists and zoologists, but also by the population in general. This large beetle belongs to the extensive family of Lucanidae, commonly called Stag Beetles, that contains about 800 species, although these are mainly from tropical areas. Only a few of the smaller species are known in Europe and of these *cervus* is the largest being up to 74mm in body size. It is distributed throughout the palaeartic region being particularly common from Middle Europe to the Baltic Sea basin in the North and being found especially in oak tree forests. In the USSR for example there are known some 15 species of Lucanidae, including the genera *Dorcus* (3 species), *Platycerus* (2 species), *Ceruchus* (1 species), *Sinodendron* and *Lucanus*. Apart from the last, all the species in these other genera are small beetles about 12-32mm in body size and occur especially from the Southern European part of USSR, the Crimea and the Caucasus. *L. cervus* inhabits these areas too, especially those with deciduous forests.

Similar to *cervus* is the Asiatic *L. dybowsky* Parry which inhabits the Far East tree forests. *L. cervus* is known in forests from the extreme western part of the USSR to the Volga river in the East and to the Baltic Sea area in the north, but there the beetles are rare, only a small quantity of them having been recorded from time to time in the southern part of Latvian SSR.

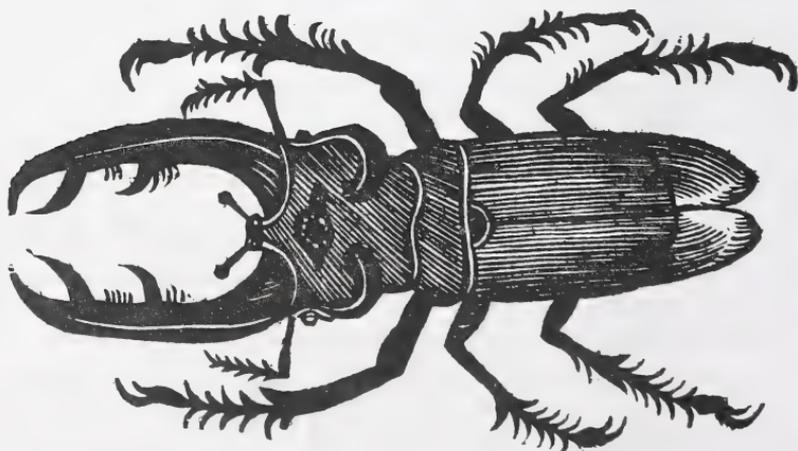
The typical biotope of this species are oak trees as has been noted in all the literature dealing with this species. The large size of *cervus*, whose large horns in the male resemble those of deer (hence the Russian name "deer-beetle") attracted the attention of naturalists many centuries ago. Indeed the essential knowledge about *cervus* is known from early times. The then very common *cervus* was known in early Rome. Gaius Plinius Secundus in his *Historiae Naturalis* wrote about them when he said that the big tree worms (larvae of *cervus*) were common and often collected by the Roman people from oak trees and were called "Cossi".

These worms were used as a delicacy at banquets being often coated first with flour. According to the writings of Teromina the big white worms with black heads were well known in the Pontian and Frigian areas (Black Sea basin and Balkan Peninsula). The inhabitants of these areas collected the larvae that lived in weak trees and the sale of larvae as a choice of food was very profitable.

The Stag beetle was first illustrated and described by Thomas Mouffet in his book *Insectorum sive Minimorum Animalium Theatrum* in 1634 (English translation, *Theatre of Insects*, 1658). Linnaeus later scientifically named this beetle as *cervus*. Alfred Brehm in his monumental work, *Brehm's Tierleben*, (10 volumes on Animal life) gave the known information about *cervus* to the end of the 19th century and noted this beetle as common throughout Europe and typical for oak trees habitats.

The larvae are largish, about the size of a finger, some 10.5 mm long and spend up to four years in trees especially those that are old, big and weak. The pupal stage occurs in the fifth year of life and is contained in a cocoon built by the larva from a mix of soil and tree remains and can be as large as a man's fist. This stage lasts at least half a year and emergence of the flying adults takes place in June and July and the longevity of the imagos is only some three to four weeks.

In the 19th century it was observed that immense swarms of Stag beetles sometimes occurred and once a large swarm of them was seen to fly into the Baltic Sea off the Lithuanian coast. Many flying swarms were observed in Germany by Kornelius in 1867 at Elberfeld, while Haaber observed the mass flying of *cervus* in 1862 and 1867 in the vicinity of Prague in Czekoslovakia. In 1863 a large quantity of adult beetles was observed near Sonderhausen around an old big oak tree. The many other insects also present included flies and species of hymenoptera such as Apidae species.



The Stag beetle illustrated in Mouffet

Since the last century many drastic changes have taken place in the environment. The number of oak trees and the area of wild forests where they occurred have become much smaller in many areas. Industrialisation has emitted many toxic chemical preparations that have polluted the environment. The active use of insecticides have caused the disappearance of many species of animals from previously recorded habitats. These actions may be dangerous for the entomofauna that



Stag beetles illustrated in Brehm.

need special attention for the preservation of some species. In a recent conference of the Society for the Protection of Mountain Insects held in Erevan it was reported that some colourful, well-known and previously common insects are now very restricted in numbers according to observations in urban and industrial areas of Europe and protection by special legislation which limits or forbids their collection etc. has become necessary. *L. cervus* is now protected by law in Germany and I believe in other countries also.

According to most entomological works the Stag beetle is common in USSR. Many entomologists have observed it in this area but only in small numbers with few actually observed and collected. For example, near Kiev in an extensive forest with oak trees, entomologists usually succeed in capturing from one to three imagos in a day.

Nevertheless some interesting observations have been made on large populations of *cervus* in some habitats. An unusual biotope was recently discovered by this author in Kiev — in the centre of an urban industrial city. The old part of Kiev contains a number of small individual old houses with gardens and narrow streets and roads. This quarter also contains many plants, old trees and vegetable, flower and fruit gardens that are very little polluted by toxic industrial chemical emanations or insecticides.

There are a number of tree species present: big old trees of akazia, apple, and especially many cherry trees, that are extremely attractive to the beetles. These trees are usually suitable hosts for this population of *cervus*. The flight time of the imagos is from the middle of June to the middle of July when it is possible to obtain no less than several hundred insects.

The adults fly on the nearest small streets of this old part of Kiev known as Goncharovka and which contains the Pokrov Cathedral. The observations on this population were made from 1974 and again, more thoroughly, in 1976. The population is relatively stable with little fluctuation in the quantity of insects.

The males commence flying at sundown and continue for 30-40 minutes after this moment. They fly from one tree to another and especially flying is concentrated near cherry trees.

In the daytime the beetles sit near trees or under their leaves. After about 11.00 o'clock in the evening, the flying activity begins to slow, becoming less and less intensive. The males begin to fly near one particular tree and then quickly sit on it, often then crawling from leaf to leaf. The flying beetles are most often observed in sunny warm and especially dry weather when the temperature is around 23-25°C. They are very sensitive to an increase of humidity which will stop the mass flying.

The imagos can remain active flyers even at lower temperatures than 20°C and especially in July and even less towards the end of the season.

The last records collected by the author in 1976 were on 26th July. After this time the beetles were not observed. A captive male from 26th July lived to 14th August in captivity! The females are less active than the males, seldom fly, and usually live on the tree leaves and are far more sedentary than the males to which they are very attractive. It is possible to observe no less than 2-4 males near one female actively fighting each other over her. Generally the number of males is greater than that of the females and may reach as much as about 5-6 males to one female.

During the flight time it is possible to observe 10-15 males for each female. The males at this time are more active and easier for observation than the smaller active females. However Haaber in the nineteenth century once collected to one female about 75 small males near Prague between 11.00 o'clock and midnight.

The males often attack each other when near a female on tree sap. This fighting is well known and has been shown in various illustrations and photos. The big horns of the males are very suitable for these acts. Usually the beetles fight more often in the evening and at night under the dim light then present and they also take advantage of the artificial illumination of streetlights. From this cause the photography of their activity is difficult, for they are inactive during the day when strong sunlight would make for easy photography. This negative phototropism of *cervus* is easy to observe.



The male Stag beetle illustrated by member Frank Marples.

The fights between males is seldom lethal. The male seizes his opponent's body by his horns and tries to throw him onto his back. In captivity, however, the quick death of males under the powerful trauma from the fighting is a common result of the beetles' community life. In captivity, the males show restless behaviour, seek each other out and begin to fight very quickly.

The reactions to females in captivity are less obvious. Egglaying has not been observed in captivity by the author. The female is but little active in a cage whereas the male begins his restless and chaotic trips in the cage from 21.00 o'clock to midnight. In a large insectarium the males have space in which to fly. This un-natural life and behaviour of captive males is caused by the need to search for females and whereas in the wild they live for three to four weeks, in captivity this is reduced to two to three weeks.

The larvae feed internally in trees, the imagos feed on the sap of the tree. In captivity they very easily begin to drink sugar solution in water or moistened berries. In the author's experience *cervus* can drink in captivity the sap of various fruits, boiled berries (strawberries, for example) either with or without added water and sugar. They will also accept a mixture of sugar, water, boiled berries, sap and extract of oak leaves and bark. They are very attracted to the clean concentrated water extract from boiled oak bark. They need and must have water and a humid atmosphere, for without water they die quickly within 5-7 days.

They need a relatively small quantity of food, less than 40-50 grains (3gms) per day. From the beginning of July is observed the active wandering of females that usually continues to the middle of July. The author has observed the females near big old trees of akazia and also near fruit trees. They begin wandering in the evening after it becomes dark. The eggs are about 2.25mm in size and oviposition occurs particularly in the bark of trees.

The natural enemies and pathology of *cervus* is little known. Sometimes the beetles die soon after emergence, but the cause is not known[®] may be a virus — Editor). Ants frequently quickly attack the weak small active beetles on the land. The beetles may also be used as food for birds. The Author has also collected mites from weak living and dead beetles. From one beetle it was possible to collect up to 19 mites. But the role of mites on beetles (parasites or not) is little known or understood.

In Kiev it was observed that a cat was regularly attracted by flying beetles. Each evening this cat would actively attack and pursue them. This active hunting for beetles included both eating them and jumping for flying beetles in the air. Many of the imagos are also killed in the

streets from cars and man. Also the children, particularly those aged between 10-13 years of age, actively hunt for beetles for they like playing with males and encourage and observe them fighting. The children select the males largest in size with as big horns as possible and have little interest in females or small sized males.

In the life of *cervus* can be noted the details — the typical habitat of *cervus* is oak trees, the beetle being specialised to this tree. But some atypical habitats for the species are also recorded. The Stag beetles have the ability to adapt to other trees. According to Alfred Brehm *cervus* is known in Italy from young ivy. According to Yornostaev in *Insects of USSR* (Moscow 1970), this species does, but not often, exist on some broadleaved trees other than oak, including birch.

The size of the Stag beetles in their Kiev atypical habitat is smaller than normal. For example the many males recorded have a size only about 40-43mm in body length and about 16-18mm in horn length. The female's size can be as large as 40mm, but the majority of the imagos are less than this. It is possible that overcrowding in the larval stage is responsible, but it may also be caused by the larvae feeding in trees other than oak and this is a problem in need of further research. The fact that they can survive in trees other than oak could be of great advantage to *cervus* for oaks are one of the tree species that are becoming fewer and fewer.

The species is now in need of conservation, particularly of its habitat and where there is already a strong colony. The forming of special microsantuaries of several hectares in size may be useful for effective conservation of natural habitats, not just for *cervus* but for other plants and insects of some areas.

The collecting of *cervus* from the beginning of July, especially males near the middle of July, is probably not endangering the population since the majority of the insects will by then have mated and eggs will have been laid. Of course the protection of *cervus* and other useful insects from insecticides and other venomous preparations is essential. The main aim should be the protection of the habitat and only occasionally will protection from any collecting also be necessary and the fact that this beetle can adapt to differences in environment can help to have a satisfactory future for this species in the urban and extremely industrial landscape of Europe.



A SMALL INFLUX OF THE LONG-TAILED BLUE *LAMPIDES BOETICUS* AT S'ALBUFERA NATURAL PARK, MALLORCA

by Nick Riddiford (9388)

I was interested to read in the AES December 1990 *Bulletin* of Long-tailed blue records in August 1990 at two localities in southern England. As part of an extensive ecological study at S'Albufera Natural Park, Mallorca, a butterfly census was carried out over a standard route on most suitable days of April and May in 1989 and again in 1990. In terms of species, the results were similar in both years.

However, no Long-tailed blues were recorded in 1989, nor were there any casual records of the species. On 11th May 1990 one was recorded in sector 1 of the census route but not during a census walk and, away from the route, two more were seen. Singles were recorded during census walks on 12th, 18th and 20th May, in sectors 1, 8 and 4 respectively. The first records coincided with a large influx to the Park predominantly involving Painted lady (*Cynthia cardui*). Winds were light-moderate E to SE (force 4 Beaufort) and observations at the coast indicated an arrival from those directions, suggesting a crossing from North Africa. Thousands of Painted ladies were involved in the movement on the 11th but, in addition, Red admirals (*Vanessa atalanta*) and Clouded yellows (*Colias croceus*) were considerably more abundant than usual. A series of observations coinciding with this influx, and the lack of previous records, suggested that the Long-tailed blues were also part of the immigration.

British occurrences are assumed mainly to involve migrants from the continent. The observations at S'Albufera may indicate that the 1990 British records had their roots in a movement northwards as early as May and from as far afield as Africa; and the influx to south-west Europe at the start of a dry, hot summer may have been the catalyst for continued population growth, inducing eventual migration as far north as southern England.

The butterfly studies were part of Earthwatch Europe's *Project S'Albufera*, a research programme monitoring for long-term environmental change.

PRACTICAL HINT — LARVA REARING

by Christopher Nissen (7002)

The larvae of the Small copper (*Lycaena phlaeas*) do not do well in glass-topped metal boxes, on account of the oxalic acid in the leaves of their usual foodplant, sorrel.

PRACTISING BIOLOGICAL CONTROL IN MY GREENHOUSE

by John Gale (9270)

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Last spring (1990) I erected a 10½ x 6½ lean-to greenhouse in my garden. In May it was planted up with six tomato plants, two cucumber plants, four pepper plants, two gourds and one Madagascan jasmine (*Stephanotis floribunda*).

Aphids were accidentally introduced with the tomato plants. When their numbers had increased (early June) biological control was attempted. This consisted of my going along to the nearest large nettle patch and collecting various insect predators and parasites. It is important to select a nettle patch that receives full sun, for the amount of sun on the nettles greatly affects the number of insects thereon.

I found numerous parasitised aphids, a few hoverflies and ladybird eggs and larvae, some small midge larvae (which at the time I believed to be the aphid predator *Aphidoletes aphidimyza*), many anthocorid bugs and unfortunately some thrips. All were placed in the greenhouse.

After this introduction of 50 - 100 parasitised aphids, I awaited results. Fortunately I had introduced the correct species of aphid parasite and the numbers of parasitised aphids increased and the aphid population decreased.

Unfortunately the aphid parasite was unable to control the aphids on the peppers and by mid-July the peppers were beginning to suffer. An abundance of ladybirds came to my rescue. In half-an-hour I was able to collect about 50 ladybirds which I placed in the greenhouse. Although eventually they all left through the vents, they ate most of the aphids first.

For the rest of the year I kept the aphids under control by placing in the greenhouse any aphid predators that I found in the garden (especially ladybird and hoverfly larvae and eggs, but also red velvet mites (*Allothrombium fuliginosum*), one or two lacewing larvae and adults, and any parasitised aphids).

Unfortunately (and inevitably), at some stage I introduced an aphid hyperparasite. The hyperparasite gradually reduced the number of aphid parasites in the greenhouse until there were nine left. By mid-October, aphid predators were becoming hard to find in the garden, and the population of aphids on the peppers was increasing.

I was hoping to introduce some parasitised mealy cabbage aphids (*Brevicoryne brassicae*). The parasite of this particular aphid is a parasitic wasp (*Diaeretiella rapae*) with a very wide host range and I was

hoping that it might be able to help out now that the hyperparasites had all died through lack of food. Unfortunately, there were insufficient mealy cabbage aphids on my brassicas! So by mid-December, when I used my last pepper (in a vegetable curry), the pepper plants were totally covered with black sooty mould and sticky honeydew. The few parasites from the parasitised mealy cabbage aphids that I had introduced, had been insufficient to control the aphids.

The first glasshouse whitefly (*Trialeurides vaporium*) appeared on my cucumbers in July. For a reason that I don't know, they never (well, hardly ever!) went onto the tomatoes. I waited for their numbers to build up a little and then attempted biological control.

The usual biological control for glasshouse whitefly is the use of the tropical parasite wasp (*Encarsia formosa*). This can be purchased from many commercial sources and is introduced in the form of parasitised whitefly scales.

However, as an experiment, I thought I would try using a very closely related British native parasite wasp — *E. tricolor*. This species parasitises cabbage whitefly (*Aleyrodes protella*). Cabbage whitefly and glasshouse whitefly are fairly closely related and so I hoped I might be able to induce *Encarsia* specimens from off my summer brassicas and my neighbour's autumn sprouts.

Several of those that I collected were not *E. tricolor*. I thought that perhaps they were another native *Encarsia* — *E. inaron*. Soon parasitised whitefly scales started appearing. It had worked. I collected some of the *Encarsia* wasps from the greenhouse and was surprised to see that none of them were *E. tricolor*.

These wasps are only 0.65mm long and so correct identification is not easy. I sent them to the Natural History Museum where they were identified as *E. formosa*!

Since the winters of '89 and '90 had been so mild, I suppose it is possible that some fugitives from commercial greenhouses may have overwintered and established a breeding population outdoors. The nearest commercial greenhouse is only about a quarter of a mile away and I don't know if they use *E. formosa*. Although the whitefly problem had been solved, it meant an end to experimenting with DIY whitefly biological control for 1990. Therefore I will try again this year (1991).

Sometime in late August I began to worry about the number of glasshouse red spider mite (*Tetranychus urticae*). They were beginning badly to mottle the cucumber leaves.

When inspecting the situation (with a magnifying glass) to see whether I was going to be forced to purchase some red spider mite predators (a

foreign predatory mite, *Phytoseivlus persimilus*), I noticed that there were dozens of tiny larvae crawling in amongst the red spider mites and eating them. I did not know what these were, but they appeared to be the small pink/orange larvae that I had introduced in the spring believing that they were aphid predators (the aphidophagous gall midge, *Aphidoletes aphidimyza*). I spent some time looking among the leaves and eventually discovered tiny little cecidomyid midges flying around. They fitted the description of midges that are predatory on aphids, but I also found their cocoons — and these did not. They lay along leaf veins on the underside of the cucumber leaves. I sent them to the Natural History Museum and they were identified as *Therodiplosis persicae*. This is a native midge that feeds on red spider mite, and since the specific zoological name of glasshouse red spider mite is *urticae* and the generic botanical name of nettles is *Urtica*, I assume that the larvae that I had introduced into the greenhouse in the spring were possibly these! I would be grateful if anyone could let me know details of the natural history of *T. persicae*.

Once I knew that the spider mite problem was being seen to, I was able to ignore the leaf blotching.

The next problem in the greenhouse was the woodlice. I had ignored them because I had considered them to be harmless, but there were so many that they were beginning to run short of food. They started eating the lower leaves on the paper plants and the gourds and they adored young cucumbers. I took two courses of action, I am not sure which one did the trick, but the number was drastically reduced and damage to the plants halted. I put down a 1.5 inch thick layer of rotted manure and compost (hoping to feed both the plants and the woodlice) and also put a couple of toads in the greenhouse. As well as eating the woodlice, they also ate the violet ground beetle that I had put in the greenhouse to eat any slugs that might appear.

In September I noticed that a lot of the leaves of the gourd had taken on a silvered appearance. These later withered and dropped off. Reference to 'Collins Guide to Pest, Diseases & Disorders of Garden Plants' suggested thrips and an inspection with my trusty magnifying glass revealed hundreds of them. I decided it was too late in the season to do anything, but I have been told that it is possible to buy thrip predators, although as far as I am aware, these are not native. I would prefer to use native thrip parasite/predators from my nettle patch. Can anyone give guidance as to what might be suitable predators or how to find parasitized thrips?

I suspect that the information might not be necessary. If enough nettle leaves are introduced into the greenhouse, it seems as if everything is there already.

BOOK REVIEW

Stick-Insects of Europe and the Mediterranean by Paul Brock. Pp.50, 1 coloured and very many black and white illustrations. Oblong A4, Ringbound. ISBN 0 9510939 83. Fitzgerald Publishing, London. 1991. Price £10.00 from Publisher; £15.00 bookshops.

Paul Brock has a great deal of experience with European phasmids and has produced several previous publications on different aspects of stick insects including the well known Phasmid Rearer's Handbook. My overall impression of this latest publication is that it is essentially a good book which is blemished by poor presentation. The front cover has a small colour illustration which is obviously printed sideways. The back cover is a colour photograph of one of the British species; this one is the correct way up. A quick flick through the book immediately impressed me by the number of illustrations. In fact there are over 200 illustrations but only one colour plate inside, the same as the back cover illustration. Most of the illustrations have been produced by the editor, not by the author.

The pages are A4 sized, hinged at the narrow edge. While this allows large illustrations and maps, it makes the book both difficult to fit onto a bookshelf and impracticable as a field guide. The ringbinding means that unless you are careful it will tend to damage the covers of adjacent books and in addition I feel it detracts from the outward appearance of the book. I find the size somewhat inconvenient to read — when open it is two feet wide, and would have preferred the book to be produced in a more conventional format.

The numerous drawings of foodplants vary in quality and several are duplicated such as the drawing of bramble which appears on pages 11, 19 and 43. The few photographs of foodplants are much more informative and more interesting where they also include the phasmid which feeds on them. Considering there are few photographs of foodplants I was surprised to see two similar photographs depicting *Pistacia lentiscus*, neither with stick insects on them. I feel most of the drawings of foodplants should have been omitted; better illustrations can usually be found in many of the numerous basic guides to plants which are readily available.

The text is laid out in two columns throughout the book and, although tables of data are not boxed in, the text is generally clearly distinguished from the tables and illustrations. There are a large number of hyphens used at the ends of lines — in one place I found a sequence of five lines which terminated in a hyphen. This makes for difficult reading and is surely unnecessary. Good use has been made of emphasised text throughout the book and, apart from the cramped looking contents list and index, it gives an impression of having a spacious layout.

The introduction gives some general information about phasmids and then goes on to outline the scope of the book. This is followed by illustrations of the external anatomy of a stick insect; although the male is labelled, it is not clear which species is represented by the drawings of the female. Throughout the book the drawings of the phasmids and their eggs are generally of good quality and size, although some are shaded in a rather unorthodox manner. Sadly however, there are a number of poor points and factual errors in some of the drawings. Lines or arrows should have been used to connect labels with the parts to which they refer, for example on page four, the labels of the micropyle and micropylar cup on the egg of *Ramulus libanicus*, although correctly placed, are not clearly attached to any particular part of the drawing.

The section "Eggs: Taxonomic tool", which begins on page four, introduces the standard terminology for egg descriptions but without crediting them to J.J. Clark's 1976 paper *The eggs of stick insects (Phasmidae): a review with descriptions of the eggs of eleven species*, published in Volume 1 of *Systematic Entomology*, which is also omitted from the bibliography at the end of the book. In this section the capsule and operculum are wrongly labelled on the eggs of *Bacillus rossius*. I have spoken to the author and understand that this, and a number of other mistakes, were corrected by him at the proof stage but the corrections were not transferred to the final copy by the publishers. The following two pages are taken up with illustrations of eggs and a Table of sizes. Although some of them are readily available, the heights of eggs of five species are listed in the table as "not stated".

The next section gives instructions on rearing European phasmids before going on to describe habitats where the author has personally caught the various genera. There are several sketches of habitats which I feel do little to enhance the book and would be better if replaced with photographs; habitat photographs are used in two cases later on and give a very good impression of the areas.

The key to suborders, families, and genera is in a section which has the same title as the book. The key is short but assumes that you understand such terms as *carina* and *dorsobasally serrated*, neither of which are illustrated and the latter does not appear in the glossary. This will be a disadvantage to anyone who is new to entomology or unfamiliar with the terminology. There is a key to the three British species but not to the species from the rest of Europe. The number of illustrations in the book should however enable species to be identified quite easily without reference to a key.

The book then moves on to the main section which deals with each genus in turn. Each species is described and illustrated to aid identification. Interestingly there is also mention of names for some, as

yet, undescribed species. There is a distribution map for each genus, each showing the distribution of the individual species. The drawings could be improved by having some form of scale on them to avoid the need to refer to the text for sizes. This, the largest, section of the book contains a huge quantity of distribution data for each species, much of which is previously unpublished. Each area where a species is known to occur is referenced with the source of the record. This section on its own makes the book an essential addition to anyone interested in European phasmids — clearly an immense amount of time has gone into compiling this data.

Page forty-six has a brief note on the few known parasites of European species and includes illustrations of one species. This is followed by a rather limited glossary which includes common words such as dorsal and posterior but omits karotype, a word which is frequently used in the text. The bibliography is extensive, including over 100 publications. The book finishes with the addresses of phasmid societies and an index which could have been improved by being extended and by being laid out differently.

Although slightly marred by the quality of production, the book is a comprehensive and long overdue reference book which is an essential addition to the library of anyone interested in European phasmids. It should also prove to be a popular book amongst the non-specialists as it is written in a very readable style and provides excellent data on where to go and how to find stick insects when on a Mediterranean holiday. It is good value at £15.00 from a bookshop and better still direct from the publisher at £10.00.

P.E. Bragg

BOOK REVIEW

Insects of the British cow-dung community by Peter Skidmore. Pp.166, 377 Figs 8vo (card cover). An AIDGAP guide. ISBN 1 85153 821 6. Field Studies Council, Shrewsbury 1991. Price £8.25.

Dung, to most entomologists, may not seem that interesting, or even off-putting, but there is a complete fauna and flora to a cowpat, from tiny mites to large beetles and fungi, and if due care and attention is taken there should be no worries about catching a bug from the dung.

The sections covered are preparation of material, keys to the organisms and the cow dung community and its role in the nutrient cycle in pastures.

There is a key to all of the major groups of organisms inhabiting dung, including insects, plant seeds and fungi. There are keys to all the insect families, and with some of the major families to species. Larvae and adults are covered for most groups of insects.

NON-INSECT FAUNA ASSOCIATED WITH SUGAR BAITED TREES

by Thomas Seabolt

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In regards to S. L. Patel's article (*Bulletin* 50:3), she discusses the question of the appearance of non-insect visitors to her sugar-baited trees used for the evening collection of moths. I have had some similar interesting observations that I will relate here.

During the period of 10th August through 25th August, 1983 I conducted a mark recapture study at Mille Lacs Wildlife Management Area in central Minnesota designed to use sugar bait for the capture and investigation of a pair of *Catocala* species, *Amphipyra pyraidoides* Guenee and *Pseudaletia unipuncta* Haworth (Seabolt 1990). It was observed that a few of the ten regularly baited trees would on occasion accommodate variously one, two or three Eastern gray treefrogs *Hyla versicolor* Le Conte (Vogt 1981). It was on only the third or fourth night of the study that these amphibians first made their appearance. At bait tree number 3 two to three treefrogs perched nightly adjacent to the sugared area of the tree for most of the remainder of the study which lasted for twelve more days. Other instances of appearance at other baited trees by treefrogs were irregular and less frequent. (Fig. 1).

The following year at the same location Ms. Susan J. Andres and myself were conducting similar studies simultaneously in adjacent woodlots. Although this work was conducted for a much longer period than that of the previous year (from the first week of August through early November) there was a dearth of treefrogs detected this particular season. Needless to say the investigations did not proceed without incident. This year our competitors for the moths were flying squirrels of the genus *Glaucomys* (Hazard 1982). Both the Southern Flying Squirrel *G. volans* and the Northern Flying Squirrel *G. sabrinus* are resident in Minnesota. Because Mille Lacs WMA lies on the approximate border between the two ranges and observations were relatively short termed it was difficult to specifically define which of the two species was occurring at our baited trees. Instances of observation were infrequent and generally involved spotting the animal on the tree adjacent to the bait. Notably though on 12th September Ms Andres encountered a situation where after having snared a moth in her capture jar a flying squirrel glided down to the jar with the fluttering specimen inside apparently attracted to the possibility of a potential meal while ignoring Ms. Adres until the last moment. It then proceeded to make a quick escape (see also illustration by Andres 1988). A single instance of similarity had occurred during the previous years study where I had trapped an excited moth



Fig. 1. The Gray treefrogs *Hyla versicolor* sit next to sugared bait tree at Mille Lacs Wildlife Management Area in central Minnesota, USA (Aug. 23, 1983). Photo by Brian Gulden.

against a tree trunk with my capture jar. This attracted a flying squirrel which sailed down over my shoulder and landed on the tree just above the jar. Realising my proximity the animal chose to direct itself up the trunk of the tree.

During the late summer of 1988, while conducting further mark recapture studies at Crow Hassan Park Reserve in north-west Hennepin county, central Minnesota, I discovered that a particular one of my baited trees would yield a number of roughly torn and generally or nearly scaleless moth wings at the base of its trunk. On 11th September a White-footed Mouse *Peromyscus leucopus* was observed to be patrolling the baited surface of the tree. This animal was captured using a sample jar and displaced to another part of the woods. This instance is one of several that occurred over the years of sampling in which unidentified species of the genus *Peromyscus* and/or other small rodents were spotted in the area of regularly sugar-baited trees.

In each case related here it appears that it was not the bait but the presence of the moths that attracted these predators. There also appears to be some acclimatisation of these higher order animals to the situation of repeated baiting at the same location. This is not unusual in that wildlife characteristically adjusts to situations that provide easy opportunity for nourishment as in the case of the moths themselves by their appearance at the bait. It is nonetheless interesting to observe the simple food chains that are constructed over time around the sugar baited trees.

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HOLLY BLUE LAYING ON FIRETHORN

by Trevor Peach (9377)

While watching Holly blue butterflies (*Celastrina argiolus*), of which there seems to have been quite an emergence of the spring brood this year, I noticed that they were quite fond of the flower buds of firethorn (*Pyracantha atalantioides*) and on close inspection I found that the females were laying eggs on the undersides of the buds of this evergreen shrub, which was growing on a south-facing fence.

REPORT OF, AND EXHIBITORS AT, THE 1990 ANNUAL EXHIBITION

by Roy McCormick (3375)

The third Exhibition at Kempton Park started grey, cloudy and cold; thankfully the rain held off. A good queue formed early despite the weather, and a total of 1,200 people paid to enter, not the usual numbers that we expect. As the entrance was at the far end this year, we were unable to let people shelter.

Sixty-eight stands were booked this year, eight of which had other Natural History societies and AES Groups manning them. Legislation is still on the increase, but dealers were able to display bred stock of the restricted species providing they had a declaration to this effect; licences had to be obtained for the "Wildlife and Countryside Act" species.

The individual members' exhibits were up — a very welcome sight; 45 spaces were booked and I believe taken up, which makes a remarkable increase in exhibits; response was so good that we had to assemble more tables to cope with the unexpected increase. I do hope that I have all of your reports as I cannot emphasise more strongly that a report is essential to a write-up of your exhibits in the *Bulletin*. *Keep up the good work and bring your exhibits — this is what YOUR EXHIBITION needs.*

In the afternoon a new member, Linda Barnett, gave a talk accompanied by photographs of her travels in Malaysia, and the "Exotic Entomology Group" had meetings, with talks, by various speakers throughout the morning; these events were held in the "Winners Bar", our Special Events room.

The old chestnut of catering reared its ugly head again, marring an otherwise successful day; hopefully this will be sorted out for 1991, as I have written to the caterers and I have a promise from them that all facilities will be open for this year, with hot lunches a priority.

I would like to thank all members who gave their free time to help with setting up on the previous day, and assistance on the day. The job of organiser could not be done without this valuable free labour.

A list of Exhibitors follows:—

Linda Barnett (9360)

Photographs of butterflies encountered on her travels around America (North and Central), Australia, Indonesia and Malaysia. This was shown in the Winners Bar and was accompanied by a talk on the subject.

Dr C. Betts (4976)

A display concerning the Royal Entomological Society's "Young Entomologists Scheme". This is based at the University of Exeter, Devon, and aims to

Phil Bragg (8737)

Phasmids from Borneo with projections of these insects onto a daylight screen.

S. Button (7649)

Wild caught British butterfly aberrations from 1990.

T. Carter (6178)

Variations of butterflies taken from his garden, including Red admiral var. *klemensiewiczzi*; Small tortoiseshell, (three vars.), and a Painted lady var., all taken on buddleia with normal butterflies for comparison. Other species exhibited were Silver-spotted skipper var. *centripuncta* from Oxfordshire; Wall butterfly var. from Witham Bank, Boston; Gatekeeper var. *multiocellata* and var. *albinotica* from Boston Dock; Large heath vars. Female ab. *cockaynei* and male with large spotting on hindwing and Red admiral female with left hindwing band a gold colour. Most of these had normal specimens for comparison.

M.E. Castle (2490) and Mrs J.E. Mulvaney (8648)

Various Mygal spiders plus photographs of a holiday in the forests of Ecuador in 1989, with further pictures of Mygal spiders and butterflies; also exhibited were examples of butterflies taken in Ecuador.

Graham Collins (1036)

Aberrations of British moths taken in 1990; Silver Y (*A. gamma* L.), melanic aberration from S. Croydon, and Canary-shouldered thorn (*E. alniaria* L.) lacking transverse fasciae taken from Banstead. This last specimen exhibited on behalf of S. W. Gale.

D.R. Copestake (8471)

Specimens of Coleoptera.

P.A Cordell (8782)

Macrolepidoptera taken or bred during 1989/90 including a specimen of *M. loreyi* Dup., Cosmopolitan, bred from a larva taken at Frinton, Sussex; *Z. trifollii palustrella* Verity, ab. *lutescens*, Five-spot burnet taken from the North Downs; specimens thought to be *Z. trifollii decreta* Verity, Marsh, five-spot burnet, but subsequently identified as *Z. lonicerae* Verity, Narrow-bordered five-spot burnet by W.G. Tremewan; these came from Walberswick, Suffolk; a melanic form of *T. luctuosa* Hüb., Satin lutestring from Hamstreet, Kent; *S. lubricepeda* L., White ermine with extra black marking along terminal fascia, from Nutfield, Sussex. Plus several other specimens from Walberswick and Nutfield. Also shown was a case of preserved British macrolepidoptera larvae showing the results of a process described in Worthington-Stuart's *Collecting and Breeding Butterflies and Moths* (Wayside and Woodland series, F. Warne & Co Ltd, 1951).

Colin Drage (8644)

A selection of small and aberrant butterflies bred or captured in 1990.

Des Fox (7831)

A frame of *P. icarus* Rott. Common blue, ten of which were normal females compared with ten female var. *mariscolore* from various localities in Ireland. A frame of *H. semele* L., Grayling var. *hibernica* and var. *clarensis* and two pairs of *A. aglaja* L., Dark green fritillary var. *scotica* from the Burren, Co. Clare.

B.O.C. Gardiner (225)

A selection of Large white butterflies *P. brassicae* L. showing some of the variation that has occurred from breeding the species for 40 years with examples from England, Sweden, Germany, Italy, Syria, Libya, Morocco, Azores, Canary Islands, Nepal and Chile, which shows the variation in this species that occurs within its distribution area.

