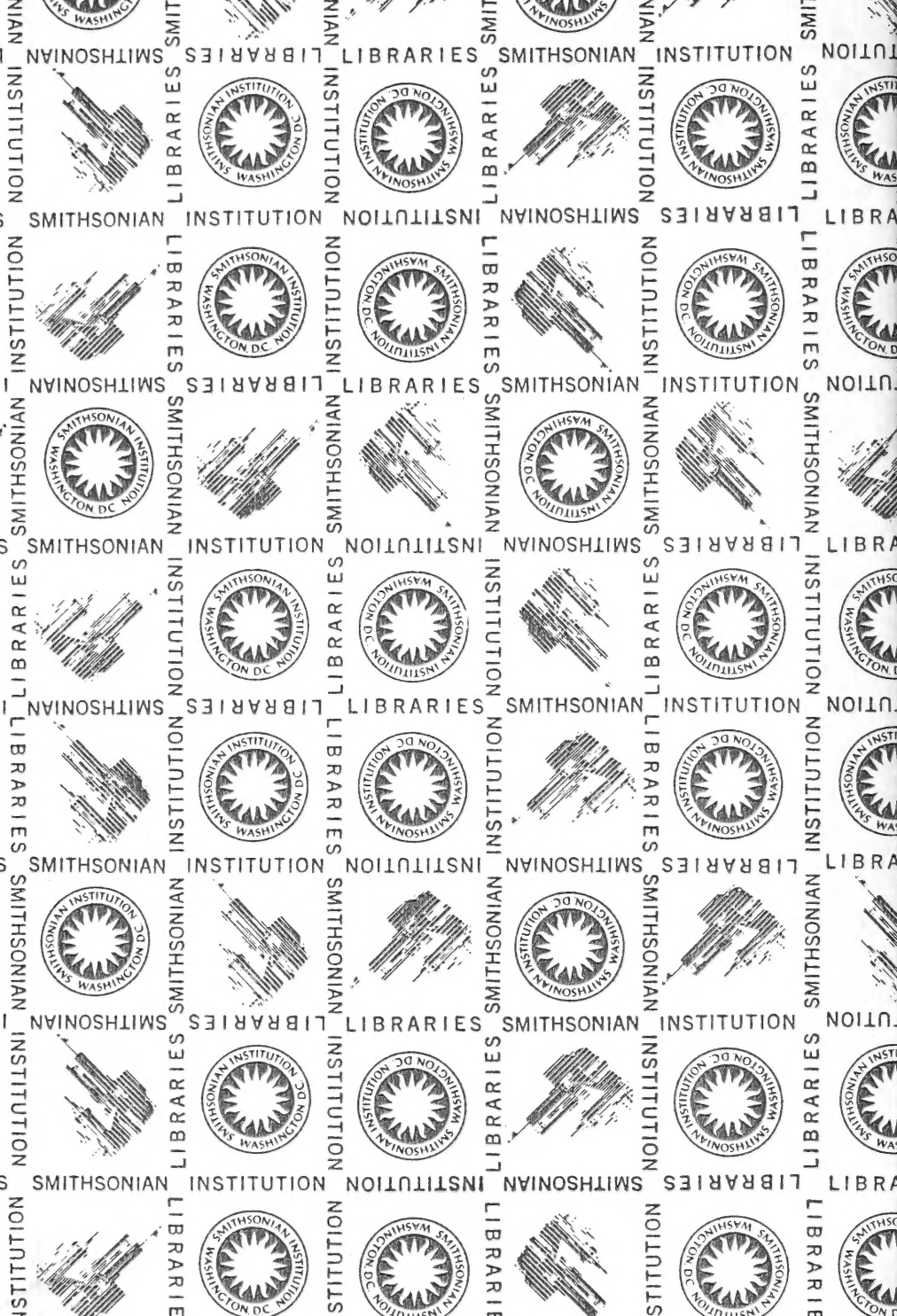


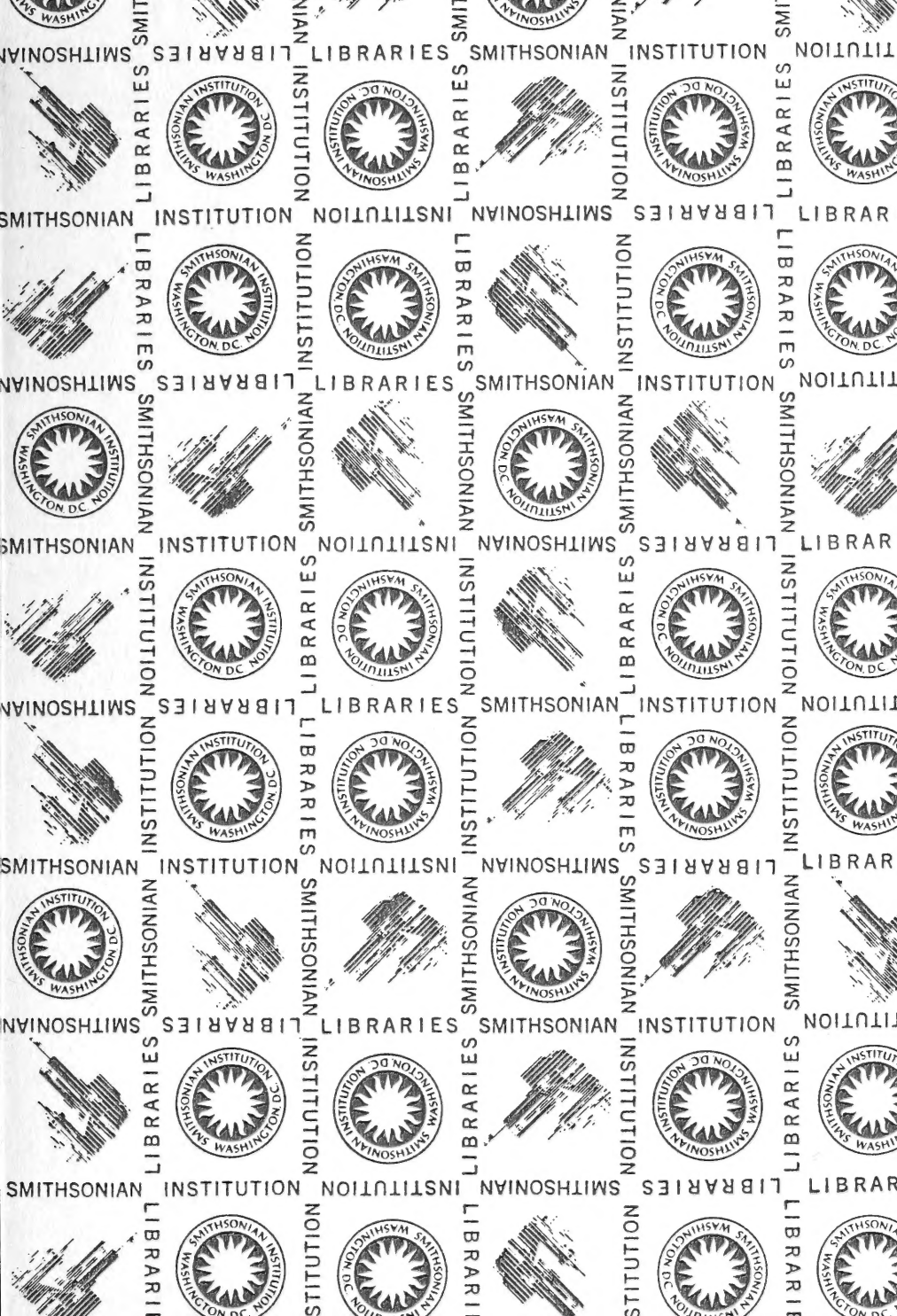
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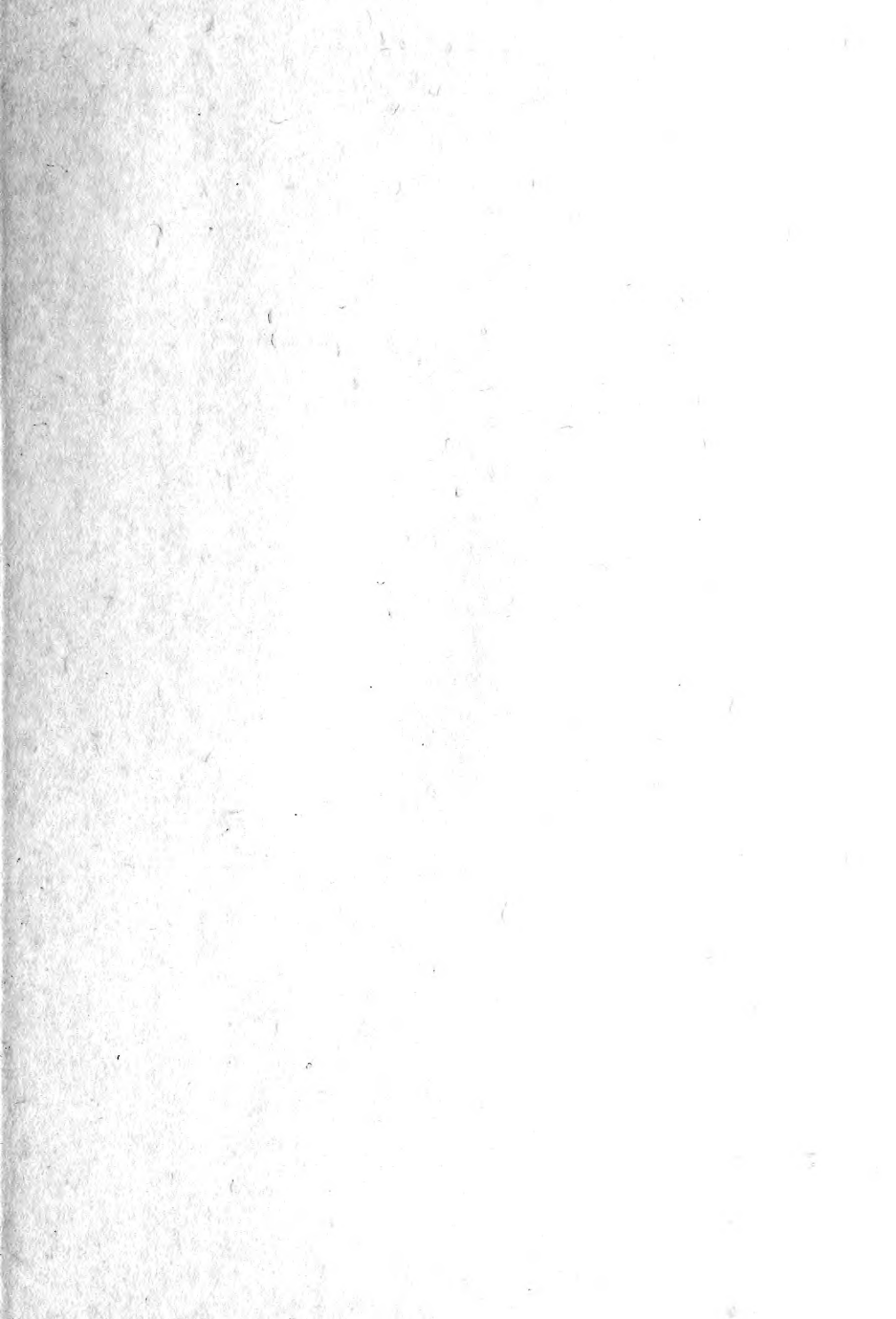
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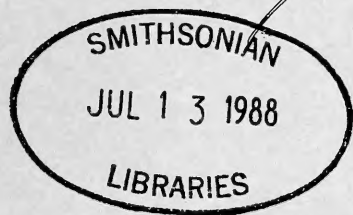
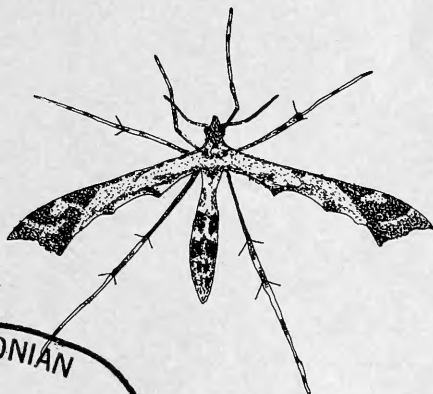
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Editorial

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RESTING POSTURE IN THE LEPIDOPTERA

By M.W.F. TWEEDIE

Barn House, Rye, Sussex TN31 7PJ.

By reason of the development of a mosaic of overlapping scales on their wings the Lepidoptera have come to display a remarkable degree of diversity in coloration and pattern. Correlated with this, often in such a way as to produce cryptic and other adaptations, they have evolved a diversity in their resting postures, particularly in the disposition of their wings, far greater than that found in any other insect order. It is true that not all the peculiarities of posture are obviously adaptive, but it must be remembered that diversity in itself provides protection against predation by increasing the number of searching images needed by predators that hunt by sight.

It is customary to dispose collections of butterflies and moths in a way that best displays their wing coloration, but in almost all cases this wholly obscures the resting posture of the living insect. It is my purpose in this paper to present a very brief introduction to a hitherto rather neglected branch of entomology, that of photographically recording the appearance of insects in life. The Lepidoptera, for reasons I have stated, are the most obvious candidates for a systematic study of this kind.

For an indication of the primitive lepidopteran posture it seems reasonable to look at one of the most primitive groups within the order, the Hepialidae. All the swift moths that I have observed hold their fore-wings, when at rest, directed backwards forming a steep ridged roof covering the hind-body. Support for considering this a primitive posture is given by its invariable occurrence in the Trichoptera or caddis flies, which are generally regarded as less highly evolved relatives of the Lepidoptera.

The ridged-roof mode of holding the fore-wings together is often met with in other Lepidoptera, in some perhaps as a persistent character, probably more often as a secondary one. It is seen in the 'prominents' of the family Notodontidae, in which a disrupted outline is produced by scale-tufts on the dorsal margin of the fore-wings. Among the Noctuidae the metallic-marked Plusiinae rest in a similar position. In most of the larger moths which rest with the hind-wings concealed these are folded like a fan.

The first stage leading away from the primitive stance consists of a progressive flattening of the 'roof' until the fore-wings lie horizontally, meeting in the middle line, a condition seen in some of the Hypeninae and in the herald moth, *Scoliopteryx libatrix* L. In many of the more heavy-bodied moths the flattening of the fore-wings is accompanied by a tendency for them to overlap at the tornus or for the greater part of their length. This posture is seen in a great many species of Noctuidae and also in the much more slender-bodied Lithosiinae or footman moths.

In the direction contrary to overlapping fore-wings are cases where they do not meet or approach closely in the middle line, so that the abdomen is exposed. This is seen in the Sphingidae, in which the hind-wings are usually almost or quite covered, producing an arrow-head shape in the resting insect. The poplar hawk-moth, *Laothoe populi* L., is exceptional in carrying the hind-wings pushed so far forward that they appear in front of the costa of the fore-wings, breaking up the insect's outline and producing a striking cryptic effect. The wings are similarly disposed in the lappet, *Gastropacha quercifolia* L., producing a remarkable resemblance to a bunch of dead leaves.

Many geometrids sit as I have described for the Hypheninae, flattened against the substratum with the fore-wings covering the hind-wings. The abdomen may or may not be covered, and in a few species it is completely concealed by the overlapping fore-wings; the March moth, *Alsophila aescularia* D. & S. is an example of this and the Streak, *Chesias legatella* D. & S. affords another. Species with a flattened posture in which all four wings are exposed are numerous among the Geometridae. Most of the 'pugs' (*Eupithecia*) rest in this posture with the hind-wings wholly or partly uncovered, and some of the 'waves' show it in a rather extreme form. In such cases the hind-wing is usually marked and coloured similarly to the fore-wing, but in geometrids the hind-wings are seldom patterned if they are concealed.

Most of the Pyralidae rest flattened and the hind-wings may be exposed or hidden. *Nomphila noctuella* and the Scopariinae overlap their fore-wings and most of the Crambinae wrap the fore-wings round the body to produce an elongated image for crypsis among grass stems.

The familiar butterfly posture with the wings closed over the back provides the advantage of enabling the insect to present two totally different appearances. The comma, *Polygonia c-album* L., feeding on a flower with wings spread advertises its identity to others of its species, at the same time remaining alert for danger. With its wings closed in hibernation among winter foliage it becomes virtually invisible. Some geometrids rest in the wings-over-back position, but usually only as a temporary 'perching' posture.

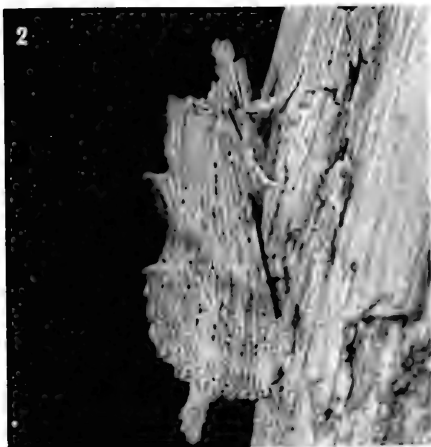
I have described what I see as the main trends in lepidopteran posture by reference to British insects. Some peculiar departures from the usual pattern are shown among the photographs in Figs 1 to 24 (pages 3-6). In conclusion I propose to illustrate the enormous scope for enquiry in this field among exotic faunas by describing two tropical encounters.

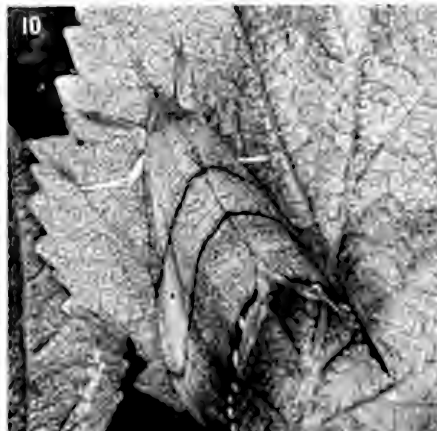
Figs 1-6, page 3.

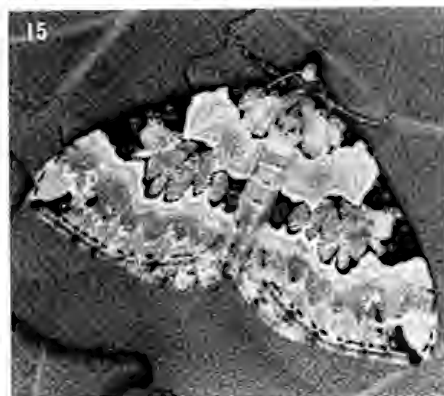
Fig. 1. Common Swift, *Hepialus lupulinus* L. The swift moths display what may well be the primitive lepidopteran resting posture. Fig. 2. Pale Prominent, *Odontostia palpina* Cl. Fig. 3. Beautiful Golden Y, *Autographa pulchrina* Haw. Neither of these are primitive moths but they have a resting posture very like that of the hepialids. In both the 'prominents' and the Plusiinae the dorsal profile is disrupted by projecting tufts; these are of scales arising from the fore-wings in the prominents and of hair on the thorax and abdomen in the plusiines. Fig. 4. Buff-tip, *Phalera bucephala* L. This is a supreme example of posture and coloration combining to produce a cryptic adaptation, in this case resemblance to a broken twig. Fig. 5. Striped Hawk-moth, *Hyles lineata livornica* Esp. This 'arrow-head' posture, with the abdomen exposed between the wings, is typical of the Sphingidae. Fig. 6. Poplar Hawk-moth, *Laothoe populi* L. This moth is unusual among the sphingids in advancing the hind-wings when at rest so that they are broadly exposed in front of the fore-wings.

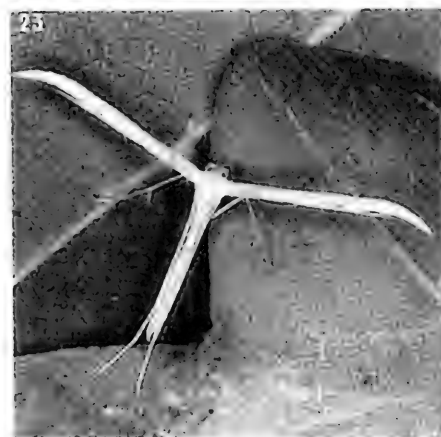
Figs 7-12, page 4.