C.J. Gardiner (5249)

Remnants from the collection of the late G.S. Kloet, including Hymenoptera, Coleoptera and Microlepidoptera discovered for sale in a secondhand record shop in Stockport.

Nigel Gosling (5169)

A display of photographs and notes on observations of a colony of Clouded yellow butterflies found in the Battle, East Sussex area in August and early September 1990.

Norman Hall (7859)

Macro moths on the British list captured in Europe.

Andrew Halstead (6346)

Twelve months' collecting of Picture-wing flies *Tephritidae*, which has produced 34 ssp. out of the British list of 73 ssp. Most of the specimens were taken in 1990 but collecting started in August 1989. These flies normally develop as larvae in the seed heads of Compositae. Some however, have leaf mining larvae such as *E. heracleii* on Umbellifers, and *A. cognata* on coltsfoot. *S. wiedemanni* develops in the fruit of white briony, while those of *A. purmunda* feed in hawthorn berries. Some species attack the stems of plants and an example is *D. guttulans* which feeds in galls formed at the base of yarrow stems; *U. cardui* causes galls to form near the tops of creeping thistle. The more interesting specimens shown were *U. cuspidata* Mg., from Royston, Herts, and *I. westermanii* Mg., from Guildford, Surrey.

Colin Hart (3845)

Migrant lepidoptera caught at MV light at Gillan Creek, Falmouth, Cornwall in the first week of October 1990. The species seen were *R. sacraria* L., *O. obstipata* Fabr., *U. pulchella* L., two specimens were captured; *M. vitellina* Hb., *M. unipuncta* Haw., four were seen; *S. exigua* Hb., *H. amigera* D. & S., one female captured and *H. peltigera* D. & S. one captured. Interesting species caught at MV at Buckland, Surrey were *U. pulchella* L. one on 5.10.91; *M.*

tillae, the first red specimen seen in the area and an *O. lunosa* Haw. with dark basal area to the forewings.

P.J. Hodge (5335)

A selection of Coleoptera and Hemiptera-Heteroptera taken in southern England, mostly during 1990; among the Coleoptera were 11 vice-county records including *A. flavicollis* Sturm, from Hastings, E. Sussex; *T. coarctata* Er., from Woolbeding, W. Sussex; *B. fasciatus* Forst., from Rye, E. Sussex; *P. lichenum* Marsh, from Guildford, E. Sussex; *A. voicinum* Kirby, from Coldwaltham, W. Sussex and *C. viduatus* Gyll., from Bury, W. Sussex. There were eight other specimens shown.

Among the Hemiptera-Heteroptera was one new county record, *C. wagneri* Rename, from three localities, and a species that has only been seen once before, *P. seladonicus* Fall. from Beddingham, E. Sussex. A specimen of *I. quadratus* Fieb., from Dover, Kent, was also shown.

Victor Howard (3871)

Some examples of mimicry among insects.

Gareth King (8585)

A selected series of moths caught in Central Spain in 1989/90, including Noctuids, Geometrids, Lasiocampids and Arctiidae. Also shown was a map of the province of Madrid, showing the most productive sites for the author. Larvae of *T. herculeana* feeding on *Helianthemum* from Madrid; *P. srigillaria* from Orduna and *I. aversata* from W. London were also exhibited.

Guy Knight (8040J)

Specimens, photographs and notes featuring Diptera.

Robin James (5005)

A selection of *Pieris napi brioniae* specimens including those of the summer brood. This species is normally univoltine and a second summer generation is most unusual. Included in the exhibit were a couple of *P. napi* aberrations, *funebria* and *restricta*.

Mark Johnston (3464)

Fossil insects.

Basil MacNulty (4528)

Microlepidoptera from the Gower Peninsula.

Roy McCormick (3375) and Colin Penney (3880)

Exhibits of varieties and oddities taken over many years, including *L. sinapis* L., Wood white, ab. *brunneomaculata*; *A. paphia* L. Silver-washed fritillary, ab. *valesina*; *E. epiphron* Knoch, Mountain ringlet, ab. *caece*; *T. fluctuosa* Hb., Satin lutestring, Scottish form; *P. albulata* D. & S., Grass rivulet with narrow banding on forewing; *L. populi* L., Poplar hawk, a pink form; *S. lubricepeda* L., White ermine, a heavily striated form; *S. luteum* Hufn., Buff

ermine, ab. *zatima* and *O. gothica* L. Hebrew character, a Scottish form with no black markings.

Roger Morris (7558)

The Hoverfly recording scheme showing a case of representative species of Hoverfly.

Steven Nash (7088)

Microlepidoptera.

D.A. Oram (7127)

Insects from the Falkland Islands showing three exhibition cases covering the wide range of insects from the island. Specimens exhibited included the second record of *A. cingulata* Fab. This hawkmoth is similar to our *Convolvulus* hawks and has a similar migratory habit. The moth is found throughout the Americas and is the only hawk to visit the island. *I. cytheris cytheris* Drury, Queen of Falklands fritillary, is the only resident butterfly and is sexually dimorphic, a male and female with undersides were shown. Six other orders were exhibited; these included two Coleoptera, *M. blanda* Dejean, Metallic beetle and *M. compressiventris* Enderlein, a weevil. One Diptera *S. octomaculatus* Walker. A Hoverfly, one Orthoptera, *P. falklandicus* Enderlein. Camel cricket. Two Hymenoptera, *A. occidentalis* Morley and *T. penai* Porter, both Ichneumon flies. A photograph of *S. vallentini* Hogg. This is one of the harvestmen and *A. opiliones* which was found near the shoreline in W. Falkland and was identified by P. Hilliard; this specimen is with the Natural History Museum.

Joe Parker (9002J)

Dictpyoptera and information comparing both Mantids and Cockroaches.

John Payne (5923)

British butterflies including *A. urticae*, L., Small tortoiseshell, a specimen from a wild collected web; *I. io* L., the Peacock, second brood specimens from temperature experiments; ab. *prochnovi* Pronin. and ab. *belisaia* Oberthur were the result.

A.J. and C.T. Pickles (5225)

British Macrolepidoptera. Nine species were exhibited, included in these were *T. fimbrialis* Scop. Sussex emerald, bred from larvae from Dungeness, Kent; *S. nigropunctata* Hufn., Sub-angled wave from Folkestone, Kent; *I. dilutaria* Hübn., Silky wave, bred from larvae from Gt. Orme, Caernarvonshire; *A. euphorbiae myricae* Guen., Sweet gale, bred from Newtonmore, Inverness and compared with wild caught ones from The Burren, Co. Clare. The latter are slightly smaller and more contrasted. *D.oo* L., Heart-moth from Ashtead, Surrey and *G. borelii lunata* Freyer, Fishers estuirine from Essex. These were bred from eggs and the larvae were started on celeriac root, but after reaching half size they refused this and had to be transferred to carrot.

Richard Revels (3942)

A display of photographs illustrating a variety of insects, with some pictures of landscapes. These photos are part of a vast library of wildlife pictures that are available to publishers in the Richard Revels Photo Library.

P.J.C. Russell (8977)

Yugoslavian butterflies of which some seventy species were shown in four cases. Among these were the very local *S. tessellum*, a Hesperiid; *E. charlonia* and *A. gruneri* from the Pieridae; *M. phoebe*, a lightly marked example and *M. didyma*, both Nymphalidae; *C. pamphilus* which tended towards ssp. *thyrasis*, this specimen from the family Satyridae. The Lycaenidae were well represented and included *C. osiris*, *S. orion*, *L. argyrognomon* and a very early example of *A. anteros*.

Malcolm Simpson (4859)

A selection of old catalogues and price lists including the London dealers Janson (1938 and 1939), Watkins and Doncaster, spanning 30 years from 1939 to 1968, and W.F.H. Rosenberg, date unknown. Also shown was a collection of price lists from lesser known dealers. This was all part of a collection assembled over a period of 15 years.

Bernard Skinner (2470)

Two drawers and two cases of set British Macrolepidoptera which included aberrations of *S. luctuata*, White-banded carpet from Hamstreet, Kent, *L. aversata*, Riband wave, from Hamstreet, Kent; *E. nymphaea*, Brown china-mark, from Dungeness, Kent and *A. tristella* from Addington, Surrey.

Ian Stacey (7653)

British Rhopalocera.

St Ivo School (2941)

The usual mixed bag of livestock from this forward looking school where natural history takes a precedence. The only trouble is telling the wildlife apart from the pupils.

David Stokes (7630)

A series of Duke of Burgundy fritillary aberrations with the white ground colour known as *leucodes* Lamb. They were all caught in different years at the same locality.

Alan Stubbs (6481)

A method of monitoring garden Hoverflies. The results of using an adaptation of the BTO/BASF Garden Bird Monitoring method, showing with histograms the seasonal pattern of hoverfly species and numbers in a garden in Peterborough.

Dr Raymond Thompson (9301)

Video films made by Raymond Thompson and Kay Medlock of emerging Dragonflies; *G. vulgattissimus* and *S. striolalum* where shown along with the

life cycle of Ladybird, *Zygoptuna*; also on show was literature on The British Dragonfly Society.

David Veevers (8910J)

Insects and Crustaceans kept in the course of his hobby, along with models and photographs made and taken by himself.

WINNER OF THE SIR ERIC ANSORGE AWARD.

David Wareham (9370)

An exhibit to show the results of work carried out over the past five years to study Glow-worms on a 2½ acre compartment of Fentmell Down, a Dorset Naturalist Trust Reserve. Studies to date have been centred on recording insect numbers and life patterns with a view to ascertain rates and sex ratios. Coupled with this is an effort to determine better management of the area and all associated flora and fauna.

Paul Waring (4220)

British Macrolepidoptera. Exhibited were two specimens of the Butterbur *H. petasitis* Doubl. with a series of photographs taken during a search for this widespread but easily overlooked species. Also exhibited were photographs showing this year's work on protected species including the New Forest burnet, *Z. viciae argyllensis* Trem.; the Reddish buff, *A. caliginosa* Hübn., the Barberry carpet, *P. berberata* D. & S.; the Essex emerald, *T. smaragdaria maritima* Prout, and the ongoing studies of the Black-veined moth, *S. lineata* Scop. No Vipers burgloss, *H. irregularis* Hufn. were reported during 1990.

Alex Weir and Ken Smith, The Cleveland Industry and Nature Conservation Society.

Studies of the Coleoptera on the ICI site at Brinefields, Cleveland.

David Young (5547)

British Macrolepidoptera caught or bred during 1990 including *H. lineata livornica* Esp., Striped hawk from Studland, Dorset; *T. fimbrialis* Scop., Sussex emerald, bred from larvae, Dungeness, Kent; *S. nigropunctata* Hufn., Sub-angled wave, from Folkestone, Kent; *A. melanopa* Thunb., Broad-bordered white underwing, from Aviemore, Inverness-shire; *X. alpicola alpina* H. & W., Northern dart, bred from pupae, from Aviemore, Inverness-shire and *C. palaemon* Pallas, Chequered skipper, from Loch Arlaig, W. Inverness-shire.

The compiler of these notes is not responsible for errors or claims made by the exhibitors. However, an effort has been made to be as accurate as possible.

PRACTICAL HINT — ALTERNATIVE FOODPLANT

by *Christopher Nissen (7002)*

The larvae of Mullein moth, *Cucullia verbasci*, will also feed on lilac. (Editor's note: I have also fed it on *Buddleia*.)

BOOK REVIEWS

Die Bombyces und Sphinges der Westpalaearktis (Insecta, L. Lepidoptera) by Josef de Freina and Thomas J. Witt. A comprehensive, richly illustrated book for the identification of European and North-west African moths. Volume 2: Cossoidea: Cossidae, Limacodidae, Megalopygidae; Hepialoidea: Hepialidae; Pyraloidea; Thyrididae; Zygaenoidea; Epipuroipidae, Heterogynidae. Pp.140, 14 coloured plates, 52 text illustrations, 57 distribution maps and other illustrations. A4. Hardback in artleather, protective cover. ISBN 3 926285 02 8. Munich (Edition Research and Science) 1990. Price DM 198.00 (about £70).

Three years after the appearance of the first volume (reviewed *Nachrichten des entomologischen Vereins Apollo* 10: 178-182 and *Bulletin* 46: 212) the second volume has now appeared. It is far thinner in size (198 as opposed to 708 pages) but less "painful" in price (198 against 460 DM) even though this leads to a less favourable price per page. Complaints from potential readers about the inflated introductory price (adequate indeed for printing costs but another matter for the buyers) contributed to the authors' decision to publish the work on the other families in three volumes, not in one as was originally announced. In the introduction, the authors mention a gain in topicality as another advantage, because the preparation of the combined volume would have necessitated a long delay in preparing and collecting together the manuscripts dealing with the various sections.

The book follows the same construction as the first volume. The "Bombycological Feuilleton" with photographs of dead and living entomologists interested in the "bombyces". It is unfortunate that genuine mistakes which appeared in the first volume are carried on, an example being the maintenance of the tertiary nomenclature (monotypic species have by definition no subspecific names!). As in the first volume, Asia Minor, which belongs to the West Palaeartic, has not been included — there being nothing to add to our wish in our 1989 review that the bombycid fauna of Asia Minor should be represented in a separate column.

The colour plates have again been produced in the accustomed superb quality and are the most valuable ingredient of the new volume. Finally, this is a work in which all the species dealt with have been illustrated in many variations, in colours true to nature. For example, those of North Africa and the Scandinavian areas, which are so little known to us, are both illustrated. It would have been useful, however, if small species, here reproduced natural size, had been enlarged. For example, in the Epipyropidae, the only holotype illustrated is absolutely without significance as it is far too small, as are some Thyrididae and

Heterogynidae. Many details are lost as these insects are very small and details of delineation are simply lost in the printing. Enlargements would seem to be urgently needed in later volumes, let us say for the small Sesiidae and similar species.

The authors have again "cleaned up" the nomenclature in a reliable way. In many cases they have critically revised and condensed the unbelievable abundance of described taxa. I cannot judge how correctly they have acted and, as experience shows, experts will long continue to discuss in controversy many a taxonomic proposal.

Unfortunately a printing mistake occurred during production of this volume. In the list of contents "Corrigenda to Volume 1" is mentioned as being on page 143, but the volume ends on page 140. As one of the authors told me, the printers simply forgot the corrigenda. A short list of printing errors is provided as a stick-in sheet for Volume 1. In this a significant error has been omitted: for Volume 1, a communication from a Swedish colleague was unfortunately not checked. While studying the 10th edition of "Systema Naturae" by Linnaeus he copied "*cribaria*" instead of "*cribraria*" for the small Arctiid (Vol. 1, 108). This was accepted by the authors unchecked. Here it may be pointed out that the correct name is in fact *cribraria* (with "r" appearing three times).

In the review of Volume 1 I made some comments about the authors' views on systematics. Something may also be noted relative to the second volume: the modern phylogenetic way of thinking is not for the authors. Although one may regret this, it is however, a pardonable lack in a general reference work!

It is always easy for a critic to find errors in a completed, printed work. Only he who publishes nothing makes no mistakes, and it is always easier to pick out weak points than to praise what is good. Thus, as a resumé, it remains to confirm that there is no alternative to this noteworthy book; it is the best on this theme on the market. As a general reference work on West Palaearctic bombyces the volumes are indispensable, and those who work seriously on palaearctic heterocera cannot do without it. All-in-all, a very recommendable book!

Wolfgang A. Nässig

Translated by Jamieson C. Little (8460), and approved by Hr. Nässig. Reprinted with permission from Nachrichten des entomologischen Vereins Apollo 12: 87-88.

A field guide to butterflies and moths of Britain and Europe by H. Reichholf-Riehm, translated from the German with adaptations by J. Thompson and B. Goater. 287pp, paperback. 579 colour photographs and line illustrations. Crowood Press 1991. Price £8.99.

Yet another book on European butterflies and moths, in a format similar

to the Audubon Society's Guides of North America, this uses photographs of the insects as illustrations, supplemented with line drawings of larvae, etc. The photographs are a mix of live and set specimens and are of excellent quality. The text describes briefly the adult insect, habitat, distribution and status, flight period, life-cycle and foodplants. With such a wide coverage, which includes some of the "microlepidoptera", representative species only are described without any description of closely related or similar species, so that it has limited use for the serious lepidopterist, being more appropriate for the interested observer/photographer.

Identifying lepidoptera from photographs is hazardous, particularly when one needs to be able to examine both upper and undersides, or, in some cases, the genital structures. Using this book could lead to many misidentifications: for example, only *Eurodryas maturna* is pictured, an upperside female, easily confused with *E. aurinia*, *E. intermedia* or *E. Cynthia*. None of the genus *Mellicta* is figured and the only *Coenonympha* are *C. pamphilus* and *C. hero*. Most Blues are shown with the upperside only and the only *Pyrgus* is *P. malvae*.

The sketches of the larvae, where no colour is introduced, are not very useful and there are one or two minor errors. On page 274 is portrayed the larva of Berger's clouded yellow with the caption "Pale Clouded yellow" and on page 126 there is a transposition of plates and the larva of the Broad-bordered beehawk is placed with the text for the Oleander hawkmoth. Some of the distribution comments are misleading viz. *Zerynthia polyxena*, the Southern festoon, is not restricted to valleys in the Southern Alps as it is quite abundant in areas of the Balkans down into Greece and in the Mediterranean littoral up to the Department of Var. Also *Apatura iris* is found in Southern Europe if you include North Spain and North Italy in that area. There is a useful appendix giving information on wildlife legislation and the addresses of societies, etc, and a brief bibliography.

The book is extremely well produced, printed, alas, in Singapore.

PWC

British Sawflies: a key to the adults of genera occurring in Britain by Adam Wright. 64 pp, line drawings. AIDGAP Series No. 203. ISBN 1 85153 203 X. Field Studies Council, 1990, paperback. Price £4.25.

This is the latest of the very practical identification guides published by the Field Studies Council, earlier insect keys having dealt with Water Beetles, Diptera, Coleoptera, Bees, Ants and Wasps. The Sawflies, the Symphyta, are primitive wasps without stings, though the female's saw-like organ occurring in most species may look like one, its function being

to cut into plant tissue in order to lay eggs. The keys lead to the 109 genera occurring in Britain using descriptive text supported by line-drawings. The keys have been tested by field workers for their reliability. With the increasing need for the evaluation of the insect content of threatened sites, these AIDGAP keys are invaluable as they can be used successfully by most amateurs, upon whom falls much of the recording work.

For identification to species level, reference must be made to other publications which are listed in the notes on the genera. Adam Wright is a Senior Keeper at the Herbert Art Gallery and Museum at Coventry, one of our associated members. He is to be congratulated on the clarity of this work. PWC

Orthocerus weevils (Coleoptera: Curculionoidae), Nemonychidae, Anthribidae, Urodontidae, Attelabidae & Apionidae, by M.G. Morris. Pp.108, 321 figs, 8vo (card cover), *Handbk. Ident. Br. Insects. Vol. 5 part 16*. RES, London 1990. Price £20.00.

This is the only recent work on the British species of this group of beetles. Before this publication students had to rely on *A Practical Handbook of British Beetles*, by N.H. Joy (1932), which is very difficult to use, or find a translation of one of the continental keys. This usually meant that all but the most determined Coleopterist ignored the Apionidae, the other families in this group being large and relatively easy to determine, even with Joy's book.

The book covers methods of collecting, preservation, economic importance, life history and distribution. There is also an extensive list of host plants and an up-to-date checklist.

There are keys to the families of the Curculionoidea, and to all the species of *Orthocerus* weevil. When specific determination is accomplished there is a paragraph or more on each species, giving information on the sexual differences and biology. There are also genitalia diagrams for the Apionidae species which are very useful for problem males.

BOOKS NOTICED

By the Editor

No sooner has the June issue been printed than my attention was drawn to a recently published book by Messrs Collins. My wish that a book be published to include the dayflying moths had already been fulfilled. It is *Butterflies and dayflying moths of Great Britain and Europe* by Michael Chinery.

A catalogue of books on lepidoptera has been received from Messrs.

Bioquip, 17803 LaSalle Avenue, Gardena, California 90248-3602, USA. Containing well over a hundred books on the lepidoptera from a wide range of publishers, while some half of the books are available either at our Annual Exhibition or from your usual book-dealer in Great Britain, the other half I have not seen advertised here and include a number of specialised and general United States items as well as those from other countries. One whole page is devoted to books specially aimed at children and young adults.

There is one book of which I possess several editions and on which I would like members to help. It is *Episodes of Insect Life* by Acheta Domestica (Miss E. L. Budgen). Now the first edition was in three volumes and published 1849-1851. Each volume contains a fine coloured frontispiece and coloured vignette illustrations to each chapter. In 1867 that prolific author, the Rev. J. G. Wood, published an edited and revised edition in one volume. The coloured vignette chapter titles are there, but also called for in the contents list is a coloured frontispiece, which, from its description (and a whole page is devoted to it), should be that which adorned the original volume two of 1850. Not only is it *not present* in my copy, but I have failed to come across it in about ten or twelve other copies I have examined, nor does it appear to have been physically removed. It is interesting that in the second Wood edition of 1879 this frontispiece is *not* called for in the contents list. I suspect that something went wrong in the printing, or copies left over from the first edition were not available as had been thought, and it was never present. I do wonder though if some copies may in fact have it and, therefore, if any member has, or knows of, a copy of the 1867 edition where a coloured frontispiece (or even a plain one!) *is* present, then I should be pleased to hear from them.

Butterfly and moth motifs: a checklist of butterfly and moth images on postage stamps of the world by Jack R. Congrove. Pp122. Bugle Publishing Co, 7 Dale Avenue, Highland Falls, New York 109288, USA. Price (post paid) \$20.00.

For those interested in lepidoptera on stamps this book is a must. It is a complete country by country checklist of postage stamps containing images of these insects and includes all species which can be identified as well as the stylized designs which cannot. All known varieties are listed, some of which make rather tedious reading. Note that, being an American book, stamp catalogue numbers are those of Scott not Gibbons. A full review of this book was published in the January 1991 issue of our contemporary journal *The Swallowtail*.

Wildlife on your doorstep compiled by Robert Gibbons. A4 hardback, Pp192. Readers Digest Association. Reprint 1990. Price £12.95.

This is a book for the more sedentary of us, who prefer to observe life

around our surroundings rather than go out into the field collecting and observing. It is about all sorts of animals and plants which can be seen and found in many suburban gardens and their surroundings. Excellently printed and with many superb colour photographs, while all aspects are covered, insects do seem to play a prominent part, and since this is a multi-author work, the fact that they are dealt with by such well-known entomologists as Michael Tweedie, John Feltwell, David Corke, Michael Chinery, David Carter, Keith Porter speaks for itself. Butterflies, both colourful and invidious ("cabbage-patch villains") are included as well as cockroaches, house and other flies, spiders, honeybees, earwigs, ladybirds, black ants, and there are also chapters on the relationship of insects to man and on industrial melanism. We understand the publishers are producing a series in this format on various habitats, such as Woodlands, another on Heathlands, etc.

A natural history of the butterflies and moths of Shropshire by Adrian M. Riley. A5, paperback, pp.205, 32 coloured figures. ISBN 1 85310 2490. Swan Hill Press 1991. Price £10.95.

Local lists of lepidoptera are now appearing with some regularity and we have already reviewed some of them in our pages (Hertfordshire, *Bulletin* 47: 140; Northumberland & Durham, *Bulletin* 47: 25; Derbyshire, *Bulletin* 48: 19). This one numbers the insects according to the list of Bradley & Fletcher 1979, but we are a bit puzzled as to why we start off with the Hepialidae, Zygaenidae, Sesidae and then the butterflies! The text layout is clear, the number, English, scientific name and author being in bold type and this is followed by a copy of the Victoria County History records of 1908, then post these, flight period (which includes type of habitat), larval foodplant and, with some species, further notes. The microlepidoptera have been so poorly recorded from Shropshire in the past that these are listed differently from the macros, giving straightforward records, mostly recent, and no VCH listings or foodplants. It is, however, good to see them included and it does show how much more profitable research could be done in the county. The 32 coloured figures, called plates, are set out on 17 pages and are a mix of habitats, living specimens, with two, of set specimens being the best, the others being of variable quality and not of the same standard as those recently published in our own book *Habitat conservation for insects: a neglected green issue*. I also regard this title as being a misnomer for I do not read much "natural history" in this book: it is a straightforward and thoroughly researched county list. While it is useful, and appreciated, for Societies to be listed, I do wish publishers would check with them beforehand, for both the AES and the British Entomological & Natural History Society have been given long outdated

addresses. Nevertheless this is a well-produced book and the price is very reasonable. It should do much to put one of our largest counties, with its very varied habitats, and which lacks any Entomological Society (unlike some of its neighbours) onto the lepidopterological map.

Butterflies in south-east Cornwall by M.P. Frost & S.C. Madge. pp 69, illustrated in black and white and with maps. A5 paperback. The Caradon Field & Natural History Club, 1991. Price £3.95 (by post £4.95). (Available from A. Aston, Briar Cottage, Downderry, Torpoint, Cornwall).

A well-printed item in an attractive coloured card cover. Dealing as it does only with the butterflies this book treats them in far more detail than does the Shropshire book and gives maps for all the regular butterflies (but not the occasional visitors) to be found in this part of Cornwall. The status of occasional migrants or visitors to the area are discussed and reliable sightings reported. The changes that have and are occurring in habitats are considered. Flight periods for many species are done in some detail, as are the list of foodplants. Perhaps usefully the extent of the coverage of the area by entomologists is given, which gives one a chance of going to the under-recorded areas when visiting South-east Cornwall.

Safer insecticides (development and use) edited by Ernest Hodgson and Ronald J. Kuhr. Hardback 8vo, pp 593. ISBN 0 8247 7884 7. Marcel Dekker, 270 Madison Avenue, New York, NY 10016, 1990. Price (N America) \$135; (overseas) \$162.

A Book that puts the case for insecticides that do not harm the environment as so many now in use have been shown to do and still are doing. Primarily designed and aimed at the professional rather than the amateur, as reflected in its price.

Habitat conservation for insects — a neglected green issue edited by Reg Fry and David Lonsdale, with a foreword by HRH The Prince of Wales. Hardback A5, pp 262, 32 coloured plates. ISBN 0 900052 2. The Amateur Entomologists' Society, 1991. Price (post included) £12.

With so much attention being paid to the conservation of birds, whales and elephants, this book comes as a timely reminder that over 90% of the world's fauna is in fact invertebrate, most of those being insects and they act not only as a controlling factor on vegetation, but serve as food for an appreciable number of the higher vertebrates. Their conservation therefore is of the utmost importance and a healthy insect population can well mean a healthy bird and smaller mammal population as well. This in turn serves to keep the larger carnivores in victuals. The book draws

attention to the many factors involved in keeping up a healthy supply of insects and the many dangers from man and his activities that are prejudicial to them.

The first two chapters outline the importance of insects to the environment and the serious reduction in abundance and geographic range of many species as a result of changes in land usage. Examples of a range of insects and their varied life cycles are used to demonstrate the need for a greater awareness of insect habitat isolation. The following seven chapters give examples of specific habitat requirements amongst all those concerned with conservation strategy and land management. Emphasis is placed on the importance of habitat mosaic and the dangers of habitat requirements and some of the management options for highforest, coppiced woodland, grassland, heathland, moorland, aquatic, garden and wasteland habitats. The final chapter deals with current legislation, the need for recording schemes and advice on dealing with planning applications likely to damage valuable habitats.

A Coleopterist's handbook by Jonathan Cooter et al, 3rd edition, hardback 8vo. pp 256, illustrated. Amateur Entomologists' Society 1991. Price (post included) £14.

After a long gestation period this fine third edition of our handbook on beetles, first published in 1954, with a revised 2nd edition in 1975, has now been published, this time as a hardback and in a larger and easier to read typeface than the last edition.

This is a completely new edition to which leading British coleopterists have contributed chapters. Part I deals with the practical aspects of collecting, curating and studying beetles. Part II consists of chapters on each of the beetle families prepared by experts in each group. Part III considers beetle associations — with plants, ants and stored foodstuffs. Beetle larvae are dealt with in Part IV which describes and illustrates the morphology of family types, their habits and methods of rearing. Part V gives advice on recording methods and on the conservation of coleoptera. There is a detailed glossary and an index of genera referred to in the text. Each chapter has details of appropriate books and papers of reference.

PRACTICAL HINT — REARING

by Christopher Nissen (7002)

The larva of the Festoon moth, *Apoda limacodes*, forms its cocoon in the autumn, and remains in this as a larva throughout the winter; it is most important for successful rearing to leave it strictly alone in its cocoon.

BUMBLEBEE NEST SURVEY

The Cambridgeshire bumblebee nest survey is now in its third year. Last summer 227 new records were received bringing the total number returned up to 357. Information about the different nesting places of bumblebees is needed in order that bumblebees can be encouraged on farmland and in gardens where they are useful as pollinators. Some bumblebee species are very similar in appearance so they are grouped according to their colour patterns. Seventy percent of nest records received so far were from gardens. This tells more about the habitat distribution of observers than about that of nest sites. However we can investigate differences between colour groups in the percentage of nests found in each habitat category.

Colour groups differed markedly in the level at which they nested. Seventy percent of 2-banded white tails (mainly *Bombus terrestris* and *B. lucorum*) nested underground, but only 40% of browns (mainly *B. pascuorum*) did so. Browns were most likely to nest at ground level (71%) and black-bodied red tails (mainly *B. lapidarius* and some *B. ruderarius*) the least (13%). Banded red tails (mainly *B. pratorum*) were more likely to nest above ground than other colour groups (43%).

Over 90% of all nests were sheltered from winds from the south-west or from more than one direction and no differences between colour groups could be detected. Twenty seven percent of all nests never received direct sunlight, and 53% received sunlight for only part of the day. There was no indication that morning sun was preferred to afternoon sun and there were few differences between species. Only 20% of all nests were sunlit all day.

Many nests were found inside man-made forms of shelter. Twenty six nests were inside garden sheds including 27% of all banded red tail nests. Nest boxes (most put up for birds but some specially for bumblebees and one for hedgehogs) were popular with black-bodied red tails (9%) but particularly banded red tails (18%). Nests of all colour groups (but only 2% of browns) were associated with brick and concrete buildings. Black-bodied red tails, banded red tails and 3-banded white tails (mainly *B. hortorum*) were found above ground in buildings as often as not but 2-banded white tails were more likely to nest at or below ground level. Red tail nests were often found in loft insulation.

Concrete, bricks, rocks and bare soil all warm up in the sun and act as reservoirs of heat at night. These materials often harboured bumblebee nests outside buildings. Black-bodied red tails seemed to appreciate the extra heat more than other species (21% of black-bodied red tail nests).

Compost heaps and piles of grass cuttings harboured similar proportions of all colour groups (9-12%) except black-bodied red tails

which showed little interest (2%). Rarely cut grassy areas were popular with browns (31%, with six nests found inside tussocks). Short grass, either mown or grazed, was used more by underground nesters such as 2-banded white tails (10%).

Many types of bedding materials were used by the different colour groups and there were some differences between colour groups; for example, surface nesting browns commonly use mosses whereas underground nesting 2-banded white tails are found more often in old mouse nests. Other materials included white lawn clippings, hay, straw, the leaves of the bedding plant Lamb's ears, *Stachys lanata*, other leaf litter, wood chippings, paper, sacking, old carpet and underlay, upholstery and clothing textiles, insulation lagging and old birds' nests.

In the last year's survey participants were asked whether or not bumblebees returned to 1989 nest sites in 1990. We received 18 negative replies and no positive ones at all.

However some recorders noted bumblebees nesting close to the previous year's nest site, for example, under the same garden shed. It is likely that the decaying brood of an old nest, perhaps infested with parasites, is unsuitable for further colonies. However, new queens produced from a successful colony, may search for nest sites similar to those in which they were reared.

Further nest records are needed and records for named species, especially *B. terrestris* and *B. lucorum* would be welcomed. Dead bees sent in with record forms would also be helpful. Nest record forms are available from Mike Fussell, The Bumblebee Nest Survey, Dept. of Zoology, Downing Street, Cambridge CB2 3EJ.

BROWN-TAIL MOTH STRIKES AGAIN

by The Editor

"Hairy caterpillars which cause severe skin rashes have returned to plague the Portsmouth area." So starts a news item in a May last issue of the *Portsmouth News*, kindly sent us by member Frank Marples (8266) who first reported this menace to us back in 1986 and again last year (see *Bulletins* 45: 61 and 49: 171). In 1986 it cost the local council over half a million pounds in control measures. It says something for the tenacity and resilience of this moth species that it has been able to retain a strong foothold in the area and again increase to such numbers as to pose a serious health risk. One wonders why this rather local moth, although exceedingly common where it does occur, is quite unable to spread inland from the coastal areas which are its main habitats. Does it perhaps require a "salty" atmosphere, or are other factors involved? Seems to me that there are the makings of a good Ph.D. thesis in studying this problem.

MONARCHS AND PLAIN TIGERS IN SPAIN

by Paul Sokoloff (4456)

In the February *Bulletin*, Gareth King draws our attention to the Spanish literature which confirms that the Monarch (*Danus plexippus*) breeds regularly in Spain as does, by implication, the Plain tiger (*Danaus chrysippus*), which although a regular immigrant to Spain, never became properly established and most of the temporary colonies died out in the early 1980s.

Plexippus, on the other hand, is still established as a breeding species and there is some evidence that it is acting as a pollinator for its main foodplant, *Asclepias curassavica* (it also breeds, in Spain, on the imported *Gomphocarpus fruticosus*).

Readers might be interested in an English language account of the Monarch's establishment in Spain published a couple of years ago in the *Entomologist's Record*. It discusses foodplants, climatology, origin of population and speculates on its future survival. A very detailed bibliography is also included.

REFERENCE

Martin, J. & Gurrea, P. (1988) Establishment of a population of *Danaus plexippus* (Linn.) (Lep.: Danaidae) in Southwest Europe. *Entomologist's Rec. J. Var.* **100**: 163-168.

ADMIRALS AT SEA

The following item under the above title was sent to us by member David Stokes (7630) and is reprinted, with permission, from the November 15-21 1990 issue of *Shooting Times and Country Magazine*.;

"FOR THE past 16 years I have worked on a trawler, mainly in the English Channel. On October 17, we were about 35 miles south-east of Plymouth, and had experienced three days of total calm and no winds whatsoever. Suddenly we were surrounded by, I would say, 400-500 Red admiral butterflies. I have fished the same area for the past 15 years and have never come across anything like it before. After 24 hours most of the butterflies had died. I am wondering, do they migrate or was this a freak of nature?"

A. Pearce

Teignmouth, south Devon

THE RED admirals of the autumn are the progeny of butterflies that migrated from southern Europe in early summer. Vanessa atalanta rarely manages to hibernate successfully north of the Alps and a migration does occur by the British-born insects. Their predicament was probably due to lack of assistance from a favourable wind.

STRANGE BEHAVIOUR

by Alan Butler (7903)

Since living in Holland I have found it particularly interesting to note differences in behaviour between Dutch and British butterflies. I have mentioned previously about the presence of Silver-spotted skippers flying on heathland accompanied by Graylings! I have also been fooled by Holly blues flying in the same heathland habitat as Silver-studded blues and ovipositing on heather. Then there are the Speckled woods that fly in my immediate neighbourhood along the tree-lined roads. In this article I would like to talk about the strange behaviour of a colony of Purple hairstreaks which I observed last summer. The interesting question is whether this is typically Dutch behaviour, or whether members have noted such behaviour in the UK.

The summer of 1990 seemed to be a very good one for the Purple hairstreaks here. From talking to various colleagues I understand that this was not the case in the UK. Generally the habitat of the Purple hairstreak differs here from that in the UK in that here we do not have the magnificent oak woods still to be found for instance in Surrey and Sussex. Here the butterflies are often to be found along road edges and even on heathlands which just support a few stunted oaks here and there (these often provide suitable habitat for the Ilex hairstreak as well). The result is that the species is frequently seen flying at low level, and is therefore much more conspicuous than those which frequent the tree tops of the larger oakwoods in the UK.

Around the middle of July last year I was with my father-in-law when we noticed tens of individuals gathered on a particular alder-buckthorn bush at the edge of a track in a pine forest bordering a heath. Half the individuals were feeding on the blossoms (which were so small as to be almost not visible) whilst others were resting quietly on the leaves. Both sexes were present and appeared to be the same. The surrounding bushes of alder-buckthorn (and small oak) seemed to be of no interest to them. If disturbed the butterflies simply flew a few yards and returned directly to the same bush. The surrounding bushes seemed to be the same in terms of location and maturity but did not hold the same attraction for the butterflies. So far I cannot think of a logical explanation for this behaviour. To complicate matters further we noticed that a few hundred yards further down the track, the butterflies were behaving in the same way but this time were attracted to a small area at the edge of a field of sweetcorn. The butterflies were resting quietly on the broad leaves of a few sweetcorn plants! Any ideas?

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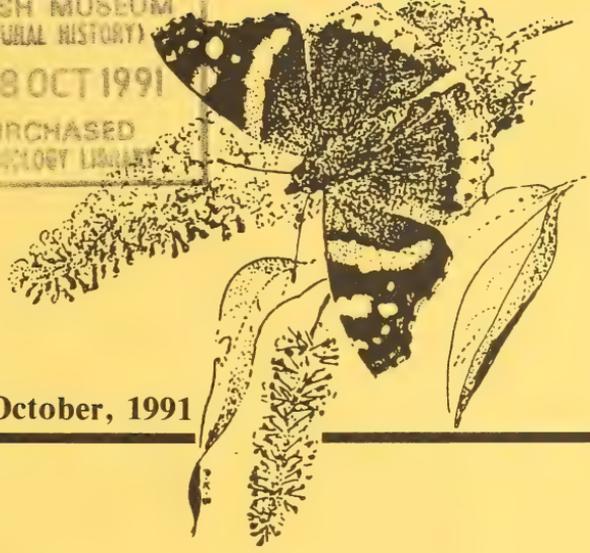
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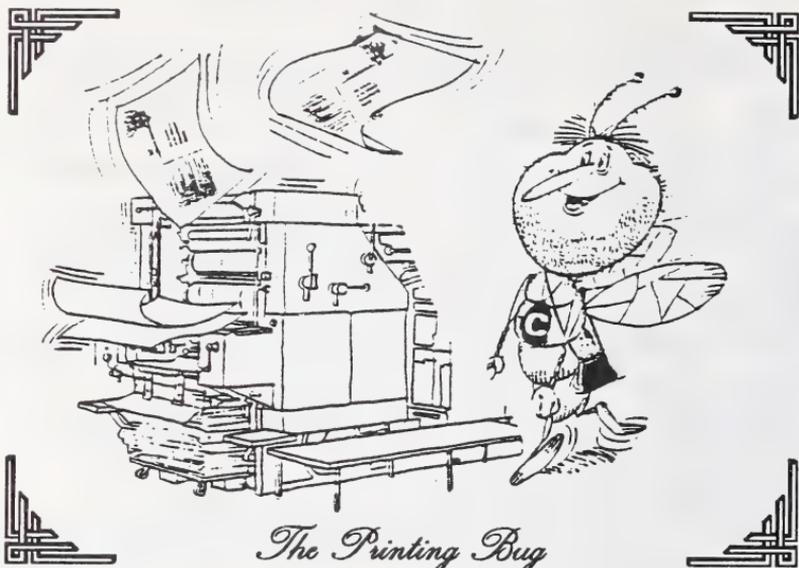
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AES BULLETIN

No. 378



ATTENTION! . . . AS (A FEW OF) YOU WERE

by Peter G. Taylor (719)

5 Darleys Close, Grendon Underwood, Aylesbury, Bucks HP18 0SE.

Reading in a recent *Bulletin* (*Bulletin* 49: 97) the interesting article about the evolutionary changes that have affected our Annual Exhibitions over the years, stirred within me a veritable welter of nostalgic recollections . . . and a resolutely suppressed, nagging conscience whispering darkly in the dusty crannies of my subconscious, that I really ought to bestir myself to put pen to paper and share a few of them with any younger (or at least, more recent) members who might find them interesting. The particular passage that produced this effect, would you believe, was “Corporal Classey (you know him?)”.

Having been an enthusiastic naturalist since early boyhood in the mid-1930s, and under the influence (though not pressure) of a very dear, kind “big boy” (who now reaches half-way up my chest!) I crystallised my interest into collecting butterflies, expanding a little later into moths. In those halcyon days, before the serious advent of agrochemicals — especially herbicides, selective weedkillers and powerful insecticides; and of combine-harvesters and many other big agricultural machines bringing with them the economic pressure to rip out hedgerows in order to generate vast, amalgamated prairie-like fields — you could do this without either constituting one more adverse influence denting the (then) flourishing populations of the insect species that you loved so passionately, or being suspected of having short horns growing from your temples and a barbed, pointed tail tucked away out of sight in your trousers! In fact, collecting was the common avenue along which many (or even most) of the finest and best entomologists approached the serious work for which they subsequently became known. Just plucking a few names out of the air, with no implications as to the order, or even the selection, may I mention Norman Riley, John Heath, P.B.M. Allan and F.W. Frohawk.

Of course, there was a little competitiveness between the few school-friends with like interests but this, if anything, served to reduce any slight effect we may have had upon the local insect populations. You see, it negated the "Unity is Strength" aspect of co-operation and pooling one's skills, and each collector was limited by his or her own individual ingenuity. Moreover, as a non-entomological friend — an astute observer of *Homo sapiens* — pointed out many years later, after spending a few days in the field in the company of another "bughunter" and me, "They spent far more time keeping an eye on each other than in looking for specimens!", so that entomological acquaintances, though mutually affable, tended while "at work", to remain stalwart "loners".

But to return to the personal reminiscences. After leaving grammar school in 1944 I started work as a farm pupil (for bed and board under the ever-vigilant eye of a housekeeper, plus the princely sum of ten shillings a week pocket-money, from which was subtracted one-and-tuppence a week for insurance, the remaining one pound, fifteen shillings and fourpence being paid to us in cash, in arrears, once a month!). Much of the work I hated, but there was a war on, and we had all been brought up to accept more-or-less stoically whatever unpleasant vicissitudes life hurled at us . . . after all, we did eat a lot better on a farm than the general run of townfolk, what with rationing, shortages and exhortations from government to "tighten our belts".

What really got me down was the agony of isolation — geographical and cultural — and when one day there appeared among my very meagre mail, a handbill recruiting for the Amateur Entomologists' Society, I lost no time in sending off my half-a-crown Junior Annual Subscription — to Miss Phyllis Rogers, as I recall. I well remember the delight and excitement with which I received the slim *Bulletins*, edited then by Beowulf A. Cooper (19), whom I regarded with something approaching awe and, as I was to learn very much later, without whose energy, dedication, enthusiasm, ingenuity and plain hard work the AES would not have survived those austere and chaotic times. . . . And then there were the shadowy august figures whose names (and *very* low Membership Numbers!) reverberated around the (to me) entomological unknown, e.g. L.R. Tesch, L.W. Siggs, R.C. Dyson, A.M. Walton, W.H.T. Tams, R.D. Hilliard, P.J. Gent, S.M. Hanson, and so on. Some of these I later came to know quite — or even very — well.

Eventually the war ended, although the anticipated improvements in our living conditions were minimal, and in some respects they worsened. In fact, half a year later and like a large number of other teenagers at regular intervals, I was "called-up" — compulsorily enlisted for military service "for the duration of national emergency".

As with my agricultural interlude, my loving Mum regularly forwarded to me all mail that arrived for me at home, and this included AES *Bulletins*, handbills etc, and I remember vividly one such, that arrived while I was stationed at RAMC base camp at Crookham in Hampshire, announcing that at (I think) 7.00 pm sharp on a certain weekday evening in 1946, in the Social Club Room of Messrs Kodak at Wealdstone, AES member Mr E.W. Classey (41) would be delivering an illustrated lecture on the use of male genitalia to distinguish and identify some easily confused species of moths.

I had never been to an AES gathering, and this was a subject that greatly appealed to me, so that I was determined to attend if at all possible. Now, unless we had specific written permission from the Commanding Officer (for which we had to make written application well in advance, giving our reasons, and then wait . . . and hope) we were allowed no further afield in the evenings and at weekends than Fleet or Aldershot, and even then had to be back in barracks by 2359 hours (the Army's version of midnight). I had never availed myself of this generous concession, having settled for the camp NAAFI canteen, so didn't know "the ropes" when it came to times, services and fares on the buses to get back. Besides, by the time the AES handbill reached me, time was very short, and in any case an official application might have produced a refusal or, worse for a sensitive youngster, derision!

Yes, you've guessed it! I meant to get to that lecture, come Hell, high water or the "red caps" — the (now Royal) Military Police, even though it meant going AWOL (Absent WithOut Leave — a crime in the Army). Accordingly, I did a lot of careful homework with train and "tube" timetables ("Time-Table Tuppence — for *all* services in your area", buses, coaches, trains, "tubes", even ferries, if applicable!) — London Transport, who compiled them, even published the scheduled clock-times for "tube-trains" in those days — and kept reliably to them! I found that I could catch a train from Fleet to Waterloo, change to the Bakerloo line and get to Harrow and Wealdstone station with about nine minutes to spare, arriving in uniform, the nick of time and a bath of sweat, having most unseemly run all the way from the station. At least I still remember how to distinguish the Grey dagger moth from the Dark dagger, as adult males!

I had to leave before the end, having hung on as long as I could for fear of missing some of the pearls of wisdom, but despite again running all the way, I heard my train squealing to a halt beneath my feet as I hammered across the foot-bridge, and saw the doors roll shut when I was ten stairs from the platform!

The next train was only 7½ minutes later but, as I already knew, was to deliver me at Waterloo an enormity of TWO minutes later the last

The next train was only 7½ minutes later but, as I already knew, was to deliver me at Waterloo an enormity of TWO minutes later the last train left for Fleet and salvation. I desperately scanned the indicator-board, and lit on another that would get me to Aldershot at about a quarter-past eleven (2315 hrs in Army parlance, and *had* to be back in barracks by 2359 . . . or else . . .!), there was still eight miles over totally unfamiliar country roads to negotiate in pitch-darkness, and I only had 8s.6d. I settled for this slender hope.

In the station-yard at Aldershot there were only two hire-cars: a rather tired-looking, but modest-sized Hillman Minx — to which the other five service-men and -women hurried, intent on sharing both taxi and cost, piled in and disappeared into the night; and a magnificent, tall, vintage Rolls-Royce with uniformed chauffeur. My heart sank, but in desperation and clutching at straws and my eight-and-sixpence, I hastily burred out my situation into the taxi-driver. He said he'd see how far he could take me for the money I had, and I climbed (yes, climbed) aboard.

Encouraged by, and warming to, my youthful enthusiasm, he soon became expansive about his beautiful vehicle so that, to my great surprise, relief and delight, he took me all the way back to camp! However, instead of setting me down a discreet 100 yards from the Guardroom, at the foot of the approach-road, he drove me right up to the flag-pole, where the sentry — clearly overawed by the arrival of such a grand conveyance and expecting a high-ranking officer to emerge — sprang to “attention” and “presented arms” in salute. His confusion when Private Taylor appeared was a delight to be savoured.

It was now 23.55 hrs, and in some trepidation I marched into the Guardroom and, affecting a confident, innocent, honest air, reported to the Orderly Sergeant that I had spent the evening in Aldershot for the first time and, unfamiliar with “the ropes” had missed the last bus back (most of which was true!). He clearly didn't believe me, but forebore from trying too hard to crack my story, knowing that he had no evidence of the perpetration of a misdemeanour. He merely raised one eyebrow, looked at me askance, and said “Go on”, so that I crept gratefully to my Nissen-hut barrack-room and into bed — again in pitch-darkness, as it was well past “Lights Out”.

But what an evening! . . . Do I know Corporal Classey?!

* * *

Postscript: Some six months later, after having trained and then worked for some time as a Pathology Laboratory Assistant in an Army hospital, I found myself posted to the Army School of Hygiene and Tropical Medicine at Mytchett in Surrey, where I was assigned to work in the Entomology Department. My new colleagues waxed vociferous and

lyrical in singing the praises of a recently—"demobbed" member of the same Department — one Corporal Classey who, it appeared, in their eyes could do no wrong. I was intrigued and delighted to find, among a small collection of pinned insects held by the Department for teaching purposes, a number bearing manuscript data-labels inscribed "Mytchett, Surrey, E.W. Classey" and various dates — in 1946, I think!

Since then, I came to know "Mr Classey" when he worked with Mr R.L.E. Ford at Watkins and Doncaster, Entomological and Natural History Dealers, 36 Strand (a few yards from Charing Cross Station), and we soon became firm friends, having now been "Eric" and "Peter" for more years than I care to admit to.

Do I know Corporal Classey, indeed!

THE SELECTION OF SMALLER SHRUBS FOR OVIPOSITING

by Peter W. Cribb (2270)

As a follow-up to R.A. Wright's comments on p.72 of No. 375 of the *Bulletin*, this phenomenon occurs in a wide range of lepidopterous species and does not appear to relate to any obvious feeding needs of the larvae. Examples occur in the following species from my own observations:

The Puss moth (*Cerura vinula*) prefers the suckers of aspen or dwarf poplars to nearby large trees.

The Brimstone (*Gonepteryx rhamni*) on the chalk downland uses dwarf purging buckthorn (*Rhamnus cathartica*) in preference to the larger nearby bushes.

The Scarce swallowtail (*Iphiclides podalirius*) lays on small sloe (*Prunus spinosa*) bushes or small *Prunus mahabel* on the edges of clumps of large bushes of the same species.

None of these species overwinters on the foodplant. Is it possible that being small, the plants will not be so perchable for birds which will tend to search the larger bushes and trees for larvae?

In the case of the Black-veined white (*Aporia crataegi*) mentioned by Mr Wright, the number of females ovipositing on the same small bush inevitably means that in the spring the foliage will be insufficient to support the larvae and I have observed the small overwintered larvae migrating quite long distances to find new bushes. So the ploy of using small bushes for laying would appear to be beneficial to the larvae before hibernation but a disadvantage afterwards.

The question is a very open one and other suggestions are welcome.

BOOK REVIEW

Ladybirds and lobsters, scorpions and centipedes by the Natural History Museum. 108 pages of colour plates with text. London 1991. Price, paperback, £5.95.

This excellent introduction to the world of arthropods will be of instant appeal to both children and adults, with its excellent photographs of members of this diverse phylum and its simple explanatory text. The various orders are the subject of the first chapter; Chapter two considers their morphology and method of growth with subsequent chapters devoted to coloration and its uses, survival, food and feeding methods, builders, relationships with man and the fossil records of the arthropods. The whole is totally absorbing and should lead many more to take an interest in our neglected invertebrate fauna. It should also prove of considerable use to school teachers considering the subject of "Creepy Crawlies", the title of the book in its USA version.

PWC

ANOTHER MBGBI PUBLISHED

Members might like to know that *The moths & butterflies of Great Britain & Ireland Vol. 7, part 2: Lasiocampidae to Thyatiridae* has now been published. It is the usual format hardback and contains 400 pages, 8 coloured plates, text Figs and maps. ISBN 0 944589 26 7. The price is £49.95 until 31st December, thereafter £55.00, so it will make a good Christmas present! The following text is from Messrs Harley Books' information sheet and I have been promised a critical review of this volume in time for our December issue.

"Due to the small number of species covered and the position in the series of this volume between the micro- and macrolepidoptera, the opportunity has been taken to include a considerable amount of new introductory material providing a unique source of reference for lepidopterists of all persuasions as well as conservationists and ecologists.

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LUMINESCENT BEETLES

by S.J. Patel (751)

St Dabeocs Cottage, North Stow, Bury St Edmunds., Suffolk

The firefly and the glow-worm are the best-known of the Coleoptera which emit light. These, however, are not the only ones; a number of others are known, which have been given such descriptive common names as lightning-bugs, star-worms, railroad-worms, and so on.

Early records

The first recorded descriptions of a luminous beetle (albeit probably erroneous) was made in 1798 when an observer in Sierra Leone, West Africa, was astonished to discover a luminescent beetle. He wrote: "It dropped from the ceiling of my room at dusk, and I placed it in a box. In the evening I went to look at it, and by chance stood between the light and the box so that my shadow fell upon the insect. I observed, to my great astonishment, the ends of two antenna-like lanterns, spreading a dim phosphorescent glow. This singular phenomenon aroused my curiosity and, having examined it several times that night, I resolved to repeat my researches the following day. By that time, however, the animal had died, and the light disappeared". A similar observation has not been recorded since by anyone, and it was thought that possibly a luminous bacterial infection was responsible.

Another beetle widely-quoted as being luminescent is *Buprestis ocellata*. Latreille,(1) in 1829, stated that the ocelli on the elytra were luminous. It is unusual for buprestid beetles to be luminous, but Latreille is such a highly-respected authority that no one has challenged his findings. He also considered that the two red oval spots covered with a downy membrane located on the second abdominal segment of the beetle known as *Chiroscelis bifenestrata* were also luminous.

Some later entomologists have rebutted the findings of Latreille and consider that neither *Buprestis ocellata* nor *Chiroscelis bifenestrata* is luminous. One can only give Latreille the benefit of the doubt. Luminosity has been attributed to yellow spots on various carabid beetles since as long ago as 1880, but there appears to be no definite confirmation that these spots are luminous at night. More research could, perhaps, be carried out by entomologists in this area.

Another carabid beetle has been credited with luminosity in the literature. Reiche, (2) in 1849, gave a talk before the Entomological Society of France, during the course of which he stated that "the discharge given off by the Bombardier beetles of the genus *Brachinus* was luminous". At the same meeting, a M. Rouzet stated that he had

seen a similar phosphorescent discharge from the *Brachinus* beetles which he had found under some stones in the vicinity of Paris. We have a common Bombardier beetle in Britain, *Brachinus crepitans*, and its discharge has never been reported as being luminous, even in the dark. It is quite possible that the fine droplets of the discharge in the French examples could have appeared luminous by reflecting the dim light in which they were observed.

In Kuala Lumpur, Malaysia, a Dytiscid beetle fell from a laboratory bench to the floor in the Malaria Bureau building, upon which Williamson, (3) in 1948, reported as follows: "The beetle . . . displayed a unique type of luminescence, appearing to emit bright flashes of white light, three or four at a time, from its eyes". Williamson never saw these flashes again despite repeated observations, and it is now thought that this phenomenon was merely the reflection of the light from an incandescent lamp which was illuminating the room at the time.

Occasionally a beetle which has attacked a luminous centipede has been bespattered by the luminous secretion, and will then appear itself to be luminous. Such an event was described in 1851 at a meeting of the Entomological Society of London.

The Lampyrids

The literature on the Lampyridae or fireflies, glow-worms and the so-called "lightning-bugs" far exceeds that on any other luminescent group. They have been known for hundreds of years, appearing in the folklore and literature of all civilised nations. Descriptions of these creatures go back as far as Pliny and Aristotle.

The observation that the males of glow-worms and fireflies fly and the females are wingless was made as long ago as 1643, in which year the Sicilian entomologist Carolus Ventimiglia of Palermo stated that "Nature has endowed the females with a more vigorous light, in order that they could call the males at night with their shine". Ventimiglia was mainly correct in his observation, but what he did not appear to have noticed was that the wingless forms which emitted light could also be the larvae, either male or female, of several species of lampyrid beetles.

The true fireflies are common in most parts of the world, although rare in desert areas, and they are also absent from certain islands. The eyes of fireflies are particularly large in relation to the size of the head, and Gorham, (4) in 1880, pointed out that there was a definite relationship between eye size in the male and the luminosity of the light organ in the female.

In northern and central Europe the most well-known lampyrid is the glow-worm, *Lampyris noctiluca*, known as *le ver luisant* by the French

In northern and central Europe the most well-known lampyrid is the glow-worm, *Lampyris noctiluca*, known as *le ver luisant* by the French and *Glühwürmchen* by the Germans. The wingless female has two large light organs on the fifth and sixth abdominal segments, with four smaller ones on the fourth and seventh segments. A smaller species, *Lampyris splendida*, has one large light organ on the sixth segment and thirteen small ones on the sides of the other segments. The males are winged, and in Germany they are called *Johanneskäfer*. The male *noctiluca* has two small light organs on the last abdominal segment, while the male *splendida* has two large light organs on the fifth and sixth segments.

In Italy and southern Europe the fireflies are of a different genus, *Luciola*, the two commonest species being *Luciola italica* and *L. lusitanica*. Atypically, both male and female are winged, but in *L. italica* the wings of the female are shorter and she flies only occasionally. The light organs cover the fifth and sixth abdominal segments in the male, but are restricted to two small ones on the fifth segment of the female.

In North America and the Caribbean region, the genera *Photinus* and *Photuris* comprise most of the species which occur. Their light organs are situated on the ventral surface of the fifth and sixth abdominal segments. The eighth abdominal segment in the larva is also luminous in these two genera. In another species, *Lamprorhiza splendida*, all the ventral segments have luminous organs, while in the genus *Pyractomena* the light organs are situated laterally rather than ventrally.

An unusual wingless glow-worm from 9750 ft. in Ecuador has been described, its luminous organs having been stated to be situated in the joints between the penultimate body segment and the segment immediately proximal to it.

Aquatic lampyrid larvae

Aquatic firefly larvae which are found in inland waters have already been mentioned, and it was in 1900 that Annandale (5) first described what he called "aquatic glow-worms" which he had observed in a small stagnant pond near Lampan, the chief town of Patalung, in Thailand. They were clinging upside down to plants which were floating on the surface of the water, and when they were removed a bluish light which they had been emitting from two small abdominal photophores went out, returning only some time after they had been collected and placed in a jar of water. Annandale noted that the larvae were not silvery in colour from air clinging to their bodies, but that the light was being emitted from definite photophores. No special respiratory apparatus was observed, and the larvae never came to the surface to take in air. Annandale considered that oxygen diffused into the body through the cuticle.

Six years later, Annandale (6) observed another aquatic lampyrid larva in a pond near Calcutta, in the roots of water plants. The larvae had no

spiracles, but possessed a funnel at the rear end supplied with air tubes. This could be extruded and pushed into an air bubble clinging to the plant in order to absorb oxygen, and then withdrawn. This larva was not noted as being phosphorescent, but was given as an example of an unusual respiratory device. It was probably the larva of *Luciola vespertina*.

Glow-worms with tracheal gills are of great interest. In 1927 Blair (7) received specimens from a mountain stream near Bonthian in southern Celebes (now Sulawesi) at a height of 4000 ft. These larvae were under two feet of water, and their integument was very thin and almost devoid of pigment. They possessed eight pairs of tracheal gill filaments projecting from the rear lateral edge of each of the first eight abdominal segments. The last segment was provided with a hook-like device to enable the larva to cling to the surface of stones. Light was emitted from the rear segments. The larvae were thought to be of species in either the genus *Pyrophanes* or *Colophotis*.

At about the same time similar larvae were described from Japan. Two bluish, luminescent spots were present on the dorsal lateral surface of the penultimate body segment. The larvae breathed through tracheal gills, never coming to the surface, but they pupated above water, and it was noted that all parts of the pupae emitted light. Two species were reared: one large one, *Luciola curciata*, and one smaller one, *L. viticollis*. These larvae feed on water-snails, many of which harbour stages of the parasite which causes the disease schistosomiasis in man. The discovery of this fact led to a Japanese doctor writing a popular article intended to encourage people to protect fireflies as a conservation measure, because they helped to reduce the numbers of the *Schistosoma* parasite. Unfortunately, however, since that time these fireflies have become much more scarce in Japan.

Light as a sex attractant

The function of the light as a sex attractant has always been accepted, and claims that it can be used as a warning signal or to repel predators have been considered dubious. The use of the light as a mating device pure and simple is universally accepted at the present time.

The fairly continuous light emitted by the female *Lampyris noctiluca*, for example, advertises her situation to flying males. This purpose has been recognised as long ago as 1821 by Rogerson (8) and other subsequent researchers, Elmhurst, (9) in 1912, found that the female *noctiluca* occupies a permanent position on the ground for several nights in succession, frequently attracting hundreds of males to the spot. Nearly all researchers mention the fact that the end of the body which bears the photophores is held pointing upwards so as to be more easily seen. Curiously, in view of the greenish colour of the light from the female,

Elmhurst found that *noctiluca* males were particularly attracted to red light, as compared to blue, green or white light. This has never been satisfactorily explained, but possibly it is the intensity of the light rather than its colour which is the decisive factor.

In those lampyrid species where both males and females are luminescent, a fairly complicated signal system has been developed. This appears to have been first recognised in America by Osten-Sacken (10) in 1861, since which time it has been much more comprehensively studied by entomologists. Each species of firefly has a characteristic flash whereby the female of one species can recognise a male of the same species and distinguish him from a male of another species. Although a fairly continuous glow such as that of the female European glow-worm would be, in theory at least, a better way of attracting a male, at the same time the continuous light would also attract enemies, and this may have been an evolutionary factor in the development of the flash signal system.

The role of the light-flashing pattern in relation to the mating habits of fireflies has been extensively studied by McDermott, (11) who described this as follows:

(In *Photinus pyralis*) "at dusk the male and female emerge from the grass. The male flies about approximately 50cm above the ground, and emits a single short flash at regular intervals. The female climbs some slight eminence such as a blade of grass, and perches there. She ordinarily does not fly at all, and she never flashes spontaneously, only in response to a flash of light produced by a male. If a male flashes within a radius of three or four metres of a female, she usually responds after a short interval by flashing. The male then turns directly towards her in his course, and soon glows again. Following this, the female again responds by glowing, and the male again apparently takes his bearings, turns and directs his course towards her. This exchange of signals is repeated, usually not more than five or ten times, until the male reaches the female and mates with her."

Since males never respond to the flashes of other males, the conclusion to be drawn is that in some way they can distinguish between the flashes produced by females and those produced by other males. Mast,(12) in 1912, noted the following points: 1. The female is always at rest when she glows, while the male is ordinarily on the wing. 2. The form of the luminous area differs in the two sexes. 3. There is always a certain time relation between the glow of the male and that of the female in response to it. 4. The quality of the light produced by the two sexes may differ. 5. Its intensity may differ. 6. The duration of the glow may differ.

Buck, (13) between 1935 and 1938, recorded his observations on the way in which males distinguish between male and female flashes, and he

decided that such recognition depended on the time interval between the male flash and that of the female. This, again, varied according to the temperature, the flashes being more frequent when the temperature was higher. Buck found this interval to be two seconds at 25°C. Males flying about flashed on average every 5.8 seconds, but the female invariably responded to a male flash after two seconds. Buck found that only if another male flashed two seconds after the first male would the latter fly towards the second male. This would seem to contradict the findings of McDermott, who asserted that males did not respond to the flashes of other males.

Buck conducted some experiments in which a flash of artificial light, irrespective of colour and duration (from one-fiftieth of a second to one second) would also induce a male to fly towards it. Earlier workers, however, had been unsuccessful in attracting fireflies with flashlights.

Other species of fireflies besides *Photinus pyralis* have other signalling systems and types of flash. This variation has been particularly studied by McDermott, who found that the exact type of flash also appeared to vary in the same species in different places. In 1948 McDermott (14) described three totally different types of flash among males of *Photuris pennsylvanica*. He also found that slight differences in the dimensions and colouring of this particular firefly correlated with the types of flash. Since the range of this species extends from Massachusetts to Panama, it is quite possible that, while McDermott was under the impression that the individuals he was describing were all *Photuris pennsylvanica*, it could be that several different sub-species could have been recognised — or even different species — over so wide an area.

Synchronisation of flash signals

It would appear that any signalling system in which a female responds to a male after a definite time interval might lead to synchronism if a number of males responded to the flash of one female. McDermott felt that synchronism should occur, yet neither he nor other workers at that time observed it.

Synchronism of an entirely different kind is regularly found among tropical fireflies in eastern Asia, including Burma, Thailand, the Philippines and Indonesia. In these regions all the fireflies on one tree will flash, let us say, one hundred to 120 times per minute with perfect synchronism, while on another tree some distance away the same synchronism will be apparent, but out of step with those on the first tree. Early travellers as far back as 1727, and continuing into the 1800s, were particularly impressed by this display, which still is one of the sights of the Far East. Records of such synchronous flashing are very numerous,

and are fully-documented by Buck and other workers. Apart, however, from the mere observation of this phenomenon, little experimental work has been done on it. Every possible attempt has been made to explain this synchronism, but as yet no reason for it has been discovered.

According to Reinking, (15) who described the phenomenon in 1921, the species responsible belongs to the genus *Colophotia*. In Thailand the beetles accumulate on one particular tree species, *Sonneratia acida*, which grows on low ground and whose roots are frequently covered by water. All the fireflies on the trees are males. It is not known where the females hide, but apparently the males fly from the jungle to the trees for the purpose of putting on this display. To start with the flashing is irregular, with no indication of the synchronism which will follow; the absence of the females would appear to eliminate the phenomenon as a mating display, but further studies of this particular species may bring to light as it were, some viable explanation.

A remarkable aspect of this synchronous flashing is its persistence, keeping up, according to Smith, writing in 1935:

“ . . . hour after hour, night after night, for weeks or even months, without regard to air currents, air temperature, moisture or any of the meteorological conditions which have been stated to influence firefly flashings; there may be a dead calm, a gentle breeze may be blowing, or even a steady wind may prevail. The night may be clear, the sky may be overcast, or a light rain may fall, without noteworthy effect on the rhythm or intensity of the flashing. However, during bright moonlight the phenomenon is practically absent”.

Morrison, (17) in 1929, found that it was possible to inhibit the synchronism of a tree of fireflies by exposing them to a bright light for about a minute, and when the light was switched off the synchronism returned. The newly-started up synchronism seemed to arise from some individual of group located in the central part of the tree, gradually extending over the entire tree in an irregular way until all were flashing in unison.

Effects of temperature on flashing

All observers have noted the effects of temperature on the luminescence of lampyrids. Fireflies are fundamentally tropical, and in temperate climates they do not light up if the temperature is too low. This would tend to indicate that the rhythmic flashing of fireflies is affected by temperature in the same manner as other physiological rhythmic processes. If the sexes detect each other by the type of flashing, the rate will change with temperature and thus the perceptive processes of the fireflies must also change, in order that recognition may still occur at different temperatures. Buck observed that the interval between the flash

of a male and the response of a female *Photinus pyralis* does, indeed, decrease as the temperature rises, but nevertheless the male still recognises the signal.

Most fireflies hide among leaves on the ground in the day time, and if the temperature is high enough they will come out at twilight as soon as the light intensity reaches a certain low level. This reaction does not necessarily imply that the luminescent ability is affected by light, but the insects' behaviour pattern is affected. There is in fact a diurnal rhythm of lighting behaviour, which Buck studies in American firefly species. He found in the laboratory that the change from bright artificial light to a dim light induced flashing at any hour of the day, but if kept continually in total darkness the frequency of flashing was relatively low. A change from darkness to dim light would cause flashing, provided that the fireflies had been in darkness for multiples of 24 hours, but not if they had been in darkness for other periods which do not correspond to the 24-hour diurnal/nocturnal pattern, such as, for example, 12 or 30 hours. This and similar experiments indicated an inherent diurnal periodicity manifested by periods of flashing recurring at 24-hour intervals.

The Cantharoidea

We now come to another group of beetles which includes some luminous species — the Cantharoidea. The most well-known of these is *Diplocladon*, commonly known as the Star-worm, which is common in Singapore and also parts of northern Borneo.

The earliest record is one from 1924 by Gahan, (18) who described “a large glow-worm in Malaya with three lights on each segment of the body, forming three longitudinal rows of lights, one central and two lateral”. Much more recently Haneda, (19) in 1950, collected many Star-worms in Singapore and, unlike Gahan, Haneda found males as well as females. The species *Diplocladon hasselti* was described by Haneda as follows:

“The female and the larva . . . have a middle line of luminescent spots. The three thoracic and eight abdominal segments carry three light organs, the ninth abdominal or penultimate (segment) two light spots, and the last segment one median spot. The luminescence is continuous and greenish blue; or, as the Malays call it, a diamond-worm”.

The Elateroidea

The click-beetles or Elateroidea also include a few luminous species. These are placed in a sub-family known as the Pyrophorinae (= “fire bearers”). The genus *Pyrophorus* is restricted to tropical and sub-tropical America; *Photophorus* (= “light-bearer”) has two luminous species from Fiji and the New Hebrides, and *Campyloxenus pyrothorax*

species from Fiji and the New Hebrides, and *Campyloxenus pyrothorax* is from Chile. One or two *Pyrophorus* species occur in Texas and Florida, but are uncommon.

Almost every traveller in the Caribbean region has mentioned these luminous elaterids, which the Spanish call *cucujos* and the French term "les taupins". These insects have been described innumerable times in the literature; even the earliest naturalists from Linnaeus onwards included them in their writings.

In 1810 Macartney (20) described *Pyrophorus* in his *Observations on Luminous Animals*, and gave a figure of the insect. More recent accounts have been written by Boyer (21) in 1934 and, in French, by Dubois in his monograph *Les Elaterides Lumineux*, which deals exhaustively with the histology, anatomy and physiology of the beetles as well as the physical properties of their light. Dubois's interest started with one specimen which he received from a ship at Le Havre; this eventually led to the monograph referred to.

Pyrophorus and *Photophorus* possess two kinds of luminous organs similar in structure. The most obvious is a pair of luminescent oval greenish spots, which look like eyes, on the posterior lateral margin of the prothorax. These brilliant spots of light look for all the world like car headlights, and for this reason the insect is often called the "automobile-bug". In addition, there is an orange-coloured, heart-shaped ventral luminescent organ on the first abdominal segment, visible only when the beetle is in flight. Adults are frequently found in the canefields, where they suck the sweet juices from bruised portions of cane. The females lay their eggs on dead wood and humus. According to Dubois, the egg itself is luminous when laid, and so is the newly-hatched larva, which has a median bilobate luminous organ between its head and the first thoracic segment. Additional light organs appear in later larval stages, which have been extensively studied by Dubois.

Like fireflies, *Pyrophorus* is nocturnal, hiding under the bark of trees or leaves during the day, becoming active at dusk, and flying throughout the night. The light is most probably used to attract the sexes. So far no special study of this point appears to have been made, but Blair, (23) in 1926, reported the observations of a Dr. C.L. Witherby who, in Trinidad, once saw a male follow a female in a straight line, as opposed to its usual flight, which is slow and irregular. Both individuals, he said, landed on the ground, and the female's light was extinguished. He deduced that the male apparently found her by the sense of smell. The light organs are the same in both male and female, differing in this respect from those of fireflies, which are sexually dimorphic.