Fig. 7. Small Skipper, *Thymelicus sylvestris* Poda. Butterflies of this genus rest in a very unusual posture with fore- and hind-wings held in two different planes. Fig. 8. Oak Hook-tip, *Drepana binaria* Hufn. Fig. 9. Chinese Character, *Cilix glaucata* Scop. Fig. 10. Scalloped Hook-tip, *Falcaria lacertinaria* L. The Drepanidae vary in their resting posture. The *Drepana* species may cover the hind-wings as in *binaria* or expose them behind the fore-wings (*falcataria*). *C. glaucata* has a stance probably associated with its mimicry of a bird-dropping. That of *F. lacertinaria*, with the wings curved to form an arch, is very unusual. Fig. 11. Small Fanfoot, *Herminia nemoralis* Fabr. Here the fore-wings are disposed to form a triangle covering the hind-wings. Fig. 12. Obscure Wainscot, *Mythimna obsoleta* Hb.









In 1977 I was on a path in rain forest in the Solomon Islands and noticed what I took to be small butterflies fluttering and settling around me. Having some book-knowledge of the butterflies of the region I found myself momentarily wondering

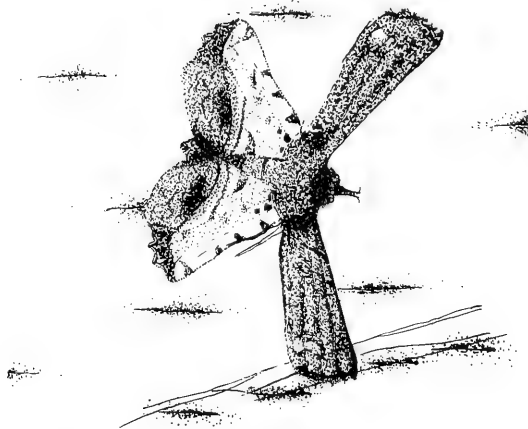


Fig. 25. A moth of the family Epiplemidae, Peru.

Figs 13–18, page 5.

Fig. 13. Autumnal Rustic, *Paradiarsia glareosa* Esp. In the Noctuidae there is a tendency to direct the fore-wings backward so that they overlap, at the tornus (*obsolata*) or more extensively (*glareosa*). Fig. 14. Dinky Footman, *Eilema griseola* Hb. In the arctiid genus *Eilema* there is an extreme degree of overlap of one fore-wing over the other. Fig. 15. Green Carpet, *Electrophaes pectinataria* Knoch. The flat triangular posture with the hind-wings concealed is very general among the Geometridae. Fig. 16. Small White Wave, *Asthena albulata* Hufn. Here all four wings are exposed in a flattened stance, and the fore- and hind-wings are similarly marked. Fig. 17. Blood-vein, *Timandra griseata* Peters. This geometrid affords an outstanding example of coincident pattern, the dark streaks on fore- and hind-wings being continuously aligned in the natural resting posture. Fig. 18. March Moth, *Alsophila aescularia* D. & S. The posture involving overlapping fore-wings is rare among the Geometridae.

Figs 19–24, page 6.

Fig. 19. Lilac Beauty, *Apeira syringaria* L. Folding of the fore-wings along the costal margin occurs uncommonly among the larger moths. This species is a geometrid; the condition is also seen in the noctuid Angle Shades, *Phlogophora meticulosa* L. Fig. 20. Barred Straw, *Eulithis pyraliata* D. & S. In an unusual posture all four wings are directed forwards, the hind-wings being concealed under the fore-wings. Fig. 21. Mother of Pearl, *Pleuroptya ruralis* Scop. Most of the Pyraustinae (Pyralidae) rest in this posture or as a flat triangle. Fig. 22. *Agriphila geniculea* Haw. The grass moths (Crambinae) achieve an elongate shape by rolling the wings round the body. Fig. 23. *Emmelina monodactyla* L. Fig. 24. *Platyptilia calodactyla* D. & S. In the plume moths (Pterophoridae) the deeply dissected hind-wings are always concealed and the fore-wings may be tightly rolled, as in *monodactyla*. It will be seen that in this species the hind legs are laid back along the abdomen and are not involved in supporting the insect at rest; in *calodactyla* all six legs are used in support. It is possible that these two modes of disposing the legs are characteristic of the two subfamilies Pterophorinae and Platyptiliinae.

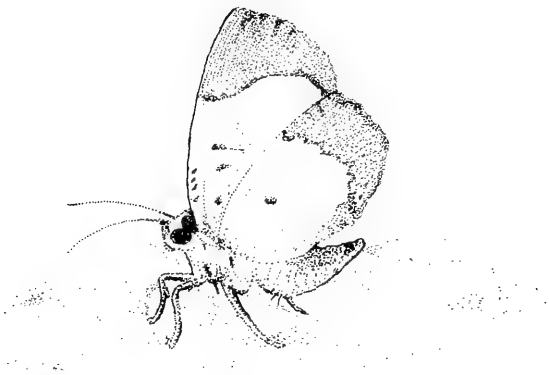


Fig. 26. A moth of the family Callidulidae, Solomon Islands.

what on earth they could be. Close inspection revealed them as callidulid moths, a family found mainly in tropical Asia and Australasia. Their diurnal flight and wholly rhopaloceran resting posture must, I am sure, have briefly puzzled other naturalists beside myself.

The Epiplemidæ, which might well be called 'cross-wings', are small moths with a circumtropical distribution and a very curious and distinctive posture. I found one of these sitting on the palm-leaf wall of my sleeping quarters in a camp beside the river Madre de Dios in eastern Peru on a visit in 1980. I cannot identify either this or the callidulid beyond the family, but on both occasions I had the means to photograph the insects and the drawings (Figs 25 and 26) were made from my colour slides.

BOOK REVIEW

Nature Diary of a Quiet Pedestrian by Philip Croft. Harbour Publishing Co, Madeira Park, British Columbia, Canada. 141 pages.

This attractive publication documents the natural history observations made by Philip Croft, over a calendar year, during his almost daily perambulations around a residential suburb of Vancouver. Much of that recorded could well have been noted under similar conditions around many a British coastal conurbation. The Palearctic is a common factor of both regions and many species were transports from Western Europe, either deliberately or accidentally, by those human migrants to the west coast of Canada. As well as the familiar, the reader is also given many a tantalizing glance at that different and larger flora and fauna which is characteristic of the North American land mass—humming birds, black bears and the Pine White butterfly are to be seen as well as the Holly and Ivy and the Small Cabbage White butterfly, these latter three being two deliberate and one accidental introductions from Europe.

Philip Croft, a long standing member of our Society, prepared this book just before he died. In addition to the somewhat lyrical text there are many delightful colour illustrations and line drawings from the same hand. We are fortunate that his family decided to publish posthumously as we are now able to enjoy what is a fitting tribute to a true lover of nature who was, incidentally, an ex-patriate Englishman himself.

P. J. BAKER

OCCURRENCE OF *CYDIA COROLLANA* (HÜBNER) (LEPIDOPTERA: TORTRICIDAE) IN KENT

P.J. JEWESS

Boyces Cottage, Newington, Sittingbourne, Kent ME9 7JF,
and K.R. TUCK

British Museum (Natural History), London SW7 5BD.

Burnt Oak Wood, near Orlestone, Kent, has been acquired recently by the Kent Trust for Nature Conservation. It is being managed to conserve wildlife by opening up its glades and rides in order to encourage ground flora. One consequence of this is a proliferation of young aspen seedlings and suckers — the hostplant of *Cydia corollana* (Hübner) — and it is to be hoped that eventually a habitat will be formed similar to that which used to exist in nearby Longrope Wood, now largely destroyed by the activities of the Forestry Commission.

On 26.v.82 my wife and I accompanied Mr Mike Enfield to record nocturnal insects from Burnt Oak Wood. We ran mercury vapour lights and actinic light traps in the woodland rides near the pond at one end of the reserve. The weather was thundery and unfortunately it began to rain, but nevertheless a good total of Lepidoptera species was recorded.

One of the specimens I collected was a small dark tortricid that seemed to be a *Cydia* species. It came to mercury vapour light between 21.30 and 22.00 hours but would not settle and was difficult to catch. It is sad to relate that it was not until January 1987 that I examined it and attempted to identify it. Reference to the figures in Bradley (1959) and Bradley, Tremewan & Smith (1979) indicated that the wing pattern and male genitalia most closely corresponded to *C. corollana*.

According to Bradley *et al.* (1979), the only confirmed record of this species in Britain is of one specimen captured by Bouchard in July, about 1850, at Whittlesey Mere, Cambridgeshire. As Kent is such a well collected county, and as this species has not been taken for such a long period, I began to doubt my identification of my specimen. I therefore sent it to the British Museum (Natural History), where Mr Tuck kindly confirmed that it was indeed *corollana*. (P.J.J.).

Mr Jewess's specimen, a male, matches Bouchard's specimen very well and also agrees with several examples of *corollana* from France and East Germany in the BMNH collection.

The life-history of *corollana* is given by Bradley *et al.* (1979). The male and female genitalia are illustrated by Kuznetsov (1978), who places *corollana* between *Cydia conicolana* (Heylaerts) and *C. cosmophorana* (Treitschke). However, the hostplants of both of these other species are conifers. (K.R.T.).

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[Editorial note: this specimen, exhibited at the Annual Exhibition on 24.x.87, was photographed and will appear on Plate II, Fig. 3, to appear in a future issue of the Journal.]

BOOK REVIEWS

F.W. Frohawk — his life and work. June Chatfield. Marlborough, The Crowood Press, 1987, 184 pages, £16.95.

Forty-one years after his death, F.W. Frohawk remains a revered name in entomological circles. His immense work *The natural history of British butterflies* in two volumes must stand beside E.B. Ford's remarkable *Butterflies*, at the pinnacle of entomological literature. Consequently, any book about him is bound to excite interest in many entomologists. Indeed one reviewer of the booklet *F.W. Frohawk* (by his daughter Valezina Bolingbroke), published by Classey in 1977, remarked that his only criticism was its brevity.

'His life and work' contains many quotes from an unpublished notebook of autobiographical writings put down during the later years of his life. The quotes are interspersed in June Chatfield's text, added to which are well over one hundred illustrations by 'F.W.F.' and a number of photographs.

His life is followed from a childhood as part of the landed gentry in East Anglia where his interest in natural history started early, encouraged by his parents (he was bird-watching at the age of three!). Forced to find full-time employment when his father's death left the family virtually penniless, he pursued a career as a zoological illustrator for the rest of his long life. He had particularly fruitful relationships with *The Field*, the British Museum (Natural History), Lord Walter Rothschild and Lord Walsingham. He was employed by *The Field* at a particularly exciting time when new and wonderful animals were arriving regularly at London Zoo from distant countries, and he was often commissioned to draw these. Through his work, he mixed with many famous scientists and explorers, including Charles Darwin. Separate chapters deal with various phases of his life and work. Of especial interest to the entomologist will be the chapters on his butterfly books, collecting trips and his place in the entomological world of the period.

The profuse, and generally excellent, illustrations show that insects were only a part of his natural history interests. He was quite at home studying and illustrating, very competently, more or less any animal. With modern printing techniques, the reproductions of illustrations from his butterfly books are far sharper, clearer and do his talent more justice than in the original books. Some criticisms may be raised: by its nature, as a series of extracts from his notes, the book makes rather 'jerky' reading, and despite the biographer's connecting text, still reads as a series of notes. There are a few mistakes in scientific names and there seems to have been inadequate research done on whether a butterfly is an aberration, form or variety — all three terms are used rather haphazardly, and some aberrations are not remarked upon, as being anything other than typical examples. The illustration on page 103 of the vein structure of the wings of a butterfly is clearly of the wings of a moth.

However, this is a book which is nicely presented and fascinating to read. It is a book which not only details the life of a very important and talented naturalist, but gives an interesting insight into the professional and social lives of Victorian naturalists. It fills a definite gap in the biographies of naturalists/scientists and should make an attractive and valued addition to the book-shelves of naturalists and artists. I would strongly recommend reading Valezina Bolingbroke's booklet before the present volume as it paints a very sympathetic portrait of his character, which will make 'His life and work' all the more interesting.

R.D.G. BARRINGTON

SOME NOTES ON THE 18-SPOT LADYBIRD (*MYRRHA 18-GUTTATA* L.) (COLEOPTERA: COCCINELLIDAE)

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The 18-spot ladybird (*Myrrha 18-guttata* L.) is a widespread species in its preferred habitat of mature Scots Pine woods. Yet the early stages of this species have rarely been recorded in the wild in Britain, and during the recent Cambridge Ladybird Survey, very few records of this species were sent in. Those that have been noted have usually been single individuals. It has been suggested (Pope and Muggleton *pers. comms.*) that this species, although common on mature Scots Pine, is elusive for two reasons. Firstly, its pattern of creamy white markings on a maroony-brown ground colour makes the species extremely difficult to see with the naked eye against the buds, male catkins and young cones of Scots Pine. Secondly, it has been suggested that the 18-spot tends to live and breed mainly in the high crowns of the pine trees. I was fairly convinced that the species was very cryptic when at rest, for I had only once previously found the species except by beating. However, I could find no documented evidence that the species was a crown specialist. During 1987 I was able to obtain evidence to support both of these contentions. In June 1987, I was collecting ladybirds from Scots Pines growing on an area of *Calluna* and *Erica* heathland just north-east of Cadnam, Hampshire (O/S reference SU307145). The pines at this site are of various ages, from young saplings to mature standards and some degenerating semi-senile trees. Beating the younger trees produced five species of ladybird, 7-spots (*Coccinella 7-punctata* L.), 10-spots (*Adalia 10-punctata* L.), pine ladybirds (*Exochomus 4-pustulatus* L.), eyed ladybirds (*Anatis ocellata* L.) and cream-spot ladybirds (*Calvia 14-guttata* L.), but no 18-spots. However, when I transferred my attention to the mature and semi-senile trees, it was immediately obvious that the 18-spot was present in numbers. Indeed it was more common than at any site where I have previously encountered the species. On one tree each beat of a branch produced two or three individuals. By the time I had worked about half way round the tree, and had found over twenty 18-spots, it occurred to me that the species was common enough on this tree to try to look for it by eye and test just how difficult it was to see. I therefore spent the next two hours searching all the pine branches on this tree which I could reach easily, and which I had not already beaten. I have been looking at or for insects for 25 years, and consider myself to be a reasonably practised collector with a good eye trained by experience. During the 2 hours I found just two 18-spots, one walking along a pine needle, and the other at rest on a male pine catkin where it was indeed superbly camouflaged. Many times I had to stop as I searched to be sure that a bud or catkin was not a ladybird. I found quite a number of other ladybirds, including a cream-streaked ladybird (*Harmonia 4-punctata* Pontopiddan) which itself was beautifully camouflaged on a pine bud. These are listed in Table 1 together with the results of subsequently beating these same branches, a process which took about 10 minutes. As can be seen, 14 more 18-spots were discovered by beating which bears witness to the effectiveness of the camouflage. Although my opinion that I have a good eye for insects took a severe knock from the fact that I missed seven-eighths of the 18-spots present, my judgement of myself is somewhat restored by the fact that I only 'missed' six other ladybirds.

Most ladybirds are thought to be poisonous to, or at least distasteful to, many predators, and their patterns of contrasting colours are generally considered to be warning colour patterns advertising their noxious properties. It has previously been

Table 1. Results of collecting ladybirds by eye-searching and beating half the reachable branches of a Scots Pine.

Species	Number found in 2 hours of eye searching	Number found by subsequently beating the searched branches
<i>Myrrha 18-guttata</i> L.	2	14
<i>Coccinella 7-punctata</i> L.	7	0
<i>Adalia 10-punctata</i> L.	3	2
<i>Anatis ocellata</i> L.	3	0
<i>Neomysia oblongoguttata</i> L.	5	1
<i>Exochomus 4-pustulatus</i> L.	9	2
<i>Harmonia 4-punctata</i> Pontopiddan	1	1
<i>Calvia 14-guttata</i> L.	2	0
<i>Propylea 14-guttata</i> L.	1	0

suggested that some of the species which live mainly on Scots Pine, such as the cream-streaked, striped, eyed and 18-spot ladybirds employ a dual colour pattern defense, being highly visible and warningly coloured when moving about on pine needles, and cryptically coloured when at rest on pine buds or male catkins (Majerus 1985). While I think that in the case of eyed and striped ladybirds, and to a lesser extent cream-streaked ladybirds, the warning component of their colouration is of crucial importance, I now suspect that the smaller 18-spot will escape detection the vast majority of the time through its cryptic properties, so its warning colouration (if it truly has warning colouration) is of secondary importance to its survival.

An unexpected opportunity to test whether the 18-spot is a crown specialist arose out of the catastrophic winds which caused such devastation across the south and east of England on the night of the 15th/16th October 1987. On the 19th October I had occasion to travel to Grimes Graves, Suffolk (O/S ref. TL820900), with a class of students. The site we visited is an area of breckland common with areas of bracken, some heather, and stands of young and mature Scots Pine. The mature trees are typical standard Scots Pine with the primary apex poorly developed and the foliate branches all down the trunk. This area is bordered by a large mixed conifer

Table 2. Numbers of 18-spot ladybirds found on different portions and different classes of Scots Pine.

Type of pine beaten	Number of pines	Amount of time spent (minutes)	Number of 18 spots found
Lower branches of mature trees on common	20	45	1
Young pines on common	45	25	0
Lower branches of fallen mature trees on common	3	10	1
Crown branches of fallen mature trees on common	3	15	8
Reachable branches of mature plantation trees	4	5	0
	(7 branches)		
Lower branches of fallen mature plantation trees	6	20	1
Crown branches of fallen mature plantation trees	6	20	11

plantation including Scots Pine. The mature Scots Pines are of a typical plantation form, having the primary apex strongly developed and the foliate branches confined to the top half of the tree.

Both the common area and the plantation had been severely hit by the storms and there were many fallen trees. This gave me the opportunity to beat the 'higher' branches which were now in easy reach. The reachable branches of still standing pines were also beaten, although in the case of the plantation trees only seven branches on four trees near the edge of the plantation could be reached. The foliate branches of fallen trees were roughly split into a top crown portion and a lower portion, the top crown being defined as branches within the top 10 feet of the primary apex of the tree. Table 2 shows the number of 18-spots that were found.

By the second half of October 18-spots will have taken up their over-wintering quarters. This data therefore shows that many 18-spots pass the winter high up amongst the crowns of pine trees. It does not provide definite evidence that this species also breeds in such a situation, however, I feel that this is highly likely.

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BOOK REVIEWS

Dung beetles and chafers Coleoptera: Scarabaeoidea. L. Jessop. London, Royal Entomological Society, 1986, Handbooks for the Identification of British Insects, Volume 5, Part 11 (new edition), 54 pages, £5.

The first edition of this Handbook was written by E.B. Britton and published by the Society 30 years before in 1956. This is no mere rehash with a few additions, this is a completely new Handbook. The figure on the cover is the same and the old text figures are retained, but the text is radically altered. New is the checklist; new is the key to larvae; new are many of the characters; new are the expanded habitat and distribution details; new is the expanded reference list; new is the layout and new is the entire look and feel of the Handbook.

With nomenclature seemingly in a more or less permanent state of flux, the Scarabaeoidea is surprisingly little plagued with confusion. Nevertheless, the checklist is a welcome reference point and includes all the recent changes — notably the inclusion of *Onthophagus similis* (Scriba) and *O. joannae* Goljan (*O. ovatus* of British authors). *Saprosites mendax* Blackburn makes a late appearance after being mysteriously absent from the first edition. The key to larvae identifies to genus, although only two figures accompany it. The majority of the book is dedicated to keys and although introducing many new characters, suffers some of the same problems as Britton's. With such a diverse and distinct group of beetles, a single key to genera based on more overall characters would have sufficed, and indeed might have been preferable to any beginner who must now examine the club of the antennae to distinguish a stag beetle from a cockchafer from a dor beetle from an *Aphodius*. The keys to the Scarabaeoidea make long and complicated reading, as we are taken first to subfamily, then to tribe, then to genus, then to species. Identifying *Aphodius* is a necessary plod, with 41 species keyed out. The extra information on distribution and biology is very welcome and considerably expands and updates

Britton's sparse notes. There are many new figures including several more of complete insects. The distinction between *Geotrupes spiniger* and *G. stercorarius* used to cause me much confusion, but figures of the tibiae now make all clear. Unlike Britton's book, the Society has chosen to follow its recent style of putting all the figures together at the back of the book — an appalling mistake in my view which makes for very difficult use. One now needs two copies of the book open together, one for the text and one for the figures. Despite this, the Handbook is very good. And as long as it does not interfere with the production of new parts, I look forward to second editions of other early handbooks as they go out of print.