The light of *Pyrophorus* appears slowly, gradually rising to a maximum intensity which persists for a considerable time, then gradually

fading. It is known to be under the control of the nervous system. (Dubois (24) in 1891 and Harvey (25) in 1931.) The insect does not light spontaneously during the day time unless handled or disturbed. After such stimulation the light of the prothoracic organs first shows in the centre and then spreads laterally.

Pyrophorus has served as an outstanding example of light production without heat — a phenomenon which man has, up to now, been unable to emulate. As long ago as 1886 Dubois pointed out the value of its light as an illuminant, since it consisted entirely of visible rays but lacked any thermal or actinic rays. He attempted to detect the emission of radiant heat in the course of laboratory experiments, using various kinds of heat-sensitive equipment, but had no success. He observed that *Pyrophorus* was luminescent between 0°C and 47°C, but no special study has ever been made of the intensity of the light at different temperatures.

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SMALL BLUE LOCALITY

In our October last issue (*Bulletin* **49**: 352) we published a "Practical Hint" concerning a locality for the Small blue butterfly and the suggestion that it was a good place to collect the larvae. Times change and member Nicolas Brown (9289) has pointed out to us that under the bye-laws of the Corporation of London, who now own the land, it is not permitted to take any kind of animal, nor pick any kind of wild flora. Conservation work is now being carried out on Riddlesdown, aimed primarily at the Chalkhill blue butterfly, but, needless to say, the Small blues also benefit.

Nearer home, I am pleased to say, the Small blue still occurs on the Gog Magog hills where it has been threatened, not by entomologists, but by a combination of Gypsies camping, bikers, and fly-tippers.

ADDRESS CORRECTION — GEORGE MAMONOV

We regret to say that the wrong Flat Number was given in his address in our last issue in his Stag Beetle article. It should be Flat 40, *not* Flat 70, and members are asked to correct this in their copies. I have member Dean Warren to thank for drawing this to my attention. Mr Mamonov is also keen to correspond with entomologists, particularly coleopterists and his correct address is 252208 Kiev 208, ul. Vasilia Porika Street, 3a-Flat 40 USSR. Mr Warren has written to his (correct) address, but received no reply and wonders if letters addressed in English are not interpreted and therefore not delivered, by the Soviet postal workers. For anyone with access to Locoscript 2 on an Amstrad it might be worth addressing letters in Cyrillic script.



Fig. 1. Gynandromorph of *Euphydryas maturna*. Left side male, right side male.



Fig. 2. Gynandromorph of *Papilio machaon*. Left side female, right side male.

SWALLOWTAIL AND SCARCE FRITILLARY GYNANDROMORPHS

by *Ekkehard Freidrich*

Colegio Aleman, Apartado aereo 25174, Cali, Colombia

A full description of these two gynandromorphs, both from the same locality, has already been given by me in *The Entomologist* **110**: 114-116, and the colour plate of these is reproduced here with the permission of the Royal Entomological Society.

Figure 1 is the Scarce fritillary (*Euphydryas maturna*) which emerged from butterflies reared from an egg cluster taken in 1983. The left side is male, the right female (unfortunately mis-labelled on the plate). Figure 2 is the Swallowtail (*Papilio machaon gorganus*) and resulted from eggs laid in the author's garden at Kuenzelsau, Hohenlohekreis, South-west Germany in 1988.

QUEEN OF SPAIN FRITILLARY AT GORLESTON-ON-SEA

by *Christopher Bales (6774)*

I am pleased to report that on the afternoon of 16th August 1991 I had the good fortune to capture a fine male specimen of the Queen of Spain fritillary (*Argynnis lathonia*), taken while it was feeding from a buddleia bush in my garden. After taking it, I showed it to my friend, Mr Ken Rivett who is recorder for the Great Yarmouth Naturalists Society. I then returned home and released this beautiful butterfly back into my garden.

FRESHWATER BIOLOGICAL ASSOCIATION

The Freshwater Biological Association is an independent research organisation, whose laboratories and headquarters are situated in the Lake District and who have had over 60 years of experience in freshwater scientific research. This includes the publication of over 2,000 scientific papers in recognised scientific journals as well as a series of independent publications.

They also have one of the finest libraries dealing with the subject in the world and an advisory service to members is available including literature searches and photocopies of articles.

Members receive the journal *Freshwater Forum* containing reports, news and short papers. Many other facilities and benefits connected with freshwater biology are available to members, whose dues are £20 per year (Students £10) and further details may be obtained from their Membership Secretary, Freshwater Association, The Ferry House, Far Sawry, Ambleside, Cumbria LA22 0LP.

4EME SALON INTERNATIONAL DES PLUS BEAUX INSECTES DU MONDE

The fourth International Exhibition of the Most Beautiful Insects in the World is organised this year in Paris by the Groupe d'Etude des Phasmes, with accordance of France Entomologie.

This exhibition will take place in the Parc Floral of Paris from Friday, 29th November to Sunday, 1st December 1991. The Parc Floral (31 hectares) is a park for walks and leisure activities well known to the inhabitants of Paris and its suburbs.

For this exhibition, the G.E.P. has booked four linked pavilions surrounded by greenery, trees and flowers. In this exceptional setting with a surface area of 1500 square metres, this exhibition of insects should be one of the most prestigious ever organised.

Opening time for the public

From Friday, 29th November to Sunday, 1st December from 9.30 am to 5.00 pm.

Car park

For exhibitors: 300 free places.

For visitors: 800 free places.

Access to the Exhibition

Metro: Line No. 1, Station: "Chateau de Vincennes".

Bus: Line No. 112.

Car: Five minutes from Peripherique Boulevard (exit: "Porte de Vincennes").

Five minutes from motorway A4 (exit "Joinville).

Sign posting "Parc Floral" in all the wood of Vincennes. The Parc Floral takes place in front of the castle of Vincennes.

Food

A buffet and bar will be organised in the exhibition room.

To have more information, make contact with:

Pierre-Emmanuel Roubard, Groupe d'Etude des Phasmes, 17 Avenue Foch, 94100 St. Maur, France. Tel: (16-1) 42.83.47.30.

ENTOMOLOGICAL CLUB GRANTS

The Entomological Club has a small income from investments implemented through the generosity of members attending its annual Verral Supper. Grants are made to assist entomologists studying British insects. The club would need to be satisfied that the line of work would lead to publication and that it is not fundable elsewhere. Grants would not exceed £200. Applications should be addressed to Claude Rivers, The Entomological Club, 17, Cumnor Rise Road, Oxford OX2 9HD.

SPECIES DIVERSITY AND SEASONALITY IN THE MOTHS OF THE RIO MAZAN NATURE RESERVE, AZUAY PROVINCE, ECUADOR, SOUTH AMERICA.

by Adrian Spalding (6741)

Tregarne, Cusgarne, Truro, Cornwall.

INTRODUCTION

At an altitude of over 3,000m, the Rio Mazan nature reserve covers about 3,300 hectares of cloud forest and paramo grassland on the edge of the Cajas plateau near Cuenca, Ecuador. Three broad habitat types are present: primary forest (260ha), secondary forest and grassland (130ha) and high altitude paramo grassland (2,900ha). The primary forest is isolated, separated from the adjacent valley forests by mountain ridges of windswept paramo and it is possible that the geographical isolation of the reserve has led to a high degree of endemism (Robinson 1986). During the recent ice ages, the Mazan valley was covered in ice. Now, the climate is variable with night-time temperatures ranging from 0° to 15°C, whilst daytime temperatures can soar to 25°C. Rain falls on most days and the forest is usually cloud-covered.

AIMS

1. To make an initial examination of species diversity and altitudinal differences on the reserve.
2. To compare the moths of the reserve in different habitats and in different seasons.

METHODS

Day-flying moths were netted whilst flying or disturbed from the foliage. The chief method of collection was with the Heath trap, a small collapsible box of 330mm cubed, surmounted by an ultra-violet light powered by a car battery and activated by a solar switch. Crumpled paper was placed in the trap to allow resting places for the moths to settle. Many moths sat on the surrounding foliage, often well camouflaged, and it was necessary to search carefully for these. Although factors such as temperature, wind speed and direction, rain, and atmospheric pressure all affect the abundance of moths on a particular night, it is possible to compare catches made in this way as the light source and box area were the same in each case.

Chloroform was poured onto the paper in the trap to stun the moths, which were then boxed and killed with carbon tetrachloride. After the moths were killed, they were sorted into families on superficial appearance and dried in boxes containing silica gel crystals. The entire



Fig 3. Moths of the families Cossidae, Megalopygidae, Thyatiridae, Sphingidae, Notodontidae, Ctenuchidae and Arctiidae.

1	2	3	4	5	1. <i>Dasylophia poecila</i> 2. <i>Podalia</i> sp. 3. <i>Xylophanes crotonis</i> 4. <i>Thyatira staphyla</i> 5. <i>Langsdorffia malina</i>
6	7	8	9	10	6. <i>Hypomolis</i> sp. 7. <i>Homoeocera duronia</i> 8. <i>Phragmatobia</i>
10	11	12	13	14	sp. 9. <i>Symphlebia</i> sp. 10. <i>Hemihyalea yesta</i> . 11. <i>Halisidota melaleuca</i> 12. <i>Meragisa inalbata</i> 13. <i>Hypercompe neurophylla</i>
15	16	17	18	19	14. <i>Amastus simulator</i> 15. <i>Hemihyalea yesta</i> 16. <i>Amastus descimoni</i> 17. <i>Elysius atrata</i> 18. <i>Amastus paramensis</i>
20	21	22	23	24	19. <i>Amastus simulator</i> 20. <i>Amastus bipartitus</i> 21. <i>Amastus fulvizonata</i> 22. <i>Amastus ambrosia</i> 23. <i>Lophocampa hyalinipuncta</i> 24. <i>Amastus conspicua</i>

catch was taken. They were then labelled and layered in airtight boxes between sheets of tissue paper, with silica gel crystals to reduce moisture, and transported to Britain. Here, they were unpacked, relaxed in a warm moist container containing thymol crystals to prevent the occurrence of mould, and then pinned on setting boards to dry.

Two visits were made to the reserve and six sites sampled (Fig. 1) in different habitats and at different altitudes. Four sites (2 - 5) were sampled in September 1987, Site 6 was sampled in April 1989, whilst Site 1 was sampled in both years. The altitudinal interval was governed mainly by the topography of the reserve and was checked using an altimeter. A car battery of 45 Ah was used which operated the trap for three nights before being recharged. At Site 2, moths were collected on the white walls of the reserve headquarters as well as in a Heath trap.

Photographs of the 1987 catch were prepared by Mr Fleming and each moth was named or numbered. In 1989 these photographs were used as an aid to the identification of the 1989 catch and only new species were collected.

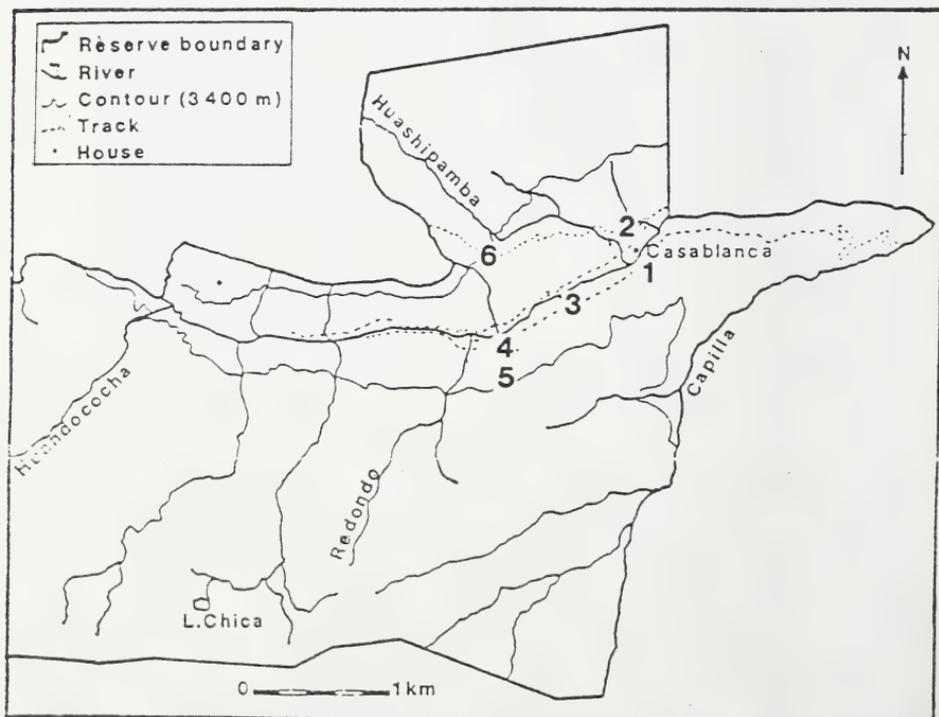


Fig. 1: A map showing collecting sites 1, 2, 3, 4, 5 and 6

Fig. 1. A map showing collecting sites 1, 2, 3, 4, 5 and 6.

RESULTS

A total of 1,275 moths were collected, belonging to over 14 families and representing 333 species (Table 1). Those species reliably named are listed in Table 2 and the majority of these are illustrated on the colour plates, Figs 3, 4 and 5, which accompanied my earlier article on the Rio Mazan moths in *The Entomologist* (Spalding, 1991) and which are reproduced here by permission of the Royal Entomological Society.

Eight moths (1 Pyralidae, 6 Geometridae, 1 unknown) were collected on the main track at 3,048m. Six moths (3 Notodontidae, 1 Geometridae, 2 Noctuidae) were collected at Site 1 on 16.4.89.

Site 2 was in secondary grassland and out of 100 species found, 54 were found only at this site (20.6% of the total for 1987). The largest catch was in the primary forest at Site 4 on 19.9.87, when 100 species (452 moths) were caught. On the following night (20.9.87) at Site 5 (3,340m) 81 species were caught (196 moths) in primary forest. Although twice as many moths were caught at Site 4 compared with Site 5, the ratio of species numbers was approximately 3:2 (120:81).

Primary forest Site 1 was also rich in species. On 16.9.87, 43 species were collected, whilst 70 species were recorded here on 18.9.87. On

FAMILY	SITE 1 3017m		SITE 2 3048m		SITE 3 3127m	SITE 4 3200m	SITE 5 3340m	SITE 6 3400m	TOTAL
	(a)	(b)	(c)	(d)	(e)	(f)	(g)		
Cossidae		1				3			4
Gracillariidae		1							1
Tortricidae		2							2
Pyralidae	3	8	4	10		16	2		43
Megalopygidae				1					1
Lasiocampidae				2					2
Bombycidae	1		1						2
Thyatiridae		2				1			3
Geometridae	34	69	38	68	13	224	113	27	586
Sphingidae				1				36	37
Notodontidae	4	15	7		1	17	15	2	61
Ctenuchidae	1								1
Arctiidae	9	23	7	12		29	26	7	113
Noctuidae	12	8	10	57	5	157	40	100	389
Unknown	3	5		3		5			16
TOTALS	67	134	67	154	19	452	196	172	1261

Table 1: Totals of moths in families at each collecting site.



Fig. 4. Moths of the family Noctuidae.

1	2	3	4	5	6	7	8	1. <i>Agrotis ipsilon</i> 2. <i>Agrotis vibora</i> 3. <i>Lycophotia calvescens</i> 4. <i>Lycophotia striolata</i> 5. <i>Lycophotia lilacina</i> 6. <i>Gaujonia arborescens</i> 7. <i>Eriopyga euchroa</i> 8. <i>Eriopyga melanopis</i> 9. <i>Eriopyga syruides</i> 10. <i>Tandilia</i> sp. 11. <i>Nephelitis fluminalis</i> 12. <i>Bryolimmia bicon</i> 13. <i>Lycophotia lilacina</i> 14. <i>Prionoptera serra</i> 15. <i>Plusia</i> sp. 16. <i>Hypnotype placens</i> 17. <i>Pseudaletia sequax</i> 18. <i>Hadena imitata</i> 19. <i>Trachea</i> sp. 20. — 21. <i>Perotrachea</i> sp. 22. <i>Eriopyga perrubra</i> 23. <i>Cornu- tiplusa</i> sp. 24. <i>Eriopyga stygia</i> 25. <i>Tricheurois</i> sp. 26. — 27. <i>Trichestra</i> sp. 28. <i>Heterochroma</i> sp. 29. <i>Heterochroma tolima</i> 30. <i>Apoxestia euchroa</i> 31. <i>Pseudoleucania centripuncta</i> 32. <i>Hadena mesotoma</i> 33. <i>Trichestra goniophora</i> 34. <i>Eriopyga glaucopsis</i> 35. <i>Heterochroma</i> sp. 36. — 37. — 38. — 39. — 40. <i>Copitarsia consueta</i> 41. — 42. — 43. — 44. — 45. — 46. — 47. — 48. — 49. — 50. — 51. — 52. — 53. — 54. — 55. — 56. — 57. — 58. — 59. — 60. — 61. — 62. <i>Chabueta major</i> 63. <i>Eriopyga oroba</i> 64. <i>Eriopyga</i> sp. 65. <i>Eriopyga</i> sp. 66. <i>Cucullinae</i> sp. 67. — 68. <i>Leucania arcuncinata</i> 69. — 70. <i>Eriopyga phaeostigma</i> 71. <i>Lycophotia suboleginea</i> 72. <i>Poliodestra viola</i>
9	10	11	12	13	14	15	16	
17	18	19	20	21	22	23	24	
25	26	27	28	29	30	31	32	
33	34	35	36	37	38	39	40	
41	42	43	44	45	46	47	48	
49	50	51	52	53	54	55	56	
57	58	59	60	61	62	63	64	
65	66	67	68	69	70	71	72	

14.4.89, 45 species were caught here, of which 16 species (36%) were new to the reserve. Only 16 species were caught on 16.4.89, when the battery ran out of charge. Fifteen (33%) of the species recorded at Site 1 in April 1989 had been recorded from the same site in September 1987. Five species were common to catches 1a, 1b and 1c. The catches in different years can be compared using the Sorenson coefficient of similarity $C_s = 2j/(a + b)$, where j = the number of species in common and a and b are the number of species in each catch. The Sorenson coefficient of similarity for catches on 16.9.87 and 14.4.89 was 0.23, and for catches on 18.9.87 and 14.4.89 it was 0.16 (where a result of 1 would mean total similarity and 0 would mean total dissimilarity).

Seventy-six species were caught at Site 6, of which 54 (71%) were new. 66% of the 172 moths caught were new and 58% of the moths were Noctuidae. The next commonest family here were the Sphingidae, with five species (36 moths) not found on the reserve before. In 1989, 50 species were collected that had been recorded in Mazan in 1987 and 70 new species were recorded, all of which were found at one site only.

Three species were found at all five main sites (Sites 1, 2, 4, 5 and 6). 189 species were found only once, 47 species were recorded twice, and 28 species thrice (Fig. 2). 32 species were found in double figures.

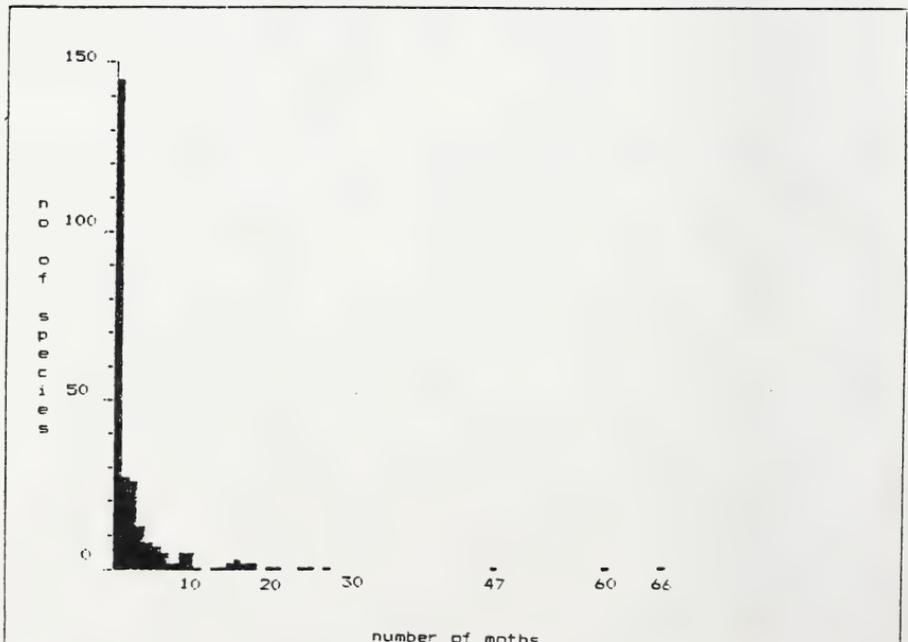


Fig. 2. The number of species containing n moths, where $n = 1-66$ (1987).

Table 2: Habitats, frequency and seasonality of named species in Mazan, 1987 and 1989.

- Frequency: A = Abundant (common at most sites)
 C = Common (present at all sites except site 3)
 L = Local (common at one or more sites)
 O = Occasional (small numbers at more than one site)
 R = Rare (small numbers at one site)
- Habitat: F = Primary forest
 S = Secondary grassland
 P = Paramo grassland
- Sites: 1 = River at 3017 metres
 2 = Casablanca at 3048 metres
 3 = Bat Cave at 3127 metres
 4 = Manuel's Path 3200 metres
 5 = Manuel's Path 3340 metres
 6 = Paramo at 3400 metres (1989)

Moths found both in September and April are marked *. These do not include three unnamed species also found in both months.

NAME	Frequency	Habitat	Sites	Numbers
COSSIDAE				
<i>Langsdorfia malina</i> Dognin	O	F	14	4
MEGALOPYGIDAE				
<i>Podalia</i> species	R	S	2	1
PYRALIDAE				
<i>Nomophila</i> species	R	F	1	1
BOMBYCIDAE				
<i>Colobata</i> species*	R	F	1	2
THYTIRIDAE				
<i>Thyatira staphylya</i> Dognin	O	F	14	3
GEOMETRIDAE				
<i>Racheospila</i> species 1	R	F	4	1
<i>Racheospila</i> species 2	R	F	1	1
<i>Racheospila jenna</i> Dognin	R	F	4	1
<i>Anisodes</i> species 1	R	F	3	1
<i>Anisodes rufifrons</i> Prout *	O	FP	146	7
<i>Eois</i> species	L	F	14	12
<i>Eois</i> species A	R	F	4	1
<i>Eois ambarilla</i> Dognin *	L	SF	1245	8
<i>Eois azafranata</i> Dognin *	L	SF	1245	26
<i>Eois hermosaria</i> Schaus	R	F	1	1
<i>Eois yvata</i> Dognin *	O	F	145	6
<i>Euphyia luxuriata</i> Prout	O	SF	245	5
<i>Euphyia spissilineata</i> Dognin	R	F	1	1
<i>Euphyia trajectata</i> Walker *	R	S	12	2
<i>Eupithecia sexpunctata</i> Dognin	R	F	1	1
<i>Eupithecia</i> species	A	SF	1245	21



Fig. 5. Moths of the family Geometridae.

- | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 |
| 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 |
| 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 |
| 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 |
| 77 | 78 | 79 | 80 | 81 | 82 | | | |
1. *Pero propinqua* 2. *Brachyctenistis incongruata* 3. *Pityjeja pura* 4. *Melanolophia* sp. 5. *Dasytrole colopholeuca* 6. *Iridopsis jurgina* 7. *Iridopsis* sp. (near *synriaria*) 8. *Sabulodes* sp. 9. *Pero propinqua* 10. *Cargolia arana* 11. *Lomographa fulvicosta* 12. *Melanophia* sp. 13. *Dasytrole albisecta* 14. *Iridopsis cinerascens* 15. *Iridopsis* sp. (near *sapulena*) 16. *Sabulodes pumilis* 17. *Colpodonta pimienta* 18. *Bassania annulifera* 19. *Oxydia* sp. (near *subdecorata*) 20. *Sphacelodes studiosa* 21. *Oxydia* sp. 22. *Sabulodes* sp. 23. *Certima lojanata* 24. *Certima lojanata* 25. *Digonis* sp. 26. — 27. — 28. — 29. *Cosmophyga monastica* 30. — 31. *Sabulodes caberata* 32. — 33. *Digonis* sp. 34. *Euphyia luxuriata* 35. — 36. — 37. — 38. — 39. — 40. — 41. — 42. *Euphyia spissilineata* 43. *Scotopteryx emanata* 44. *Euphyia trajectata* 45. — 46. *Anisoperas* sp. 47. *Perusia* sp. 48. *Perusia vertica* 49. — 50. *Callipseustes* sp. 51. *Callipseustes* sp. (near *trisecta*) 52. — 53. — 54. *Eois* sp. 55. *Eois ambarilla* 56. *Eois yvata* 57. *Eois* sp. 58. *Eois azafranata* 59. *Eois hermosaria* 60. — 61. — 62. — 63. *Spargania colorifera* 64. — 65. — 66. *Racheospila* sp. 2 67. — 68. *Pseudopsodos placilla* 69. *Anisodes rufifrons* 70. — 71. — 72. — 73. — 74. — 75. — 76. *Racheospila* sp. 1 77. — 78. *Leucochesias subnitens* 79. — 80. *Graphidus puncticulata* 81. — 82. —

NAME	Frequency	Habitat	Sites	Numbers
<i>Graphidus puncticulata</i> Guenee *	O	SF	1245	6
<i>Hammaptera praderia</i> Dognin	L	F	45	10
<i>Pseudopsodos placilla</i> Druce	R	S	2	1
<i>Scotopteryx emanata</i> Dognin	R	S	2	1
<i>Spargania colorifera</i> Warren	R	S	2	1
<i>Anisoperas</i> species	R	F	4	1
<i>Bassania annulifera</i> Warren *	L	F	145	17
<i>Brachyctenistis incongruata</i> Warren	A	F	145	24
<i>Callipseutes</i> species *	O	F	14	4
<i>Callipseutes</i> species like <i>C. trisecta</i>	R	S	2	2
<i>Cargolia arana</i> Dognin	L	SF	245	10
<i>Certima lojanata</i> Dognin *	A	SF	12345	63
<i>Colopodonta pimiento</i> Dognin	R	S	2	1
<i>Cosmophya monastica</i> Dognin	O	SF	12	3
<i>Dasystole albisecta</i> Warren	O	F	1	2
<i>Dasystole colopholeuca</i> Prout	O	F	14	6
<i>Iridopsis</i> species like <i>S. sapulena</i>	O	F	45	2
<i>Iridopsis</i> species like <i>S. syrniaria</i>	O	SF	24	2
<i>Iridopsis cinerascens</i> Dognin *	A	SF	12345	48
<i>Iridopsis jurgina</i> Prout	R	F	1	1
<i>Leucochesias subnitens</i> Herbulot	R	F	5	1
<i>Lomographa fulvicosta</i> Walker*	L	SF	1245	15
<i>Melanolophia</i> species	O	SF	12	2
<i>Oxydia</i> species 1 *	O	SF	1245	12
<i>Oxydia</i> species 2	R	F	1	1
<i>Pero propinqua</i> Dognin *	A	SF	1245	20
<i>Perusia</i> species like <i>P. pulverosa</i>	R	S	2	1
<i>Perusia vertica</i> Warren *	O	SF	124	12
<i>Pityeja pura</i> Warren	R	F	3	1
<i>Sabulodes</i> species like <i>S. cleodora</i>	L	SF	245	16
<i>Sabulodes caberata</i> Guenee	R	F	4	1
<i>Sabulodes pumilis</i> Dognin *	L	SF	1245	28
<i>Sphacelodes studiosa</i> Dognin	R	F	1	2

SPHINGIDAE

<i>Xylophanes crotonis</i> f. <i>crotonis</i> Walker	R	S	2	1
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NOTODONTIDAE

<i>Dasylophia poecila</i> Felder *	O	FP	1456	10
<i>Disphragis</i> species *	L	FP	1456	19
<i>Merigisa inalbata</i> Dognin	O	F	45	4
<i>Urgida</i> species 1	O	F	15	3
<i>Urgeda</i> species 2	O	F	3435	3
<i>Urgeda</i> species 3	O	F	145	6
<i>Urgeda</i> species 4	R	F	5	4

NAME	Frequency	Habitat	Sites	Numbers
CTENUCHIDAE				
<i>Homoeocera duronia</i> Druce	R	F	1	1
ARCTIIDAE				
<i>Elysium atrata</i> Felder	R	F	1	1
<i>Agylla sanquivitta</i> Hampson	R	S	2	1
<i>Hypomolis</i> species	R	S	2	3
<i>Amastus</i> species 1	R	S	2	1
<i>Amastus ambrosia</i> Druce *	L	F	145	13
<i>Amastus bipartitus</i> Rothschild *	L	F	15	11
<i>Amastus conspiciua</i> Maassen	A	SF	1245	9
<i>Amastus descimoni</i> Toulgoet	O	F	145	5
<i>Amastus fulvizonata</i> Hampson *	L	F	14	12
<i>Amastus paramensis</i> Dognin	R	F	4	2
<i>Amastus</i> species 2	L	F	1	7
<i>Amastus simulator</i> Toulgoet	O	F	45	2
<i>Amastus</i> species 3	R	F	5	1
<i>Hemihyalea yesta</i> Dognin *	O	FP	456	5
<i>Halisidota melaleuca</i> Felder	O	F	14	2
<i>Hypercompe neurophylla</i> Walker	R	S	2	1
<i>Leucanopsis</i> species	R	F	1	1
<i>Lophocampa hyalinipuncta</i> Rothschild*	O	FP	456	6
<i>Paracles</i> species *	O	FP	1456	4
<i>Phragmatobia</i> species	R	S	2	1
<i>Symphlebia</i> species	R	S	2	1
NOCTUIDAE				
<i>Agrotis ipsilon</i> Hufnagel *	R	SF	26	2
<i>Agrotis vibora</i> Dognin	R	S	2	1
<i>Lycophotia calvescens</i> Draudt *	A	SF	12345	17
<i>Lycophotia lilacina</i> Zerny *	A	SFP	12456	73
<i>Lycophotia striolata</i> Draudt	R	S	2	1
<i>Lycophotia suboleaginea</i> Dognin	R	F	5	1
<i>Pseudoleucania centripuncta</i> Draudt *	C	SFP	12456	25
<i>Tandilia</i> species *	O	SP	26	4
<i>Trichophotia homogena</i> Hampson	O	F	14	3
<i>Chabueta major</i> Guenee	O	F	134	6
<i>Eriopyga</i> species 1	L	F	1345	5
<i>Eriopyga</i> species 2	R	F	4	4
<i>Eriopyga euchroa</i> Hampson	R	F	4	1
<i>Eriopyga glaucopsis</i> Hampson *	C	SFP	12456	23
<i>Eriopyga melanopsis</i> Druce *	O	F	145	5
<i>Eriopyga oroba</i> Druce	R	S	2	1
<i>Eriopyga pererubra</i> Hampson *	O	FP	456	8
<i>Eriopyga phaeostigma</i> Druce	O	SF	24	2
<i>Eriopyga stygia</i> Dognin	O	F	14	5
<i>Eriopyga syrroidis</i> Dognin	R	F	3	1

NAME	Frequency	Habitat	Sites	Numbers
<i>Hadena calographa</i> Maassen	R	F	4	1
<i>Hadena imitata</i> Maassen *	O	FP	456	15
<i>Hadena mesotoma</i> Hampson *	O	FP	46	3
<i>Leucania arcupunctata</i> Maassen *	R	S	2	1
<i>Nephelistic fluminalis</i> Dognin *	R	F	14	2
<i>Poliodesra viola</i> Druce	R	S	2	1
<i>Pseudaletea sequax</i> Franclemont *	L	SP	26	9
<i>Trichesta goniophora</i> Hampson	O	F	14	3
<i>Trichestra</i> species *	O	SFP	246	5
<i>Trichestra jucunda</i> Maassen *	O	FP	456	3
<i>Trichestra</i> species	R	S	2	3
<i>Heterochroma</i> species 1	R	F	1	1
<i>Heterochroma</i> species 2	R	F	1	1
<i>Heterochroma tolima</i> Todd	R	F	1	1
<i>Bryolimnia bicon</i> Druce	R	F	4	1
<i>Perotrachea</i> species	R	S	2	1
<i>Trachea</i> species 1	O	F	45	6
<i>Trachea</i> species 2	R	F	5	1
<i>Apoxestia euchroa</i> Dognin	R	S	1	1
<i>Cuculliinae</i> species	R	S	2	1
<i>Copitarsia consueta</i> Walker	R	F	4	1
<i>Hypnotype placens</i> Walker	R	S	2	1
<i>Gaujonia arbosoides</i> Dognin *	O	SP	26	2
<i>Cornutiplusa</i> species	O	SF	245	3
<i>Plusia</i> species	R	F	4	1
<i>Prionoptera serra</i> HS	R	F	5	3

TOTAL (including 56 moths found at Site 6 in 1989) 830

DISCUSSION

Catches may vary in species and numbers because of a number of factors, including altitude, position within the habitat, habitat type, seasonal differences and climatic conditions. All figures refer to 1987 records except for the catch at Site 6.

(a) Altitude

The number of trapping stations was too few to allow a detailed analysis of altitudinal variations in moth species and populations. Only Sites 1, 4, 5 and 6 were trapped with Heath traps, thus allowing comparisons to be made. The smallest catches were at the lowest site (Site 1), with counts of 67 and 134. The next smallest catch was 383 metres higher at the highest site (Site 6) with 172 moths. 196 moths were caught 60 metres lower down at Site 5. The smallest catches were near the edges of the forest and the largest catch was at Site 4 (452 moths), in the middle of the primary forest. It would appear that small altitudinal differences have little effect on catch size and that position within the habitat may be a more important factor.

Work done in 1986 on the Satyrinae butterflies in Mazan (Robinson, 1986) suggests that closely related species show parapatric distribution patterns. This phenomenon was observed for three pairs of species, e.g. the butterflies *Steremnia monachella* and *Steremnia rugilas*. This phenomenon would be difficult to observe for nocturnal moths, especially those that are attracted away from their habitats by the ultra-violet light, and no definite altitudinal differences were noted.

(b) Habitat types

Seventeen percent of the total species were only found on the paramo including five species of Sphingidae. The moths of this family are unlikely to be found in areas of dense forest as they are strong, fast-flying moths and the only other Sphingid (*Xylophanes crotonis*) recorded was found in the area of secondary grassland. *Crotonis* is a widespread species found from Guatemala and Costa Rica to Peru. Of the 76 species found on the paramo, 28 (37%) were Noctuidae (a family of strong-flying moths) and 71% were new to the reserve. Unlike the primary forest, the paramo is a managed habitat and the grassland is regularly burnt to encourage new growth for cattle grazing. In 1987, there were many signs of recent burning, such as the charred remains of the Bromeliad *Puya hamata*.

Seventeen percent of the total species were only found in secondary grassland which indicates that there are considerable differences between the moth populations of the primary forest and this area. The partial clearing of the valley is likely to have increased species diversity. Eight species (all Noctuidae) were common to both paramo and grassland, and four species (*Agrotis ipsilon*, *Tandilia* species, *Pseudaletia sequax* and *Gaujonia arbosoides*) were found only in these habitats. Of these *P. sequax* has a widespread distribution including Chile, Venezuela and the Galapagos, the *Tandilia* species (near *T. microstigmoides*) has also been found in Peru, whilst *A. ipsilon* is a cosmopolitan grass-feeding species. *G. arbosoides* is one of many similar species with semi-transparent wings found in South America, and has also been recorded from Colombia.

Many of the species were found only in the primary forest area, but this habitat type was recorded more thoroughly than the paramo and secondary grassland. The largest catch (452 moths) was at Site 4 in the centre of the forest on 19.9.87, despite the fact that the trap was surrounded by close vegetation which limited the light range. Many of the named species are widely distributed in South America, such as the Geometrid *Cargolia arana* (which occurs in Peru and Colombia). Others have been recorded from different regions of Ecuador, such as

Sabulodes pumilis, which has been recorded from Quito and Coca in Ecuador. Twelve of the named species were found only at this site on the reserve; most of these are widespread in South America such as *Racheospila jenna* (also found in Colombia) and *Sabulodes caberata* (also recorded from Colombia, Peru, Bolivia and Venezuela).

In some situations species diversity may increase at habitat edges, as species from two adjacent communities overlap, but if one community is species poor then species diversity can be lower at the edge. It might be expected that Site 5 (15 metres from the forest edge) would include species from both forest and paramo. *Hadena imitata* was found here, although it was most common on the paramo. However, the forest boundary is clearly defined with a sharp change from trees to grassland where the steep valley side levels off and wind exposure increases. Only 11 species were common to both Site 5 and Site 6, out of 81 species at Site 5 and 76 species at Site 6, and species richness appears to decrease near the forest edge compared with the 120 species caught at Site 4 in the forest centre.

(c) *Species diversity and richness comparisons*

Most of the collecting was by light traps, so that mainly light-sensitive species were caught. Very few day-flying moths were recorded, none from the forest. No "sugaring" was attempted and some species would have been unrecorded. The bulk of the work on the moths of Mazan was to record species richness (number of species) and species diversity. Species richness in tropical forests is generally higher than for temperate forests. Barlow & Woiwod (1989) found using Rothamstead traps that there was much higher species diversity in the tropical Genting Highlands of Malaysia than in temperate Britain (although there was no consistent cycle of diversity throughout the year). The Mazan reserve was rich in species, with 263 species being recorded in 1987. In 1989 a further 70 species were recorded in three trapping nights and some daytime collecting and this high capture rate over a short period indicates that there may be many species as yet unrecorded from the reserve. The Heath trap placed in the centre of the primary forest on 19.9.87 attracted 120 species (452 moths). By comparison, the same trap (before its travel to Ecuador) caught only 33 species (43 moths) in an ancient woodland site in the Seaton valley in Cornwall on 28.5.84. This site was in a much more open habitat than existed at Site 4, and with a wider light-attraction range the trap might have been expected to attract more moths than in the closed canopy of Site 4. The total number of species (333) recorded in nine days at Mazan compares favourably with the number of species (471) recorded by the author in an ancient semi-natural woodland in Cornwall between 1980 and 1987 using mercury vapour lamps, which

Cornwall between 1980 and 1987 using mercury vapour lamps, which give much higher catches than actinic light (Heath, 1970). However, allowance has to be made for trap catches being higher in cloud forests than under clear skies (Bowden, 1982), as a high percentage of cloud cover reduces illumination by the moon and increases catches.

As well as species richness, species frequency distribution was recorded.

Herbert (1980) noted that there was a high number of species represented by only one specimen in Malaysia and Papua New Guinea. This was a feature in the trapping programme in Mazan in 1987 (Fig. 2). 55% of the species were found only once. Some of these species may have been casual visitors (such as *Xylophanes crotonis*) and not resident on the reserve. This may be especially true of the larger species found only on the paramo in 1989, such as *Thysonia zenobia*, which has been found from Mexico to Brazil, *Ascalapha odorata* (found in Mexico, Cuba and even Hawaii), and the cosmopolitan *Peridroma saucia*. However, most of the species caught in the forest are likely to have been resident there, as the thick canopy would inhibit casual immigration. It can be difficult to distinguish between species, particularly if nothing is known of their ecology. The commonest moth was *Lycophotia lilacina* (73 caught), but this species is very variable in colour form and size, and may form a species complex (Honey, pers. comm.), in which case species richness and diversity are greater than at first apparent.

Barlow & Woiwod (1989) found that the highest diversity in Britain and Malaysia was for the Geometridae and Noctuidae, whilst the Pyralidae showed much higher diversity in Malaysia. In Mazan, the Geometridae were the most common family, with 153 species. Next in order were the Noctuidae (131 species), the Arctiidae (35 species), the Pyralidae (16 species) and the Notodontidae (15 species). Many of the families were represented by one species only, e.g. the Bombycidae and Cossidae.

(d) Seasonality

Seasonal differences between species may occur where there are clear seasonal differences in temperature or rainfall. In temperate regions, such as Britain, different species fly in cold and warm seasons. In tropical regions, seasonal differences tend to be between wet and dry seasons, as the availability of the larval foliage-food source changes in response to rainfall (Wolda, 1978). In tropical regions, there may be large fluctuations in species abundance although the same species may be present and in Mazan, 66 *Lycophotia lilacina* were collected in September 1987, whereas only seven were collected in April 1989. Like many tropical countries, Ecuador has wet and dry seasons, but there is little information on the rainfall in Mazan itself, and it is likely that there is no clear seasonal division at this altitude.

On a visit to the paramo grassland in April 1989, it was noticeable that all the central flowering stalks of the Bromeliad *Puya hamata* had seeded and died in a mass flowering. Seasonal differences in plants might be repeated in the associated fauna. Out of 121 species recorded in April 1989, 42% (50 species) had been caught in Mazan in 1987. These figures include the paramo site, which had not been trapped previously. Catches 1a, 1b, and 1c were dissimilar, but these results may have been due to chance factors. In fact 64% of the species caught in 1989 at Site 1 had been recorded in Mazan in 1987, and 33% had been recorded from Site 1 in 1987. Continued trapping in different months may show that many species fly continually throughout the year.

(e) Endemism

Of the 333 species recorded in Mazan, 141 have been named. It is possible that many of the unnamed species will be found to be endemic to this isolated valley. Work done on the butterflies of the reserve in 1986 (Robinson, 1986) suggests that some of the Satyrinae might be endemic to this area. The Pronophilinae tribe of satyrine butterflies are largely confined to cloud forests and paramo grassland and at least seven of the 17 species recorded in Mazan in 1986 are unknown in the western cordillera near Quito. It has been suggested (Adams, 1985) that the degree of endemism in the pronophilinae butterflies lies in the succession of glacial and inter-glacial periods in the Pleistocene age. A widespread species becomes isolated on different mountain peaks as the climate warms and separates into different species on each peak. Adams (1985) suggested that, for butterflies, there is a significant correlation between the percentage endemism in a mountain range and its degree of topographical isolation. Adams (1983) suggested that there could be a strong link between endemism in pronophilinae butterflies and endemism in the general fauna. It is likely that there is a high degree of endemism in the moths of the reserve.

ACKNOWLEDGEMENTS

I would like to thank Martin R. Honey of the British Museum (Natural History) for help in identifications, particularly of the Noctuidae, and for allowing me the use of the facilities of the Museum. I am also grateful to Rose Ainsworth, Loveday Jenkin, Steve Leftwich and Richard Veal for help with the collecting, and to Vaughan Fleming for taking the photographs.

SUMMARY

Initial survey results at the Rio Mazan nature reserve indicate that it has high species diversity compared with Britain. Seasonal differences appear to be slight, and may be typified by fluctuations in species

abundance. Species diversity appears to be governed more by habitat type than altitude. Species numbers appear highest in the primary forest sites, although more Sphingidae were found on the paramo grassland. The reserve may hold many endemic species, but some cosmopolitan and wide-ranging species were caught even in the closed-canopy central forest site.

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BOOKS NOTICED

Guide to bees & honey by Ted Hooper. Hardback. 8vo pp 276, 5 coloured and 844 b/w pictures, 48 line illustrations. ISBN 0 7137 2244 4. 3rd edition, Blandford Press 1991. Price £15.95

First published in 1976, this acknowledged classic is now in a comprehensively updated and revised edition adapted for the new environmental awareness which has grown up in recent years.

The book is structured in four main sections. The first deals with the honeybee and the honeybee colony. Section 2 covers the essentials of hives and equipment and the strategy of bee-keeping. Strategy is highly important — it is vital that each beekeeper has a sense of the ongoing processes within a bee colony. These processes can be broken down into units, and the individual tactics employed in these processes comprise Section 3. Section 4 deals with the flowers which the honeybee works, and with the removal, composition, handling and preparation for sale of honeybee products.

The book is intended and designed for both the beginner and the experienced beekeeper alike. This edition now includes advice on the identification and treatment of diseases in the hive, full information on the disease varroasis which has recently been subject to much research, suggestions for the siting of hives and an expanded list of garden flowers attractive to the bees.

Jamaica and its Butterflies by F. Martin Brown & Bernard Heinman. Pp 478, 11 coloured plates. 4to. E.W. Classey Ltd 1972. Price £14.95.

Aberrations of British butterflies by A.D.A. Russworm. Pp 151 incl. 40 coloured plates. Large 8vo. E.W. Classey Ltd. 1978. Price £9.95. (For review see *Bulletin* 38:18).

These two fine books which we have recently seen in catalogues at up to £40 each, have now been remaindered and are in both the South Kensington and Cambridge (G. David, 0223-354619) bookshops at the above prices.

VISIT THE HIBERNATION SITE OF MONARCHS IN MEXICO

In our Jubilee issue (*Bulletin* vol.44) the discovery of the hibernation site in Mexico of the Monarch butterfly was described and illustrated in a colour plate. Now messrs Bales Tours are arranging an entomological holiday to Mexico which will include a visit to this astonishing assemblage of hibernating butterflies. The tour is being organised and led by Claude Rivers and will take place from 18th January until 1st February 1992 at the cost of £1,475. Further details from Bales Tours 0306 76867 or Claude Rivers, 17 Cumnor Rise Road, Oxford OX2 9HD.

BOOK REVIEW

Beekeeping: a practical guide to beekeeping in the school grounds by Dr John Feltwell. A4 paperback, pp 18, coloured and b/w illustrations. ISBN 1 872 865 038. Learning Through Landscapes Trust 1991. Price £3.50 (post incl.) from 3rd floor, Southside Offices, Law Courts, Winchester, SO23 9DL.

This is the second in this series of publications to be reviewed by the Society, designed to meet the needs of the National Curriculum for schools. There are probably more books published on the honey bee than on any of the other insects but here the emphasis is on learning from observation and the book does not deal with management or the end product which concerns most beekeepers — the honey. As in the publication on butterflies there are a few statements which need rewording if not to be misleading, e.g. "honey bees can see a much wider colour spectrum than humans" omits their inability to see red;

“propolis” is mentioned but not its purpose nor its source. However these are minor points in a publication which has a clear and interesting text accompanied by excellent colour plates and drawings. One hopes it will encourage more schools to keep bees though this does require a dedicated teacher who will manage the bees during the long school holidays if they are not to be a nuisance to neighbours and other beekeepers.

PWC

TOTAL MIS-INFORMATION, OR HOW THE CABBAGE WHITE BUTTERFLY OVERWINTERS AS AN EGG IN THE SOIL!

On page 18 of the February *Bulletin* we corrected some errors in a Press Release concerning the Wood-cricket. Compared to what we have recently come across that was but a minor blemish and at least the record of discovery and locality was a true one.

We recently received *101 Tips for successful gardening*, being a cross section of the types of questions *Gardening from Which* subscribers ask and are answered. This is published by the Consumers Association, an organisation which likes to be known for its accuracy and objectivity. Items such as that printed below, which all entomologists and indeed the majority of gardeners and any member of the public who has the slightest interest in natural history will know to be false, can but shake one's faith in the accuracy of many other statements from this source to which one does not know the answer. We print the item in full.

NIBBLED FERN

I have a fern in my garden whose leaves have been stripped to the midrib. What is eating them?

The caterpillars of the cabbage white butterfly and some larger moths, as well as the vine weevils, will strip ferns down to the midrib. Pick off caterpillars and any eggs off the foliage — being particularly vigilant when cabbage white butterflies are prevalent (April or May). The eggs can overwinter in the soil, so don't leave any debris nearby. If there are too many to pick off, use a pyrethrum powder like Synchemicals Pt Powder. Vine weevils are more difficult to control but you can use pyrethrum powder as for caterpillars or gamma-BHC dust (Murphy Gamma BHC Dust).

We have written to the Consumers Association advising them to employ an entomologist on their editorial staff before making any more such rash pronouncements about insects. I was also under the impression that, like DDT, gamma BHC was on the list of banned pesticides!

A NOVEL FOODPLANT OF THE POPLAR GREY

by Przemyslaw Szafranski

The Poplar grey, *Acronicta megacephala* (Schiff. et Den.) is a common noctuid moth widely distributed in the Palaearctic region. Its caterpillars feed on leaves on poplars *Populus*, especially *P. nigra*, and willows, *Salix*; according to some sources they feed also on oaks *Quercus*. During the studies performed in 1990 in the Bemowo Woodland (a forest complex in Warsaw suburbs, Mazovian Lowland, Poland), I found a couple of almost fully grown larvae of this species feeding on an old birch, *Betula verrucosa*, at the edge of the forest. Taken to the laboratory, they continued to feed on birch leaves and pupated within a week. In the Bemowo locality, *A. megacephala* prefers the aspen *P. tremula* (dominating there with with *B. verrucosa*) and, to a lesser extent, the willow *S. alba*. The finding that *A. megacephala* is able to feed on the birch seems of interest as the leaves contain the glycosides, flavonoid, terpenoid and other compounds, all inimical for insect development, differing remarkably from those of the Fagales (e.g. *Betula*, and Salicales (*Salix*, *populas*)). However, on the other hand, more than half of other representatives of the genus *Acronicta* found in Europe do feed, among other trees, both on birch, poplar and willow.

A LATE REPORT OF THE BLACK COLLAR FROM GLOUCESTERSHIRE

by Brian M. Kiddle

I wish to report a very rare moth (*Ochropleura flammatra*) which I found in June 1968. It was attracted to light a kilometre north of Huntly, Gloucestershire. The moth's wings are similar to some other species, but the black collar was quite distinctive and it was identified by reference to Richard South's *Moths of the British Isles*. I am sorry it has taken me so long to report this rarity, but I do not study insects very much as I find so many of them hard to identify and only recently came to hear of the Amateur Entomologists' Society. Since only three examples have been reported, the last over a century ago in 1876, I feel this sighting should go on record.

THE SWALLOWED FLY

"There was an old lady who swallowed a fly"; then a spider, a mouse, a cat. So goes the old Victorian nursery song. A modern version occurred this year in Turkey when a farmer, having swallowed a fly at once gulped down some insecticide in order to stop it breeding. "I heard that flies reproduce fast" he said when interviewed in his hospital bed.

A NOTE ON *OPHIDIUS HISTRIO* (BOISDUVAL) (COLEOPTERA: ELATERIDAE) A CLICK BEETLE FROM EASTERN AUSTRALIA

by Trevor J. Hawkeswood

49 Venner Road, Annerley, Brisbane, Queensland, 4103

Ophidius histrio (Boisduval) (Elateridae) is probably the most attractive of the Australian click beetle fauna, most species of which are drab brown or dark grey in colour without markings. A colour illustration of *O. histrio* is provided by Hawkeswood (1987a: 70, plate 100) and a black/white photograph is illustrated by Neboiss (1975: plate 3, fig. 4). The dorsal surface of the elytra is adorned with a complex pattern of dark cream, orange-brown and black, with the black forming a wavy pattern and the pronotum is proportionately large and broad and has three longitudinal black or dark red-brown lines alternating with dark cream areas. Adults measure 15-22 mm long 4-6 mm wide (Neboiss, 1975). The species appears to have a sporadic coastal distribution from just south of Sydney, New South Wales, to Mt. Spec in north-eastern Queensland. Neboiss (1975: 29-30) listed the following localities from which specimens have been collected: Queensland — Mt. Tamborine, Springbrook (Lamington) National Park, Stanthorpe, Brisbane, Southport, Glen Lamington, Montville, Bunya Mountains, Mt. Spec; New South Wales — Rivertree, Batemans Bay, Kangaroo Valley, Dorrigo, Lismore, Richmond River, Ulong, Comboyne Plateau, Acacia Plateau, Kurrajong. Illawarra, Sydney, (Royal) National Park, Gosford, Rosebank and Otford. Almost all of these localities are coastal while others, e.g. Mt. Spec, Mt. Tamborine, are largely montane rainforest habitats which are situated near the coast. In some areas, the species may have already suffered local extinction, e.g. Southport (Gold Coast) where commercial developments have cleared almost all of the native vegetation from the coast. Even though the beetle appears to have a widespread distribution in eastern Australia, it is my opinion that the beetle is not common. During many years of collecting in various areas of Australia I failed to find any specimens of *O. histrio* and it appeared to be absent in the Blue Mountains although it has been recorded from Kurrajong (Neboiss, 1975).

During the summer of 1987-88 I first observed the beetle in heathland near Hastings Point, north-eastern New South Wales (28°31'S, 153°35'E), during December, feeding on the nectar from the small, white flowers of *Baeckea stenophylla* F. Muell. (Myrtaceae). The beetles were usually only found on one or two bushes over a period of a few days and the numbers varied from one to eight beetles/plant. Mating occurred on the flowers or more often on the leaves and branches of the host bushes. This species was not observed in previous seasons at Hastings Point (see

Hawkeswood, 1987b, for a list of beetles collected from *B. stenophylla*). *Baeckea stenophylla* is the only foodplant recorded to date for this beetle. Chisholm (1929: 333) noted that *O. histrio* was occasionally seen on flowers in the gardens in the Comboyne Plateau, New South Wales, but did not provide specific details. Froggatt (1914: 18) provided an extensive list of flower-frequenting Coleoptera and other insects on the flowers of *Angophora hispida* (Sm.) Blaxell (cited by the old name of *A. cordifolia* Cav.) (Myrtaceae) in the Sydney area but the only Elateridae collected from the flowers was *Anilicus semiflavus* Germar. It would be interesting to determine host plants of this beetle throughout its range and especially in the rainforest areas where it is purported also to occur.

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A NEW RECORD OF A PALE CLOUDED YELLOW IN MIDDLESEX

by P. W. Cribb (2270)

On the 7th July, 1991 I was leading a group of members of the London Wildlife Trust (Richmond branch) on a visit to the Feltham Marshalling Yards, recently saved from a housing application and one of the finest floral sites in Greater London. It was about 3.00 p.m. and the sun was brilliant and the flowers, benefitting from the June rains, made a great show. As we approached a large stand of lucerne (*Medicago sativa*) we observed a Pale clouded yellow fluttering above it. It settled and enabled me to positively identify it as a male but whether of *Colias hyale* or *C. alfacariensis* it was not possible to say. The lucerne might indicate that it was the former but as it was a male this might not have been relevant and there are on the yards many species of vetch which would probably be acceptable to *alfacariensis*. In previous "croceus" years I have observed the Clouded yellow using the lucerne for breeding purposes here but this is my first record of any Pale clouded yellow here or elsewhere in Middlesex, my other sightings having been on the south coast and on the South Downs.

MIGRANTS IN KENT 1990

by Tony Rouse (6572)

On 24th August an *Acherontia atropos* (Death's-head hawkmoth) larva was brought to our butterfly house at Hamstreet in Kent. It had been found in a potato field during the harvest, somewhere on the Romney Marsh, and had been kept in an old lemonade bottle for a few days with a cabbage leaf, and was the worse for wear. It duly pupated and produced a female on the 29th September. The year before, in 1989, I had reports of one field alive with larvae and pupae but only found out about it two weeks after the field was cleared of potatoes, but managed to round up eight pupae from various potato pickers. Most were dead or deformed, and only one female hatched. On speaking to the pickers, reports (perhaps exaggerated) were of hundreds of larvae and pupae — children were collecting them, birds were eating them, and larvae were wandering in all directions. I am surprised there were any potatoes to harvest!

Anyway, getting back to 1990, although I ran my MV trap night after night at Densole, nothing of great rarity was taken. Meanwhile, friends on the edge of the marsh and at Dungeness were taking *Agrius convolvuli* (Convolvulus hawk) — a female on 29.8.90 and a male on 30.8.90 (other dates not known). That is until October. Sean Clancy took a male *Catocala fraxini* (Clifden nonpariel) at Dungeness on 29th September. He also told me of Bernard Skinner taking a female in Pagham, Sussex on 13.10.90. This laid about 70 ova. Things were looking good although it was late in the year. On 18th October I peered into my MV trap at Densole and found a female — rather tatty but none the less, alive, female. Having had no practical experience of sexing *C. fraxini* I hoped it was a female, although it looked like a male. Ever hopeful, I decided to keep it alive, and lo and behold, over the next week it laid 38 ova before dying. These are, at the time of writing (6.3.91) still overwintering, but started hatching on 7.5.91. Sean tells me that these are the first reports in Kent since 1960. Just a quick note: on the night of the 17th it was very warm for the time of year — 15°C. and cloudy with a slight fog. Now, the thought occurs to me that if these moths normally lay 200 - 300 ova, where were the others laid? Could they possibly be in France? Or did it migrate across the channel after pairing? There is a small possibility that there could be a small colony hatching somewhere along the south coast in 1991. I would be interested in any more reports this year.

Just to round off the year nicely, I also took *Palpita unionalis* on the 19th, 20th and 22nd October — another rare migrant from the southern Mediterranean. Obviously something to do with the long hot summer. Can't wait to see if we have another one!

Other migrants noted by Sean Clancy at Dungeness were a male *Hyloicus pinastri* (Pine hawk) on 27.7.90, and several *Macroglossum stellatarum* (Hummingbird hawk) on 2.6, 6.8, 2.9, 12.9, 19.9, and 18.10.1990.

ORTHOPTERISTS MEETING 1991

The annual meeting will be held at Queen Mary College, Mile End Road, London, on Wednesday 6th November 1991 from 15.00 to 20.00. The total cost will be £10.00 per person to cover tea and cake during the afternoon and a buffet with wine at about 18.00. The meeting is being hosted by Richard Nichols of the School of Biological Sciences.

Following the success of the short talks sessions in previous years we are intending to have a similar session this year. We hope that as many participants as possible will contribute to the session. Videotape replay facilities will be provided, as well as space to display posters. As usual, exhibits on *any* subject will be welcome.

If you wish to attend the meeting, or would like further information, please contact me: David Robinson, Department of Biology, Open University, Walton Hall, Milton Keynes MK7 6AA.

THE LESSER BROAD-BORDERED YELLOW UNDERWING IN IRELAND AND A NAME CHANGE FROM JANTHINA TO JANTHE.

by Tim A. Lavery (8677)

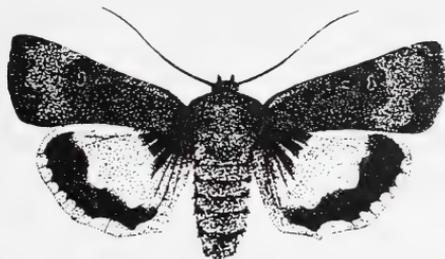
All previous Irish records of the Lesser broad-bordered yellow underwing have been assigned to *Noctua janthina* (D. & S.) from which it has only recently been split (Mentzel *et al.*, (1991), however, it appears that only *N. janthe* actually occurs in Ireland (and Great Britain).

Since the common name, Lesser broad-bordered yellow underwing, was probably first used to describe British specimens, it follows that it should now be applied to *N. janthe* only.

Keys and illustrations of these similar species and a further species, *N. tertia* Mentzer, Moberg & Fibiger, are to be found in the comprehensive article by Mentzer *et al.*

N. janthe is a moderately common and widely distributed Irish noctuid moth (Fig. 1). It is single-brooded and flies from early July well into August: it is often the most abundant insect at light.

The figures in Skinner (1984) and Heath *et al.* (1983) are of *N. janthe*.



Left: Map of distribution of *Noctua janthe* (post 1960). Right: The moth, illustrated by Tim A. Lavery.

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- (Editor's note. The differences between *janthina* and *janthe* are fully described and illustrated in *Nordens Uglyer* by Peter Skou, which has just been published by Apollo Books).

ALTERNATIVE USES OF JUNGLE GEL

by P.E. Bragg (8737)

In tropical countries an insect repellent is essential to keep away the mosquitoes. There are various makes available in liquid, gel and aerosol form. I have always used a gel form of which there are several available marketed by various companies under names such as "Jungle Gel" or "Jungle Formula". I have recently discovered two new uses for it; the first one will only work with a gel, the second would probably work with all three basic forms of repellent.

The first is to protect insects which are being preserved for while they are drying on your setting board they will attract ants or other scavengers which will then eat the dead insect. To prevent this, the setting board should be supported on pins and a blob of repellent gel should be applied to the head of the pins. This proved very effective in Sarawak.

The second use is to remove leeches from your body. Last year in Sabah a friend had a leech sucking his blood. It took him several minutes for him to persuade it to release its hold. A swollen, sore wound remained for several days. When the same thing happened to another friend in Sarawak, I applied a blob of Jungle gel and the leech dropped off instantly. In this case only a small mark remained, and this quickly disappeared.

GREEN-VEINED WHITE BUTTERFLY CAUGHT IN MOTH TRAP

by Owen Lewis (8132)

On opening my moth trap on the morning of 3rd August 1991, I was amazed to find a Green-veined white butterfly (*Pieris napi*) alongside the expected Large yellow underwings and Common Rustics.

The "Heath" style trap had been put out in the garden half an hour before dusk and was checked at 9.00am on a dull morning, before any butterflies were active, so I doubt it blundered into the trap by accident. I have read of the migratory Nymphalids being caught at light, but never of a more or less sedentary species like the Green-veined white. Do they really fly at night?

SILKWORM GUT

The following item under the above title was sent to us by member David Stokes (7630) and is reprinted, with permission, from the November 15-21 1990 issue of *Shooting Times and Country Magazine*.

"I often come across passing reference to the days when fishing casts were made of gut and I understand that this, like silk, came from the silkworm. Can you tell me how this was obtained?"

M.A. Absalom
Glasgow

THE SILK, of course, comes from the caterpillar's cocoon. The gut is obtained from the full-grown larva itself, a quantity being steeped in strong acetic acid, after which the glands are separated from the body. From this a clear fluid emerges and hardens under sunlight, forming the basis of the gut used for casts."

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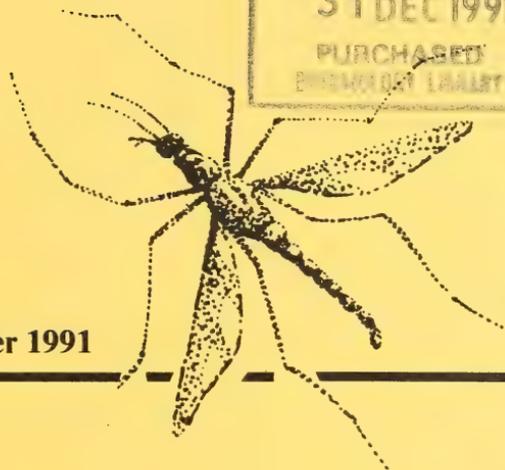
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CONTENTS

Address correction — George Mamonov	209
Alternative use of jungle gell, <i>by P.E. Bragg</i>	239
Another MBGBI published	198
Attention! . . . as (a few of) you were, <i>by Peter G. Taylor</i>	193
Book reviews	198, 232
Books noticed	231
Entomological Club grants	212
Freshwater Biological Association	211
Green-veined white butterfly caught in a moth trap, <i>by Owen Lewis</i>	240
Late report of Black collar in Gloucestershire, <i>by Brian M. Kiddle</i>	234
Lesser broad-bordered yellow underwing in Ireland and a name change from <i>janthina</i> to <i>janthe</i> , <i>by Tim A. Lavery</i>	238
Luminescent beetles, <i>by S.J. Patel</i>	199
Migrants in Kent 1990, <i>by Tony Rouse</i>	237
New record of a Pale clouded yellow in Middlesex, <i>by P.W. Cribb</i>	236
Novel foodplant of the Poplar grey, <i>by P. Szafranski</i>	234
Note on <i>Ophidius histrio</i> , a click beetle from eastern Australia, <i>by Trevor J. Hawkeswood</i>	235
Orthopterists meeting	238
Quatrième salon international des plus beaux insectes du monde	212
Queen of Spain fritillary at Gorleston-on-Sea, <i>by Christopher Bales</i>	211
Selection of smaller shrubs for oviposition, <i>by Peter W. Cribb</i>	197
Silkworm gut	240
Small blue locality	209
Species diversity and seasonality in the moths of the Rio Mazan Nature Reserve, Ecuador, <i>by Adrian Spalding</i>	213
Swallowed fly	234
Swallowtail and Scarce fritillary gynandromorphs, <i>by Ekkehard Friedrich</i>	211
Total mis-information, or how the Cabbage white butterfly overwinters in the soil!	233
Visit the hibernation site of Monarchs in Mexico	232



Volume 50, No. 379, December 1991



The Bulletin of the Amateur Entomologists' Society

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

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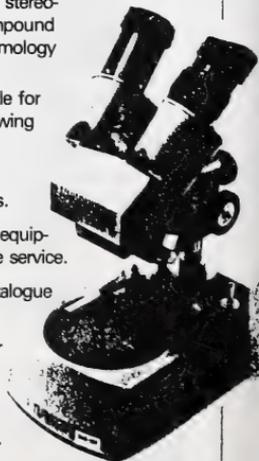
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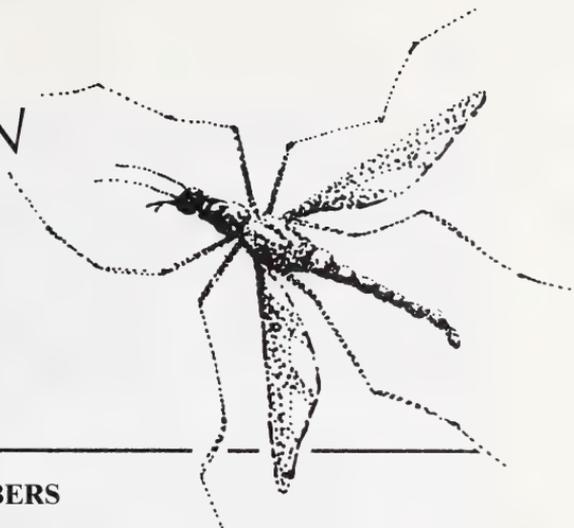
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AES BULLETIN

No. 379



THE AES AND JUNIOR MEMBERS

by *Darren Mann*

The council of the Amateur Entomologists' Society has stepped up the effort to encourage young people to join in the study of entomology. The two most recent advances made are:-

1. The addition of a Junior section to the *Bulletin*. This will consist of a couple of pages dedicated to articles for and by Junior members to write more articles and will also give Juniors a medium to express their entomological views and opinions. The majority of Junior members who replied to a recent questionnaire said that there were far too many articles on Lepidoptera (butterflies and moths) and that a lot of the articles were too complicated for them to understand. Well, you now have the opportunity to change this.

We hope that there will be a good response from the Juniors in answer to the plea for more input, so that we non-juniors do not have to write everything and secondly you do not have to read everything that we have written.

2. The creation of the post of Junior Secretary, which was proposed, seconded and agreed, at the 7th June 1991 council meeting. At that same meeting Mr Darren J. Mann, was elected to the aforementioned post. We hope that this will give the juniors a focal point for them to send in their articles and so forth.

Introduction

The two articles in the first Junior section are by Mr Guy Knight and Mr Andrew Salisbury, both of whom were gently persuaded by me to provide some written work for the section. As you can see from these two articles by Guy and Andrew they do not have to be technical or full of Latin names, so put pen to paper and see what you can come up with.

In the next Junior section there will be a report written by the participants of the 1991 Junior Fieldweekend, which I think went very

well and was enjoyed by all who attended, even though we did have a few minor hitches.

I would like to take this opportunity to thank all those Juniors who have returned their completed questionnaires, and to remind those who have forgotten all about it, to send them back, as the more replies I can get from you, the easier my job gets and the more I can do for you. Some of the more positive answers have already been translated into recommendations to the AES Council, and have been acted upon.

Accidents will happen!

by A. S. Salisbury (8478J)

Since becoming interested in entomology, I have spent a lot of time at Coombe Abbey Countryside Park, near Coventry, recording mostly beetles (Coleoptera) and the occasional true bug (Hemiptera). This is a large site, with a variety of habitats, such as woodland, aquatic and marshland.

I have spent many a happy hour wandering around the park, and catching insects. Unfortunately I have also spent a few uncomfortable hours there due to accidents, usually in the wetter areas of the park. One area in particular has given me more troubled moments than others. There is a small marshy area which is hidden by hawthorn hedges and rhododendron scrub, in a northern corner of the park, in which both myself and Darren J. Mann have both had unforgettable cold, wet days.

One wet, windy and very cold day in February when we first came across the marsh, we really got stuck in — literally. There was a thin path between the rhododendron scrub, through which the site was accessible. Daren went first, he took one step onto the path and sunk. His Wellington boot had almost completely disappeared into thick stinking mud, some of which was pouring over into his welly. It was left to me to retrieve the welly, whilst Darren hopped about with a soggy foot. When Darren was reunited with his muddy welly we continued with more care.

We eventually reached our objective, to find a large pond surrounded by willow trees and sedge. We decided to find out how deep the pond was, so I grabbed a stick which was about five foot long. I plunged the stick into the pond and promptly followed it in, head first. I quickly righted myself and grabbed the vegetation on the banks. I realised my feet were not touching the pond's bottom! I looked up to see Darren laughing as he pulled me out. Upon further investigation the pond was found to be about eight foot deep. At this point being very wet and a little distraught I decided to walk the three miles home; leaving Darren to search for beetles.

Later in the year we revisited the site, via a different route. After a brief search we found some frog-spawn on some grass in what appeared to be a shallow pool. Darren decided to remove the frogspawn to the deeper pond. He trod on what he thought to be a solid piece of turf, and sunk to his waist into another deep pond. It was now my turn to laugh.

Although this is not one of the most productive areas of Coombe it has turned up at least 50 species of insects including at least two notable rarities. Unfortunately the best sighting from the marsh is, to date, not an insect but the protected Great crested newt. It is hoped that with further searching a good list of insects will be achieved.

Work experience by Guy Knight (8040J)

After recently completing my fortnight's fourth form work experience at the Entomological/Natural History Department of the Herbert Art Gallery and Museum, Coventry, it was suggested by Darren Mann, a volunteer there, that I should share my experience in his forthcoming Junior section of the *AES Bulletin*. This would hopefully, give other readers a "taste" of the work done in this occupation. However, at the time I was on placement, work at the museum was slightly untypical as the department had undertaken work on a site survey funded by the local authority. This survey was to cover fifty potentially entomologically rich sites within the city boundaries. A team of volunteers from the museum were occupied mostly by this work. In charge of the project was Steve Falk, Deputy Keeper of Natural History, who at the time was covering for the Head Keeper, Adam Wright, with whom I had originally arranged the placement and who had recently left the museum staff. However, Steve still seemed happy for me to work alongside the other volunteers in the field and to help with museum work.