R.A. JONES

Dragonflies. By Peter L. Miller, with plates by Rupert Lee. Naturalist's Handbook No. 7, Cambridge University Press, 1987, 84 pages, £15.00 hardback, £5.95 paperback.

This is a well presented short volume restricted to the British dragonflies, which has involved the co-operation of several leading specialists on the Odonata. It benefits from newly prepared keys to larvae by Graham Vick and to adults by David Chelmick. Both keys are amply illustrated with figures of diagnostic characters. The four colour plates illustrate whole insects of 18 species, and are perhaps the least impressive aspect of the work.

The greater part of this publication, however, comprises a very useful summary of the life cycle, physiology and behaviour of dragonflies. This is a good introduction, providing sufficient detail to stimulate future work and to indicate where there is particular need for further observation. Techniques for fieldwork are described.

The importance of conservation is stressed and attention is drawn to the dragonfly recording scheme. Information on the distribution of individual species is mainly restricted to brief comments in the body of a check list of the British species, although this information is available elsewhere and the section on further reading is quite comprehensive. A table showing the seasonal order of appearance of British dragonflies completes the work.

This should provide a useful complement to Cyril Hammond's *The Dragonflies of Great Britain and Ireland* and certainly fulfils the aim of this series in making its field of study available to a broader group of people.

P.J. CHANDLER

Other books received some of which will be reviewed in forthcoming issues of the journal.

Ladybirds in Dorset. Adrian Moon. Dorchester, Dorset Environmental Records Centre, 1986, 24 pages, card covers, £2.40.

Legislation to conserve insects in Europe. N. Mark Collins. Amateur Entomological Society, 1987, Pamphlet 13, 80 pages, card covers, £3.40.

A field guide to the caterpillars of butterflies and moths of Britain and Europe. D.J. Carter and B. Hargreaves. London, Collins, 1986, 296 pages, £9.95 (hardback).

The Cambridge illustrated dictionary of natural history. R.J. Lincoln and G.A. Boxshall. Cambridge, Cambridge University Press, 1987, 413 pages, £15 (hardback).

THE ARACHNID FOSSIL RECORD

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Arachnids belong to the arthropod phylum Chelicerata which, in addition to the scorpions, spiders, mites and others, embraces the extinct eurypterids, the king-crabs (Xiphosura), and arguably the pycnogonids (sea-spiders). Before presenting a review of the recent discoveries which extend and modify the traditional picture of arachnid evolution, let us first look at the eurypterids and king-crabs.

The eurypterids, or sea-scorpions, are known from rocks ranging from Ordovician to Permian in age (Fig. 1) but are most abundant in upper Silurian strata in Britain, Scandinavia and the USA. Indeed, their distinctive appearance (scorpion-like but with broad swimming paddles in place of the last pair of legs) and abundance in Silurian limestones in the north-east USA has earned one species, *Eurypterus remipes* De Kay the title of State Fossil of New York. This part of the world has also yielded the giant *Buffalopterus* which at 2 m in length was the largest arthropod which ever lived. Its fearsome, huge chelicerae exemplify just one of the methods of prey-capture of these giant carnivores of mid-Palaeozoic seas. Though rare as fossils, eurypterids are usually very well preserved, and one species, *Baltoeurypterus tetragonophthalmus* (Fischer), has provided a wealth of information about the mode of life and palaeoecology of these fascinating animals (Selden, 1981, 1984).

Traditionally allied with the eurypterids in the class Merostomata are the king-crabs, typified by the living *Limulus polyphemus*. The oldest xiphosurans are Cambrian in age, and forms closely similar in morphology and ecology to the living species have been found in rocks as old as Carboniferous, hence *Limulus* is often dubbed a 'living fossil'. The oldest member of the superfamily Limuloidea was described recently from Scotland (Waterston, 1985), and a slightly younger but giant form is now known from Weardale (Siveter & Selden, 1987).

Scorpions have generally been considered the most primitive of arachnids; many authors (e.g. Bristowe, 1958; Grasshoff, 1978) have considered them as the sister-group of the eurypterids, in which case the eurypterids must be included in the Arachnida, or the scorpions excluded from that group. Alternative opinions (Boudreaux, 1979; Weygoldt, 1980; Weygoldt & Paulus, 1979) place the eurypterids as the sister-group of the arachnids (including scorpions); under either scheme, the Merostomata becomes an unnatural group.

Modern scorpions are mainly tropical, nocturnal, terrestrial animals particularly adapted to arid environments and are classified into less than a dozen families. However, fossil scorpions are known from rocks as old as late Silurian; at that time they lived in water alongside their eurypterid relatives, and aquatic scorpions persisted possibly into Mesozoic times. Air-breathing scorpions apparently appeared in the early Carboniferous, and scorpions were at their most diverse in the late Carboniferous when 25 families have been recognized (Kjellesvig-Waering, 1986). Living scorpions can be searched for at night with a blacklight, since they fluoresce in ultraviolet light. This is a property of one layer in their exoskeleton: the hyaline exocuticle. Hyaline exocuticle seems to be unique to scorpions, but is possibly present in eurypterids and king-crabs also. Scraps of scorpion cuticle are abundant in coals and related sediments to the exclusion of all other arthropods, a phenomenon which is attributed to the inertness of the hyaline exocuticle (Bartram *et al.*, 1987) and helps to explain the relative abundance of scorpions amongst arachnid fossils.

Other arachnids have very sporadic fossil records (Fig. 1), though there is a general trend which can be attributed almost entirely to the time distribution of the rare localities in which they are found. Spiders are abundant in some Tertiary (Palaeogene and Neogene) ambers (Oligocene, Baltic and Dominican Republic for example), and are known from shales of the same age in Colorado. Tertiary faunas

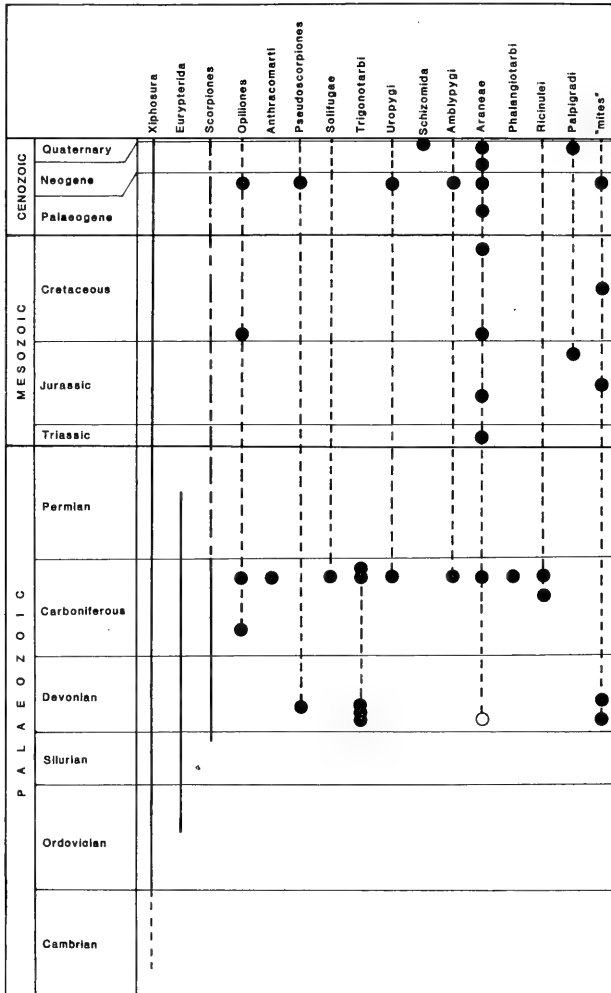


Fig. 1. Known stratigraphic ranges of the major groups of chelicerates, from published and unpublished data. Solid lines indicate fairly continuous occurrence, dashed lines indicate data poor or lacking. Solid circles mark only or most important occurrences, open circle indicates uncertain occurrence.

are more similar to those of today than to Mesozoic and Palaeozoic faunas. The end-Cretaceous mass extinction brought the Mesozoic era to a close and the faunal and floral changes across this boundary are great. Unfortunately, Mesozoic arachnids are exceptionally rare, so we cannot be sure whether the same is true of them. Incidentally, Cretaceous ambers are known from Canada and the Lebanon which contain spider inclusions, so it may not be very long before we have enough well preserved specimens to test this hypothesis.

In the last few years, four spider specimens from early Cretaceous lithographic limestone of the Sierra de Montsech in north-east Spain have been discovered. This locality has long been famous for its beautifully preserved plants, insects, amphibians, and especially bird feathers. Three of the spiders are mature males with their distinctively elaborate palps, and the fourth has characters which could place it in a modern family. A major problem with these Mesozoic spiders is that the details needed to place them in the classification scheme for Recent spiders are not always preserved. In a Jurassic example (Eskov, 1984), a combination of characters of numerous living families was observed which resulted in the setting up of a new 'extinct' family.

Travelling further back in time we pass the end-Permian extinction event, the most severe of all, and come to the late Carboniferous. Ironstone nodules in coal measure rocks of Europe and North America have yielded an abundant terrestrial and near-shore fauna, including crustaceans, insects, millipedes, xiphosurans and arachnids. Particularly interesting are the 20 or so specimens of ricinuleids. Ricinuleids are charming little thick-skinned arachnids which creep amongst leaf litter under logs and in caves in the American and West African tropics. There are about 50 living species in three genera. The Carboniferous ricinuleids are remarkably similar to the living forms; an interesting difference being that the fossils show two pairs of eyes in the position on the living animals where vestigial eye-spots are present (Selden, 1986).

Another group of arachnids relatively well-represented in Coal Measure rocks are the extinct trigonotarbid. These animals are very close to spiders in their morphology, but lack spinning organs. Trigonotarbid are also a major component of the terrestrial faunas of three important Devonian localities: the Rhynie chert of Aberdeenshire; Alken-an-der-Mosel, Germany; and Gilboa, New York. Hirst (1922) described the Rhynie fauna, a bog habitat of early vascular plants rapidly engulfed in hot, siliceous waters from nearby volcanic eruptions. The Rhynie chert contains the oldest terrestrial fauna known, and includes a springtail, a mite, numerous trigonotarbid, and a possible spider (see Rolfe, 1980 for review of this and other early terrestrial faunas). The Alken fauna includes both terrestrial (trigonotarbid, myriapod) and amphibious (eurypterid) elements (Størmer, 1970–6).

More recently, palaeobotanists Bonamo and Grierson were dissolving grey siltstones from the Devonian of Gilboa, New York for early vascular plants when they came across an extremely varied fauna of early land animals (Shear *et al.*, 1984; Shear, 1986). Again, trigonotarbid are very common (Shear & Selden, 1986), but there is also evidence of insects, myriapods (the earliest centipede), scorpions, and mites. The fossils are beautifully preserved, and when mounted in balsam and viewed in transmitted light, minute details of setae, trichobothria, slit sensillae, lyriform and other sense organs are clearly visible (see Shear *et al.*, 1988).

One element of the fauna caused the greatest modification to the arachnid fossil record when first discovered. Two beautiful little creatures, described by the assistant who found them as 'little dragons', turned out to be pseudoscorpions.

Virtually identical in all aspects to living pseudoscorpions, the find of these Devonian forms pushes the fossil record of the group back tenfold.

Exciting though these finds of rare, earliest terrestrial arachnids are, their importance to Zoology extends beyond that to Arachnology alone. They help us to understand how the very first land animals pioneered the empty terrestrial habitat 400 million years ago. It was these pioneers which paved the way for the rich and varied arthropod fauna which abounds in our countryside today.

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1987 ANNUAL EXHIBITION
Imperial College, London SW7 — 24 October 1987

Imperial College was chosen as the new venue for the Society's Annual Exhibition because it had a number of advantages over Chelsea Old Town Hall, where it had been held for many years previously. Car parking space had always been a problem in the congested King's Road area of Chelsea and with the closure of the only National Car Park close by, this meant even more problems. Over the years, the attendance at the exhibitions had been increasing, and it was felt that a larger room would be necessary. The number and size of exhibits was also increasing, so much so that last year there was very little table space for late-comers and the exhibits were crowded together in a very crushed disarray. It was hoped that the Sherfield room at Imperial College would overcome all of these difficulties and have other benefits besides. Falling attendance at the Annual Dinners might be halted and reversed if the dinner were to be held in a room close by on the evening after the exhibition.

As members and guests started to arrive at 10 o'clock, it was clear that the change was a good one. Car parking was cheap and easy; space for exhibits was no longer at a premium as the ten long series of tables allowed plenty of room; light was good, the room was bright and airy; refreshments were excellent and a bar brought a further atmosphere of civilized enjoyment.

According to the attendance book, numbers were down both of members and visitors, but exhibits were up both in numbers and quality; 164 are itemized in the ensuing report. The attendance at the dinner was significantly up on previous years, as 72 members and guests sat for an excellent meal.

Specimens selected for photography were taken to a separate room where Mr David Wilson was working. This was thought to be a better arrangement than the rather exposed tables on the stage at Chelsea Old Town Hall. Two plates comprising 30 species of butterfly, moth, fly and wasp show some of the splendid specimens shown this year; these plates will appear in a future issue of the Journal, when they can be printed along with other colour work.

The Society owes a debt of gratitude to the committee set up to organize the exhibition — John Owen, John Muggleton and especially Colin Hart, who despite still being without electricity and telephone following the fateful storm-force winds of October 16 (8 days previous), made the event a splendid success.

The following account of exhibits has been compiled by R.D.G. Barrington (British butterflies), B.F. Skinner (British Macrolepidoptera), J.M. Chalmers-Hunt (British Microlepidoptera), R.F. Bretherton (Foreign Lepidoptera), P.J. Chandler (Diptera), R.A. Jones (Coleoptera and Hemiptera), A.J. Halstead (other orders) and E.S. Bradford (Illustrations).

BRITISH BUTTERFLIES

After such a terrible summer it was very pleasing to see that members had, nonetheless, been able to produce some very fine aberrations, both as a result of field work and of experimental breeding. Such poor weather makes breeding butterflies something of a trial and several cases were heard of exhibitors losing interesting strains. However where results were obtained they were invariably of the greatest interest and added to the ever growing bank of knowledge that amateur entomologists have provided on the genetic basis of butterfly aberrations.

BAILEY, K.E.J. — (1). Two melanic aberrations of *Boloria selene* L. from the Cotswolds, 1987, one being an extreme form with hindwings largely black.

Homoeotic specimens of *Melitaea cinxia* L. and *Mellicta athalia* Rott., the latter with a large splash of orange across the underside of one hindwing.

(2). A large display illustrating Mr Bailey's continued work in the field of aberrations induced by temperature shocks on the early pupal stage of nymphalid butterflies. Species used included *Ladoga camilla* L., *Nymphalis polychloros* L., *Polygonia c-album* L., *Apatura iris* L., *Vanessa atalanta* L., *Cynthia cardui* L., *Fabriciana adippe* L., and *Argynnis paphia* L. Space does not permit detailed analysis, but a note on a very interesting set of results follows: *A. paphia*—a range of extreme melanics induced by low temperature shocks. Very few similar forms are produced by high temperature shocks although this must be responsible for the periodic bursts of these aberrations in the field (most recently in 1976/7 and 1986). A concept shown clearly by this exhibit is that the development of the melanism in nymphalids follows a reliable sequence such that one part of the pattern will not be affected without a part of the pattern earlier in the sequence being affected also, i.e. these temperature experiments do not produce a series of individuals with randomly blackened patterns as it may sometimes appear, although particular forms are not produced by particular temperatures.

BANNER, Dr J.V. — An extreme *Aglais urticae* L. ab. *conjuncta* Meub. caught at St Margaret's Bay, Kent, 1987.

BARRINGTON, R.D.G. — (1) *Maniola jurtina* L. taken in North Dorset in July, 1987, including females ab. *fracta* Zweigl., ab. *postmultifidus* Lipscomb affecting one side only and ab. *antiauroalancia* Leeds with the upperside forewing fulvous greatly reduced on one side only.

(2) *Plebejus argus* L. ssp. *caernensis* Thompson from Gt Orme, North Wales where it swarms in its chosen spots. Some females were almost completely blue. *Coenonympha tullia* Mull. ab. *cockaynei* Hopkins from Shropshire. All taken June 1987.

BECCALONI, G. — A perfect, wild caught bilateral gynandromorph of *Ladoga camilla* L. taken July 1986. Probably unique and a tribute to the sharp eyes of the exhibitor.

BREHERTON, R.F. — Historic, British caught examples of *Cyaniris semiargus* L. (1840s), *Aporia crataegi* L. (Bristol 1840 and Kent 1878) and *Maculinea arion* L. (1924/30, Cotswolds).

DENNIS, R.C. — Variation in *Hipparchia semele* L. from two localities including an extreme ab. *monocellata* Lpke male, a good male ab. *suffusa* Tutt and four female ab. *punctata* Aigner. A new aberration of *Maniola jurtina* L. (exhibited in 1986) with black streaks between the veins on the upperside of the hindwings.

ELSTON, Major H.J. — A beautiful male *Argynnis paphia* L. ab. *sifkai* Silbernagel with white ground colour from Hampshire, 1987. This very rare insect has turned up at least five times since 1981, probably all from the same woodland complex. Despite careful search only males have been found and this may be an example of a sex-controlled aberration as are f. *valezina* Esp. of *paphia* and f. *helice* Hübn. of *Colias croceus* Geoff. in which the genes coding for the aberration are activated only in the cellular environment of one sex (the female in the latter two examples). Equally, it may be a simple recessive or dominant in which, as in *Lysandra coridon* Poda ab. *foverleri* South (a recessive), the females are, inexplicably, very difficult to find.

EMMET, Lt. Col. A.M. — *Melitaea didyma* (Esp.), one of two specimens taken by schoolboys at Fobbing Marshes, south Essex on 6.viii.86. Several others were seen and it is likely that a female, having been accidentally transported by sea, escaped and oviposited to give rise to a small generation of adults.

FARWELL, I.G. — A selection of aberrations including *Hipparchia semele* L. ab. *parviocellata* Lpke. from Portland, 1987 and some good *Lysandra coridon* Poda from past years including males ab. *melaina* Tutt, ab. *antistriata* B.&L. and *antidiscoelongata* B.&L. and a female ab. *inaequalis* Tutt (=ab. *roystonensis* B.&L.).

FENSOME, B. — Three *Lycaena phlaeas* L. ab. *radiata* Tutt and one ab. *obsoleta* Leeds and a superb albinistic male with all the darker markings replaced by silver with the copper ground colour unaffected. An extreme *Lysandra coridon* Poda ab. *inaequalis* Tutt — a female butterfly having the appearance of a gynandromorph, half of one hindwing being blue. The blue, however, is of the shade that occurs in *abssemisyngrapha* Tutt and *tithonus* Meigen not the shade of a male, and *inaequalis* is not a gynandromorph. A male ab. *ultrafowleri* B.&L. *Melanargia galathea* L. with the left hindwing suffused with black and a female *Maniola jurtina* L. with the lower half of the underside hindwing median band heavily suffused which may well be an extreme example of ab. *postmultifidus* Lipscomb.

HARMER, A.S. — A selection of minor, bred forms of *Colias croceus* Geoff. including an unnamed aberration with the forewing discoidal spot pulled out to a point. A nice *Lycaena phlaeas* L. ab. *oblitera* Scudder, two bred aberrations of *Hamearis lucina* L. (one transitional to ab. *obsoleta* Tutt and one ab. *semibrunnea* Osthelder) and a very beautiful *Lysandra coridon* Poda. ab. *ultrafowleri* – *margino* B.&L. bred in the F₃ generation from a *fowleri* female. *Boloria euphrosyne* L., a specimen transitional to ab. *interligata* Cabeau and, of particular interest, a pair of wild-caught unnamed aberrations of *Lysandra bellargus* Rott. with a smokey brown suffusion over the underside obliterating the normal white areas. This aberration resembles ab. *pulla* B.&L. of *Lysandra coridon* Poda, although unlike *pulla* these *bellargus* have type uppersides.