The purpose of the survey was to generally investigate some of the habitats of the area and to offer suggestions to the owner as to how it should be managed to fulfil its potential for wildlife without becoming overgrown and devoid of the wide range of flora and fauna it was capable of supporting. The task, which was mainly tackled by Steve, involved among other things, the meticulous drawing of maps showing which areas, however small, perhaps hosted an insect not found anywhere else on the site. Before this could be done, several visits had to be made to the site and as long a list as possible had to be compiled, of insects of all orders. Not a very easy task for a team of five or six people working to a time limit. I soon learned that the secret of an entomological survey is to take as much as possible from groups, sometimes totally alien to the collector and identify them at a later date, a technique employed by Darren and other volunteers such as Tony

Barlow. This was so that the management of the site would not become too narrow and would provide a chance for all types of wildlife to thrive. My own interests lie mainly with Hymenoptera and I found that this illustrated the point very well, in that a site which I regarded as poor for bees and wasps, may have been found by Steve to be very productive for other groups, such as Diptera.

Another important technique for surveying that I did not have time to encounter during my brief stay at the museum, was to visit a site many times in different conditions and at different times of day. Again, this produces a much more realistic representation of what the site holds, because unexpected insects may turn up, even on the most well-worked sites in the area. This was proved by many first and second county records being obtained during the survey.

For myself, the chance to try this kind of work in habitats and areas that I would not normally visit, produced many species new to me.

Many thanks to Steve, Darren, Tony, Mike, Andrew, Adam and everyone else at the museum for their time, advice, help, the use of the museum resources and a very productive and enjoyable break from school.

BOOK REVIEW

Bees of the world by Christopher O'Toole & Anthony Raw. Large 8vo, hdbk. 192pp, 50 coloured, 48 black and white illustrations. ISBN 0 7137 2085 9. Blandford, London 1991. Price £16.95.

This is the fourth book in the Blandford series devoted to insects of the world, with a fifth on the spiders, already reviewed in our pages. The number of bee species, around 25,000 in the world, means that this work can give only an overall view of the Apoidea but this provides an excellent introduction for the interested beginner.

The families and sub-families and where they live are dealt with in the first two chapters with subsequent ones considering specialised groups: miners, potters, masons, leaf-cutters, carpenters and social bees.

The evolution of social living and its differing forms are explained and there is an interesting chapter on the much maligned drone or male bee. The associations of bees with flowers, particularly the orchids, and other partnerships and the role of predators, cuckoo bees and parasites, such as the new scourge *Varroa jacobsoni*, complete the chapters. There is a brief glossary and guide to further reading.

This is a fascinating book, well produced, and should increase interest in a group of insects so important economically and ecologically to our plants.

DOWN THE TUAH ROAD

by Leigh Plester (2968)

(Continued from Vol. 49, page 250)

We made two trips to Bako National Park. The most vivid recollection of getting there is of a taxi we picked up in downtown "Catsville" (*Kuching* is Malay for "cat"), the driver staying doggedly with us until we had sorted out our belongings at Stephen's house (a matter of an hour or so) and then after checking the 5mm of ground clearance on his vehicle, calling up reinforcements in the shape of a second stalwart. The driver of *this* vehicle, mindless of my two Finnish lady companions under the equipment on the back seat, on the 37km journey discussed at length the prices of girls of ill repute in Sibuan and, like a field entomologist, told me where I ought to go if I desired to add this or that to my collection, without realising that my speciality was entomology and not clinical bacteriology.

However, I am now jumping the gun by a fortnight or so. On 24th April Nick climbed into the driving seat of Stephen's car, its owner (not apparently convinced that all is ordained) sneaked onto the rear seat, and I discovered that it is possible to maintain a degree of equilibrium by clamping one's teeth onto a plastic dashboard. Nick missed killing a snake as we blue-smoked it down the final straight just before the cunning perpendicular turn off to the *Kampung Bako* wharf. He missed killing it because the snake was already dead when, for good measure, he hammered it into the tarmac.

Drawing up at the wharf, we parked and plank-creaked down a row of dingy shops to swig ice cold coca-cola. Many dogs sniffed at our knees, flies hummed and an incredible variety of refuse winked, glimmered and fermented in the sun just a few feet from where we sat. Coca-cola certainly has hidden body, I mused.

Refreshed, Stephen carefully locked the car, going round twice to check that each door was in order. Personally I would have spent the time inventorying the remaining big-end bearings, but there again it wasn't my car. We all piled into a longboat, accompanied by a group of Chinese Sarawakians, one of whom was incongruously wearing Dallas headgear. Putt-putting down the river and into a slice of the South China Sea, we had a chance to view mangroves from close at hand. At low tide it is not possible to get to the national park at all, but at this time of day a couple of metres of each tree trunk lay under water. The island on which the park lies drops sheer into the sea or glutinous mud at many places, blotches of yellow and black cliffs peeping out between trees jostling each other on impossible crags, the whole backdrop a museum showcase in the finest Victorian style.

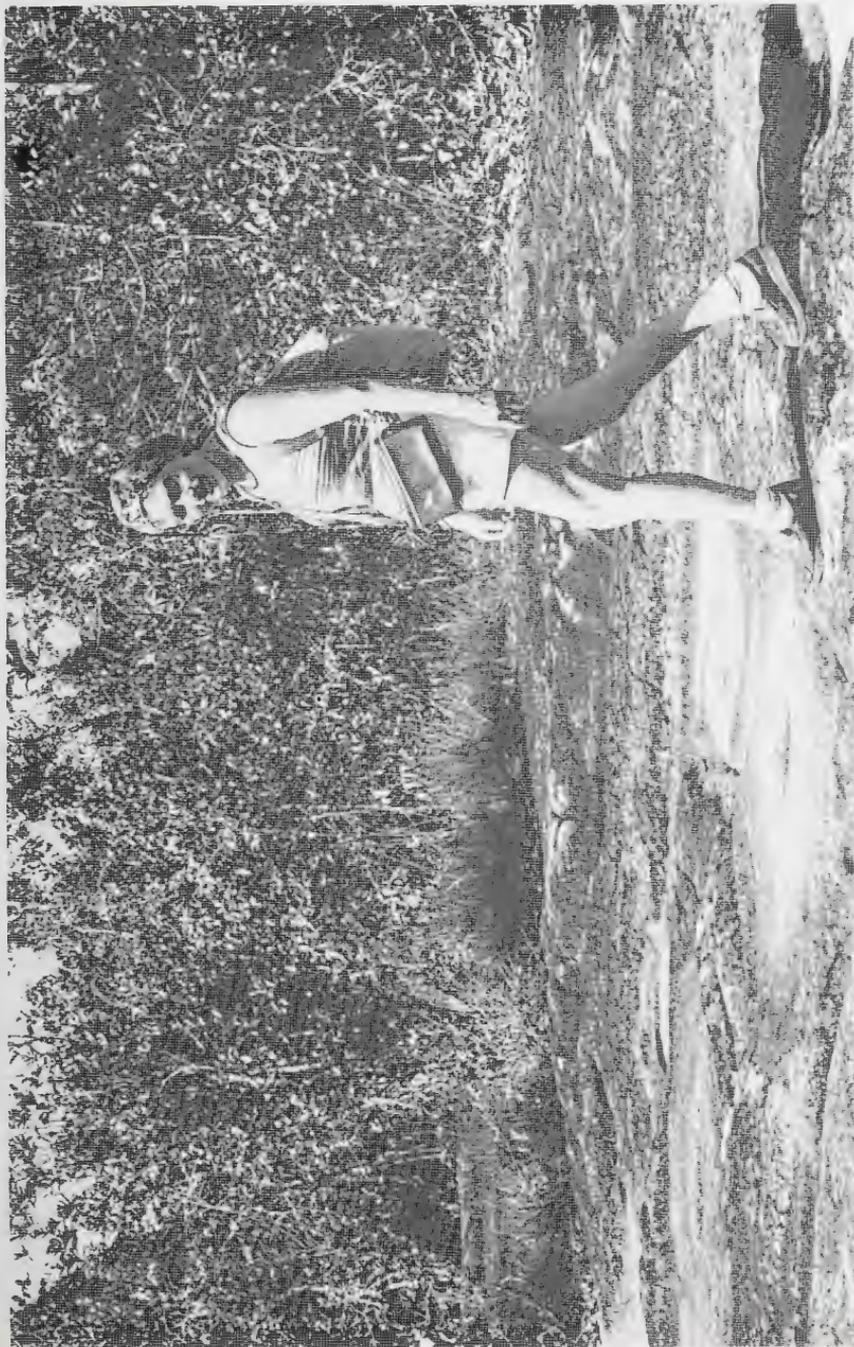
Arriving at the park headquarters before mid-day, we discovered we should have to wait until the previous occupants moved out of the villa we had booked at the park office in Kuching. Dumping our stuff at the information centre, an open-fronted structure with a veranda and one of those peculiarly eastern-looking roofs that sag in the centre like a rubbish tip settee, we took stock of our surroundings. There was still no sign of primary rainforest, but one felt it had to be somewhere, as the national park brochure stressed the presence here of at least five major habitats, viz. beach forest and cliff vegetation, mangrove forest, swamp forest, mixed dipterocarp forest, kerangas pole forest, scrub and padang.

A male Common mormon (*Papilio memnon*) flapped nonchalantly by, just to emphasise the fact that it was protected.

Some fifty metres distant, the seashore was sandy. It was separated from the long strip of lawn (composed of an obscure species of plant bearing no relation to the *Gramineae*) by a no-man's land in which strange pandan shrubs thrust up and then wandered about in the air, large conifers and *Crinum asiaticum*, a giant lily-like effort covered with cutworms, which are brownish moth caterpillars that systematically carve great chunks out of the long leaves, grew scattered and scarcely touching one another. Through the foliage and out across the bay your gaze was sucked in by what appeared to be a mountain. Learn that it's name is "Santubong" and you are a lost man. Often I walked slowly along the sandy, crab home-pocked shore of Bako, wondering why on earth I had not decided to make an entire film of that sky-dominating spectacular mountain. Alas, only later did I discover that the land on which it lay was not an island and that a posh tourist hotel had been constructed at its foot. Such is the way of all our dreams.

Standing stiffly on the lawn in front of a bevy of palm trees, a helpful notice warned "*Awas! Buah kelapa di atas mungkin jatuh*" (Beware of falling coconuts). This exhortation was in the same category as the World War II Burmese montane warning to "Drive carefully looking up". But it did demonstrate that they cared about you at Bako.

The long strip of lawn was split by a narrow line of paving stones from which that great Borneo favourite, wooden walkways, led off into the gloom of planted trees overshadowing the actual villas. These latter stood on stilts, known officially — to one's horror — as "piles". Macaque monkeys roamed the shadows in droves. Nearer at hand a small wooden bridge had been constructed overlooking a lantana bush in full flower. During the time we were at Bako this sprawling bush with its not-orange not-red blossoms was visited by a variety of butterflies, including a superb male jet and gold Common birdwing (*Troides helena*) that was chased away by other swallowtails, a Black and white helen (*Papilio nephelus*) — virtually a welcome mat with chicken droppings



Raija on the padang. Note the dried up puddles and the pole forest, with one or two conifers, in the background.

on it — a gaudy lacewing (*Cethosia pentheseles*), several Clippers (*Parthenos sylvia*) and some Common grass yellows (*Eurema hecabe*).

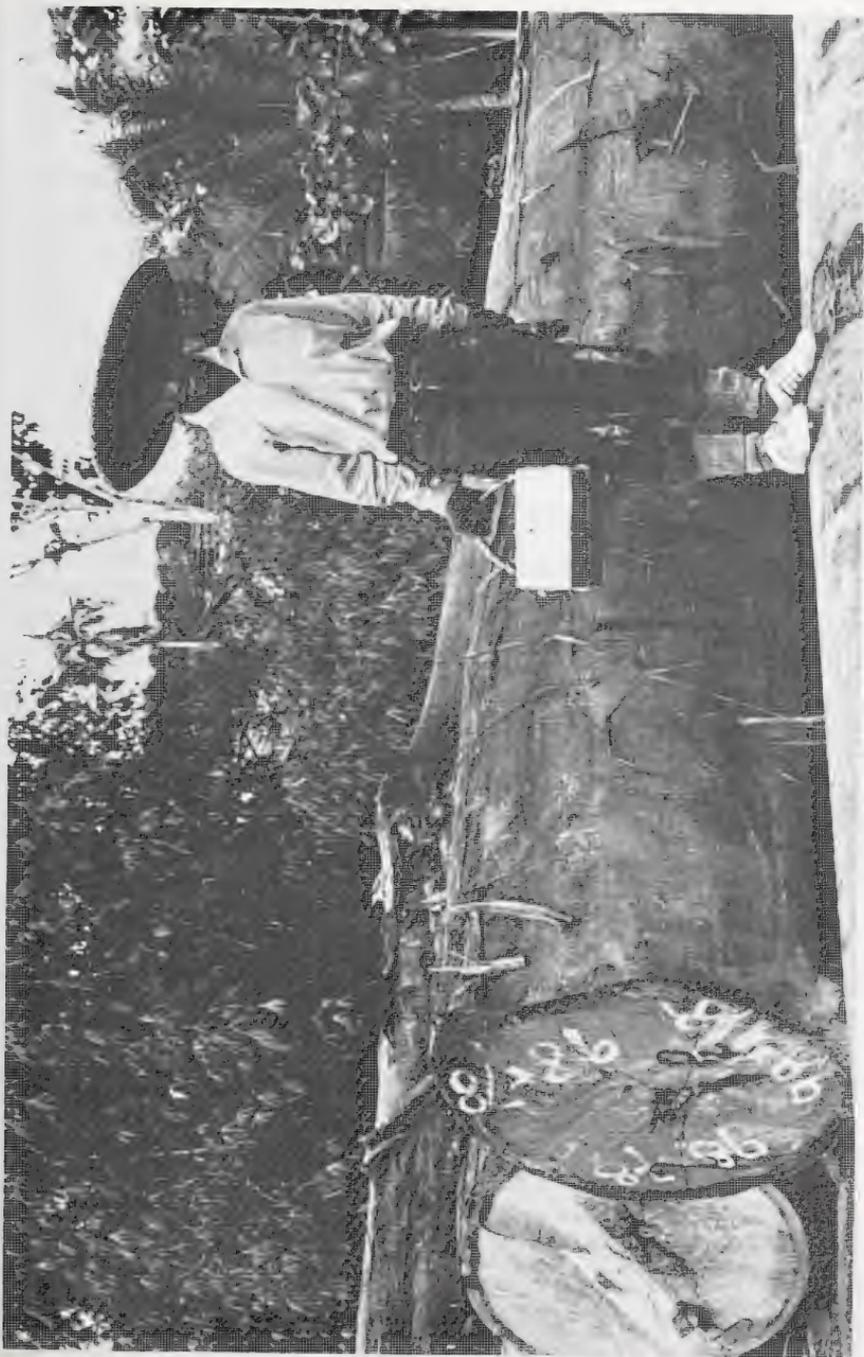
With the departure of last night's human guests, we lugged our gear up one of the walkways and across the veranda into one of the rooms of our villa. This contained beds and mattresses, wire screen windows, a creak-creak floor and a pair of both busy and nubile maidens who regrettably turned out to be just the cleaning staff. The kitchen boasted a tap from which brown water flowed straight off the mountain behind us, cutlery and crockery, and a funny Borneo cupboard fitted with wire gauze. Funny, that is, to those who prefer food that has been turned down flat by both jungle rats and cockroaches.

We went outside to greet a troupe of lively macaques that had already made off with part of our food supply and, shooing them good-naturedly away, prepared a quick snack. Stephen confided that, though he lived but 37km away, he had never spent the night in Bako National Park. "There comes a time in every HASH-fellow's life," I intoned, bonhomie-clap on the shoulder, "When he has to prove he's a man." How right I was!

Now the primary forest urge had to be satisfied. Shouldering my rucksack, containing some 16mm Bolex equipment and several rolls of film, ordinary photographic equipment, three litres of boiled water and some biscuits, I staggered off down the walkway after Stephen, my legs threatening to give way at every plank. Nick, carrying an aluminium camera case loaded with gear in one hand, the Bolex tripod in the other, strolled leisurely after us with the most optimistic of expressions on his face. "I'm beginning to enjoy this," his countenance said.

Crossing a mangrove, we finally encountered primary Borneo rainforest, the trail flanked by vertical rocks, the air muggy but with the sun obscured by the broadleaved evergreens a bit cooler than out in the open. The boots I had bought were pretty useless in the mud, but I managed to slither along behind Stephen who, carrying nothing but a small wicker shoulder bag containing a litre of drinking water, easily outpaced us and was obliged to keep stopping. I couldn't see any insects, apart from inch-long ants, as I kept watching the ground, fearing that the land leeches would be on to us in a moment or two. Happily, these seemed to be absent from Bako.

Unhappily we soon reached a fork in the path. Without hesitation Stephen chose the Lintang trail, which is not actually a trail but Everest's twin without the snow. One thrust upwards, angling one's boot over a root or partially sunken plank, to arrive giddily on the next muddy ledge. Occasionally it was necessary to grab a handy root or branch in order to avoid tipping over backwards and doing a Humpty-Dumpty through



Logging is currently one of Sarawak's primary industries. Though controlled, the large number of concessions is wreaking havoc with original rainforests.

fifty metres of rainforest, pack and all. The rainforest became pole forest and there were thorny rattans that looked as though they would rip out your bowels given half a chance. Pole forest, as its name suggests, consists of straight little trees set in this case on a rather dry and infertile hill.

After twenty minutes of thrust and pull, the sweat pouring off me and my tee shirt and shorts already soaking wet, I found my nose inches away from Stephen's jogging shoes. He had actually stopped! With a supreme effort I tilted my head up: the beggar looked as fresh as a daisy. Ten minutes later Nick's planter's hat bobbed into view and he arrived red-faced and breathless just below us. Glowing with satisfaction, Stephen uncharacteristically permitted himself a most undiplomatic statement: "You should take up HASH, Nick, it'll make a man of you!" Father of three, Nick gave him a long and head-hunting look. "Get married, Stephen," he said with heavy irony. We eventually agreed that for the sake of myself (a relatively lean specimen) and of Nick (who had literally begun to suffer palpitations on the way up due to a combination of intense heat, exertion and spare tyre) we should take it a bit easier. And so it was that we arrived at a park bench just below the padang still sweating profusely but no longer stretch cases. Here two of us collapsed while one remained standing.

There was a constant "Tsit-tsit-tsit" of cicadas and a prolonged, eerie "Yiiiiiiiiiiii" from some other insect palpitating the air in the heat. After a brief rest, Nick dug out the sound recording gear and set it all up nicely overlooking the forest and the distant (noisy, though invisible) sea. The entomological orchestra promptly stopped. Now back to his old diplomatic self, Stephen tactfully suggested we return to our villa and leave further exploration until the morrow. "Suits me", muttered Nick, repacking the last item of recording equipment in its case and giving vent to a loud and decisive cough.

The cicadas and the "Yiiii"-insect instantly started up again. Muttering, Nick exhumed the gear. But as he switched on the "mike" the bugs, doubtless attuned to vibrations from penlight batteries, clammed up again. This was to set the stage for our sound recordings at Bako. As soon as everything was set up, the bird or bug or whatever would shut up, an outboard engine would appear from round a bluff, or somebody would start shouting in Malay at the top of his voice. "Wait a bit," I suggested. "Right, now cough!" He did and bang on cue the cicadas launched themselves into another rendering of their peculiar syncopation "Nail across a hot tin roof".

The padang at Bako is a flat moonscape of exposed rock littered with potholes that are half full of sand. Within a short time after rain these

temporary pools have evaporated away and they thus support no aquatic organisms. Low shrubs are interspersed with a conifer called *Dacrydium pectinatum*, one of the few fir trees in Sarawak. Entomologically speaking life went on apace around one, but this mainly took the forms of ants of various species, and there were no butterflies, for instance, flying. Several times I went into the information centre with my tape recorder, to record their exhibition text verbatim and thereby save time. A leaky roof had turned some of the colour photos into the autumn-tinted lettuce you are served in motorway cafes, their edges curling and kaleidoscopic. Upon seeing me, the warden would chuckle heartily: "Talking to yourself again!" he would say. Among the most interesting subjects were the pitcher plants *Nepenthes*, and four ant plants, all of which could be found on the padang.

An entire bush up there was covered with a magnificent growth of the spectacular *N. rafflesiana*, large pitcher with a yellow and purple "mouth". Some of the pitchers had already withered, others were in full working order, yet others still long inflorescences of tiny white flowers which attracted huge black and yellow wasps and other pollinators. The smaller *N. glacialis* often had a twist in its tail, standing up vertically on a long thin depending stem that had a perfect loop in it. Pale yellow *N. albomarginata* pitchers decorated bushes and lower-lying vegetation, while right down on the ground squatted the small, bloated pitchers of *N. ampullaria*. Urn-shaped, these were dark red and attached at the back to thick stems by a sort of bracket fringed with sharp spines.

Pitcher plants, of course, eat insects, their startling colours, exudations and waxy interiors being designed for this purpose. A lid lying horizontally a centimetre or two above the pitcher's mouth keeps most of the tropical rain out. Once inside, an insect slips down into the fluids gathered at the base of the pitcher and is there digested. Pitcher plants tend to occur all over Sarawak, even by the roadsides, and are an indication of infertile conditions, supplementing their diet so to speak with solid protein. The only insects I ever saw around pitchers at Bako were two-centimetre long ants that not only crawled all over the largest pitchers but even rested *underneath* their lids. It was tempting providence, to say the least.

Ants are used in a more subtle way by the "ant plant" brigade, which enter into a symbiotic association with them. Amazingly, this is not the patented idea of one genus, but is resorted to by several quite unrelated plants, including a species of fern. One of the most prominent padang ant plants was *Myrmecodia tuberosa*, a potato shaped organism growing attached to twigs often several metres from the ground. Pale grey in colour, it had a couple of large prominent oleander- or willow-shaped, leaves on a stalk at its top. A specimen that had been cut open along the

trail disclosed a catacomb of chambers into which the ants, presumably in complete darkness, bring litter, faecal pellets and all the little bric-à-brac that ants tend to ferret for. The tuber absorbs nutrients from these piles of refuse.

Hydrophytum formicarium is about the same size as *Myrmecodia* and grows in similar situations, but there the similarity ends, for its tuber is brown and sculpted with furrows, so that it looks a bit like a well-used soft bag. Looking more carefully at the bushes, one could discern a third species that is a kind of vine, *Dischidia rafflesiana*. The upper leaves of this small plant are like round green buttons, but further down they mature into yellow nurseries for ants. Like the other ant plants, you cannot usually see the ants until you flick one of the chambers, when tiny guard ants swarm out of holes you had not noticed.

Phymatodes sinuosa, the fern of the ant plant quartet, is a long rheumatic finger of a plant partly covered with brown hairs. Clinging to bark, its rhizome goes up this way and that, producing fronds with dark brown sori. The ants must expend a great deal of energy going up the long passages. Apart from the miniscule raiders of our larder who, it must be admitted, could gain entry to corn beef, a packet of bread, or even boxes of specimens collected elsewhere, through the tiniest of holes, the ants could be kept under control. But leave anything for five seconds on your veranda table and the macaques would pilfer it. Aside from food, which would vanish in a trice, this included a roll of Nick's ektachrome. One day, unimpressed by my expostulations to go elsewhere, a particularly vicious looking male monkey leapt onto the banister and showed me a battery of gleaming teeth.

Startled, I retreated and then my British ancestry took over and I dashed into our room to seize the first weapon that came to mind. Somewhere in the misguided creature's genetic make-up there must have been a penetrant modifier geared to the advent of the white headhunter. With a comical change in expression, the monkey glanced fearfully at my waving parang and leapt clean off the balcony.

Nick found it hilarious that a modern biologist in a national park should be dedicated to lopping off monkeys' heads. But he changed his tune next day when a female with a revolting flap-eared offspring hanging under her belly charged *him* and he had to fight her off with the nearest bit of detachable scenery. Unwittingly he had discovered the perfect solution: thereafter whenever the troupe threatened us, we reached for the broom whereupon — doubtless the result of a process of survival and natural selection in the area of the villas — the marauding macaques would scatter in fright.

Ask me, however, what most impressed me about Bako and I have to

rarely in the late afternoon, where it flitted from shadow to shadow in the undergrowth, searchlights of sunshine picking out the midnight blue pools on its sombre wings. For me it was the epitome of the primary rainforest.

(. . . to be continued)

PHASMIDS EATEN BY LADYBIRDS

by Phil Bragg (8737)

Aphids can cause a number of problems in phasmid cages. The sugary droppings of the aphids provide ideal conditions for the growth of mould and, because they are sticky, they make it more difficult to clean out the phasmid eggs and droppings. In addition, the aphid droppings and mould on the front of the cage make observation of phasmids difficult. This is a particular problem in late winter and early spring when the change from the cool outdoors to a heated indoor environment stimulates the aphid eggs to hatch and also during the occasional aphid population explosions in summer.

Recently I considered using ladybirds to control the aphid problem in my cages. However, I decided to be cautious and test the possibility that hungry ladybirds might attack the phasmids. I collected six seven-spot ladybirds (*Coccinella 7-punctata*) and kept them in a petri dish at room temperature for two days without food. I then introduced two first instar nymphs of the Indian stick insect (*Carausius morosus*) and left them for a day.

About ten hours after introducing the phasmids I moved the petri dish and several of the ladybirds fell onto their backs, a common occurrence when they are kept in petri dishes. As a general rule the ladybirds right themselves quite quickly. On this occasion I looked at the dish about a minute later and saw one ladybird still on its back eating the abdomen of one of the phasmids. It continued to eat all of the abdomen during the next six minutes and then the phasmid managed to get away. The ladybird then righted itself and pursued the phasmid for a short distance before giving up. During the next hour there was no further interest shown in the phasmids by any of the ladybirds. Twelve hours later (three days since the ladybirds had been caught) the bodies of both the phasmids had been eaten; only the heads and legs remained uneaten.

While it may be unlikely for a ladybird to eat phasmids when aphids are available, they are clearly not a suitable form of biological control for aphids in phasmid cages. The supply of aphids would quickly be consumed and the ladybirds would then turn their attention to the phasmid population.

THE LARVAE OF THE *EUCHLOE AUSONIA* GROUP

by Peter W. Cribb (2270)

Further to my article on this group (*Bulletin* 50: 101-104) and my suggestion that some of our continental members might breed stock from various areas and describe the larvae, etc, I add additional notes. While in the Campo Real area south of Alcalá de Henares on 17th May 1989, I photographed and collected a nearly full-fed larva feeding on a species of *Biscutella* (see Plate C, Fig. 2). It approximated closely to the picture of the larva of *E. ausonia* portrayed by E. Bodi in *The Caterpillars of European Butterflies* (Fig. 20). The larva pupated before we got home and I put it aside, keeping an eye on it, expecting it to emerge as it was obviously the progeny of the spring emergence and the literature states that the species is double-brooded. However, it did not emerge that summer nor in the spring of 1990 but appeared to be still alive. Observation during the summer of 1990 found no change but on 3rd May 1991 an emergence occurred, the pupa having been kept in the cool of an outhouse throughout.

The resultant butterfly is the same as the *ausonia* type taken at Campo Real which has the dark-green mottling with the nacreous white spots, the species I consider to be true *ausonia* Hbn., whereas the other species flying with it at Campo Real has the yellow mottling and white spots, which I consider to be *crameri* Butler, if they are indeed separate species.

Seitz describes the larva of his *E. belia* Cramer (= *crameri* Butler) as similar to that of *Anthocharis cardamines*, i.e. greenish with three white stripes and white speckling. A. Watson describes the larva of his *E. ausonia* as having blue and white stripes while Forster and Wohlfahrt describe the larva of *E. ausonia* Hbn. as yellow-green, spotted black with a violet dorsal stripe. These are the only larval descriptions I have been able to find and they obviously conflict.

It is of interest that this is the second experience I have had of a butterfly pupa lying over for two years, both being from this area of Spain, the previous case being of *Iolana iolas* (reported in *Bulletin* 49: 18).

ENTOMOLOGICAL CLUB GRANTS

The Entomological Club has a small income from investments and through the generosity of members attending its annual Verral Supper. Grants are made to assist entomologists studying British insects. The Club would need to be satisfied that the line of work would lead to publication and that it is not fundable elsewhere. Grants would not exceed £200. Applications should be addressed to Claude Rivers, The Entomological Club, 17 Cumnor Rise Road, Oxford OX2 9HD.

THE INSECT FAUNA AND DECOMPOSITION OF BADGER CARRION

by M. Hancox

72 Bisley Old Road, Stroud, Gloucestershire GL5 1NB.

Insect scavengers play a major role in recycling dead plant and animal matter, but there have been surprisingly few systematic studies of carrion decomposition. Many of the early observations such as J.H. Fabre's *Souvenirs Entomologiques* in the mid-1880s consisted of individual life histories or checklists of species associated with randomly selected carcasses of amphibian, bird, small mammal or rabbit. During the 1930s however, interest focussed on the blowfly and sheep strike problem in Australia, followed in the late 1950s by more systematic American studies of the insect succession in "placed" dog and pig material, and later of necrophage insect demographical and ecological energetics studies of mouse carrion (Putman, 1977, 1978).

The sequence of decomposition of 50 badger and some 25 fox corpses was monitored over 20 years as regards the linked phases of decomposition; the pattern of utilisation of carrion by vertebrate scavengers and non-vertebrate agents, the seral insect succession. Attempts to categorise distinct phases of decomposition are somewhat meaningless since the stages intergrade and are often disrupted by a few major scavengers or micro-environmental factors. Nevertheless three main phases occur, being the initial, Fresh; Rapid Decomposition; Dry Remains/Scattering phases. Newly dead carcasses are normally discovered within a few days or even hours; visually by birds such as crows and magpies which usually remove the uppermost eye, and by scent by flesh flies or mammalian scavengers during the warmer months from March to October. The flies congregate to feed and oviposit on moist surfaces such as the eyes, nostrils, buccal cavity, anus and vulva, but larvae may be unable to gain access to the carcass interior for up to three weeks, with microbial softening of even these tissues being necessary. The thick fur, skin and subcutaneous fat makes ingress difficult elsewhere. Alternatively, entry may be speedy through any open wounds and territorial bite wounds particularly on the rump and head may become infested with maggots, hastening the death of already sick individuals via fly strike or myiasis (Hancox, 1980; E. Overend & L. Stocker pers. comm.). Microbial decomposition of gut contents in warm weather may lead to a full Bloat phase within two weeks, succeeded by a Deflation and Leakage phase and consumption of most of the soft tissues within four weeks, and accompanied by a putrefaction puddle beneath the carcass and sloughing of the ventral hair. The Dry Remains: skin, bones, cartilage and ligaments phase may last for one to four

months or more, but eventually the carcass is broken up by vertebrate scavenging, the bones scattered and lost in humus, and hair blown away or removed for nest lining by birds such as Great tit and Jay (Teagle, 1969). Skulls and limb bones are often gnawed by rodents (especially Wood mice?), and in calcium-poor environments such as moorland, bones and antlers soon disappear, being consumed by deer and other ungulates.

The duration of these sequential phases is largely determined by the needs of vertebrate scavengers in the local ecosystem. Many carcasses of the fox in September-November remain untouched since alternative and often preferred foods are available then, but even dry remains of carcasses may be broken up during February-May when alternative foods may be scarcer and scavengers have young to feed. Scattering of carcasses in England may be due particularly to stray dogs or foxes, but badger, probably often as carrion, has been recorded elsewhere in the diet of Great eagle, Owl, Golden eagle, Wildcat, Lynx, Tiger, Polecat, or even occasionally as cannibalism by other badgers (Hancox, unpub., Lups & de la Mare, pers. comm.). One May, a badger corpse in Gloucestershire remained undiscovered for three or four days but was then gutted probably by dogs within a week. A February fox carcass in Argyll was similarly gutted in a snowbound week by three Buzzards, a pair of Hooded crows, an Eagle and a vagrant Red kite. Raven flocks may gut lamb carcasses within one to four days (Hancox, 1985). However, maggots can also rapidly consume some 5kg of soft tissues from badger cub, lamb or baby pig carcasses in under two weeks, given an initial warm moist micro-environment, with the "meat broth" soon engendering its own heat of decomposition. Rain may restore the workability of desiccated carcasses by necrophagous insects.

Spatio-temporal factors hence determine the availability of carcasses to vertebrate and seasonal insect scavengers, but as shown by a study of 151 sheep/lamb carcasses, non-vertebrate agents' consumption of an estimated 633kg compared favourably with bird scavenging of 837kg, and was more important than fox scavenging of 168kg on one Argyll estate (Hancox, 1979). Virtually all carcasses are discovered and utilised by vertebrate scavengers, but a minority of cadavers may be inaccessible or get lost temporarily in vegetation, and bacterial-fungal putrefaction may take three months or more. Thus, perhaps as many as 30% of natural badger deaths occur underground in remote areas, and may be walled in accidentally in tunnels, their bones and fur being excavated a year or more later. A few may however be dragged outside setts or be near enough to entrances to be reached by insect scavengers (Payne, 1979, 1982).

Road traffic now accounts for perhaps a third of badger deaths in Britain however, and is estimated at 47,500 deaths per annum (S. Harris, pers. comm.). Adult badgers may weigh an average of 10.1kg (sows) to 11.6kg (boars), although autumn fat results in a wide range of body weights; so that the recycling of badger carrion represents a considerable task for scavengers, as well as an opportunity for further study.

The seral succession of necrophilous insects follows a clear pattern, but the relative importance of different species is less obvious, and the fauna of carrion may include four categories of involvement: accidental; shelter and predation on other carrion visitors; general scavengers; primary obligate carrion feeders (Putman, 1978). All studies emphasise the primary role of flesh flies in consuming some 90% of soft tissues; badger being scavenged by Bluebottles (*Calliphora* spp.), Greenbottles (*Lucilia* spp.), and Blowflies (*Sarcophaga* spp.). Adults and larvae of Silphid beetles such as *Necrophorus humator* and *Silpha* sp. may also be numerous in the late Rapid Decomposition phase though greatly outnumbered by fly maggots. Rove beetles such as *Creophilus maxillosus* and *Philonthus* sp. are also conspicuous in this phase, but these Staphilinids, together with an occasional *Hister* sp. and Carabid (*Feronia* sp.) are probably merely incidental predators of other necrophiles. Few insects can deal with dry remains such as cartilage or keratinised hair or claws, but Dermestid, Nitidulid, Silphid and Trogid beetles and Tineid moth caterpillars are likely visitors. Ants and wasps may remove some carrion, but many other visitors are probably accidental such as spider, harvestman, millipede, slug and earthworm. Hydrophilid (*Cercyon* sp.), Scarabaeid (*Aphodius* sp.) and Silphid (*Catops* sp.) beetles and ubiquitous flies such as *Scatophaga* may be attracted to dung within carcasses, and there is some overlay between carrion/dung/sett/parasite faunas which is in need of clarification (Hancox, 1980, 1988).

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SELLAFIELD COASTAL AREA: RECORDS REQUIRED

The Environmental Advisory Unit of Liverpool University Ltd have been commissioned by British Nuclear Fuels Limited (BNFL) to undertake a full environmental assessment of the terrestrial ecology of the area to the north of the existing Sellafield complex in Cumbria.

The first element of this study requires extensive consultation with organisations and individuals who may hold information relating to the site.

I would, therefore, be most grateful if you could provide us with any information you may hold regarding the entomological interest of the area which stretches along the coast from the Sellafield outfall pipe to just south of Lantern Moss Tarn Caravan Park. Inland the area takes in Starling Castle, Tarn Head Farm, Bogholes and north-east to Church Moss.