JONES, A.M. — (1) A selection of butterflies showing considerable success in the breeding cage in 1987. Very interesting were three *Maniola jurtina* L. ab. *fracta* Zweigt bred in the F₁ from a similar parent. Roughly 27 of a brood of 74 were of this form but intermediates, and the difficulty of detecting this form in the male makes this a possible underestimate. We await the F₂ with interest. *Thecla betulae* L. ab. *fisonii* Wheeler (two female and one male) bred from wild collected ova. *Lycaena phlaeas* ab. *radiata* Tutt — a series of three of each sex bred in the F₁ from a similar parent. As this form is a simple recessive the parent male must have been heterozygous or homozygous also for this form. *Pararge aegeria* L. ab. *antico-excessa* Lpke — four examples of this unusual form with an extra apical spot bred in the F₁ from similar parent, 12 of the 17 in the F₁ were of this form. The F₂ emerging at the time of the exhibition, was showing a similar pattern. Probably a multifactor complex as in *Pyronia tithonus* L. ab. *excessa* Tutt.

(2) Two bred gynandromorphs — a mixed *Argynnis paphia* L., appearing halved but with smatterings of male colouration on the female side, and a very fine halved *Celastrina argiolus* L.

(3) Two wild caught (1987) *Aglais urticae* L. ab. *semiichneusoides* Pronin showing different extremes of this striking form.

MACFAYDEN, I. — Aberrations taken in Wiltshire, Surrey and Sussex 1984–7, including two magnificent *Argynnis paphia* L. ab. *ocellata* Spuler (Sussex 1984 and 1987), and a fine *Pyronia tithonus* L. ab. *subalbida* Vty, Three bred *Boloria euphrosyne* L. ab. *pitonii* Nitsche.

MCCNAMARA, D.S.K. — Aberrations of *Aglais urticae* L. caught or bred in West London/Middlesex over the past few years including a captured specimen of an extreme form of ab. *lutea* Raynor with the ground colour almost white — a very rare form.

PAYNE, J.H. — An unusual aberration of *Aglais urticae* L. with reduced and streaked markings. A good, bred *Lasiommata megera* L. ab. *croesus* Stauder and various extreme melanics of *Polygonia c-album* L., *Argynnis paphia* L., *Inachis io* L. and *Vanessa atalanta* L. produced by temperature shock treatment.

On behalf of Mr S.W. Humphry a print of *Aphantopus hyperantus* L. showing ab. *chrysophalaros* Collier on the left side only, taken 1946. (This form was bred by Major A. Collier from a female taken by J.H. Payne in 1964 and proved to be a simple recessive.)

REVELS, R.C. — A strong exhibit of aberrations of *Lysandra coridon* Poda aberrations taken in Dorset and the Chilterns in the 1970s. Amongst the many shown were some extreme forms including a particularly good ab. *antidigitata* Courv. (Portland 1977), various ab. *parallela* B.&L. forms (Portland 1976/7) and a complete, perfect male ab. *caeca* Courv. — these complete *caeca* forms are very rare. Two pairs of ab. *fowleri* South (Portland) and a good male ab. *marginata* Tutt (Portland 1979).

RUSSWURM, A.D.A. and MIDDLETON, H.G.M. — Two specimens showing the effect of low temperature shocks on the early pupa. *Inachis io* L. ab. *belisaria* Ober. and a very extreme *Aglais urticae* L. ab. *semiuchneusoides* Pronin with dark red-brown ground colour. Both were the only variants to emerge from whole nests of treated pupae.

STOKES, D. — Aberrations caught or bred in 1987. A most unusual *Polyommatus icarus* Rott. with the orange lunules on the underside of a male being replaced with black (I.O.W. May 1987), several *Lysandra coridon* Poda from Dorset including various male ab. *caeca* Courv. forms and two male ab. *ultrafowleri* B.&L. Two good female upperside 'striata' forms of *Lycaena dispar* Haw. ssp. *batavus* Ober. with two spots on each forewing streaking to the discoidal. This species is now commonly bred in captivity and seems rather subject to this sort of variation. Inbreeding could produce some extreme forms.

TREW, D. — *Coenonympha tullia* Mull. ab. *lanceolata* Arkle and a fine, extreme melanic form of *Argynnis aglaja* L. from Wilts., 1987. The upperside was heavily peppered with black against a normal pattern. The underside had large silver spots at the base of the hindwing with all other silver spots obliterated and the forewings showed suffused black markings.

YOUNG, L.D. — A very fine exhibit illustrating the continued success of a three year (so far) breeding programme with very large broods of *Polyommatus icarus* Rott. Pure bred series of selected specimens were shown of ab. *basielongata* B.&L. (a dominant) and ab. *antidiscoelongata* B.&L. (a recessive) from original females captured in 1984 and 1985 respectively. Crossing the two forms produced some very striking insects showing a combination of the two aberrations, although the *basielongata* character was a little less strongly developed than in the pure-bred series. Breeding so many large broods brought with it many problems, not least that of food supply and of predators. These combined with the difficulties invariably associated with intensive inbreeding emphasised the remarkable success of this project.

BRITISH MACROLEPIDOPTERA

AGASSIZ, Rev. D.J.L. — An extreme aberration of *Colostygia pectinataria* (Knoch) from Blair Atholl, Perthshire, on 2.vii.87.

BAKER, B.R. — An F₂ generation of *Diaphora mendica* (Cl.) f. *rustica* (Hbn.) having confluent spotting of both fore and hindwings, and including several extreme

rayed examples. A selection of male *D. mendica* bred from crossing an Irish female with an English male. A specimen of *Trisateles emortualis* (D. & S.) taken at Caversham, VC23, on 6.vii.87.

BELL, R.A. — A selection of bred or caught series of local species taken during the 1980s which included both *Lithophane socia* (Hufn.) and *L. semibrunnea* (Haw.) bred from females taken at Sparsholt, Hants., and *Xylena exsoleta* (L.) taken at Rannoch, Perthshire, in September and October 1984.

BRETHERTON, R.F. — Old specimens of species or subspecies now believed to be extinct in the British Isles. These included examples of *Acronicta strigosa* (D. & S.) from Cambridge during the last century, *Lithophane furcifera suffusa* (Tutt) from Llantrisant, Glamorgan, in 1878 and *Trachea atriplicis* (L.) from Waterbeach, Cambs., between 1880 and 1893.

CLARKE, Sir CYRIL — An exhibit titled 'Evolution in reverse' showing the effect of cleaner air from 1959 to 1987 on *Biston betularia* (L.) at Wirral, Cheshire.

CLARKE, Dr J. — A selection of local and aberrant species taken or bred during 1987. From St Ives, Hunts, were single examples of *Heliothis armigera* (Hbn.) on 4.x, *Mythimna vitellina* (Hbn.) on 24.ix, a mixed gynandromorph of *Agrotis puta* (Hbn.) on 27.v, and from Hoads Wood, Kent, a striking aberration of *Xestia triangulum* (Hufn.) having a black central patch on the forewing. Living larvae of *Agrius convolvuli* (L.) bred from a female taken at Plymstock, Devon, on 20.ix.87.

COLLINS, G.A. — *Xanthorhoe fluctuata* (L.) ab. *costovata* (Haw.) from South Croydon, Surrey on 29.viii.87.

CORLEY, M.F.V. — *Hyles gallii* (Rott.) from Faringdon, Oxon., on 26.vii.87 and an extreme aberration of *Orthosia gothica* (L.) also from Faringdon taken on 16.iv.87.

CRONIN, A.C. — A case of macrolepidoptera which included variable series of *Callimorpha dominula* (L.) and *Lasiocampa quercus* (L.)

DOBSON, A.H. — Three specimens of *Rhodometra sacrarica* (L.) taken in the New Forest, Hants, on 24.viii.87. Aberrant and local species included *Thera obeliscata* (Hbn.) ab. *mediolucens* Ross. from Camborne, Cornwall on 10.x.86 and *Rhyacia simulans* (L.) from Southwold, Suffolk, on 1.viii.87.

DYKE, R. — A series of *Hadena perplexa perplexa* (D. & S.) from Suffolk, Kent and Devon showing geographical variation. Bred specimens of *Thalera fimbrialis* (Scop.) from a female taken at Dungeness, Kent, in 1986.

EMMET, Lt.Col. A.M. — Local and immigrant species taken at light at Saffron Walden, Essex during 1987 were: *Catarhoe cuculata* (Hufn.) on 24.viii., *Rhodometra sacrarica* (L.) on 2.x. and *Mythimna vitellina* (Hbn.) on 16.ix. From Lewes, Sussex, were three *Catarhoe cuculata* (Hufn.) on 14–16.vii.87; and single specimens of *Lithosia quadra* (L.) on 15.vii.87 and *Meganola albula* (D. & S.) on 14.vii.87.

FAIRCLOUGH, A.J. and R. — Local Macrolepidoptera taken or bred during 1987; of special interest were a bred series of *Eupithecia insigniata* (Hbn.) from Norfolk and a specimen of *Idaea vulpinaria atrosignaria* Lempke from Portland, Dorset, on 3.vii.

FARWELL, I.G. — From the New Forest, Hants., three male *Diacrisia sannio* (L.) showing extremes of variation in the black scaling of the hindwings.

FOSTER, A.P. — A selection of local moths from southwest Cornwall included *Chlorissa viridata* (L.) from Goonhilly Downs on 21.vi.81; *Eilema sororcula* (Hufn.) from Gweek on 22.v.81; *Leucochlaena oditis* (Hbn.) from Mawnan Smith on 13.x.86 and *Conistra rubiginea* (D. & S.) from Mawnan Smith on 27.x.80.

GIBSON, Dr C.W.D. — Offspring of the banded aberration of *Cyclophora linearia* (Hbn.) exhibited and photographed at last year's Exhibition. Several attempts at obtaining an F₂ were tried but the resulting eggs proved infertile.

HART, C. — A specimen of *Euxoa tritici* (L.) from Buckland, near Reigate on 25.viii.82; a very local species in this part of Surrey.

JENKINS, A. — An unusually heavily marked *Drepana falcataria* (L.) from Shabbington, Oxon., on 27.v.87. Specimens of *Nonagria typhae* (Thunb.) ab. *fraterna* (Treit.) bred from pupae collected near Bolsover, Derbyshire in 1987. Migrant species taken in 1987 were: From Portland, Dorset — *Agrius convolvuli* (L.) on 23.viii. (two); and 20.ix; and *Mythimna vitellina* (Hbn.) on 23.viii; and from Chardstock, Devon — *A. convolvuli* on 23.viii and *M. vitellina* on 20.ix.

KNILL-JONES, S.A. — Immigrant Lepidoptera taken during 1987 at Freshwater, I.O.W. were *Agrius convolvuli* (L.) on 20.ix; *Spodoptera exigua* (Hbn.) on 14.ix; *Diachrysa orichalcea* (F.) on 20.ix; *Heliothis armigera* (Hbn.) on 5.x and a small series of *Rhodometra sacraria* (L.) taken in late August and early September.

LANGMAID, Dr J.R. — A specimen of *Heliothis armigera* (Hbn.) from Southsea, Hants., on 19.ix.87.

McCORMICK, R.F. — Photographs illustrating the immature stages of *Sabra harpagula* (Esp.).

McCORMICK, R.F. and PENNEY, C.C. — A large display showing all the Macrolepidoptera recorded in the gardens of both exhibitors at North Cheam, Surrey, and Chelmsford, Essex. The exhibit was designed to show those species common to both sites and those which as yet had only been recorded from one of the gardens.

McCLENAGHAN, I. — A pink form of *Comibaena bajularia* (D. & S.) taken at light at Ingrave, Essex, on 16.vii.86.

MACFADYEN, I.D. — A specimen of *Agrius convolvuli* (L.) found during the daytime at rest on a building in Harrogate, North Yorkshire on 24.ix.87.

MACNULTY, Dr B.J. — A selection of interesting moths taken on the Gower Peninsula, Glamorgan, these included three *Colostygia multistrigaria* (Haw.), Rhossili, 5.iv.87 (new record for Gower); *Semiothisa wauaria* (L.), Rhossili, 24.vii.87 (two previous records); two specimens of *Idaea dimidiata* (Hufn.), Rhossili, 25.vii.85 (only one previous record from Oxwich); and *I. trigeminata* (Haw.), from University College Swansea Campus on 13.vii.73.

NASH, S. — Local species taken during 1986 and 87 included several *Rhodometra sacraria* (L.) taken at Fernham, Oxon, in August and October 1987; *Agrius convolvuli* (L.) from Fernham on 3.ix.87; *Euphyia biangulata* (Haw.) from Savernake, Wilts., on 22.vii.87; *Mythimna putrescens* (Hbn.) and *Euxoa obelisca* (D. & S.) from Branscombe, Devon, on 10.viii.87; and a pale and yellowish aberration of *Abraxas grossulariata* (L.) from Portland, Dorset, on 8.vii.87.

O'KEEFE, D. — Aberrations included a striking male *Angerona prunaria* (L.) having the right forewing whitish-buff and the other three wings unicolorous chocolate brown, from Hamstreet, Kent, on 29.vi.87; A melanistic *Paradarisa extersaria* (Hbn.); from Petts Wood, Kent, on 29.v.87; two blackish marked *Dichonia aprilina* (L.) from Seal Chart, Kent on 13 & 14.x.86; a unicolorous *Orthosia cerasi* (F.) [*stabilis* (D. & S.)] from Hamstreet, Kent, on 13.iv.87; and an extreme melanic specimen of *Mesoligia furuncula* (D. & S.) from Petts Wood, Kent, on 2.ix.86.

PARSONS, M. — A selection of moths taken during 1986 and 1987 included *Scopula rubiginata* (Hufn.) and *Noctua orbona* (Hufn.) from the Breck District; *Idaea muricata* (Hufn.) from Dersingham Bog and Roydon Common, Norfolk; *Euxoa obelisca* (D. & S.) from Eastbourne, Sussex, and *Senta flammea* (Curt.) from Foulden Common, Norfolk.

PELHAM-CLINTON, E.C. — A presumably immigrant *Idaea ochrata* (Scop.) taken at light at Axminster, Devon, on 21.vii.87.

PENNEY, C.C. — An unusual banded form of *Alcis repandata* (Cl.) from Tintern, Monmouthshire, in 1987.

PICKLES, A.J. and C.T. — Selected species taken or bred in 1987 included a heavily suffused *Abraxas grossulariata* (L.) from Portland, Dorset; a short variable series of *Simyra albovenosa* Goeze bred from Norfolk; and a series of *Tethea or* (D. & S.) showing the differences between the English, Irish and Scottish races.

PLANT, C.W. — Some interesting captures at light from the Bishops Stortford area, Herts., in 1987 were *Lithophane leautieri hesperica* (Bours.); *Eupithecia millefoliata* (Ross.), new to Hertfordshire; *Hypena rostralis* (L.) possibly new to north Hertfordshire; *Schranksia costaestrigalis* (Steph.) from Sawbridgeworth Marsh on 1.viii and new for the district; and *Ennomos autumnaria* (Werneb.), a species now well established in parts of the country.

PLATTS, J. — Two examples of *Apamea oblonga* (Haw.) bred from pupae located under clumps of red fescue grass at Sandwich, Kent; specimens of *Apamea unanimitis* (Hbn.) bred from pupae found in the dead stems of angelica at Stodmarsh, Kent, in May 1986; *Lithophane socia* (Hufn.) bred ex females from Hailsham, East Sussex; and typical examples of *Egira conspicularis* (L.) bred from Ross-on-Wye, Herefordshire.

PRATT, C. — A specimen of *Pseudoips fagana britannica* Warr. with primrose yellow patches at the dorsum and subterminal fascia of the forewing, taken in Friston Forest, Sussex, on 12.vii.86.

RUSSWURM, A.D.A. and MIDDLETON, H.G.M. — From Boldre, Hants, a melanic *Lycia hirtaria* (Cl.) on 28.iv.87 and a melanistic *Biston strataria* (Hufn.) on 24.iv.87. From Brockenhurst, Hants., *Diachrysia orichalcea* (F.) on 15.viii.87; *Agrius convolvuli* (L.) on 15.ix.87; and a melanic aberration of *Euxoa tritici* (L.) on 28.viii.87.

SCANES, J.T. — A small selection of the local specialities to be found at Dungeness, Kent, taken during 1987. From a lesser known locality, Pentewan Bay, Cornwall, were examples of *Mythimna putrescens* (Hbn.), *M. l-album* (L.) and *Agrotis trux lunigera* Steph. taken in the second week of August; and from Haslemere, Surrey, a most striking aberration of *Tetheella fluctuosa* (Hbn.) captured on the 7.vii.87.

SIMSON, Brig. E.C.L. — A variable series of *Laothoe populi* (L.) showing the result of in-breeding over three years and a female *Euproctis similis* (Fuess.) displaying vestigial male markings.

SKINNER, B. — A series of *Agrotis ripae* (Hbn.) bred from north and south Wales, Somerset and Isle of Wight showing local variations. Single examples of *Heliothis armigera* (Hbn.) from Beddgelert, Caernarvonshire, on 14.vii.87 and *Diachrysia orichalcea* (F.) from Addington, Surrey, on 25.viii.87. A selection of aberrations taken in 1987 which included a melanic *Melanthia procellata* (D. & S.) from Chilgrove, Sussex on 5.vii; a light coloured form of *Luperina nickerlii* (Frey.) having a dark central cross band on the forewing from Tillingham, Essex on 21.viii; and a series of *Agrotis clavis* (Hufn.) displaying extreme variation from Surrey and Suffolk.

SMITH, E.G. and M.H. — Aberrant, migrant and local moths included *Chrysodeixis chalcites* (Esp.) from Portland, Dorset, on 13.ix.87; the first Wiltshire record of *Lampropteryx otregiata* (Metc.) taken on 23.viii.84; *Chloroclysta miata* (L.) from Ashton Common, Wilts.; and a very late record of *Diachrysia chrysitis* (L.) taken on 3.x.87.

SOKOLOFF, P.A. — Two generations of *Ennomos alniaria* (L.) bred from an extreme melanic female taken at Stodmarsh, Kent, in 1985.

STERLING, M.J. — A small selection of moths taken during a recent survey at an East Midlands Power Station; these included *Mythimna obsoleta* (Hbn.) and *Chilodes maritimus* (Tausch.) both new records for Nottingham; and specimens of *Rhyacia simulans* (Hufn.) and *Perizoma sagittata* (F.)

WAITE, P. — The first British record of *Polymixis gemmea* (Treit.) taken at light at Cockpole Green, Berks, on 1.ix.79. The species which bears a superficial resemblance to *Hadena albimacula* (Borkh.) is widespread on the Continent. It is not normally a migratory species and its presence in Berkshire is probably the result of accidental importation.

WARING, P. — Specimens of the usually coastal *Agrotis vestigialis* (Hufn.) taken this year in Woodwalton and Chippenham Fens, Cambs., and Cothill Fen, Oxon. Two examples of the yellow form of the male *Philudoria potatoaria* (L.) from Chippenham Fen on 20.vii.87 and a specimen of *Agrius convolvuli* (L.) from Chippenham Fen on 17.ix.87.

WEDD, D.L. — A large display of *Noctua comes* (Hbn.) from the Island of Lundy showing a wide range of variation and including many extreme ab. *sagittifer* Cockayne, a banded form normally associated with the Isles of Scilly but also now a dominant form on Lundy. An unusually late record of *Abraxas sylvata* (Scop.) taken on 17.ix.86 and a specimen of *Cucullia lychnitis* Ramb. collected as a larva at Marlow, Bucks. in the summer of 1982, but not emerging until May 1987. Two extreme aberrations were *Hypena rostralis* (L.) with light brown shading along the costa and outer margin of the forewing taken at Marlow on 15.ix.73 and *Xanthorhoe designata* (Hufn.) having a much reduced central band on the forewing taken at Tavistock, Devon, on 28.viii.64.

WEST, B.K. — A selection of aberrant moths, the most noteworthy being *Ligdia adustata* D. & S. ab. *plumbosa* Cockayne, the only second record of this melanic form, taken at Brockenhurst, Hants, on 29.iv.1987.