If any member can help with this project will they please get in touch with A.M. Whitfield, Environmental Advisory Unit of Liverpool University, Yorkshire House, Chapel Street, Liverpool L13 1511.

TWO BRED ABERRATIONS OF THE PEARL-BORDERED FRITILLARY EMERGE ON THE SAME MORNING!

by Dominic Rey (7929)

On 10th June 1986 I was quite taken aback to find two female Pearl-bordered fritillaries (*Boloria euphrosyne*), both ab. *pittionii* (Nitsche) in the container-box in which I was hatching them out at the time.

It was on 8th June 1985 that I captured the parent — in Dymock Woods on the N.W. Gloucestershire-Herefordshire border. The parent had a sprinkling of dusted scales in the central part of the forewings so I chose to breed it. Wise decision!

The species was formerly fairly plentiful in favoured parts, clearings, in these woods, but in the last several years has undergone a decline. In 1985 it was noticeably commoner than the population in 1986, and only around 20 imagines in 1990! During that year I made the following observations of some early appearances.

Jan. 3rd. Noted some male Spring ushers (*Agriopis leucophaearia*) sitting on dead herbage and hollytrees and a pair of Dotted borders (*A. marginaria*) in copula on a tree trunk also that night in the Forest of Dean.

Feb. 23rd. Noticed a Comma (*Polygonia c-album*) in flight in Gloucester and on that same day, a warm and sunny one, I noted a lone male Orange underwing (*Archeiaris parthenias*) on commonland near Stroud, Glos. flying in the usual manner.

INSECTS ON BIRCH

by John W. Lavery (7469)

100 Marian Park, Tralee, Co. Kerry, Eire.

Birch is the foodplant of many of our native moths, the most prized of these being the White prominent (*Leucodonta bicoloria*), possibly the most rare species of moth found on this island. It was first taken at Killarney, Co. Kerry in 1858, as an adult, by Peter Bouchard, and later it was found as larvae feeding on birch which grows profusely in that area. Though searched for many times since, nobody has found the moth since 1938 and no doubt some fortunate entomologist will in the years to come re-discover this species in some unnoticed stand of birch somewhere in the Killarney region.

Another fine member of the prominent family, the Scarce prominent (*Odontesia carmelita*), deposits its eggs on the foliage of birch in late April/early May where the larvae quickly grow to maturity and the adult is to be found commonly in birchwoods in Kerry, Cork and Wicklow (Skinner, 1984).

Possibly the most unusual (in appearance) feeder on birch would be the larva of the Lobster moth (*Stauropus fagi*), so called owing to its striking resemblance to a miniature lobster during the larval stage. To the uninitiated, the finding of a full-grown larva of this species, chewing its way through a leaf of birch must be a puzzle indeed, as to its exact identity!

A very local species mainly confined to the northern counties, is the Dark tussock (*Dicallomera fascelina*), an exciting find, especially when



turned-up feeding outside its normal range of distribution. Another moth, with a curious title, the Hebrew character (*Orthosia gothica*), finds birch a most suitable foodplant for its voracious larvae. This species is quite common and is often found resting on walls or window sills at night where it may be drawn by window light.

Sometimes a species gets named after the plant on which it was first found as a larva. This name can lead one to believe that the species in question will eat only the plant after which it was named. One such species is the Sycamore (*Acronicta aceris*), the larvae of which will feed on a variety of plants including birch.

My favourite moth, which I often find feeding on birch, is the lovely Large emerald (*Geometra papilionaria*) a very large green moth which I never fail to find, year after year in a stand of birch in Scotia's Glen, in the Sliabh Mish Mountains, Co. Kerry. In the same glen I have noticed an unusual association between the adult Green hairstreak (*Callophrys rubi*) and the birch saplings especially. The males of this butterfly use the top branches of the birch saplings to sun themselves and wait for females of their species to come along. They then fly from their "look-outs" and spiral upwards, later resting while mating in the green foliage, safe and perfectly camouflaged as they resemble in shape and colour (when wings are closed) the smaller leaves near the tips of the birch saplings.

Finally one insect found on birch which unlike the many moth species, appears in plague proportions and can only be described as a pest. This is the Birch sawfly (*Cimbex femoratus*). When it is found, as it usually is, in great numbers, it can quickly strip a tree bare of its foliage. Fortunately, the larvae of this species occur at a time when birds seeking food for their nestlings is at a peak and I have watched members of the Tit family take a heavy toll of these larvae from infested birch trees.

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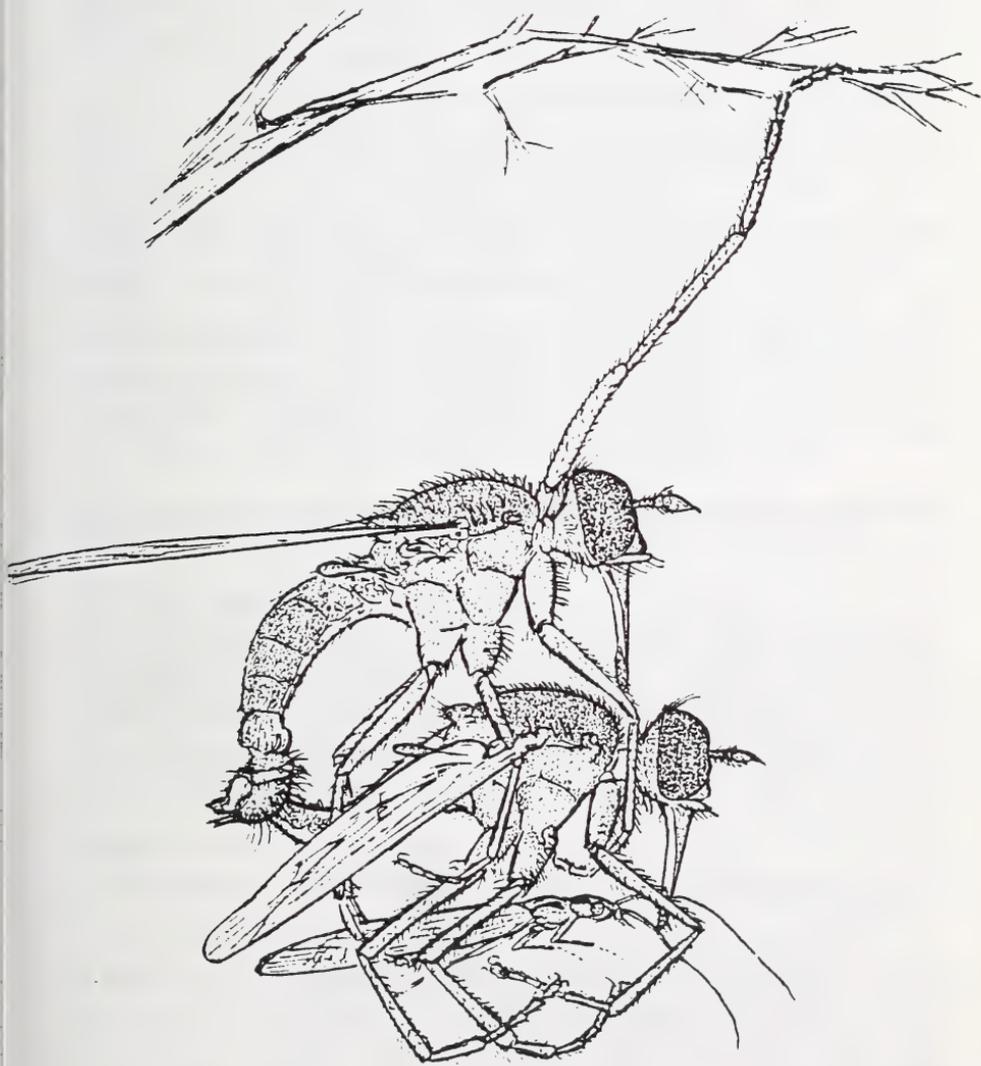
A NOTE ON *EMPIS (PLATYPTERA) BOREALIS* LINN. (DIPTERA: EMPIDIDAE)

by *Tim A. Lavery (8677)*

Farnes, Castlemaine, Co. Kerry, Eire.

This is one of the larger British and Irish empidids. I have found it to be frequent in lowlying districts equally as much as in hills and mountainsides. It has been recorded from seven counties in Ireland including Kerry, where I have seen it abundant although very localised at a number

of localities in the county during the spring. At one site near Lickeen Wood, Glencar (Irish Grid ref: V7186), it occurs in profusion at the edge of a conifer plantation and oakwood, where these open onto wet heath



Platyptera borealis Linnaeus



with *Salix/Betula* scrub. This locality provided the opportunity to observe swarming in this species, and an estimated several thousand individuals on one visit in early April suggested that I had come across an apparent mass emergence of both sexes. Dancing swarms numbering some 30-40 insects were stationed over isolated bushes and along the edge of the conifers at a height of about 2.5m. Both sexes were observed in the swarms, perhaps a larger percentage of males.

Male insects leaving the swarm abruptly, returned invariably with a species of *Plecoptera*, and less frequently small Calypterate flies. Females, except after pairing were never seen to take prey. Pairs "in cop" dropped from the swarm and landed on lower parts of the bushes or any lowlying vegetation. It was not observed whether the female receives her prey from the male during courtship or whether the male waits for the female to obtain prey before attempting to mate. Mating pairs were seen to remain in the one spot for up to ten minutes without disturbance. The females did not seem to feed on the captured prey during mating. I first encountered these swarms at about 11.00 am and they were still persisting at 7.30 pm when I left for home.

SPURGE HAWKMOTH AT NEWTON ABBOT, DEVON

by S.J. Pettit

On 17th June 1991 at 9.00 pm when it was still daylight I left my armchair and magazine with a small light on to answer the phone. An hour later (!) I returned when it was dark and noticed this large Spurge hawkmoth on the magazine — it had flown in through the conservatory window or lounge door towards the light. I do have an *Euphorbia polychroma* in my small garden, and so when I had identified it from the book (I am more of a gardener than an entomologist) I returned it to the spurge plant.

Now in the evening when I was cutting my golden privet hedge I suddenly noticed this bat-like creature hanging from it just in time before the shears cut it — this was a Poplar hawkmoth.

As I said, I'm no entomologist — can hardly name any species — but having come across a Hummingbird hawkmoth last year I was prompted to look them up as I believed I have never seen any of them before — we have been living here 16 years now, and in the district most of my 58 years.

I moved the Poplar hawkmoth to the end of the hedge I had cut at 5.00pm — it was still there at 10.00pm, but moving slightly (I know I did not hurt it). There is a street light at the end of the hedge — it may have fallen from that the previous night.

RED NECKED FOOTMAN IN TRALEE

by D. Norris (9175)

On 5th July whilst moth trapping in my garden at around 1.30am, to my surprise, sitting on the glass baffles of the trap was a Red-necked footman — *Atolmis rubricollis*.

I had remembered taking one the year before and how Tim and John Lavery, the local experts, were amazed that I had taken one due to the fact that in the past there isn't a single record of one being taken in the town of Tralee.

When John searched the records he found that it is very uncommon in Ireland and yet on this particular night I stopped counting after about 30 or 40 of them and kept six for my cabinet.

So I informed John the next night and showed him the specimens and he called round the house at around 12.30am and we took another six and in the morning I found a few scattered around the floor.

I find it very strange that a moth can be found in such large numbers and yet be absent before. Maybe someone else knows the reason.

NEW RECORDS FOR *ATOLMIS RUBRICOLLIS* (RED-NECKED FOOTMAN), IN COUNTY KERRY, IRELAND

by John W. Lavery (7469)

Although once recorded as widespread and locally common (Donovan, 1936), this species has been recorded only very infrequently in recent decades, including single records from Kerry (Killarney 3.7.1956), Kildare (Newbridge, 1982), Co. Clare (Ballyvaughan, June 1990), Cork (Freemount, 21.6.1989) and Tyrone (Pomeroy Forestry School, June 1979). It is evidently still widely distributed in Ireland, but is very local and rarely visits light, so that it is probably widespread but under-recorded.

A. rubricollis is mainly found in woodland, where its larvae feed on tree lichens and algae.

While visiting AES member David Norris on 5th July 1991, I inspected his moth-trap, sited near Nun's Wood, Oakpark, Tralee, Co. Kerry. I was surprised to find no less than seven specimens of this rare species. Dave then showed me five more specimens set on boards from the previous night, 4th July. The following morning Dave reported three more specimens in the trap, and a local member of our Irish Study Group, Tom Ryall, turned up with another specimen taken just outside Tralee, in a locality close to the sea called the Kerries. On 7th July I took one single specimen at light at my garden in Tralee, and this proved to be

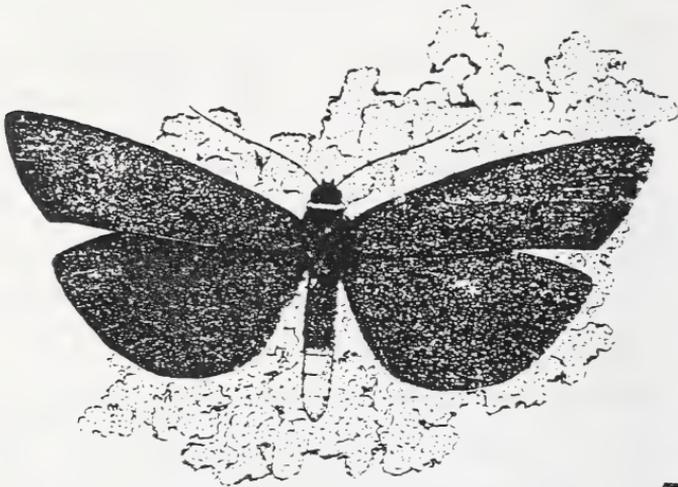


Fig. 1. The Red-necked footman, *Atolmis rubricollis* (Linn., 1758).
Illustration by Tim A. Lavery (8677).

the last as none have been seen since then. This great surge in numbers in a locality not previously recorded from, amounts to more than were ever recorded in Ireland to date. The temperature during the dates mentioned above were very high along with humidity and weather conditions which could only be described as truly tropical. Could this in any way be the reason for such a showing in large numbers of a species not recorded except for the occasional singleton down through the past fifty years?

STAG BEETLE IN ROAD ACCIDENT

by David Holland (8535)

Reading George Manonov's article on *The Great European Stag Beetle* in which he mentioned that many get killed by cars, I was reminded that in July this year at about three o'clock in the afternoon, I was walking along when I saw a male stag beetle fly across a road and get hit by a van going faster than thirty miles an hour. I went over to where it had landed and found that remarkably it was unhurt except for being upside down and a bit slow moving, as if it were in shock. I crossed the road with it and placed it on the ground near the group of trees it had seemed to be flying towards.

NOLIMETANGERE A PHASMID WHICH CAN BE TOUCHED!

by Phil Bragg (8737)

The phasmid *Epidares nolimetangere* (de Haan) belongs to the subfamily Heteropteryginae. Members of this subfamily are often heavily spined and have a very strong cuticle; this species is no exception. For its size it is perhaps the most heavily spined phasmid, perhaps even the most heavily spined insect in the world. The specific name translates from Latin as do-not-touch-me; a clear warning!

I once suffered a painful injury in Borneo when I put my hand on an adult male one night; the insect appeared to be unharmed, my hand was bleeding. I also had a female fall on my head after I had disturbed the bush on which it was resting. As I am bald on the top of my head this also proved painful although it did not draw blood! The defence seems to be purely passive, the legs are not armed with spines, unlike some of the larger members of the subfamily such as *Heteropteryx dilatata* (Parkinson) and *Haaniella* spp., so they cannot inflict injury when carefully picked up. The spines on the back of both the males and females (Fig.1) should however provide excellent protection against predators.

This species is very common in some areas of Sarawak, particularly those which have had the primary rainforest cleared. Until recently I had assumed that, as their name suggests, they were immune to attack from most of the usual potential predators of phasmids. I know that spiders will feed on the nymphs in captivity because the occasional escapee has appeared in webs in my phasmid room. This is not surprising, the spines would not offer protection from spiders as they can avoid them and eat the contents of the body, leaving the spines and hard cuticle behind. Predators which ingest either the whole insect, or at least large parts of it, seemed to fall into a different category; they would find the spines too much of a mouthful.

I decided to test my assumption by offering one to my pet lizards. They are eyed skinks, *Chalcides ocellatus*, a species found in the Mediterranean region. A male *E. nolimetangere* was placed into a cage containing a pair of skinks which had not been fed for ten days — usually I feed them about once per week. Both the skinks are about 25cm in length and have occasionally been given other species of phasmids in the past. The floor of the cage is divided into three distinct areas; two contain a 5cm depth of sand and the third contains 5cm of bark chippings. The phasmid was placed on the bark area. It remained stationary and was well camouflaged as its colour matched that of the bark chippings quite well.

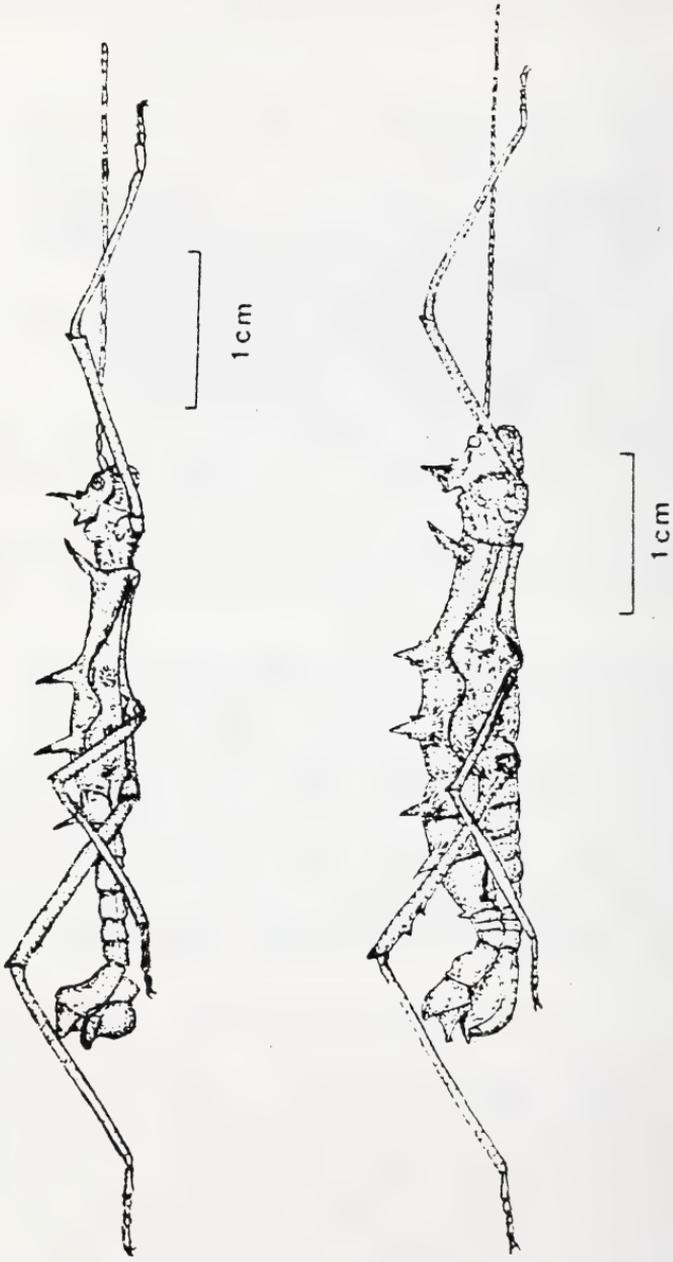


Fig. 1. *Epidares nolimetangere*. Top male, bottom female.

Within seconds the male, which is less shy than the female, emerged from cover and sniffed at the phasmid. After about a second the lizard seized the phasmid in his mouth and started to shake it violently. This is a typical treatment for prey which are difficult to kill due to being large or hard to bite through. At one point the phasmid was thrown to the ground and then quickly seized again. The male skink, still shaking its prey then went out of sight, under a large piece of bark. At this point the female appeared and went under the same piece of bark. There were scrambling sounds and the female briefly emerged with part of the abdomen in her mouth. She then burrowed out of sight under the bark chippings.

The cage was later checked and no remains of the phasmid were found. The spines of the insect did not act as an effective deterrent in this case. The main problem for the lizards appeared to be the thickness of the cuticle. I have little doubt that well fed the lizards would ignore *E. nolimetangere* rather than tackle difficult prey but the spines do not provide a perfect defence. The combination of nocturnal habits and the large spines must give sufficient protection in the wild. On Mt. Serapi, Sarawak, I have found large numbers of *E. nolimetangere* when searching at night and I have seen lizards, including a number of skinks, during the daytime.

ILLUMINATING IDEAS FOR USE AT NIGHT

by P.E. Bragg (8737)

8 Cornwall Avenue, Beeston Rylands, Nottingham NG9 1NL.

I have been on three trips to Borneo and will be setting off on my fourth quite soon. As my interest is phasmids, which are almost all nocturnal, I have had to give serious consideration to the problems of illumination in rain forests at night; similar considerations are needed for any nocturnal environment. Obviously if you are interested in lepidoptera, etc. you can use a light trap and avoid most of the footwork. However for those of us with interests in groups which are not attracted to light, the only way to find them is to go out at night and look. This seems to pose several problems although all are actually different facets of the same problem; at night you need one more hand than you use in daylight, the one that holds a torch.

Most of us use two hands to do most of our collecting, photography etc. during the daytime. Now pretend one hand is out of action because you're using it to hold a torch. I guarantee you will lose most of the cockroaches, crickets and bush-crickets that you see. If you get them into

a net using only one hand, try transferring them into a specimen tube. What do you mean, it escaped because both hands are occupied with your torch and net? Why couldn't you focus the camera and get a decent photo? There are two easy solutions — have a torch-wielding partner or use a headtorch. Partners become tired and bored and are difficult to replace. Batteries in headtorches also become tired but are easy to replace.

From the photographic point of view, you need to have a good light shining onto the insect while you focus. To do this I use a headtorch with the beam set on its narrowest setting, an SLR camera with a 50mm lens set at f16 at 0.3, with a flash unit held to the side of the camera body. Clearly without the headtorch I would need to work with a partner or try holding a torch in my teeth; having tried the latter I can categorically state that it doesn't work! The flash unit cannot be mounted on the top of the camera for two reasons; firstly it would be in the way of the headtorch; secondly most flash units will not point at a very close object if they are mounted on top. This year I am going to experiment with a ring-flash to avoid having to hold the flash unit.

Consideration should be given to the type and cost of the headtorch and to the availability and duration of batteries. Each time I have been abroad to collect at night I have used a better headtorch. However, each one seemed good enough at the time!

The first type I used was a Pifco headtorch costing about £5.00. Since then I have used a Petzl Zoom which has an adjustable beam and have up-graded from a standard bulb to a halogen bulb. A quick trip around Nottingham in April revealed a variety of models and prices . . . it pays to shop around! The cheapest headtorch I found was one for £2.99 in the Scout Shop. Petzl seem to be the most common brand, available in most shops which specialise in outdoor sports. They offer three models to choose from:

Petzl Micro — £14.90 to £18.99.

Petzl Zoom — £16.99 to £22.99.

Petzl Macro — £30.50 (in stock at only one shop).

All these allow the width of the beam to be varied by simply turning the front of the lamp. I find adjusting the beam reduces eye strain which can become significant after several hours peering along a narrow beam of light. In addition, as the batteries near the end of their life, narrowing the beam makes them seem brighter thus extending their usable life. It is important to use alkaline batteries, anything else becomes dim very quickly. The halogen bulb (£3.99) greatly increases the brightness.

However, it is rather hard on the batteries, using them about three times faster than with the ordinary bulbs.

The Micro uses two AA batteries and, along with the Macro, is a recent addition to the range. The Zoom uses a single rectangular MN1203 battery but you can get a converter for £3.75 to allow you to use three AA batteries. The Macro uses R14 (HP11) batteries, has a built-in converter for AA, and comes with a halogen bulb as standard. As its name suggests it is larger, and therefore heavier especially with R14 batteries. However, the larger batteries do not need changing so often. AA batteries do not last as long as either of the other types but are much more widely available (MN1203 seem to be unavailable in Borneo and even in the UK they are difficult to find).

My personal recommendation is a Zoom with halogen bulb and AA converter. I have not tried the Macro but think it would become too heavy over a long period; the Micro with a halogen bulb and only two AA batteries would not last long enough to be of much use.

BOOK REVIEW

Nordens Ugler: Handbog over de i Danmark, Norge, Sverige, Finland og Island forekommende arter af Herminiidae og Noctuidae by Peder Skou. Large 8vo, hdbk. 565pp, 37 coloured plates, 529 text photographs plus distribution map of each species. ISBN 87 88757 26 9; ISSN 0109 7164. Apollo Books, Kirkeby Sand 19, DK-5771, Stenstrup, Denmark. Price DKK 600 (about £50).

Although more northerly than England, let alone most of Scotland, Scandinavia supports a greater number of noctuids than with us and this is due to our having been cut off from the Continent at the end of the last ice age, whereas Scandinavia has had constant land access to species moving in from the south and east. A look through the plates of this book reveals very many familiar species, some of which are rare with us but common in these more northerly areas and one is inclined to query the problem as to why some of our more southern residents have not moved up into Scotland.

While the arrangement of the species is not the same as with us in the books by South, Skinner or Brooks and the Herminiidae are treated as a separate family (subfamily Hypeninae in Skinner) the treatment is uniform and is divided into clear paragraphs (see below) to which there is an explanation, in English, in the introductory chapter explaining the scope of the book.

The plates are excellent and show the advantages of photographic illustration, at least for this group, over artists' paintings. Indeed this is not surprising, for the photography is by our David Wilson, who not only illustrated the books by Bernard Skinner and by Margaret Brooks, but is also responsible for the coloured illustrations produced by the British Entomological and Natural History Society. The black and white illustrations of many of the larvae do not of course show the varied nuances of colour often present in this group, but they do give an indication of the patterning and will in a number of instances help in identification. A few habitats are also shown and all species have distribution maps with large clear dots and which are fleshed out in the text with the names of the countries from which they have been recorded; these in turn being clearly identified on the larger scale map of Scandinavia on the end-papers.

One advantage of possessing a book like this is that it not only differentiates closely allied species, which might or might not both be present in Great Britain, but it draws our attention to the many similar species we do not yet have but in fact might well come across in the future, for after all a number of new noctuid species have been steadily recorded here since the turn of the century, some being new arrivals and others being recognised as separate species either as the result of taxonomic study which in turn might have been initiated by observed differences in the larvae or feeding habits or times of appearance.

Now comes the crunch question. How are we to understand this book which is in the Danish language? Well, with both ease and difficulty and with the help of a Danish dictionary. There should be little problem in translating and understanding the habitat, larvae, time of appearance or most of the distribution information. The actual description of the moths is, however, the difficult bit, but made up for by the excellence of the plates and the fact that the more subtle nuances to differentiate similar species are illustrated with arrows pointing to the feature to look for and in a few cases the genitalia are also illustrated. Sometimes the distribution and habitat does go into rather more detail than is understandable, but 80% should be. Let me give a few examples, taken from each of the paragraphs mentioned above. Many of the Danish words will occur frequently such as "sjælden og lokal" (rare and local) and some may have alternative renderings, "krat" for instance, can mean thicket, copse, scrub or undergrowth.

Kendetejn = Description. This section is undoubtedly the most difficult of translation. The following is from *Catocala sponsa*. "Vingefang 62-70mm. Forvingen med forskellige nuancer af gra og brungra til sort; en hvidlig plet lige under nyrmaerket. Bagvsingen rod med et bredt brunsort band . . ." (Wingspan 62-70mm. Forewing with different

shades of grey or brownish grey to black; a whitish spot under the reniform stigma. Hindwing red with irregular blackish . . .)

Udbredelse = Distribution. "Eurasiatisk. Fra Japan og de østligste egne af Sovjetunionen gennem Kina, Centralasien, Armenien, Tyrkiet og Ural til Rusland og Vesteuropa, og fra det mellemste Fennoskandien til Nordspanien, Midtitalien, Jugoslavien og Bulgarien." No need I think for me to translate this, it just makes me envious that so many countries can enjoy the pleasures of the Clifden nonpariel!

Levested = Habitat. "I Danmark i skov og krat." (In Denmark in woods and copses (or thickets).)

Flyvetid = Flight period. "I Danmark fra medio eller ultimo august til ultimo september; i Finland fra ultimo august til ultimo september, dog noget tidligere i invasionsarene hvor arten optræder allerede fra ultimo juli til primo august." (In Denmark from the middle to the end of August until the end of September; in Finland from the end of August until the end of September, however some may appear early as the result of migration.)

Biologi = Biology. "Larven lever fra maj til først i juli på bævreasp (*Populus tremula*). Imago kommer til lys og især til sukkerloking." (The larvae live from May until the beginning of July on poplar. The adults come to light and also to sugar.) Foodplants are given their scientific names as well as their Danish colloquial.

In the *Bulletin* we have had many accounts of mainly butterfly rather than moth collecting, from southern Europe. Perhaps this book will encourage some of us to go north and take notice of the exceedingly interesting butterflies as well as moths which occur in Scandinavia. This is an excellent and informative book, very well produced and illustrated. It is an absolute must for anyone who has the slightest interest in the Noctuidae.

Brian Gardiner

BOOK REVIEW

The Scientific Names of the British Lepidoptera — their history and meaning by A. Maitland Emmet. 8vo. 288pp. 8 monochrome plates. Harley Books, 1991. Hardback, £49.95, paperback, £24.95.

Some years ago, at an AES exhibition, I bought a copy of the *Accentuated list of the British Lepidoptera* published by the Entomological Societies of Oxford and Cambridge Universities in 1858. That book, which is still quite readily available secondhand sought to define and standardise the pronunciation of the scientific names of the British Lepidoptera then prevailing. It also described the derivation and meaning of each Latin or latinized Greek name and had an interesting chapter of short bibliographical details on the various nomenclators. I

was quite amused by reference to the Russian author, Sodoffsky. Since that time and Colonel Emmet's work we have also had the *Key to the names of British butterflies and moths* by R.D. Macleod published in 1959. This new work goes far beyond the scope of the two earlier publications and is a delightful and erudite book which will appeal to all entomologists who would like to know more about the etymology of their subject.

The work begins with a foreword by Professor Southwood and a brief introduction. There then follows an extensive chapter on the history of scientific nomenclature with particular reference to the Lepidoptera and, to me, that is the most fascinating part of the whole book. The father of modern nomenclature was the Swede, Karl Linné (Linnaeus) and the chapter is of necessity a history of his development of the binomial system of nomenclature, culminating in the publication of the *Systema Naturae* and followed by its subsequent modification as ideas about the evolutionary inter-relations of species have developed.

The systematic section which follows describes all of the genera and species of British Lepidoptera at present known and referenced by their *Log Book* numbers according to Bradley and Fletcher (1986). Each name is given the author of the name and its meaning or origin. For names derived from the Greek, the derivation is given, together with a transliteration into Roman characters. There follows four appendices: people commemorated in the scientific names, geographical names, unresolved names in which the author is unable to ascribe derivations or meanings and apparent errors in Macleod's *Key*. This last item contains 354 entries, many of which are also referenced in the systematic section and must be a major *raison d'être* for this new publication.

Colonel Emmet's experience, both as a classics scholar and Lepidopterist makes him the ideal author for a book of this nature. His style is both learned and lively and makes what to many would seem a dry subject, full of interest. Scientific names are a problem to many amateur Lepidopterists since the languages of the classics are now rarely taught and "Latin" names must be learnt as a foreign language without idea of meaning. I would not guarantee that recourse to this book will make up for lack of grounding in Latin and Greek as an aid to memorising scientific names but careful study should help the tyro build the basis of an understanding of these whimsically-derived epithets. Thoroughly recommended.

P.J. Jewess

A RARE HOLLY BLUE VARIETY FROM DAVENTRY

by K.F. Williams (8179)

Members may be interested to learn that I caught a female Holly blue (*Celestrina argiolus*) ab *aquilina* in Daventry, Northamptonshire, this year.

A COLLECTING TRIP TO GREECE 1990

by Charles L. Young (5045)

65 Dudley Lane, Madison, C.T., 06443, USA.

Hydra is a small Greek island situated in the Aegean seas about four miles south-east of the Peloponese. This tiny island, occupying only 18.5 square miles, is mostly barren rock with high jutting cliffs ascending to Mt. Ere, a two-thousand foot ridge, the highest peak on the island.

I arrived on Hydra on 1st July in glaring sun with 100°C temperatures. The light coloured, treeless cliffs contrasted sharply against the sparkling deep blue and turquoise Aegean sea. The island was dry as a bone except for privately watered gardens, olive orchards and an occasional parched, dust covered pine tree. Light grey boulders and fine brown earth with a splattering of burnt out shrubs dominated the landscape. The island had not seen a drop of rain for nearly two months.

I had come to Greece to collect Diptera, being interested in Bombyliidae, Syrphidae, and especially Asilidae. I had been collecting on Hydra some years before during the earlier spring months and it had been quite productive.

The first couple of days yielded very little in what I was after. I took only one small Asilid and spotted another larger species. The Syrphids were a rather small species confined to flowering shrubs in the early morning hours.

July 3. Lying high above the port of Hydra is a large, whitewashed monastery, with a sparse pine forest located halfway up on a steep rocky pathway. I decided to try these higher slopes with a stiff, arid onshore breeze blowing. On the way several large, clumsy Ant lions (*Myrmeleonidae*) flitted around smaller boulders and many Brown butterflies (*Satyrinae*) were feeding off fresh mule and donkey droppings. Along the pathway and within the pine forest there were numerous Bombyliidae (*Thyridanthrax*) flying both in high patches of sunlight as well as low, resting on the ground. On my way back down in the cooler evening I was surprised by the sound of many buzzing beetles. There were literally hundreds of them in a private garden clinging to and feeding on rotting peaches on a large tree. They were large, heavy, iridescent green and gold coloured and despite their heavy weight they were extremely good flyers, only occasionally falling on their backs. Further down there were many large Hymenoptera drinking water from a ruptured pipe line.

July 5. Difficult time with ANTS! Came in from collecting to find hundreds of tiny red ants swarming over my growing collection! (I had brought only loose fitting postal cardboard boxes with the intention of sending them to the United States as each box was filled.) I believe the

ants were drawn to the moisture-filled pinned insects because of the parched conditions on the island. Even the camphor I had put in the box did not deter them. After putting the collection in the fridge to "chill" the ants out, I hung a basket from the ceiling and then put the boxes into the basket. It worked and the ant problem seemed to be under control.

July 9. I decided to get off Hydra in search of a cooler, more densely vegetative environment. The Pelion, a peninsula lying south-west of the city of Volos in northern Greece had been a good spot some years before so I decided to try my luck there.

July 11. After having taken a seven-hour bus ride north from Athens I arrived at Tsangarada, a small village nestling 1,600 ft up on Mt. Pelion. Here was a paradise compared with hot, dry Hydra. The entire mountain was covered with rich, deep green. Gigantic plane trees, pines, cypresses, olive and apple trees, rose bushes of every colour, ferns, flowering bushes, and many kinds of wild flowers covered the steep mountainside. Many natural springs and streams spewing crystal clear water flowed everywhere. The houses were spread well apart with beautifully kept gardens. It seemed as though spring was still in full bloom up here.

July 12. Went 300 ft below the village on a small over-grown rock pathway. The first half was open and dry but this soon gave way to a shaded covered patch. Even with a stiff wind blowing I did quite well. At about 1,300 ft there were some very small asilids (*Leptogastrinae*) clinging to the upper-sides of low growing ferns. One of these tiny Robber flies was feeding on an aphid, which I lost in the wind. Further on down there were many asilids resting on lower grasses, two to three feet high. On the higher slopes I took two Robber flies clinging onto my shirt in the wind; one even flew into my net of its own accord!

Heading back to the village that afternoon I spotted a beautiful large Stag beetle holding on to a wire fence with its head cocked back in a sluggish manner. All throughout this area there were large numbers of Lepidoptera on the wing. Painted ladies, Commas and White admirals, Satyrinae, Lycaenidae, Pieridae, Papilionidae (*Zebra swallowtails*) and Hesperiididae were all in abundance feeding on fresh animal droppings, flowering plants and wet mud. Odonata were everywhere. One particularly large species with beautiful green stripes on its abdomen and thorax I observed noisily "bobbing" its abdomen in and out of a small roadside stream, probably laying eggs.

July 14. Went straight down the mountain to sea level towards a small fishing village called Damoucharie. On the way down a black, white-chested squirrel was jumping from tree to tree making an incredible amount of noise as it twitched its tail and chirped. Large land tortoises

laboriously pushed their way into the undergrowth in search of cool shade.

At 500 ft there were many asilids; I took at least five different species. Syrphids were also in abundance feeding and hovering above flower heads (especially Queen Anne's lace, which there was quite a lot of). On one of these flower heads a large syrphid (*Helophilus*) rested warily in the hot afternoon sun. Although I saw a number of these flies they were extremely difficult to catch; I was only able to net one during my stay, missing many others.

On the steep, rocky pathway leading down to the sea there were many bombyliids and asilids (Asilini) resting in both sun and shade. Here I was particularly pleased to take a large, tan Robber fly with reddish legs (Dasygogoninae). Low down on the pebble beach a huge Redheaded digger wasp was flying heavily around a flowering bush. After a short rest in the shade of the picturesque harbour I started the long climb back to Tsangarada.

On the way back up a dusty road in a wooded area I saw a very large asilid feeding on a bombyliid. It was in a very awkward position and I lost him. (I returned to this spot for two days in a row to see if I could find others like it, only to miss two more!) These flies were extremely fast fliers and very wary. Their abdomens were amber-coloured with grey, whitish bristles covering the thorax.

After several days of collecting on and around Mt. Pelion it was time to head south then back to the United States. I was very pleased with the Diptera I had taken up north. I think any collectors interested in Greece should consider going during the early spring months, especially in the southern areas. I highly recommend the Pelion mountain range from April to July, the earlier the better. From mid-July and onwards Greece is dry and parched with little insect activity.

BUTTERFLIES AS PREY OF WASPS

by Stuart Pittman (9135)

On 2nd September this year I observed a very disturbed Small tortoiseshell (*Aglais urticae*) spinning about furiously on my lawn. Such behaviour warranted the use of my mainly now redundant net. Having lost none of my deft skill I scooped the butterfly up and observed that it was in the grip of a common wasp (*Vespa vulgaris*). Said wasp was firmly attached to the underside of the thorax of the tortoiseshell and it was possible that it had already used its sting. Upon separating the two combatants the Small tortoiseshell quickly took to the air, seemingly unaffected.

Have any other readers experienced a similar situation, or have any comments to make on the ability of butterflies to survive wasp stings? I note that John F. Burton (*Entomologist's Record* **103**: 99) has recorded wasps attacking Hawker dragonflies and butchering a Silver-Y moth (*Autographa gamma*) by removing its wings and flying off with the head and thorax.

(Editor's comment: I doubt if the prey insects are actually stung by the wasps, which are much stronger than most of our butterflies, their weight and strength being sufficient to bring them down. I have many times seen them attack Large cabbage whites (*Pieris brassicae*) which they seize on the wing, bring down to the ground, and then cut off the wings one by one, using their pincer-like jaws, before departing with the body. Although I have not witnessed the cause, I have found wings of both Small whites (*P. rapae*) and Small tortoiseshells (exceedingly abundant this year) both around the buddleia bush and in our sunroom which both butterflies and wasps not infrequently enter. From the good condition of most of the wings the inference is that wasps were the culprits rather than our cat!

In 1883, Rev. J.G. Wood in his book *Insects at Home* described and illustrated in a colour plate a hornet, *Vespa crabro*, attacking and de-alating a Red admiral (*Vanessa atalanta*), which it did in mid-air before going off with the body.)

TOO MANY INSECTS

by *The Editor*

The insect house of the London Zoo has a fine display of insects in display cages. Unfortunately it now finds it has even more insects loose and on the prowl, sometimes even eating the exhibits! Apparently four different cockroach species are involved. Whereas only two species, *Periplaneta americana* and *Gromphadorina portentosa* are exhibited, *P. americana*, *P. australasiae*, *Blatta orientalis* and *Blatella germanica* are on the loose. Frankly this surprises us, as our previous experience of roach infestation in insect houses, laboratories and elsewhere has been of only *one* species at a time being present as a pest; in particular we have always understood, as has been the case in Cambridge, that *P. americana* and *B. germanica* do not live together, the one (first to occupy the niche) driving off the other. Quite simple really, you leave your own eggs alone but eat the other fellows!

A difficult problem to solve, since any use of insecticide could harm the captive stock. Traps therefore are being used. Nevertheless the Zoology Department here in Cambridge did get rid of its *P. americana* by the use of "Ficam" without harming its locusts whose production was being affected by said roaches. Another thought. Roaches are much used in research and teaching, are expensive to buy and have even in the past been in desperate short supply. Perhaps the Zoo could help its present financial crises by collecting them up and selling them.

AN INLAND COLONY OF THE BROWN-TAILED MOTH

by *Andrew Halstead (6346)*

In the August 1991 *Bulletin* (p.190) the editor, B.O.C. Gardiner, commented that although common in southern coastal areas, the Brown-tail moth, *Euproctis chrysorhoea*, is quite unable to spread inland. Woking in Surrey is about 36 miles from the nearest coast as the moth flies but a thriving Brown-tail infestation was found there in 1986. In October of that year I noticed several dozen silk hibernaculi which had been spun by young larvae on a mixed hawthorn and holly hedge. This was about four feet high and 80 yards long around two sides of a business premises. The larvae survived the winter and proceeded to defoliate the hawthorn parts of the hedge during the summer. The older larvae also fed on sycamore growing in the hedge. Since then the moth has maintained itself through a variety of cold or mild winters and dull or hot dry summers.

The origin of the Woking colony is unknown. A deliberate release is a possibility or a gravid female may have hitched a ride on a lorry. Its numbers have fluctuated from year to year but the fact that it has survived from at least 1986 until the present time suggests that its distribution is not dependent on a salty environment or a mild coastal climate. I have in some years seen the occasional nest of larvae in gardens close to the original site but the hedge remains its stronghold. It would appear that female Brown-tails are not very mobile and may not fly until after they have deposited their eggs.

A PSEUDOSCORPION HITCH-HIKER

by *G. W. Danahar (5658)*

37 Hounsdon Road, Winchmore Hill, London N21.

On the side of my family home, we have a long lean-to conservatory. With a door at either end, it acts like a wind tunnel and during the summer it frequently fills up with large numbers of insects, especially flies, bees, wasps and the occasional butterfly. On one particular date, I noticed a soldier fly resting on the wall at eye level. This was a female *Sargus bipunctatus*. According to literature cited in Colyer and Hammond (1968) — from Edwards (1947) — “A female was believed to have been seen ovipositing in cow dung”. Perhaps it was activities such as this that gave an opportunity for a free loading passenger to get a ride. Holding on to the front tibia, by one palpal, was a pseudoscorpion, waving itself about wildly.

Due to the limitations of my microscope, I was only able to identify the specimen to family: Charentidea (Menge 1955). In Legg and Jones

(1988) there is a reference to: Baily, G. (1865). Fly Parasites, Science Gossip, 1, 227-228, where more information may be available, but I have been unable to track this down. Perhaps an AES member might be able to help me with this.

One must presume that an individual pseudoscorpion's powers of locomotion are restrictive to say the least and no doubt, the aid given by the *Sargus* must increase the dispersal powers of this individual several fold. It is an interesting thought to contemplate, with regards to dispersal, that wings could be viewed as extravagant when pedipalps will do. Further, pedipalps can be used for other purposes as well. Perhaps the pseudoscorpion pedipalps are the invertebrate equivalent of the hitch-hiker's thumb. However, this presupposes that the *Sargus* is a willing host.

Although I could not see any means by which the *Sargus* could benefit from this association, I can say that it didn't appear to be attempting to remove the passenger. In fact I am convinced that the *Sargus* was completely oblivious of its presence.

The lack of records of this nature in the literature suggests that entomologists observe such incidents infrequently and so I tentatively suggest that pseudoscorpions are irregular passengers of winged insects. But, it could be interpreted as a comment on the observational powers of entomologists! Perhaps others have similar events to report. I would be most interested to hear from them.

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A VERY UNUSUAL EGG-LAYING SITE FOR SILVER-WASHED FRITILLARY

by *T.R. Smithers (9447)*

On Sunday 28th July 1991 whilst on a day out photographing butterflies with a friend at a site on the Surrey-Sussex border, I witnessed something that would have been hard to believe had I not seen it with my own eyes.

The strange occurrence concerned a young man who was with a group of butterfly enthusiasts who had come down from Bedfordshire (I believe this is where they said) to try and photograph Purple emperors. We met these gentlemen near one of the entrances to the reserve just a few hundred yards inside and immediately struck up a conversation with them.

Whilst we were talking the young man in question sat down on a stack of timber at the side of the ride just a few yards away from us. No sooner had he sat down (as he later explained to us), than a female Silver-washed fritillary (*Argynnis paphia*) sailed over to him and proceeded to lay a row of three ova on the inside leg of the black jeans he was wearing, which he then came over and showed us. I was amazed and asked him to show me where he had been sitting — which he did. Just as I turned around to climb down, the said fritillary flew up the path, landed on my jeans (blue) and proceeded to feel with her antennae and curve her abdomen over as if about to lay on me also. However she did not, and instead decided to fly across to my other leg and go through the same procedure but after about ten seconds she decided I was unsuitable and flew off again, this time not to return.

Has anybody ever heard of this happening before and have they any theories as to why it occurred? I wondered if body temperature had anything to do with it as I have been led to believe that females refuse to oviposit in poor summer temperatures. However, the day in question was very muggy and hot — at least 25°C.

During the course of the day we sighted the following species: Silver-washed fritillary, White admiral, Meadow brown, Ringlet, Purple hairstreak, Brimstone, Wood white, Small white, Small tortoiseshell, Small skipper, Essex skipper, Large skipper, one only Marbled white (not natural here), Large white, but alas no Purple emperors.

BOOK REVIEW

Classification and biology of Braconid wasps by M.R. Shaw & T. Huddleston. 126pp; 126 figs. 8vo (card cover), *Handk Ident. Br. Insects, Vol 7, part II*. ISBN 0 901546 77 1 RES. London 1991. Price £18.00.

This is the latest of the Handbooks for the Identification of British Insects. One of the authors, Dr Mark Shaw, is the AES adviser on these wasps and with his co-author has produced a most readable guide to these parasitic wasps, so often discovered and, unfortunately, often discarded by the breeder of Lepidoptera. The introduction deals with their biology and morphology, followed by a key to the ichneumonoid families, a checklist of the British genera (including synonyms in view of the fluidity of a group under constant review), and a key to the extremely interesting accounts of their life-forms, hosts and other aspects which assist in identification. There are twenty-seven pages of literature references and a very necessary glossary for the uninitiated. When your caterpillars produce wasps next time instead of lepidoptera, they can form an opening to a new area of entomological study for you.

BEHAVIOUR OF PURPLE HAIRSTREAKS AND HORNETS

by Brian Mitchell (8068)

On 8th August 1991, I visited Ryton Wood Nature Reserve, Warwickshire with Mr S. Pittman. Purple hairstreaks were conspicuous, many of them coming down low onto leaves, allowing photographs to be taken. Twenty-three were counted, mostly along the main ride.

However, away from here, in another ride, a number were noted flying around sprays of ash leaves along a field edge just outside the reserve. Unable to get closer because of a ditch and fence, I stood on a small mound observing them through binoculars. I became aware of a few hornets also flying around the same ash sprays and focussing my binoculars upon one spray I was amazed to see a cluster of both Hornets and Purple hairstreaks crawling side by side on a small part of the fork of a thin bough beneath the shade of the overhanging spray. I counted at least four of each insect but it wasn't possible to be entirely accurate about the total and there were others flying around. Clearly, there must have been a sap run which both species were exploiting. Given that both Hornets and Wasps are predators of Purple hairstreak, I thought this an observation worth reporting.

Although I have observed Purple hairstreaks crawling on twigs beneath oak and ash leaves before, I had presumed they were females looking for suitable places to oviposit. However, it may be that runs of tree sap are as important as aphid honeydew in their diet and, where available, they provide an easier food source concentrated in one small area rather than the insect expending energy to locate honeydew on numerous leaves. One might also speculate on whether individuals return to the same sap run for a few days as other species of butterfly have been known to do in gardens where *Buddleia* or *Sedum* or rotting apples are present.

LUCKY YELLOW UNDERWING

by Jan Koryzko (6089)

During the summer of 1990, a patch of waste ground was being cleared by workmen, when suddenly a Large yellow underwing moth (*Noctua pronuba*) was disturbed.

On darting off, its hind legs picked up two long blades of grass which the workmen had cut. They were around 4" long, the moth looked like a daddy longlegs or some tropical swallowtail butterfly in flight.

Within seconds, two sparrows attacked the moth in flight, one to grab a blade of grass each, and the moth hit the ground and disappeared into the undergrowth. The sparrows then realised what they had missed and started to search the undergrowth with no luck; that belonged to the moth!

MOTHS IN NUN'S WOOD, TRALEE, IRELAND

by Dave Norris (9175)

91 Shanakill, Tralee, Co. Kerry, Eire.

Together with my friend Paul Dowling I decided to spend 1990 making a record of one particular wood as there are a good few records from Ireland as a whole but not much on specific woods. I have chosen the Nun's Wood, which is on the outskirts of Tralee, as it is hundreds of years old and structurally not much interfered with.

We used an ultra violet trap and a portable generator. We took in all 103 species and you don't catch everything in one year so there could quite likely be up to 150 species in the wood. It is ideal as it has hundreds of different types of flora and fauna, both native and imported, and there are streams running through with reed beds. Tim Lavery (8677) informed me that now there are no previous records from the Nun's Wood. I wish to thank John and Tim Lavery for confirming the identity of doubtful species. The following species were recorded.

Angle shades	<i>Phlogophora meticulosa</i>	Dot moth	<i>Melanchra persicariae</i>
Annulet	<i>Gnophos obscuratus</i>	Double square spot	<i>Amathes triangulum</i>
August thorn	<i>Ennomos quercinaria</i>	Drinker	<i>Philudoria potatoria</i>
Beautiful carpet	<i>Mesoleuca albicillata</i>	Ear moth	<i>Amphopoea oculea</i>
Beautiful golden Y	<i>Plusia pulchrina</i>	Early thorn	<i>Selenia bilunaria</i>
Blue-bordered carpet	<i>Plemyria rubiginata</i>	Elephant hawk	<i>Deiliphila elpenor</i>
Bordered gothic	<i>Heliophobus reticulata</i>	Fanfoot	<i>Herminia tarsipennalis</i>
Bright-line brown-eye	<i>Diataraxia oleracia</i>	Flame shoulder	<i>Ochropleura plecta</i>
Brimstone	<i>Opisthograptis luteolata</i>	Flame wainscot	<i>Senta flammea</i>
Brown silver-line	<i>Petrophora chlorosata</i>	Four-spot footman	<i>Lithosia quadra</i>
Brussels lace	<i>Cleorodes lichenaria</i>	Galium carpet	<i>Epirrhoe galiata</i>
Buff arches	<i>Habrosyne derasa</i>	Garden tiger	<i>Arctia caja</i>
Buff ermine	<i>Spilosoma luteum</i>	Ghost swift	<i>Hepialus humuli</i>
Buff footman	<i>Eilema deplana</i>	Gold spot	<i>Plusia festucae</i>
Buff tip	<i>Phalera bucephala</i>	Grey dagger	<i>Acronicta psi</i>
Burnished brass	<i>Plusia chrysis</i>	Grey pine carpet	<i>Thera obeliscata</i>
Cabbage moth	<i>Mamestra brassicae</i>	Heart and club	<i>Agrotis clavus</i>
Campion	<i>Hadena cucubali</i>	Heart and dart	<i>Agrotis exclamationis</i>
Clouded border	<i>Lomaspilis marginata</i>	Herald	<i>Scoliopteryx libatrix</i>
Common carpet	<i>Epirrhoe alternata</i>	Hummingbird hawk	<i>Macroglossum stellatarum</i>
Common marbled carpet	<i>Dysstroma truncata</i>	Iron prominent	<i>Notodonta dromedarius</i>
Common rustic	<i>Apamea secalis</i>	Jasione pug	<i>Eupithecia denotata</i>
Common wainscot	<i>Leucania pallens</i>	July highflyer	<i>Hydriomena furcata</i>
Common white wave	<i>Cabera pusaria</i>	Knot grass	<i>Acronicta rumicis</i>
Copper underwing	<i>Amphipyra pyramidea</i>	Large emerald	<i>Geometra papilionaria</i>
Coxcomb prominent	<i>Lophopteryx capucina</i>	Large wainscot	<i>Rhizdra lutosa</i>
Cream wave	<i>Scopula floslactata</i>	Large yellow underwing	<i>Noctua pronuba</i>
Dark arches	<i>Apamea monoglypha</i>	Lead belle	<i>Scotopteryx mucronata</i>
Dark swordgrass	<i>Agrotis ipsilon</i>	Lesser yellow underwing	<i>Noctua comes</i>
Dog's tooth	<i>Hadena suasa</i>		

Lesser broad-bordered yellow underwing	<i>Noctua janthe</i>	Scalloped hazel	<i>Gonodontis bidentata</i>
Light emerald	<i>Campaea margaritata</i>	Scalloped oak	<i>Crocallis elinguaris</i>
Lilac beauty	<i>Apeira syringaria</i>	Shaded broad-bar	<i>Scotopteryx chenopodiata</i>
Lime speck pug	<i>Eupithecia centaureata</i>	Silky wainscot	<i>Chilodes maritimus</i>
Little emerald	<i>Jodis lactearia</i>	Silver-ground carpet	<i>Xanthorhoe montanata</i>
Magpie	<i>Abraxas grossulariata</i>	Silver-Y	<i>Plusia gamma</i>
Mottled beauty	<i>Alcis repandata</i>	Six spot burnet	<i>Zygaena filipendulae</i>
Muslin moth	<i>Diaphora mendica</i>	Small argent & sable	<i>Epirrhoe tristata</i>
Nut tree tussock	<i>Colocasia coryli</i>	Small emerald	<i>Hemistola chrysoprasaria</i>
Oak beauty	<i>Biston strataria</i>	Small magpie	<i>Eurrhypara hortulata</i>
Old lady moth	<i>Mormo maura</i>	Small wainscot	<i>Photedes pygmina</i>
Peach blossom	<i>Thyatira batis</i>	Smoky wainscot	<i>Mythimna impura</i>
Peppered moth	<i>Biston betularia</i>	Snout	<i>Hypena proboscidalis</i>
Plain golden Y	<i>Autographa jota</i>	Spruce carpet	<i>Thera britannica</i>
Plume moth	<i>Pterophorus spp.</i>	Square-spot rustic	<i>Xestia xanthographa</i>
Poplar hawk	<i>Laotoë populi</i>	Swallowtail moth	<i>Ourapteryx sambucaria</i>
Purple bar	<i>Cosmorhoe ocellata</i>	Treble lines	<i>Charanyca trigammica</i>
Red-necked footman	<i>Atolmis rubricollis</i>	True lovers knot	<i>Lycophotia porphyrea</i>
Riband wave	<i>Idaea aversata</i>	White ermine	<i>Spilosoma lubricipeda</i>
Rosy rustic	<i>Hydraecia micacea</i>	Willow beauty	<i>Peribatodes rhom- boidaria</i>
Round-winged muslin moth	<i>Thumatha senex</i>	Yellow shell	<i>Camptogramma bilineata</i>
Ruby tiger	<i>Phragmatobia fuliginosa</i>		
Sand dart	<i>Agrotis ripae</i>		

EFFECT OF BEING STUNG BY THE HUMBLE-BEE *BOMBUS PASCUORUM*

by Andrew Grayson (862)

According to general folklore, Humble-, or Bumble-bees are not supposed to sting humans unless they are severely provoked. During the summer of 1990 I was stung by a queen of the ginger-haired species, *Bombus pascuorum*. I suppose the fact that I sat on the poor creature with all of my 15 stone weight was enough provocation for it to sting. The first effect was that I felt something similar to a small piece of grit being against my skin. Within three seconds this developed to the pain of a blunt pin being pressed against the skin and within another couple of seconds the pain was similar to a sharp pin pressed hard into my skin. By this time I was off my vehicle seat and quickly realised what had happened.

The after effects of the sting were that the area of skin around it became swollen in a hard white ring about 15mm in diameter and my skin was inflamed and sore within a radius of at least 30mm from the point at which I was stung. The appearance was very much as though I had a Polomint stuck underneath the skin and the pain and general soreness caused lasted for at least five hours.

BOOK REVIEW

The moths & butterflies of Great Britain & Ireland Vol. 7, part 2: Lasiocampidae to Thyatiridae. Edited by A. Maitland Emmet and the late John Heath. 4to. 400pp. 8 coloured plates, text figures and maps. ISBN 0 9446589 26 7. Harley Books, 1991. Price £49.95 until 31st December, thereafter £55.00.

My first reaction on opening this book was "Good heavens, they've reprinted Newman & Leeds' 1913 *Textbook of British Butterflies & Moths*", a book that has served several generations of entomologists well and is still eagerly sought after. Well, yes, they *have* re-printed it, but not just it, but an enormously expanded version to take in all the British Lepidoptera, not just the macros. Indeed this section occupies well over half (three-quarters if one includes the massive index) of this 400 page book, whereas the "Lasiocampidae to Thyatiridae" section of the title is a mere 50 pages (there are only 28 of them, after all).

The layout is the same as in Newman & Leeds, but the information has been corrected when necessary, added to, expanded, and is all-inclusive in that it contains even adventitious species only recorded once in a century. The order, as befits this scientific series of volumes, is that of the present taxonomic arrangement of the Lepidoptera, with the numbering of Bradley & Fletcher, which as views change, is no longer quite consecutive. Quite frankly, I preferred the alphabetic arrangement of Newman & Leeds, as this makes species so much easier to find, particularly for beginners (for whom such listings are of the greatest use) and who are likely to have difficulty finding their way around. It is true that any species can be traced by using the 24 page index which usefully gives both the Bradley & Fletcher number as well as the actual page. Nevertheless this index is in small type and does irritatingly use up time having to go to it first. To my great surprise not only is there no mention of Newman & Leeds in the references to this section but neither are those other two great *vade mecums* of those interested in rearing, Scorer's *Logbook* (also published in 1913) and Allan's *Larval foodplants*. I am sure they must have been consulted. It should, I think, be noted that the foodplants given are by no means a comprehensive list, but are intended as an indication of those on which a species is most commonly to be found.

While the macrolepidoptera are accorded their common English names, when it comes to the micros their use seems to me to have been chosen on a purely arbitrary basis. Why, for instance, among the plume moths, does only *pentadactyla*, the White plume moth, have an English name? Why omit the English Wormwood plume for *spilodactyla*, not to mention the other plumes. Indeed English names for the micros only occur occasionally and seemingly at the random whim of the editors.

As is customary in this series, there is a substantial preliminary essay; in this volume it is on the higher (ie, above genus level) classification of the Lepidoptera, by Dr M.J. Scoble, and the very extensive reference list enables those who so wish to study this aspect of taxonomy in depth.

This is followed by a brief account of the resting positions of the Lepidoptera (as was done in Harley Books' Pyralid moth volume) with 64 photographs of Lepidoptera at rest which gives us an indication of the many attitudes these creatures can take up.

Turning to the colour plates, while those of the resting positions are excellent, I find the others disappointing. All these moths are subtle shades of brown and grey and unlike the butterflies in Vol. 7 (1) which have sharply contrasting colours, have not come up true to life. A comparison of the photographed resting positions Plate B, Figs. 14, 15, 16 with the illustrated set specimens will indicate this. Nor do the eggars and hooktips compare favourably with the bred examples in my collection. These plates must also be judged against the contemporaneously published book *A complete guide to British moths* by Margaret Brooks where they are illustrated by photographs and it seems clear to me that *most* species, particularly those of rather uniform hue, are better photographed than painted.

This is a book that is an absolute *must* for any entomologist, not for its title — and in my opinion the Lasiocampidae to Thyatiridae would have been better included with the butterflies — but for its Life History Chart, a stupendous compilation which will serve a useful purpose well into the next century.

SAC

BOOK REVIEW

The Insect Almanac by Monica Russo. 1991. Sterling Publishing Co, New York. 128pp. Line drawings and photographs. Price unstated but obtainable through Cassell plc, 41/47 Strand, London WC2N 5JE.

This American publication is aimed at the young putative entomologist, is written in simple language, in large print and with good illustrations. Chapter 1 considers what are insects and outlines the orders and the morphology. Subsequent chapters cover entomological activities for the four seasons in various habitats and conditions. The suggestions for field and home work and hints are very practical and although it is North American orientated as to species, most is relevant to juniors in any country. The last section on making a collection of dead insects needs more amplification if beginners are to achieve reasonable results. There is a good glossary of terms for the beginner. The book should prove useful to those teaching young people about insects and would make a good starting point for any child showing an interest in "creepy crawlies".

PWC

A NOTE ON *BRAHMAEA (BRAHMAEA) CERTHIA FABRICIUS*

by Don McNamara (5537)

This beautiful insect, the Korean owl moth, is currently the most popular in the UK among the “Brahmaeid fanciers”, ousting the Japanese owl moth *Brahmaea wallichii japonica* Butler, from “pole position”.

However, it is referred to under various names which may be confusing, but as is the tradition, the first recorded name should be given priority. Briefly its “naming history” is as follows:

B. certhia (Fabricius — 1793)

B. undulata (Brem. and Grey — 1853)

B. petiveri (Butler — 1866)

B. carpenteri (Butler — 1883)

B. tancrei (Austant — 1896).

So, by rights, “*certhia*” has it.

CONTINENTAL WASP DISCOVERED IN BUCKINGHAMSHIRE

by Tony Marshall (6843)

A specimen of *Dolichovespula (Vespula) media* (Degeer) was taken by me in my garden on 21st July 1991. This wasp is a common mainland European species, but does not appear on any of the British lists. I would have thought that it was unusual for a social wasp to travel such a distance, so that the discovery seems rather surprising. I would be interested to learn whether this species has been recorded in Britain before.

The wasp has narrower stripes on the abdomen than any of our native species, so that it looks conspicuously blacker. There is also a yellow line along the front dorsal edge of the black pronotum which is another distinctive feature. The “face” is also distinct in having an evenly thick black line descending from the top edge of the yellow clypeus and not quite reaching the lower edge by the mandibles. Our native species have black dots on the clypeus or a black line with a marked swelling in the middle or at the end.

***VOLUCELLA ZONARIA* IN CAMBRIDGE**

by Brian O.C. Gardiner (225)

Amongst the many hundreds of various Syrphid flies enjoying the golden rain flowers in my Cambridge garden, I suddenly noticed one that was distinctly different from the usual *V. inanis* and taking my mind back to 1945 when I first came across it on Wimbledon Common, realised it was the rare *V. zonaria*.

OH FOR A NET, OR, DID I SEE A LARGE TORTOISESHELL?

by Brian O.C. Gardiner (225)

Of all the thousands of butterflies I have seen this year, why is it that the one and only real possible rarity did not stay around long enough for me to rush into the garage for my net and thereby make a positive identification? Among the hundreds of Small tortoiseshells that were feeding on my (and everyone else's) buddleias this autumn I spotted a similar, larger but different butterfly that looked as if it were a Large tortoiseshell (*Nymphalis polychloros*), a species I have not seen around in Cambridge for some 30 years. It was at a distance and was certainly not one of the Commas, which were also present. It was very skittish and at too great a distance for me to make a certain identification and by the time I had a net there was no sign of it. It would have been nice to have been positive about it. It certainly appeared to be more "tortoiseshell-like" than "fritillary-like" which would have been another possibility. In view of the fact that both European stock of the Large tortoiseshell and also of the Eastern tortoiseshell (*N. xanthomelas*) are offered for sale and are bred here it could have been an escaped example of one of these species.

THE LIVING WORLD — CATERPILLARS

On 24th August, the BBC Radio Four programme *The Living World* featured two of our members, Peter Cribb and Duncan Reavey, in a programme on caterpillars. The programme was recorded on the North Downs and was presented by Peter France and produced by the BBC Bristol Wildlife section's John Harrison. Caterpillars were searched for and discussion took place on the various methods adopted by butterfly and moth larvae for survival, their predators and how one went about finding them. The programme was repeated in a shortened form on the following day. The day of the recording was one of brilliant sunshine and the party was able to enjoy walking amongst downland alive with butterflies. There were large numbers of female Chalkhill blues busy laying their eggs and a Silver-spotted skipper alighted in front of them while discussing larvae that fed on grasses.

A COLONY OF ESSEX SKIPPERS NEAR DAVENTRY

by K.F. Williams (8179)

This year I came across a colony of the Essex skipper (*Thymelicus lineola*) near Daventry at Map Reference 578632. This is a very westerly site for this species. This wonderful little area where I found it is sadly earmarked for "Development" and so destruction will be brought to another little piece of Dear Old England.

DEATHSHEAD HAWKMOTH NEAR SHEFFIELD

Mr Trev Nettleship (9186) has sent a cutting from a local newspaper reporting and illustrating the presence of a caterpillar of *Acherontia atropos*, which was found on Kiveton Park allotments in September 1991.

SAVE SOME MONEY BEFORE NEXT YEAR

Members may like to know that there are going to be some price increases in the New Year. Bob George of Marris House Nets tells me that he will be producing a new price list and increases, the first for nearly two years, will be of the order of 10 - 15%. Orders from AES members at the current prices will be accepted until 7th January 1992. Save your pennies and order now.

Also due for a price increase is the recently published *Moths & Butterflies of Great Britain & Ireland Volume 7(2)* (reviewed on page 283 of this issue) which goes up from £49.50 to £55.00. The remaindered books mentioned on page 232 of the October issue are unlikely to remain in the shops for long and we have already seen *Butterflies of Jamaica* advertised at twice the remaindered price!

VOLUCELLA ZONARIA (PODA) IN CHRISTCHURCH

by R.S. George (1402)

Today, 4th September, 1991, whilst doing a demonstration sorting of a Malaise trap catch at the Annual Open Day of the Bournemouth Natural Science Society I was given two hoverflies by Mrs B. Herbert-Graham of Christchurch, v.c.11. She had brought them in with hopes that she could have an identification and information about their possible danger either to her family (thinking of hornets of course) or the plants in her garden.

She said that scores, possibly hundreds, had appeared over a couple of days in early August — this would precede the immense flux of Syrphids, mainly *Episyrphus balteatus* (Degeer), which arrived in this area later in August. The two specimens were female *Volucella zonaria* (poda) and will be deposited in the collections of the BNSS.

CONVOLVULUS HAWKMOTH IN CAMBRIDGESHIRE

by Malcolm Simpson (4859)

A live female specimen of *Agrius convolvuli* L. was given to me by a near neighbour, Pearl Longland, who found the moth resting on a carrot sack in Wistow, Cambridgeshire on Tuesday, 1st October 1991. The specimen was handed over live to Barry Dickerson, Huntingdonshire county recorder in the hope that she might have produced eggs.

Pearl Longland has previously found Death's-head hawk moth larvae and this is obviously a case of Pearl being a real gem!

"Gryllus Sölus"

Andante

Frank Marples

8va

Sopr. mp.

Vln. *f*

Fine

D.C. al Fine



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CONTENTS

A note on <i>Brahmaea certhia</i> Fabricius by <i>Don McNamara</i>	285
A pseudoscorpion hitch-hiker by <i>G. W. Danahar</i>	277
A very unusual egg-laying site for Silver-washed fritillary by <i>T.R. Smithers</i>	278
Accidents will happen by <i>A.S. Salisbury</i>	242
AES and Junior Members by <i>Darren Mann</i>	241
Behaviour of Purple hairstreaks and hornet by <i>Brian Mitchell</i>	280
Book reviews	244, 269, 271, 279, 283, 284
Bred aberrations of the Pearl-bordered fritillary by <i>Dominic Rey</i>	258
Butterflies as prey of wasps by <i>Stuart Pittman</i>	275
Collecting trip to Greece, 1990 by <i>Charles L. Young</i>	273
Colony of Essex skippers near Daventry by <i>K.F. Williams</i>	286
Continental wasp discovered in Buckinghamshire by <i>Tony Marshall</i>	285
Convolvulus hawkmoth in Cambridgeshire by <i>Malcolm Simpson</i>	287
Deathshead hawkmoth near Sheffield	287
Dowk the Tuak road by <i>Leigh Plester</i>	245
Effect of being stung by the humblebee <i>Bombus pascuarum</i> , by <i>Andrew Grayson</i>	282
Entomological Club grants	254
<i>Gryllus solus</i> by <i>Frank Marples</i>	288
Illuminating ideas for use at night by <i>P.E. Bragg</i>	267
Inland colony of the Brown-tailed moth by <i>Andrew Halstead</i>	277
Insect fauna and decomposition of badger carrion by <i>M. Hancox</i>	255
Insects on birch by <i>John W. Lavery</i>	259
Larvae of the <i>Euchloe ausonia</i> group by <i>Peter Cribb</i>	254
Lucky Yellow underwing by <i>Jan Koryzko</i>	280
Moths in Nunn's Wood, Tralee, Ireland by <i>Dave Norris</i>	281
New records for <i>Atolmis rubricollis</i> (Red-necked footman), in County Kerry, Ireland by <i>John W. Lavery</i>	263
<i>Nolimetangere</i> , a phasmid which can be touched by <i>Phil Bragg</i>	265
Note on <i>Empis (Platyptera) borealis</i> by <i>Tim A. Lavery</i>	260
Oh for a net, or, did I see a Large tortoiseshell? by <i>Brian O.C. Gardiner</i>	286
Phasmids eaten by ladybirds by <i>Phil Bragg</i>	253
Rare Holly blue variety from Daventry by <i>K.F. Williams</i>	272
Red-necked footman in Tralee by <i>D. Norris</i>	263
Save some money before next year	287
Sellafield coastal area: records required	258
Spurge hawkmoth at Newton Abbot, Devon by <i>S.J. Pettit</i>	262
Stag beetle in road accident by <i>David Holland</i>	264
The living world — caterpillars	286
Too many insects by <i>The Editor</i>	276
<i>Volucella zonaria</i> (Poda) in Christchurch by <i>R.S. George</i>	287
<i>Volucella zonaria</i> in Cambridge by <i>Brian O.C. Gardiner</i>	243
Work Experience by <i>Guy Knight</i>	243



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