WINTER, P.Q. — Interesting captures from Yorkshire included *Xanthorhoe quadrifasiata* (Cl.) from Muston; *Lycia hirtaria* (Cl.) from near Selby; *Acherontia atropos* (L.) found on a wall in Filey on 2.vii.87; and *Rhodometra sacraria* (L.) bred from a female taken at Muston on 20.viii.87.

YOUNG, D. — A selection of the more interesting species taken during 1987 at Dungeness and Hamstreet, Kent. From Gussetts Wood, Bucks., examples of *Ptilodentella cucullina* (D. & S.) and *Ptilophora plumigera* (D. & S.); and from Odiham Common, Hants., a specimen of *Adscita statures* (L.) taken on the BENHS field meeting in June.

MICROLEPIDOPTERA

AGASSIZ, Rev. D.J.L. — *Lampronia* species, Shapwick Heath NNR, Somerset, 23.vi.87. *Homosetia* species, Grays, Essex, 30.ix.86; indoors, new to Britain; the species is known in N.America, but it is uncertain whether it is named. *Acrolepiopsis assectella* Zell., a series bred from onion, Thorpeness, Suffolk, ix.87. *Monochroa hornigi* Stdgr., Grays, Essex, 6.vi.87.

BLAND, Dr K.P. — (1) Species new to the Isle of Coll (Inner Hebrides). *Pammene rhediella* Cl., reared from apples, Grishipoll (VC103), coll. 23.vii.86, em. 29.v.87. *Cydia gallicana* Guen., reared from *Daucus carota*, Cornaigbeg (VC103), coll. 29.ix.86, em. 23.vii.87. *Gypsonoma sociana* Haw., to mercury vapour light, Arinagour (VC103), 12/13.vii.87.

(2) Interesting Scottish Microlepidoptera. *Nematopogon pilella* D. & S., Forest Lodge, Glen Tilt (VC88), 14.vi.86; Tulloch Moor, Aviemore (VC94), 20.vi.87. *Psychodes verhuella* Bru., rediscovered in Scotland after 109 years: Falls of Fender, Blair Atholl (VC88), larvae on *Asplenium trichomanes*; MacGregor's Leap, Glen Lyon Woods (VC88), larvae on *A. trichomanes*, 27.ix.87. *Acrolepiopsis betulella* Curt., a third British site, reared from Wild Ransoms, Allt Cruiniche, Bridge of Awe, Argylls (VC98), coll. 23.vii.87, em. 20.viii.87. *Bucculatrix maritima* Stt., reared from Sea-Aster, Luffness Marsh, E. Lothian (VC82), coll. 28.vi.87, em. 18.vii.87.

BRADFORD, E.S. — Kentish Microlepidoptera. (1) Pean Hill, Whitstable: *Adoxophanes orana* F.v.R. 20.viii.87; *Monochroa palustrella* Dgls, 7.vii.87; *Bisigna procerella* D. & S. 20.viii.87; *Rhynchopacha mouffetella* L. 13.viii.87.

(2) Down Bank, Julliberrie Down: *Argyresthia sorbiella* Treit. 12.vii.87.

(3) Chisleth Colliery: *Aethes margaritana* Haw. 12.vii.87.

(4) Nagden: *Oegoconia caradjai* P.-Gorj. 22.viii.87.

(5) Childs Forstal Wood: *Nemapogon clematella* Fabr. 16.vii.87.

CHALMERS-HUNT, J.M. — *Pachythelia villosella* Ochs., two males, one female bred Dorset, vii.87, together with larval cases. *Synopacma sangiella* Stt., Trottscliffe, Kent, taken at light, 29.v.87. *Athrips rancidella* H.-S., two among many others of this species reared for the first time in Great Britain in vii.87 from larvae collected from *Cotoneaster horizontalis* at West Wickham, Kent v.87. *Gymnancyla canella* Zell., Sandwich, Kent, melanic form reared 15.vii–2.viii.87, from larvae on *Salsola kali* collected ix.86. *Myrmecozela ochraceella* Tengst., Camghouran, Perthshire, 29.vi.87, together with the ant with which it is associated. *Swammerdamia compunctella* H.-S., Kylloe Wood, Northumberland, 1.vii.87. *Lampronia fuscata* Tengst., Blean Woods, Kent, reared 6.v.87 from a gall on birch twig collected iv.87.

CORLEY, M.F.V. — (1) From Oxfordshire, reared or captured in 1987. *Caloptilia hemidactylella* D. & S., Wychwood Forest (VC23) at mercury vapour light, 24.iv.87. *Aplota palpella* Haw., Blenheim Park (VC23), reared from moss on oak trunks 11–13.vii.87. *Metzneria metzneriella* Stt., Cothill near Abingdon (VC22), reared from *Serratula tinctoria* [a previously unrecorded foodplant? J.M.C.-H.] 20.viii.87. *Coleophora versurella* Zell., Pucketty Farm, Faringdon (VC22), at mercury vapour light, 15.vii.87. *Cnephasia genitalana* Pier. & Metc., Pucketty Farm, Faringdon (VC22), 12.viii.87. *Ochsenheimaria vacculella* F.v.R., Near Godstow (VC22), in a crevice of poplar trunk, 7.viii.87. *Anacamptis populella* Cl., Hornsey near Banbury (VC23), reared from *Genista tinctoria* [This is an extraordinary foodplant for this normally *Populus* and *Salix* feeding species — J.M.C.-H.], 4.vii.87. *Agriphila tristella* D. & S., ab., Uffington near Faringdon (VC22), at mercury vapour light, 12.viii.87. *Dioryctria abietella* D. & S. [?], ab., Buckland Warren near Faringdon (VC22), at mercury vapour light, 31.vii.87.

(2) From Tresco, Isles of Scilly. *Nothris congressariella* Bru., reared from *Scrophularia scorodonia*, 20.v–7.vi.87.

DOBSON, A.H. — *Agonopterix bipunctosa* Curt. (det. D.H. Sterling), Bartley Heath Reserve, Hook, Hants, three at actinic light trap.

EMMET, Lt.Col.A.M. — Essex: *Stigmella samiatella* (Zell.) reared 10.iii.87 from a mine taken at Riddles Wood (VC19) on *Castanea sativa*. Of the oak-feeding nepticulids, *S. samiatella* is the only one in Britain to feed also regularly on *Castanea*. *Monopis weaverella* (Scott) Lamarsh (VC19), 15.viii.87, the 4th Essex record. *Caloptilia rufipennella* (Hübner). This species, which is rapidly extending its range in Britain, is now common in north-west Essex. Up to four a night may come to a

mercury vapour trap before, and in smaller numbers after, hibernation. *Caloptilia azaleella* (Brants) reared from a larva taken out of doors at Harold Hill (VC18) 8.v.87; adult 25.v.87, new to Essex. *Parornix carpinella* (Zell.) reared from larvae taken at Chalkney Wood (VC19), 10.ii.87 (forced) and 8.vi.87 (not forced). Added to the British list in 1986. *Parornix fagivora* (Zell.) included for comparison, reared 11.iii.87 from Ellenden Wood, Kent (VC15). *Prochoreutis myllerana* (Fabr.) Sawbridgeworth Marsh Nature Reserve, 15.vi.87. The reserve is partly in Essex and partly in Hertfordshire and the species is new to VC19 (north Essex) and VC20 (Hertfordshire). *Zelleria hepariella* (Stt.) Saffron Walden at mercury vapour, 3.ix.87. The second Essex record. *Metriotes lutarea* (Haworth). Belhus wood, 8.v.87. The only known Essex locality, where it is abundant. *Coleophora caespitiella* Zell. High Wood, Duddenhoe End (VC19), reared mainly from *Juncus articulatus*, 6–14.vi.87 from larval cases taken in September 1986. Reputedly rare, but common in the woods of north Essex. Thurnall described the life history in 1921 from larvae taken near Wanstead (VC18). *Depressaria weirella* Stt. Fobbing Marshes, reared 15–22.vi.87 from larvae collected 6.v.87 on Fobbing Marshes, the locality where *Melitaea didyma* (Esper) was taken.

Churchill, Somerset: *Scythris crassiusculella* (Hbn.) (*fletcherella* Meyrick) reared from *Helianthemum*, 29.vi–3.vii.87. *Celypha woodiana* (Barrett), reared from *Viscum*, 28.vi.87.

Barham, Kent: *Teleiodes waga* (Nowiki) reared from *Betula*, this being the first definite record for this foodplant. The larva was collected on 7.ix.85 and the adult emerged 14.v.87, after overwintering twice.

Queen's Wood, Herefordshire, 14.ix.86. *Coleophora alnifoliae* Barasch adults emerged 8–28.vi.87. *Cryptoblabes bistriga* (Haw.) reared 1.v.87 from a larva in a spinning on *Quercus*.

FAIRCLOUGH, A.J. and R. — *Eudarcia richardsoni* Wals., Portland, Dorset, imago taken 3.vii.87; piece of stone showing larval case. *Coleophora caespitiella* Zell., E. Sussex, 18.vi.87. *Acrolita subsequana* H.-S., Portland, Dorset, bred from larvae found 29.vi.87. *Platyedra subcinerea* Haw., Portland, Dorset, bred from larvae found 1.vii.87. *Palpita unionalis* Hbn., Leigh, Surrey, a live specimen which came to light trap 20/21.x with two others.

FINCH, G.L. and M.A. — (1) Leicestershire micros: *Coleophora sylvaticella* Wood, Swithland Wood (SK5312), case on *Luzula sylvatica* 7.ix.85, moth emerged 7.vi.86. *Agriphila latistria* Haw., Diminsdale NR.LRTNC reserve, at mercury vapour light, 21.viii.87, no recent Leics. records. *Pseudosciaphila branderiana* L.f.wahlbomiana L., Cloud Wood (SK4121), at mercury vapour light, no recent Leics. records. *Cryptoblabes bistriga* Haw., Old Brake Spinney (SK491012), two at mercury vapour light, no recent Leics. records.

(2) Welsh micros: *Nomophila noctuella* D. & S., Dale Fort, Pembrokeshire, 1.ix.87. *Phalonidia gilvicomana* Zell. (det. J.M.C.-H.), Wyndd Cliff, Monmouthshire (ST529974), 29.vi.85. *Dolicharthria punctalis* D. & S., Dale Fort, Pembrokeshire, at mercury vapour light, 28.viii.87; [new to Wales?]. *Udea ferrugalis* Hb., Dale Fort, at mercury vapour light, 29.viii.87.

GIBSON, C.W.D. — *Cochylis flaviciliana* Westw., Upper Seeds, Wytham, Oxfordshire, 1987. *Coleophora silenella* H.-S., Upper Seeds, Wytham, Oxfordshire, 1987. *Yponomeuta rorella* Hb., Wytham, Oxfordshire.

HALL, N.M. — *Phyllonorycter* spp. from mines collected in Childs Forstal Wood, Kent on the 1986 post-exhibition field meeting: *P.mespilella* Hbn. from *Sorbus torminalis* and *P.cydoniella* D. & S. from crab apple were new for the wood.

Micropterix aureatella Scop., Cwm Woods, Aberystwyth, Cardigan (VC46), beaten from sycamore flowers; Talybont (VC46), sitting on bilberry; *Pandemis cinnamomeana* Treit., Talybont (VC46), bred from larva beaten from oak. *Microthrix similella* Zinck., Bartley Heath, Hants, at mercury vapour light; Bagley Wood near Oxford (VC22), at mercury vapour light. *Argyresthia goedartella* L. and *A. brockeella* Hb., both bred from larvae found under birch bark, Aldermaston Park, Berks, 12.iv.87.

HECKFORD, R.J. — *Stigmella filipendulae* Wocke, Kynance Cove, Cornwall, 5.ix.87, ex l. *Filipendula vulgaris*. *Bedellia somnulentella* Zell., Kennack Sands, Cornwall, 1 & 7.ix.87 ex l. *Calystegia soldanella* (previously unrecorded foodplant). *Phyllonorycter roboris* Zell., Fingle Bridge, Devon, 14–18.iv.87, ex l. *Quercus* sp.; Hembury Woods, Devon, 14.iv.87, ex l. *Quercus* sp. *Tebenna micalis* Mann, a newly recognized British species, The Warren, near Noss Mayo, Devon, 30.viii.87, cocoon on *Pulicaria dysenterica* (which contained a dead pupa which was dissected to confirm identification). *Coleophora ochrea* Haw., Durdham Downs, Bristol, 1.viii.87, ex l. *Helianthemum chamaecistus*. *Bryotropha basaltinella* Zell., Wytham, Oxford, 6.vi.87, ex l. *Tortula muralis*. *Schiffermuelleria grandis* Desv., near Canonteign, Devon, 1.vii.87, second Devon specimen. *Aplota palpella* Haw., Ashclyst Forest, Devon, 25 & 29.vii.87, ex l. *Hypnum cupressiforme* (?) on *Fagus sylvatica*; new county record. *Cochylis pallidana* Zell., Kynance Cove, Cornwall, 13.vi.87. *Aphelia unitana* Hb., Bucks Mills, Devon, 28 & 30.v.87 ex l. *Rumex acetosa* and 27.v.87 ex l. *Heraclium sphondylium*. *Celypha woodiana* Barr. Churchill, Somerset (locality courtesy of Rev. D.J.L. Agassiz), 23–27.vi.87 ex l. *Viscum album*. *C.rurestrana* Dup., Ilfracombe, Devon, 10.vii.87; third and fourth British specimens. *Acrolita subsequana* H.-S., Slapton, Devon, 12–14.viii.87, ex l. *Euphorbia paralias*. *Eucosma hohenwartiana* D. & S. f. *parvulana* Wilkinson, Gwithian, Cornwall, 13.viii.87. *Pammene inquilana* Fletch., near Canonteign, Devon, 21.iv.87; new county record. *Leioptilus carphodactyla* Hb., Churchill, Somerset, 29.v.87, ex l. *Inula conyza*.

JEWESS, P.J. — *Cydia corollana* Hb., Burnt Oak Wood, Ham Street, Kent. Previously considered to be extinct in Britain, with only one other British specimen from Whittlesey Mere, c.1850. The larva feeds on longhorn beetle galls on aspen.

KNILL-JONES, S.A. The following taken at mercury vapour light at Freshwater, Isle of Wight. *Ostrinia nubilalis* Hb., female, 14.vii.87.

LANGMAID, Dr J.R. — *Incurvaria masculella* D. & S., Wickham, Hants., pale specimen, 2.v.87. *Lampronia flavimitrella* Hb., Hamstreet, Kent., two, 4–5.vi.87. *L.fuscatella* Tengst., Whixall Moss, Salop., one bred. *Sterrhopterix fusca* Haw., Whixall Moss, Salop., one bred, *Betula*, 1987, and cases. *Niditinea piercella* Bent., Havering-atte-Bower, Essex, four bred from bird's nest, 1987. *Ochsenheimeria vacculella* F.v.R., Southwick, Hants., 19.vii.87. *Parornix carpinella* Frey, Ham Street, Kent, bred 1987. *Phyllonorycter nigrescentella* Logan, Branscombe, Devon, two bred *Lathyrus pratensis*, 1987, and mines. *Coleophora ochrea* Haw., Gloucestershire, four bred, 1987 and cases. *Aplota palpella* Haw., Savernake Forest, Wilts., four bred 1987. *Agonopterix capreolella* Zell., Ventnor, I.O.W., *Pimpinella saxifraga*, four bred 1987. *Monochroa* sp. (apparently undescribed), East Mersea, Essex, mines with larvae in *Scirpus maritimus* collected 1.x.86, moths emerged early June 1987. *Psamathocrita argentella* P. & M., Hayling Island, Hants., four 13.vi.87. *Glyphipteryx linneella* Cl., Southsea, Hants., 10.ix.87. *Scythris crassiuscula* H.-S., Gloucestershire, two bred from *Helianthemum*, 1987. *Aethes williana* Brahm, Grays, Essex, two bred from *Daucus* 1987. *A.margaritana* Haw., Faversham, Kent,

two bred *Achillea millefolium*, 1987. *Celypha woodiana* Barr., Somerset, four bred from *Viscum*, 1987. *Olethreutes arcuella* Cl., Harewood Forest, Hants., 11.vii.87. *Cydia caecana* Schläg., Salisbury Plain, Wilts., two 5.vii.87. *Pselnophorus heterodactyla* Müll., Gloucestershire, two bred *Mycelis muralis*, 1987.

MANNING, D.V. — Species from Bedfordshire. *Lobesia botrana* D. & S., West Wood, Knotting, 21.viii.87. *Ethmia dodecea* Haw., West Wood, Knotting, 26.vii.87. Both *L.botrana* and *E.dodecea* at mercury vapour light. *Metzneria aprilella* H.-S., Cockayne Hatley, in Rothamsted trap 1.vii.86. *Phycitodes saxicola* Vaugh., Houghton Regis, 17.viii.85. *Cochylis flaviciliana* Westw., Houghton Regis, 26.vii.85. *Commophila aeneana* Hb., swept from cutting slopes at three sites: Thurleigh (roadside), 27.vi.87, Sewell (abandoned railway lines), 26.vi.87, Old Warden Tunnel (abandoned railway lines), 28.vi.85.

NASH, S. — *Evergestis extimalis* Scop., Branscombe, Devon, 10.viii.87. *Microthrix similella* Zinck., Bagley Wood, Oxfordshire, 4.vii.87. *Schoenobius gigantella* D. & S., Dungeness, Kent, 6.vii.87. *Cydia caecana* Schläg., Fernham, Oxfordshire, 25.vi.86. *Pyralis lienigialis* Zell. Fernham, 3.vii.86. *Euzophera cinerosella* Zell., Fernham, 7.vii.87. *Palpita unionalis* Hb., Fernham, 20.x.87. *Phlyctaenia perlucidalis* Hb., Fernham, 12.vii.87.

O'KEEFE, D. — *Cryptophlebia leucotreta* Meyr., Petts Wood, Kent, at mercury vapour light, 5.x.87. An African tortricid moth, a pest of citrus and other fruits, occasionally bred in Britain from imported oranges.

PALMER, S.M. — A selection recorded in Wiltshire (South). *Opostega salaciella* Treit., Dinton, 13.vii.87. *Adela cuprella* D. & S., 16–24.iv.87. *A.croesella* Scop., Stockton Down, 14.vi.86; since then recorded in three other 10-km squares in the same VC (VC8). *Incurvaria praelatella* D. & S., Chase Wood, 9.vi.85. *Lampronia oehlmanniella* Hb., Dinton, 19.v.87. *Elachista poae* Stt., Dinton, larvae on *Glyceria maxima*, 1987. *Ethmia bipunctella* Fabr. *Cochylis flaviciliana* Westw., Salisbury Plain, 16.viii.86. *Griselda stagnana* D. & S., Boscombe Down, 24.iv.87, flying in midday sun on a disused railway embankment. *Cydia caecana* Schläg. Blackball Firs, 30.v.84; this species has now been recorded in four separate locations on Salisbury Plain, and in 1987, Dr J. Langmaid and the exhibitor found a sizeable colony at Shewton. *Phlyctaenia perlucidalis* Hb., 4.vii.87.

PARSONS, M. — A small selection noted during 1986 and 1987. *Cydia pallifrontana* L. & Z., Bedford Purlieus, Northants. and near Wakerley, Northants. *Ethmia dodecea* Haw., Bedford Purlieus. *E.funerella* Fabr., Chippenham Fen NNR, Cambs., bred from larvae on comfrey. *Nascia ciliaris* Hb., Ramparts Field, Suffolk. *Evergestis extimalis* Scop., Brecks, Suffolk. *Philedone gerningana* D. & S., Rodyon Common, Norfolk.

PELHAM-CLINTON, E.C. — *Lampronia fuscata* Tengst., Epping Forest, Essex, 2.v.87, from gall on birch, with gall. *Ischnoscia borreonella* Mill., Portland, Dorset, 15.viii.87; rediscovered after 60 years. *Phyllonorycter nigrescentella* Logan, Branscombe, Devon, two bred viii.87 from mines on *Lathyrus pratensis*, an unusual foodplant; with mines. *Coleophora alnifoliae* Bar., Rannoch, Perthshire, 23.vi.51, only recently identified; new to Scotland; compared with two *C.milvipennis* Zell., Culmstock, Devon, bred 16.v.87 from unusually long (11 mm) cases on birch. *Aplota palpella* Haw., Savernake, Wilts, bred 27.vi.87 from larvae on *Hypnum cupressiform*. *Agonopterix capreolella* Zell., Ventnor, Isle of Wight, bred 21.viii.87 from larva on *Pimpinella*. *Monochroa* sp., apparently undescribed, E. Mersea, Essex, two bred v.vi.87 from larvae on *Scirpus maritimus*. *Teleiodes waggae* Haw., Peasmarsh, E. Sussex and Hamstreet, Kent, vi.87. *T.sequax* Haw., Tennyson Down, Freshwater,

Isle of Wight, 4.viii.87, two whitish forms with normal. *Pammene ignorata* Danilevsky & Kuznetsov, Axminster, Devon, 23.vi.86; new to the British Isles. *Platytes alpinella* Hb., Axminster, Devon, two 14.vii.87; Horsmonden, Kent, one 15.vii.87; presumed immigrants. *Homoeosoma nebulella* D. & S., Axminster, Devon, 1.ix.87; a possible immigrant. *Pselnophorus heterodactyla* Hüll., Cranham, Glos., three bred vi.87 from larvae on *Mycelis muralis*.

PLANT, C.W. — *Ostrinia nubilalis* Hb., Bishop Stortford, Hertfordshire, female at mercury vapour light 15.vii.87, and apparently well north of its established range.

SIMPSON, Dr A.N.B. — *Mompha locupletella* D. & S., near Gwbert, Ceredigion, ex larva on *Epilobium parvifolium*, viii.87. *Adela croesella* Scop., Shrawley Wood, Worcestershire (VC37), large numbers flying round stumps of *Tilia cordata* amongst *Rubus* at woodland edge, 6.vi.87. *Dichomeris ustalella* Fabr., Worcestershire (VC37), one specimen swept from low vegetation, 6.vi.87; larvae [this sp.?] found feeding on *Tilia cordata*, ix.87 at same site.

SOKOLOFF, P. — *Athrips rancidella* H.-S., West Wickham, Kent, bred specimens together with examples of the larval feedings on *Cotoneaster horizontalis*, cocoons and pupae.

SMITH, E.G. and M.A. — *Euchromius ocella* Haw., Portland, Dorset, two 20.ix.87.

STERLING, P.H. and Col.D.H. — *Haplotinea ditella* P. & M. (gen. det. D.H.S.), Bagley Wood, Oxfordshire (VC22), at mercury vapour light 4.vii.87. *Cataplectica farreni* Wals., Swyncombe Downs, Oxfordshire (VC23), flying diurnally 26,28.vii.87 [new to Oxfordshire? J.M.C.-H.]. *Coleophora siccifolia* Stt., Wychwood Forest, Oxfordshire (VC23), larvae on *Malus* 10.vii.86, moth reared. *C. clypeiferella* Hofm., Foxhole Heath, Suffolk (VC26), 12.viii.87. *Biselachista scirpi* Stt., Hayling Island, Hants, pupa on *Scirpus maritima* blade below mine, 13.vi.87, moth reared. *Aplota palpella* Haw., Savernake Forest, Wilts. (VC7), larvae in moss tubes on oaks, 24.v.87, and on 27.vi.87 from Blenheim Park, Oxfordshire (VC23); moths reared from both localities — the latter a new county record. *Agrolamprotes micella* D. & S., Winchester, Hants (VC11), in mercury vapour light trap, 13/14.vii.87; a new county record. *Monochroa* sp., Cliffe Marshes, Kent, mine collected 28.ix.86, moth reared; thought to be an unnamed *Monochroa* identical to those reared by E.C. Pelham-Clinton and J.R. Langmaid from similar mines from Essex. *Psamathocrita argentella* P. & M., Hayling Island, Hants, a previously unknown locality, flying freely over *Agropyron pungens* at around 16.00 hours between heavy showers on 13.vi.87. *Mompha langiella* Hb., Wytham Wood, Oxfordshire (VC22), reared from larval mines on *Circaea* collected 6.vii.87. *Dystebenna stephensi* Stt., Wanstead Flats (VC18), on old oaks diurnally 1.viii.87. *Falseuncaria degreyana* McLach., Foxhole Heath, Suffolk (VC26), flying at dusk over *Linaria* 12.viii.87. *Spatalistis bifasciana* Hb., Langley Wood, Wilts (VC8). *Cydia molesta* Busck, Winchester, reared from larva on Italian peach purchased at Sainsbury's by R.A. Bell. *Bryotropha basaltinella* Zell. and *Catoptria falsella* D. & S., Wytham, Oxfordshire (VC22), reared from the moss *Tortula ruralis* collected from an old tiled roof on 12.iv and 27.vi.87 respectively.

STERLING, M.J. — A small selection of micros taken in a Nottinghamshire Power Station during a CEGB survey carried out at their request. *Coleophora anatipennella* Hb., a new county record; *Hedya dimidioalba* Retz., an unusual melanic form; *Endothenia ericetana* H. & W.; *Eurrhypara perlucidalis* Hb., a new county record; *Pempelia formosa* Haw., a new county record.

FOREIGN LEPIDOPTERA

These exhibits have been divided between Palaearctic species, mainly from Spain and France, but including specimens of *Apatura iris* Linn. from Korea with British for comparison, and exotic species from Africa and the West Indies. Several other exhibitors showed comparisons of British and continental species which are very rare here or could conceivably be found in the future or identified in collections where they have been overlooked. Among the exotics, exhibits of reared crosses between African mainland and island Papilionidae, *Charaxes* from Kenya, and many species of both moths and butterflies from Sierra Leone and of Sphingidae from Jamaica and Thailand were outstanding.

Palaearctic species

CRIBB, P.W. — A fine case of species taken during 3 weeks in the Pyrenees and central Spain. Butterflies included extreme aberrations of *Fabriciana chlorodice* N.-S., *Brenthis ino* Rott. and *Dysandra thersites* Cant. from the Sierra de Cuenca; also bred examples of F₂ and F₃ generations of *Mellicta parthenoides* Kef.

DOBSON, A.N. — Portuguese Lepidoptera taken in the Sao Joao district of Albufeira, Algarve, mostly on shop windows or white wall lights during dawn walks. These included species which have been found in the UK: *Spodoptera exigua* Hübn., including a dark form with contrasting light orbicular stigma, and *S. litura* Bdv., both very common; *Rhodometra saccharia* Linn., common; *Eilema caniola* Hübn. (1); *Ochropleura leucogaster* Frr.; *Trichoplusia ni* Hübn. (3); *Chrysodeixis chalcites* Esp. (1); *Mythimna albipuncta* D. & S. (2); *Cucullia chamomillae* D. & S. (1); *Eupithecia phoeniceata* Ramb. (1); *Ortholitha perobolata* Hübn. (1).

GOATER, B. — Fourteen species of *Catocala* Schr. taken in Britain, France and Spain. Interesting species pairs and species groups of European Macrolepidoptera, including some that might conceivably be found in Britain: Lasiocampidae — two species of *Trichiura* and four of *Phyllodesma*; Drepanidae — *Drepana binaria* Hufn. and *D. uncinula* Borkh.; Geometridae — four species of *Cyclophora* including *C. quercimontaria* Bastelbgr., which closely resembles *C. punctaria* Linn.; *Scotopteryx moeniata* Scop. and *S. diniensis* Neuberger; four species of *Horisma* Hübn., with *H. tersata* D. & S. and three others resembling it; *Ennomos erosaria* D. & S. and *E. quercaria* Hübn.; *Nychiodes obscuraria* de Vill. and *N. andalusiaria* Mill.; Notodontidae — *Phalera bucephala* Linn. and *P. bucephaloides* Ochs.; *Cerura vinula* Linn. and *C. erminea* Esp.; Noctuidae — *Yigoga amasina* Corti & Draudt, *Y. selsicola* Bellier and *Y. gracilis* F. Wagner; *Ochropleura plecta* Linn., *O. plecta* ssp. *unimacula* Stdr. and *O. leucogaster* Frr.; *Chersotis anatolica* Draudt (non *C. elegans* Evers.) and *C. elegans* Evers. (= *C. grammiptera* Rambur); *Noctua comes* Hübn., *N. orbona* Hufn. and *N. interposita* Hübn. and *N. interposita baraudi* Boursin; *Noctua fimbriata* Schreb. and the recently described *N. tirrenica* Bieb., Hanig Heinicke; *Noctua interjecta interjecta* Hübn. from south Europe and *N. interjecta caliginosa* Shaw. from Britain; and finally *Noctua janthina* D. & S., the common species in Britain, and a recently recognized 'twin' from south west Europe which has more black and less yellow on the hindwing and a different pattern near the apex of the forewing underside. Unfortunately it appears that the latter is the true *janthina* of D. & S., and that it is our species which requires a name.

GREATOREX-DAVIES, J.N. and WESTWOOD, N.J. — A representative selection from 140 species of butterflies taken in the central Pyrenees, 17–27.vii.87, particularly around the Aigues Tortes National Park. Of particular interest was *Pseudoaricia nicias* Meigen near Bagerque in Vallee de Aran., and also *Erebia lefebvrei*, *E. gorgone* and *E. hispana* there and near La Mouzie further west in the French

Pyrenees. Other species in the Valle de Aran included *Parnassius mnemosyne*, *Libythea celtis*, *Erebia gorge*, *E.sthennyo*, *Polyommatus eros*, *Eumedonia eumedon*, *Agrodiaetus amanda*, *A.escheri*, *Agriades glandon*. Further south in the hot dry valleys of southern foothills of the Pyrenees, near the Pas de Collegrats, species included *Agrodiaetus ainsea*, *A.ripartii*, *Lysandra albicans*, *Pseudotergumia fidia*, *Melitaea trivialis*.

HALL, N.M. — Some Lepidoptera on the British list collected in France and Spain. Macrolepidoptera: *Acosmetia caliginosa* Hübn., Reddish Buff, Tarimbia, Asturias, Spain; *Periphanes delphinii* Linn., Pease Blossom, Lake Gallocanta, Zaragoza, Spain; *Pelosia obtusa* H.-S., Small Dotted Footman, Lac de Gd. Lieu, Loire-Atlantique, France. *Heliothis virescens* Hufn. Marbled Clover, Olonne, Vendée, France & Sarieena Lake, Huesca, Spain. *Heliothis maritima* Graslin, Shoulder-striped Clover, Olonne, Vendée, France. *Acontia lucida* Hufn., Pale Shoulder, Olonne, Vendée, France. *Drepana curvatula* Borkh., Dusky Hook-tip, Lac de Gd. Lieu, Loire-Atlantique, France. *Coscinia cribraria* Linn, Speckled Footman, Plage de Casernes, Landes, France; *Cyclophora puppillaria* Hübn., Blair's Mocha, Plage de Casernes, Landes, France; *Gluphisa crenata* Esp., Dusky Marbled Brown, Lieu, Loire-Atlantique, France. *Acronicta auricoma* D. & S., Scarce Dagger, Plage de Casernes, Landes, France; *Spargania luctuosa* D. & S., White-banded Carpet bred ex *Epilobium* sp., Les Haudères, Switzerland; moths of the *Cryphia algae* complex: *algae* F., *pallida* Bethune Baker or *Ochsi* Boursin, from various localities; *Cryphia raptricula* D. & S., Marbled Grey, various localities; *Cryphia domestica pyreneae* Ochs, Col Botella, Andorra.

Microlepidoptera: *Crambus uliginosellus* Zell., Olonne, Vendée, France; *Pediasia aridella aridella* Thunb., Olonne, Vendée, France; *Pediasia fascelinella* Hübn., Plage de Casernes, Landes, France; *Psammotis pulveralis* Hübn. Lac de Gd. Lieu, Loire-Atlantique, France; *Acrobasis tumidana* D. & S., Lac de Gd. Lieu, Loire-Atlantique, France (attention drawn to the raised scales on *tumidana* and desirability of avoiding flattening such species when setting.)

Also shown were four small noctuids collected in Penalba, Huesca, Northern Spain, 20–21.viii.85, so far unidentified; and a selection of other small noctuids from southern Europe, mostly Acontiinae.

HOLLINGWORTH, T.S. — Selection of Lepidoptera from Lège, Cap Ferret, South West France. This included several species of non-British Macrolepidoptera, such as *Lymantria dispar* Linn., *Odonestis pruni* Linn., *Harpyia milhauseri* Fab., *Ochrostigma velitaris* Hufn., *Drymonia querna* D. & S., *Thaumetopoea processionea* Linn., *T.pityocampa* D. & S., and several scarce species on the British list such as *Polyphaenis sericata* Fab., *Rhodometra saccharia* Linn., *Coscinia cribraria* Linn., and some interesting Microlepidoptera: *Pediasia fascelinella* Hübn., *Dioryctria sylvestrella* Retz; Gelechiidae including *Chrysoesthia sexguttella* Thunb., *Pseudotelphusa scalella* Scop., *Mirificarma mulinella* Zell., *Aroga pascuicola* Stdr, *A.velosella* Zell.; Tortricidae: *Apotomis semifasciana* Haw., *Epinotia festivana* Hübn., *Cydia amplana* Hübn.; Lithocolletinae: *Phyllocnistis xenia* Her., *Phyllocorycter platanoidella* J. de Joannis; *Trifurcula platanii* Muller-Rutz., all leaf-miners.

McFEELY, J. — *Apatura iris peninsularis* Lee and Takakura, 1981, seven specimens bred from Korea, with two *A.iris* from south England for comparison. Consistent differences are the rich mauve tint on the underside which is present in all of 50 Korean specimens so far bred, and some details in the life histories of the two 'races' from both ends of the insect's range. These constant characters have been now proved in several generations reared in England.

PRINGLE, G. — *Clossiana selene* D. & S., an aberration near f. *hela* Kals, Osttirol,

1800m, 13.vii.87. *Meleageria daphnis* D. & S., Burgos area, north west Spain, 600m, 28 and 30.vii.83. *Erebia sudetica lioranus* de Lesse, Cantal, central France, two males, 1800m., 10.vii.86; and central Carinthian Alps, Austria, two males, 20.vii.87, lent by Professor Erich Laxer of Lienz. *Erebia melampus* Fuessly, four males, Kals Osttirol, 1400m, 10–24.vii.87; Eigerhorn, Osttirol, three males, 2300m, 6.ix.86. Austrian lepidopterists are apparently doubtful if *E.sudetica* can be reliably distinguished from *E.melampus*, shown for comparison.

WAITE, P. — Lycaenidae collected in northern and central Spain in July 1987: 32 species and sub-species, several found only in restricted localities. Of particular interest are representatives of the *Lysandra coridon* group — *L.caelestissima* Verity, restricted to high, non-calcareous areas of the Montes Universales, central Spain; *L.arragonensis* Gerhardt, in the calcareous areas; *L.caerulescans* Tutt, thought to be hybrid of *L.caelestissima* × *L.arragonensis*; *L.asturiensis* Sag., limited to northern Spain, flying in some areas with *L.hispana* H.-S., which is the only representative of the group exhibited which occurs outside Spain; *L.albicans* H.-S., most widely distributed in southern Spain but occasionally further north. Other interesting species are *Agrodiaetus ainsae* Forster, occurring only in limited areas of northern Spain; *A.fabressei* Oberthur, restricted to central Spain; *Plebicula nivescens*, more widespread but local and confined to Spain. (Editorial note: there are still differences of opinion about the specific, sub-specific and formal status, and in some cases also about the distribution, of these insects in Spain. For a full recent account see Bustillo & Rubio, 1974, Mariposas del la Peninsula Iberica).

Exotic species

BROOME, G. — Butterflies and photographs from Trinidad, collected November 1986. These included Papilionidae: *Battus lycidas* and Riodinidae: *Theope excelsa*, of which there are only two previous records from Trinidad; also Riodinidae one species unidentified, probably of genus *Lemonius*, not previously recorded from Trinidad.

CLARKE, C. — Race crosses between African mainland *Papilio dardanus dardanus* and *P.d.humbolti* from the Comoros Islands and *P.d.meriones* from Madagascar, (two cases of butterflies); *Papilio nandina*, a naturally occurring species hybrid between *P.dardanus* and *P.phorcas* (one case of butterflies).

HALL, N.M. — A drawer of Macro- and Micro-lepidoptera collected from around lights in the Cape Sierra Hotel, Freetown, Sierra Leone, at Christmas to New Year 1986–1987.

HARMAN, T.W. — Sphingidae taken in Thailand during July and August 1987: *Clanis undulosa* Moore; *Maganoton analis* Feld.; *Amplypterus masoni* Clark; *Callambulyx rubricosa rubricosa* Walk.; *Marumba cristata* Butl.; *Acosmerycoides leucocraspis* Hamps.; *Marumba spectabilis* Butl.; *Barbourion lemai* Le Moul (believed to be the first specimen seen in Britain); *Ambulyx elwesi* Druce; *Pentateucha curiosa* Swin.; *Acherontia styx* Westw.; *Acosmeryx naga* Moore; *Callambulyx poecilus* Roths.; *Oxyambulyx canescens* Walk.; *Theratra suffusa* Walk.; *T.oldenlandiae* Fab.; *Ampelophaga dolichoides* Feld.; *Parum colligata* Walk.; *P.porphyrina* Butl.; *Macroglossum sylvia* Bdv.; *Panacra metallica* Butl.; *Enpinanga borneensis* Butl.; *Leucophlebia lineata* Westw.; *Cephandoes hylas* Linn.; *Sphingonaepiopsis pumilio* Bdv. Also shown were Saturniidae from Thailand, including *Salassia iris*, male and *Calligula zuleika*, male, and larvae of the latter. This is the first time this species has been bred. The larvae do not show characteristics of *Calligula*, and the genus needs to be revised.

HOMER, T.J.G. — One of six drawers of Sphingidae taken at Port Antonio, Jamaica, in 1972; a series of *Meneria tulbaghia* Linn. taken near Somerset West, Cape Province, South Africa, in 1981; some moths taken in Transkei, South Africa in 1981.

McNAMARA, D.S.K. — *Ascia monusta* (Great Southern White), bred from livestock obtained at London Butterfly House, 1986.

TREMBATH, D.A. — Part of a selection of butterflies collected in Kenya in December 1986 and December 1987, including some 20 species new to him to add to a total of some 290 species collected in previous years. Among the 'new' species were *Charaxes pollux*, *C.numenes*, *C.tiridates*, *C.bipunctatus*, *C.pythodorus*, *C.smaragdalis*, *C.anticlea*, *C.cerasa*, *Acraea rogersi*, *A.semivitreata*, *A.cerasa*, *Bematistes macaria*, *Euryphura ochracea* in two female forms, *Bebearia sophus*, *Appias sylvia*, *Athene otacilia*, *Hypolycaena antifaunus*, *H.liara*, *Bicyclus smithi*, *Melanitis lybia*.

WEST, B.K. — From Transvaal, South Africa. *Colotis ione* Godt.: dry season form *jalone* Btl., male and female to show sexual dimorphism, and a gynandromorph, Wyliespoort, 9.vii.56, left side mainly male, right side mainly female. Also wet season forms to show seasonal dimorphism.

DIPTERA

There were a good number of Diptera exhibits this year, mainly consisting of notable species found during 1987, with a few from previous years. Syrphidae were as usual well represented, but a good range of other families were shown and it was particularly pleasing to see the now very scarce *Stratiomys chamaeleon* (L.) from a new locality.

APPLETON, D. — Two syrphids from Botley Wood, Hants.: *Callicera aenea* (Fab.), male, one of three seen visiting *Rosa* flowers, 21.vi.87; *Pipiza lugubris* (Fab.), female, swept at woodland edge, 27.vi.87.

CHANDLER, P.J. — (1) Five of the six British species of *Euthyneura* Macq. (Empidoidea, Hybotidae), four of them from Windsor Forest, Berks., v-vi.87, at tree blossom especially *Crataegus* and *Prunus padus*: *E.albipennis* (Zett.), new to Britain, a female had been taken 3.vi.80, both sexes found this year; *E.inermis* Becker, recently added to the British list (Cole, J. 1987, *Entomologist's mon. Mag.*, 123: 33-34.), both sexes found at Windsor and in the New Forest in 1987; *E.myrtilli* Macq. and *E.gyllenhalii* (Zett.), both more widespread. Females of *halidayi* Collin, not found at Windsor, included for comparison. All species develop in rotten wood.

(2) Females of an *Anthalia* Zett. species (Hybotidae), also found at *Crataegus* and *Prunus padus* blossom, Windsor Forest, Berks., v-vi.1987. A new genus to the British list, only one male so far found in Britain and specific identity requires further work.

CLEMENTS, D.K. and ALEXANDER, K.N.A. — Some rare and local Diptera mostly resulting from the National Trust Biological Surveys in 1986-87: *Xylophagus ater* Meig. (Xylophagidae), a reared female with pupa-case from beneath oak bark, Mersham Hatch Park, Kent, 17.v.87; examples of the larvae, which are far more usually encountered than the adult, are shown by specimens from beneath oak bark at Nap Wood, E. Sussex, 12.v.87; *Stratiomys potamida* (Meig.) (Stratiomyidae), Rievaulx, N. Yorks., 23.vii.87; *Oxycera pardalina* Meig. (Stratiomyidae), beaten from birch, Beast Cliff, N. Yorks., 28.vii.87; *Vanoyia tenuicornis* (Macq.) (Stratiomyidae) and *Dolichopus arbustorum* Stannius (Dolichopodidae), two of a number of rarities taken from unimproved wet meadows with lush drainage-ditches

at Winchelsea, E. Sussex, 10–11.vi.87; *Xylota abiens* Meig. (Syrphidae), Knole Park, Kent, 24.v.87; *Brachypalpus laphriformis* (Fall.) (Syrphidae), normally a southern species of ancient woodlands, Forge Valley, N. Yorks., 11.vii.87; *Didea fasciata* Macq. (Syrphidae), one of several specimens seen at Hebden Dale, W. Yorks., 9.ix.87; *Urophora spoliata* (Haliday) (Tephritidae), a Red Data Book fruitfly associated with saw-wort (*Serratula tinctoria*); a large population of this species occurs on Afton Down, Isle of Wight, on a National Trust site now threatened by a road-development proposed by the County Council; *Herina lugubris* (Meig.), (Otitidae), 16.vii.87, another local species from this same site, which supports many other rarities; *Paraclusia tigrina* (Fall.) (Clusiidae), taken on a huge hornbeam pollard, Hatfield Forest, Essex, 10.ix.86; this specimen was carrying a phoretic female of the local pseudoscorpion, *Chernes cimicoides* (F.), the grip of which had permanently damaged one of the fly's legs; *Alophora hemiptera* (F.) (Tachinidae), abundant at flowers, Rievaulx, N. Yorks., 23.vii.87.

COLLINS, G. — Syrphidae taken in Surrey in 1987: *Platycheirus discimanus* Loew, Ranmore Common, 29.iv.; *Epistropheella euchroma* (Kowarz), Ashted Common, 25.iv.; *Sphaerophoria philanthus* (Meig.), Tilford, 28.vi; Frith Hill, 16.viii.; *S. virgata* Goeldlin de Tiefenau, Tilford, 28.vi; *Cheilosia velutina* Loew, Send, 1.viii; *C. vulpina* (Meig.), Mayford, 15.viii; *Portevinia maculata* (Fall.), Brewer Street, 16.v; Chaple Copse, 16.v; West Humble, 1.vi; *Rhingia rostrata* (L.), Woldingham, 20.v; Somersbury Wood, 7.vi; Tatsfield, 30.viii; *Brachyopa insensilis* Collin, Ewhurst, 7.vi; *Chrysogaster macquarti* Loew, Chobham Common, 1.viii; *Myolepta luteola* (Gmel.), Cooper's Hill, 1.viii; *Triglyphus primus* Loew, Chertsey Meads, 23.viii.

GODFREY, A. — Various uncommon Diptera collected in 1987: *Keroplatus testaceus* Dalman (Keroplastidae), male, Sydenham Hill Wood, London, 19.ix; *Symphoromyia immaculata* (Meig.) (Rhagionidae), Colney Heath, Herts., chalk grassland, 21.vi; *Agathomyia viduella* (Zett.) (Platypezidae), two males, Chalk Wood, London, 9.v and one male, Badger's Mount, Darenth Wood, Kent, 4.v; *A. falleni* (Zett.) (Platypezidae), part of a swarm of 20–25 males at a height of about 15 feet from the ground on the Horniman Nature Trail, Forest Hill, London; *Megamerina dolium* (F.) (Megamerinidae), male in oak, beech and hornbeam woodland, Sydenham Hill Wood, London, 24.viii; *Acartophthalmus nigrinus* (Zett.) (Acartophthalmidae), male ex malaise trap at Sydenham Hill Wood, 30.ix; *Paraclusia tigrina* (Fall.) (Clusiidae), male on beech log, Whippendell Wood, Herts., 1.viii; *Norellia spinipes* (Meig.) (Scathophagidae), swept by footpath on the Horniman Nature Trail, Forest Hill, London; *Paykullia maculata* (Fall.) (Rhizophoridae), male, Sydenham Hill Wood, 26.viii.

HALSTEAD, A. — Uncommon Diptera collected in 1987: *Tabanus sudeticus* Zell. (Tabanidae), male, Four Crosses, Caernarvonshire, 8.vii, on a car window; *Atherix marginata* (F.) (Rhagionidae), male, Oare Valley, Somerset, by stream, 31.vii; *Xanthandrus comtus* (Harris) (Syrphidae), male, Royston, Herts., 21.ix at *Hedera* flowers; *Triglyphus primus* Loew (Syrphidae), both sexes, Therfield Heath, Herts., at *Heracleum* flowers, 29.viii; *Arctophila mussitans* (F.) (Syrphidae), male, near Llangaffo, Anglesey, on *Corylus* leaf, 11.vii; *Anasimyia lunulata* (Meig.) (Syrphidae), female, Newborough Warren, Anglesey, 7.vii; *Parhelophilus consimilis* (Malm) (Syrphidae), female, Cors Goch Nature Reserve, Anglesey, wet meadow, 12.vii; *Microdon egeri* Mik (Syrphidae), female, Chobham Common, Surrey, on fallen *Pinus* trunk, 14.vi; *Myopa fasciata* Meig. (Conopidae), female, Chobham Common, Surrey, at *Senecio* flower, 16.viii; *Gasterophilus intestinalis* (Deg.) (Gasterophilidae), male, Dunkery Hill, Exmoor, on cairn at summit (519 m), 4.viii.

MCLEAN, I.F.G. — Some notable Diptera found in 1987: *Chrysotus suavis* Loew (Dolichopodidae), male, Red Wharf Bay, Anglesey, frequent at transition between saltmarsh and thin fore dune; *Triglyphus primus* Loew (Syrphidae), female, at *Daucus* flowers, Foxhole Heath, Suffolk, roadside verge, 15.viii; *Salicella fasciata* (Meig.) (Sciomyzidae), female, Brancaster, Norfolk, *Elymus* fore dune, 23.ix; *Opomyza lineatopunctata* von Röser (Opomyzidae), female, Dersingham Bog, Norfolk, 4.viii; *Coelopa pilipes* Haliday (Coelopidae), male, Red Wharf Bay, Anglesey, associated as larvae with seaweed, 11.vii.

MILES, S.R. — Various local Diptera found in recent years: *Nephrotoma crocata* (L.) (Tipulidae), female, Chobham Common, Surrey, observed stabbing the tip of its abdomen into dry sand at side of a path at 18.30 hours, assumed to be ovipositing, 15.vi.84; *Ctenophora atrata* (L.) (Tipulidae), male, Woolmer Forest, Hants., 13.vi.81; female, Odiham Common, Hants., BENHS Field Meeting, 13.vi.87; *Psilota anthracina* Meig. (Syrphidae), male, at *Crataegus* blossom, Windsor Great Park, Berks., 28.v.85; *Cheilosia nebulosa* Verrall (Syrphidae), female, Noar Hill, Hants., 28.iv.84; *C. soror* (Zett.) (Syrphidae), female, Broughton Down, Hants., 22.viii (both latter at Hants. and Isle of Wight Naturalists' Trust Reserves).

NATURE CONSERVANCY COUNCIL — An exhibit of species recorded from Risby Warren, South Humber, included the following Diptera: *Acrocera orbicula* (F.) (Acroceridae), beaten and swept from trees and shrubs, Regionally notable; *Dolichopus migrans* Zett. (Dolichopodidae), otherwise known only from Breckland, Red Data Book category 3.

PERRY, I. — A selection of uncommon Diptera collected during 1987: *Stratiomys chamaeleon* (L.) (Stratiomyidae), Cors Erddreiniog, Anglesey, 11.vii at *Heracleum* flowers, at edge of a fen with flushes; *Oxycera pardalina* Meig. (Stratiomyidae), Great Orme, Caernarvonshire, 7.vii, on moss by spring on a limestone hillside; *Dioctria cothurnata* Meig. (Asilidae), River Monnow, Skenfrith, Gwent, 15.vi; *Platypalpus pallidiset* Kovalev (Hybotidae), Paradise, Cambridge, 1–2.viii, swept from sedge under *Salix* carr, the second British locality, the first record being in 1976 at Earith Gravel Pits, Cambs., by Jonathan Cole; *Hilara media* Collin (Empididae), Afon Roe, Caernarvonshire, 6.vii; *H. barbipes* Frey (Empididae), River Monnow, Clodock, Hereford, 15.vi, formerly known only from Scotland, has been found at several localities on the River Monnow; *Dolichopus cilifemoratus* Macq. (Dolichopodidae), Paradise, Cambridge, 1.viii, abundant in a small marsh by the River Cam; *Hercostomus praetextatus* (Haliday) (Dolichopodidae), Traeth Dulas, Anglesey, 10.vii, on damp sand at the base of cliff seepages; *Syntormon monilis* (Haliday) (Dolichopodidae), Coe Fen, Cambridge, 1.viii; *Argyra elongata* (Zett.) (Dolichopodidae), Ely, Cambs., 28.viii; *Lonchoptera meijerei* Collin (Lonchopteridae), River Monnow, Skenfrith, Gwent, 15.vi, swept from wet shingle; *L. nigrociliata* Duda (Lonchopteridae), River Monnow, Clodock, Hereford, 15.vi, swept from wet shingle; *L. scutellata* Stein (Lonchopteridae), Coe Fen, Cambridge, 15.viii, swept from the edge of a ditch; *Epistrophe diaphana* (Zett.) (Syrphidae), Windsor Forest, Berks., 25.vii at *Heracleum* flowers; *Megamerina dolium* (F.) (Megamerinidae), Windsor Forest, Berks., 25.vii; *Acanthocnema glaucescens* (Loew) (Scathophagidae), River Monnow, Monmouth Cap, Hereford, 17.vi, found on exposed rocks and vegetation along with *Wiedemannia* species (Empididae).

SIMPSON, A.N.B. — The Syrphidae *Brachyopa scutellaris* R.-D. and *B. insensilis* Collin, both feeding at *Pyracantha* flowers, 11.vi.87, only one *insensilis* amongst many *scutellaris* in a wooded garden, 20 m from partly dead *Fraxinus* trees, near Leigh, Worcs.

STUBBS, A.E. — (1) Some notable craneflies (Tipulidae): *Limonia magnicauda*, 2 males, 1 female, Llyn Hafodol, Anglesey, on a floating mire, 11.vii.87 — this species was first discovered as British 10 years previously at the same locality; it is unknown elsewhere in Britain and has not yet been officially added to the British list. *Priocera subserricornis* (Zett.), male, Catfield Fen, Norfolk, 19.viii.87; both sexes, Woodbastwick NNR, Norfolk, by shaded ditches in alder carr, 20.viii.87; this cranefly was first recorded as British from Catfield in 1920 and was not found in Britain again until 1985 at Thompson Common, Norfolk. *Linonia* species indet., male, Kew Gardens, in a heated greenhouse, 28.vii.87; a species of African or Asian origin, which has not been seen in Britain before.

(2) Hoverflies (Syrphidae) in the Peterborough area: *Platycheirus discimanus* Loew, 2 females, Bourne Wood, Lincs., at *Prunus spinosa* blossom, 28.iv.87; *Melangyna barbifrons* (Fall.), female and *M. quadrimaculata* Verrall, both sexes, Southey Wood, Cambs., at *Salix* blossom, 5.iv.87; *Anasimyia interpuncta* (Harris), both sexes, Stanground, Cambs., *Glyceria* marsh, 8.v.87; *Cheilosia chrysocoma* (Meig.), female, Castor Hanglands NNR, Cambs., woodland ride, 26.v.87; *C. praecox* (Zett.), both sexes, Fineshades, Northants., woodland edge, at *Prunus spinosa* blossom, 23.v.87; *C. intonsa* Loew, female, Kingscliffe, Northants., at *Leontodon autumnale* flowers in church yard, 31.viii.87; *C. cynocephala* Loew, male, Sutton Heath, Cambs., at *Leontodon autumnale* flowers, 3.ix.87.

(3) Other flies: *Haematopota grandis* Meigen (Tabanidae), female, Walberswick NNR, Suffolk, 8.viii.86; *Metasyrphus latilunulatus* Collin (Syrphidae), male, Windsor Forest, Berks., at *Potentilla erecta* flowers, 22.vii.87; *Salticella fasciata* (Meig.) (Sciomyzidae), female, Gibraltar Point, Lincs., fore dunes, 9.ix.87.

COLEOPTERA

Beetle exhibits were rather down in numbers this year, several regular exhibitors being absent. Nevertheless, the standard was as high as ever, and the number of remarkable finds if anything on the increase. One rare beetle in particular appears to have had a good year (or coleopterists have had a good year of it) and that is *Odontaeus armiger*. This beetle appeared in three separate exhibits, those of Messrs Albertini & Hall, Foster and Parsons. I myself was very pleased to find another rare scarabaeid — *Trox sabulosus*, and in some numbers also. As always Professor Owen produced an extensive exhibit of extremely interesting beetles, but this time augmented with a live example of *Dytiscus lapponicus*. Much to everyone's delight, he then proceeded to feed the insect with scraps of meat, which it took voraciously. There were a few foreign beetles, Mr Barrington showed a large longhorn taken in Corfu, and Dr McClenaghan showed two foreign weevils imported into the UK. Other interesting finds were: *Ischnomera cinerascens*, a third British locality by Messrs Alexander and Clements of the National Trust, *Choleva elongata* new to Britain by Mr Collier, *Cryptocephalus nitidulus* by Mr Halstead, *Meloe violaceus* by Mr Henderson, and *Cymindis axillaris* by the Nature Conservancy Council.

ALBERTINI, M. and HALL, P. — *Odontaeus armiger* (Scop.), at mercury vapour light on the Chilterns escarpment at Grangelands, Lower Cadsden, near Princes Risborough, Bucks., 16.viii.87.

ALEXANDER, K.N.A. and CLEMENTS, D.K. — A selection of beetles mostly taken during the 1987 field season of the National Trust Biological Survey: *Bembidion litorale* (Ol.), several on sandy banks of R. Ouse, Beningbrough Park, N. Yorks., 22.vii.87; *Lucinus punctatulus* (F.), beneath stone, Dolebury Warren, Avon, 26.iv.87, and elytra of another found at Crook Peak, Somerset, 23.vi.87, both sites

being in the Mendip Hills; *Aeletes atomarius* (Aube), rotting fallen ash trunk within Lydney Park, Glos., 18.vi.87; *Prionocyphon serricornis* (P. Müll.), reared from pupa found in same ash as the *Aeletes*; *Drilus flavescens* (Fourc.), many swept on downs at Trottscliffe, Kent, 26.v.87; *Megatoma undata* (L.), on split/fallen beech, Leigh Park, Hall Place, W. Kent, 24.v.87; *Uleiota planata* (L.), beneath bark on felled large old elm at wood edge, Ightham Mote, Kent, 18.v.87; *Mycetochara humeralis* (F.), under bark of fallen oak boughs, Kedleston Park, Derby., 16.vi.87; *Anisoxya fuscula* (Ill.), beneath bark on ancient willow pollard, Walton Moor, Gordano, Avon, 17.x.86; *Ischnomera cinerascens* Pand., swept in woodland at edge of West Wycombe Park, Bucks., 12.vi.86, otherwise only known from Moccas Park, Here., and Duncombe Park, N. Yorks.; *Donacia aquatica* (L.), one of a small population found near Coniston, Cumbria, 28.vi.87, confirming the continued presence of this rarity at this site discovered in 1980; *Zeugophora subspinosa* (F.), swept from young aspen along ride in Petts Wood, S.E. London, 21.v.87; *Crioceris asparagi* (L.), swept from naturalized asparagus at Sandwich Bay, Kent, 9.vi.87; *Mesites tardii* (Curt.), two from under bark of fallen oak bough, Hayburn Wyke Wood, N. Yorks., 29.v.87; *Baris picicornis* (Marsh.), found singly at stem bases of *Reseda lutea* along trampled cliff top grasslands either side of Birling Gap, E. Sussex, 11.v. and 3.vi.87; *Platypus cylindrus* (F.), one of several found in boreholes of bark of tree, probably oak, felled as a horse jump in Sissinghurst Park, Kent, 13.v.87.

BARRINGTON, R.D.G. — Some insects from Corfu, including a large longhorn beetle.

COLLIER, M.J. — Coleoptera from the Norfolk coast: *Nebria livida* (L.), West Runton, 18.vii.83; *Dyschirius impunctipennis* Daw., Wells, 9.viii.86; *D. obscurus* (Gyll.), Cromer, 16.viii.86; *D. thoracicus* (Ros.), Wells, 9.viii.86; *Asaphidion pallipes* (Duft.), Cromer, 26.viii.85; *Bembidion ephippium* (Marsh.), Salthouse, 13.ix.87; *B. normannum* Dej., Brancaster, 3.vii.87; *Tachys scutellaris* Steph., Wells, 9.viii.86; *P. luridipennis* (Germ.), Salthouse, 13.ix.87; *Saprinus cuspidatus* Ihs., *Hypocaccus metallicus* (Herbst), *Baeckmanniulus dimidiatus* (Ill.), Brancaster, 29.vi.86; *Leiodes lunicollis* (Rye), (det. J. Cooter), Cromer, 26.viii.85; *Bledius bicornis* (Germ.), *B. diota* Schi., Salthouse, 16.viii.86; *B. longulus* Er., Sheringham, 16.v.87; *B. tricornis* (Herbst), Holme, 10.viii.86; *Cypha pulicaria* (Er.), Holme, 10.viii.86; *Diglotia mersa* (Hal.), Wells, 18.iv.87; *Lomechusa emarginata* (Payk.), Overstrand, 13.x.87, with the ant *Myrmica rubra* L.; *Limnichus pygmaeus* (Sturm), Cromer, 13.ix.87; *Dolichosoma lineare* (Ros.), *Malachius barnevillei* Put., Wells, 9.viii.86; *Coccidula scutellata* (Hbst.), Winterton, 21.ix.86; *Apion limonii* Kirby, Wells, 9.viii.86; *A. dissimile* Germ., Cromer, 16.viii.86; *Cleonus piger* (Scop.), Shepherds Port, 3.vii.87; *Pselactus spadix* (Herbst), *Ceuthorhynchidius dawsoni* (Bris.), Holme, 10.viii.86; *Tychius squamulatus* Gyll. (= *flavicollis* auct.), *Mecinus collaris* Germ., Brancaster, 3.vii.87.

Notable Coleoptera from various other localities: *Dyschirius politus* (Dej.), Homersfield, Suffolk, 14.viii.86; *Trechus discus* (F.), Flixton, Suffolk, 31.viii.86; *T. micros* (Herbst), Homersfield, River Waveney, 1.i.87; *Pterostichus gracilis* (Dej.), Stanford Battle Area, Norfolk, 26.iii.86; *Amara consularis* (Duft.), Flixton, Suffolk, 28.xii.86; *A. equestris* (Duft.), Santon Downham, Norfolk, 26.vii.87; *Abraeus granulum* Er., Homersfield, Suffolk, 2.xi.86; *Agathidium marginatum* Sturm, Santon Downham, Norfolk, 30.viii.87; *Choleva elongata* (Payk.), new to Britain, Chedgrave, Norfolk, 15.xii.85; *Nicrophorus vestigator* Hers., Santon Downham, Norfolk, 30.viii.87; *Euthia scydmaenoides* Steph., Sexton Wood, Norfolk, 4.v.86; *Coprophilus striatulus* (F.), Needham, Norfolk, 1.i.87; *Stenus butrintensis* Smet., Stanford Battle Area, Norfolk, 26.iii.86; *Aleochara sanguinea*

(L.) (det. R.C. Welch), Sexton Wood, Norfolk, 17.v.87; *Heterocerus hispidulus* Kiesenw., Homersfield, Suffolk, 2.viii.86; *Malthodes crassicornis* (Mak.), Epping Forest, Essex, 15.iii.87; *Henoticus serratus* (Gyll.), Sexton Wood, Norfolk, 17.v.87; *Halyzia sedecimguttata* (L.), Thetford, Norfolk, 24.v.87; *Enicmus rugosus* (Herbst), Santon Downham, Norfolk, 6.ix.87; *Synchita humeralis* (F.), Santon Downham, Norfolk, 7.vi.87; *Phyllotreta cruciferae* (Goeze), Homersfield, Suffolk, 30.iv.87; *P. flexuosa* (Ill.), Catfield, Norfolk, 25.v.87; *Longitarsus dorsalis* (F.), Harleston, Norfolk, 10.vi.87; *Lythraia salicariae* (Payk.), Catfield, Norfolk, 25.v.87; *Chaetocnema sahlbergi* (Gyll.), Haverthwaite, Westmorland, 26.vi.87; *Apteropeda globosa* (Ill.), West Harling Common, Norfolk, 16.v.86; *Apion vicinum* Kirby, Thompson Common, Norfolk, 12.ix.87; *Otiorhynchus raucus* (F.), Homersfield, Suffolk, 30.v.86; *Dorytomus tremulae* (F.), Lopham Fen, Norfolk, 26.vi.86; *Ceutorhynchus mixtus* Muls., Wiveton, Norfolk, 16.v.87; *C. pectoralis* Weise, Grantshouse, Berwickshire, 11.vii.87; *Phytobius quadricornis* (Gyll.), Thompson Common, Norfolk, 12.ix.87; *Sibinia primitus* (Herbst), Flixton, Suffolk, 24.viii.86; *Rhynchaenus testaceus* (O. Müll.) Santon Downham, Norfolk, 9.v.87.

FOSTER, A.P. — *Leptura scutellata* F., *Procræus tibialis* (B.&L.), *Prionocyphon serricornis* (P. Müll.), Hatfield Forest, Essex, 20.vi.87; *Licinus depressus* Payk., on a forest ride near Weeting, Norfolk, 29.vi.87; *Odontaeus armiger* (Scop.) taken at mercury vapour light at two sites: Foxhole Heath, Suffolk, 29.vi.87 and Mundford, Norfolk, 18.vi.87 and 21.viii.87; *Aphodius villosus* Gyll., common in rabbit burrows, Mundford, Norfolk, 29.vi.87; *Harpalus froelichi* Sturm, common at mercury vapour light at Foxhole Heath, Suffolk, 29.vi.87 and Mundford, Norfolk, 21.viii.87; *Licinus punctatulus* (F.), at two sites in the Mendip Hills: Crook Peak and Burrington Combe, 18.v.87; *Cetonia aurata* (L.), in a rose in a garden, Friern Barnet, London viii.87; *Cantharis abdominalis* F., Mallyan Sprout, Yorkshire, 13.vi.87, *Carabus monilis* F., in a water trap, Castor Hanglands NNR, Cambridgeshire.

HALSTEAD, A.J. — Some local or uncommon Coleoptera taken in 1987: *Ptilinus pectinicornis* (L.), on dead elm trunk, Therfield Heath, Herts.; *Halyzia 16-guttata* (L.), Rothamsted light trap, RHS Garden, Wisley, Surrey, 9.vii.87; *Mordella villosa* (Schr.), on wild carrot flower, Othery, Somerset, 5.viii.87; *Cryptocephalus nitidulus* F., on a rose leaf, Whitedown, Surrey, 31.v.87; *Amphimallon ochraceus* (Knoch), drowned in a rock pool, Porth Ysgo, Caerns. 8.vii.87; *Soronia punctatissima* (Ill.), Rothamsted light trap, RHS Garden, Wisley, Surrey, 21.ix.87; *Metoecus paradoxus* (L.), indoors in an office, RHS Garden, Wisley, Surrey, 22.ix.87; *Leptura sexguttata* F., on bracken frond, Eyeworth Wood, New Forest, 6.vi.87; *Cicones variegatus* (Hell.), on dead beech trunk, Whitedown, Surrey, 26.iv.87; *Omosita depressa* L., on bone, Eyeworth Wood, New Forest, 6.vi.87; *Melandrya caraboides* (L.), on ash trunk, Whitedown Surrey, 31.v.87; *Staphylinus erythropterus* L. running over turf, Pinkery Pond, Somerset, 31.vii.87.

HENDERSON, M. — Some beetles of the South Glamorgan Coast: *Nebria complanata* (L.) and *Chrysolina violacea* (Mull.) Merthyr Mawr Warren and Dunes in the Vale of Glamorgan, an area of high sand dunes, woodland and scrub by the estuary of the River Ogmore; *Brachinus crepitans* (L.) and several other carabids from East Aberthaw, a small area of salt marsh, limestone cliffs and old sand dunes; *Meloe violaceus* Marsh. Wentwood, an area of woodland in the Usk Valley near Newport.

JONES, R.A. — Some local and interesting beetles taken recently: *Eledona agricola* (Herbst), in dry powdery fungus on beech, Richmond Park, Surrey, 17.viii.86; *Stenostola ferrea* (Schr.), sweeping under lime trees, Scaynes Hill, Sussex, 24.v.87; *Rhizophagus parallelcolis* Gyll., under bark of small log, Nunhead

Cemetery, London SE15, 8.viii.87 (the so-called grave-yard beetle); *Anisoxya fuscula* (Ill.), sweeping under old lime trees, Nunhead Cemetery, 30.viii.87; *Trechus discus* (F.), under board on bare earth, Nunhead Cemetery, London SE15, 30.viii.87; *Platyderus ruficollis* (Marsh.), under board on bare earth, Nunhead Cemetery, 30.viii.87; *Cryptocephalus biguttatus* (Scop.), sitting on grass stem, Chobham Common, Surrey, 26.v.85; *Amara eurynota* (Panz.), running across pavement, Vauxhall, London SW8 (usually associated with 'open' ground, it is odd to find it on a central London flag stone); *Bembidion quinquestriatum* Gyll., running across sandy ride, Scaynes Hill, Sussex, 4.vii.87 (supposedly a dark-loving species, this specimen was running about in bright sunshine in company with *B.lampros* (Herbst)); *Trox sabulosus* (L.), in numbers under rotten sacking, Ambersham Common, Sussex, 23.viii.87; *Caenopsis waltoni* (Boh.), under board, Richmond Park, Surrey, 8.iii.85.

McCLENAGHAN, I. — *Diaprepes famelicus euriens* Gyll., a foreign weevil, found in a car in Hampshire, ix.87 (it was later learned that plants from Monserrat had been transported to a nursery in the car, the beetle was identified by Dr R. Thompson of the BM(NH), who said 'this subspecies occurs in St Kitts, Antigua, Monserrat and Dominica of the Lesser Antilles'); *Pentamerus fulleri* another foreign weevil (determined by M. Russell), in imported bunch of grapes, Essex, vii.87; *Prionus coriarius* (L.) indoors at light near South Thorndon Park, TQ6291 on the evening of 4.ix.77; *Nacerta melanura* (L.), indoors, Dagenham, Essex, 16 and 18.vi.86 (this beetle, usually found feeding on wood on the shore, was 3 km from the Thames); *Ospythia bipunctata* (L.), Thorndon Park, Essex, TQ 6290, (a male taken on 4.vi.86 and males taken in 1986 and a female in 1985 indicate that the species is well established in this site, 100 miles SSE from the Huntingdonshire site where most records are centred); *Tenebrio molitor* L., an imago which retained its pupal skin but with normal head, antennae and legs; *Aderus populneus* (Creutz.), at mercury vapour light, Southam, War., 21.viii.87; *Trechus discus* (F.), at mercury vapour light, Southam, War., 21.viii.87; *Pentarthrum huttoni* Woll., one of more than a dozen specimens in spiders' webs on wood in an old house, Kenilworth, War., x.87; *Euophryum confine* Broun in the same situation as *Pentarthrum*; *Atomaria zetterstedti* (Zett.), swept, North Thorndon Park, Essex, 28.vi.86 (not seen in UK for many years); *Ptilium exaratum* (Allibert), in compost heap, Witham, Essex, (new to Essex); *Nossidium pilosellum* (Marsh.), in hard fungus, Rivenhall, Essex, 8.vi.82; *Smicrus pilicornis* (F. & L.), in dung heap, Little Baddow, Essex, 6.v.85. (The last four species were determined by Mr C. Johnson of Manchester Museum.)

NATURE CONSERVANCY COUNCIL — Some beetles from Risby Warren, South Humberside: *Broscus cephalotes* (L.), an unusual inland record for this coastal species; *Harpalus anxius* (Dufts.), on sandy areas on dune; *Cymindis axillaris* (F.), in sparse grassland on sand, at northern edge of range; *Aphodius distinctus* (P. Müll.), on rabbit carcass; *Cardiophorus asellus* Er., open grassland on sandy soil; *Melanimon tibialis* (F.), another usually coastal species; *Orthocerus clavicornis* (L.), in sandy areas, another usually coastal species; *Otiorhynchus desertus* Rosen., on dry dune grassland; *Ceutorhynchus geographicus* (Goeze), on Viper's Bugloss.

OWEN, J.A. — *Nebria nivalis* (Payk.), Creag Meagaidh, Inv.; in a pitfall trap set near the summit at 1100m. Traps were set in June 1987 and retrieved in August 1987. This is a boreo-British species, confined in Britain to the summits of mountains in Scotland and the north of England. This is apparently the first record for the Monadliath range. *Dyschirius nitidus* (Dej.), Mouth of R. Kirtle, Dumfries, vi.87; crawling on bare sand. This species occurs at various coastal sites and has recently been taken on the Cumbrian coast on the south side of the Solway Firth. *Oreodytes*

alpinus (F.), Loch More, Caithness, iii.86. This was added to the British list at the end of 1985 and has not, so far, been taken outside the Caithness area. It is a boreo-British species occurring in Scandinavia but not Central Europe. *Leiodes litura* Steph. Loch Garten, ix.86; from an interception trap in a birch wood. *L.picea* (Panz.), Loch Garten, September 1986; also from the interception trap. *Colony viennense* Herbst, River Nethy, Inv. vii.87; from a shingle bank at the side of the river. This appears to be the first record for this species from Highland Scotland. *Eudectus whitei* Sharp, Aonach na Chrith, Wester Ross, vi.87; sieved from gravel and moss at 1020m. This species is known from the tops of a few Scottish mountains and from two or three sites in the Pennines. This would appear to be the most westerly record for the species in Britain. *Lathrobium ripicola* Czwalina, River Yarrow, Selkirkshire, vii.83; from riverside gravel. *Xantholinus tricolor* (F.) with *X.jarrigei* Coiffait for comparison. Glen Feshie, Inv. vii.87; under a stone on sandy bank at edge of a pine wood. Until recently, this species was confused with *X.jarrigei*. It would appear that *tricolor* is a northern species whilst *jarrigei* occurs mainly in the south. The infused pronotum of *tricolor* is a good distinguishing feature. *Hygropona cunctans* (Er.), Loch Vaa, Inv. vi.86; from moss at the edge of a swamp. There is an unpublished record for this species from Aviemore (P. Harwood). Otherwise there are records only from S. Hants., S. Devon and W. Cornwall. *Cyphon kongsbergensis* Munster, Gairloch, Wester Ross, viii.87; swept from moorland vegetation. This species was added to the British list a few years ago. It is known only from a few sites in north-west Scotland. It exists in several colour forms. *Aphodius nemoralis* Er. Rothiemurchus, Inv. v.87; from deer dung. *Atomaria procerula* Er., Loch Garten, vi.87; from mouldy bones set out as a beetle trap in a pine wood. This rare beetle is known mainly from Scottish pinewoods. This specimen appears to be the first recorded since the 1950s. *Phalacrus brunniipes* Bris., Loch Garten, Inv., vi.86; from a tussock in marshy ground. This appears to be only the second record for the species from Scotland. *P.substriatus* Gyll., Loch an Eilein, Inv., vi.86 swept in a marsh. The beetle is associated with *Narthecium ossifragium*. *Enicmus fungicola* Thoms. Cambus o'May, S. Aberdeen, vi.77, from a powdery fungus on a pine tree. Contrary to published indications, this species appears to be very much rarer in Scotland than *E.rugosus* (Herbst). *Phyllodecta pallida* (L.), Aonach na Chrith, Wester Ross, vi.87, on *Salix herbacea* at 800 m. This is the montane form of this species. The lowland form tends to be lighter and feeds on hazel. *Phyllodecta polaris* Schn. Beinn Eighe, Wester Ross, viii.87 at 1090m, from *Salix herbacea*. This beetle is known from near the summits of only six Scottish mountains but is probably more widespread. *Phyllotreta flexuosa* (Ill.) Loch Garten, Inv., vi.86, swept from grassy bank. *Polydrusus pilosus* Gredler, Loch Garten, vi.87 — green form; Taynult, Argyll, iv.71 — brown form; beaten on both occasions from birch. This species is close to *P.cervinus* (L.) but is larger with hairs on the femora whereas *cervinus* has elongated scales. Associated in the literature also with conifers but the nature of the association so far unexplained. *Sitona ambiguus* Gyll. (= *lineelus* Lind.), Loch Garten, vii.85, swept from roadside. This species is close to *S.lineelus* Bonsdorf and is best distinguished on the shape of the aedeagus. This is figured by Kevan erroneously under the name of *lineelus* Bonsdorf. *S.lineelus* (Bonsdorff) (= *decipiens* Lind.) Eochar, S. Uist, vii.78 swept on machair. This species has a coastal distribution, in Britain mainly in the west and north. The aedeagus is figured by Kevan under the name *decipiens*. The beetle is reported in Britain to be associated with *Vicia cracca* and *Lathyrus pratensis*. *Furcipes rectirostris* (L.), Invermoriston, Inv., vi.87, beaten from flowering bird cherry (*Prunus padus*). Added to the British list in 1981 from specimens taken in West Cumbria (R.W.J.).

read), the beetle has been recorded since from Yorkshire and mid-Wales. *Dytiscus lapponicus* Gyll., a living example in a large jar of water.

PARSONS, M. — *Odontaeus armiger* (Scop.), taken at mercury vapour light, Mundford, Norfolk, 18.vi.87.

HEMIPTERA

The Hemiptera were particularly poorly represented at this year's exhibition. Only three exhibits graced the tables of Imperial College, and of these, two were only of a single specimen each, the third a composite exhibit with other orders alongside. One of Britain's largest frog-hoppers *Ledra aurita* was displayed by Eric Bradford, but even this 'large' insect was dwarfed by Rupert Barrington's Greek cicada. The Nature Conservancy Council did well to save the day for both Homoptera and Heteroptera, and showed a selection of local species including in particular the fifth British record for *Ortholomus punctipennis*.

BARRINGTON, R.D.G. — Some insects from Corfu, including a large cicada.

NATURE CONSERVANCY COUNCIL — Some bugs from Risby Warren, South Humberside: *Sehirus luctuosus* (M. & R.), on forget-me-nots on disturbed ground, this species is at the northern edge of its range; *Ortholomus punctipennis* (Herr.-Sch.), fifth British locality and the first for Norfolk; *Peritrechus lundii* (Gmelin), in areas of low vegetation with bare ground; *Trapezonotus arenarius* (L.), usually a coastal species; *Mecomma dispar* (Boh.), amongst long grass; *Macropsis impura* (Boh.), on creeping willow in damp hollows; *Psamotettix sabulicola* (Curt.), normally a coastal dune species; *Scleroracrus decumanus* (Kont.), on dry grassland, an unusually northerly record; *Graphocraerus ventralis* (Fall.), in dry grassland.

BRADFORD, E.S. — A single example of *Ledra aurita* (L.), from Childs Forstal Wood, Kent, 16.xi.86.

HYMENOPTERA

The number of hymenopteran exhibits increased this year although interest in Britain's largest order still lags behind the Diptera and Coleoptera. Much still remains to be learned about the distribution, abundance and habits of many of the Hymenoptera, and all exhibits are of value in helping to supply this information.

ALEXANDER, K.N.A. and CLEMENTS, D.K. and A. — Some Symphyta and aculeate Hymenoptera taken in recent years during biological surveys of National Trust properties. The Symphyta consisted of *Abia sericea* (L.), a local species from Red Moor, Bodmin, Cornwall, on 7.vii.83 and at Plumpton, E. Sussex, on 4.vi.87; *Zaraea fasciata* (L.) taken at Bishops Frome, Herefordshire, on 17.vii.84; *Trichiosoma lucorum* (L.) at Bridestone, N. Yorks., on 9.vii.87; *Sirex noctilio* F., from a small clump of planted pines on Rodborough Common, Glos., on 28.viii.87. The first three species are in the Cimbicidae family, while *S. noctilio* is in the Siricidae. The aculeates exhibited, which were determined by Dr M.E. Archer, included *Ceratina cyanea* (Kirby) (Xylocopidae) taken on Witley Common, Surrey, on 9.vii.86. Three solitary wasps of the Sphecidae family were also shown. These were *Crossocerus binotatus* Lep. and Brullé at Wimpole Park, Cambs., 2.ix.86; *Rhopalum coarctatum* (Scop.) at Hatfield Forest, Essex, 12.ix.86; *Gorytes quadri-fasciatus* (F.) from Bellister, Northumberland, 21.viii.86 — a record that considerably extends the northern limit to the range of this species.

ARCHER, M.E. — Some notable aculeate bees and wasps taken in recent years in the Breckland or Suffolk sandings. One of these, *Philanthus triangulum* (F.)

(Sphecidae) is a Red Data Book category 2 species. A female with its honey bee prey was taken at West Stow Country Park, Suffolk, 15.viii.84, and a male was found at Nacton Heath, Suffolk, on 15.viii.76. The exhibit also contained four Red Data Book category 3 insects. These were the sphecid wasps *Podalonia affinis* (Kirby) at Dunwich Heath, Suffolk, 14.vii.87, and Thetford Warren, 6.vii.87; *Argogorytes fargeii* (Shuck.) at Cavenham Heath, 8.vii.87; and the halictid bees, *Halictus confusus* Smith at Thetford Warren, 14.viii.84, and Cavenham Heath, 15.vii.83; *Lasioglossum brevicorne* (Schenck) at Thetford Warren Lodge, Norfolk, 14.vii.83. Two aculeates more usually found in coastal areas, the sphecid wasp *Oxybelus argentatus* Curtis and the colletid bee *Colletes marginatus* Smith were taken at Thetford Warren Lodge on 14.vii.83. Some other local sphecids were *Crabro scutellatus* (Scheven) at Dunwich Heath, Suffolk, 14.vii.87; *Ectemnius rubicola* (D. and P.) at Cavenham Heath, 8.vii.87; *Lindenius panzeri* (Vand. Lind.) at Lower Hollesley Common, Suffolk, 11.vii.87, and near Hockham, Norfolk, 13.vii.83; *Oxybelus mandibularis* Dahl. at Cavenham Heath, 15.vii.83; *Gorytes tumidus* (Panz.) at Dunwich Heath, Suffolk, 13.vii.87.

BARRINGTON, R.D.G. — A collection of insects taken on Corfu in June, 1987. This included several Hymenoptera such as the carpenter bee, *Xylocopa violacea* (L.), a parasitic wasp *Scolia flavifrons*, and a hornet.

CRIBB, P.W. — A hornet taken in Normandy, France, 25.vii.87.

HALSTEAD, A.J. — Some sawflies and wasps taken or bred in 1987. Three workers of the social wasp, *Dolichovespula media* Retz., a species new to Britain in 1980. These specimens were taken at an oak sap run at RHS Garden, Wisley, Surrey, on 27–28.vii.87 and are believed to be the third UK record and the first for Surrey. This large wasp is of variable colour and one specimen exhibited had an almost entirely black abdomen. Apart from a specimen of *Neurotoma saltuum* L. (Pamphiliidae), bred 11.vi.87 from larvae on pear at Slough, Bucks., all the sawflies exhibited belonged to the Tenthredinidae family. These were *Eutomostethus punctatus* (Konow), Chobham Common, Surrey, 28.vi.87; *Tenthredo distinguenda* (Stein), Odiham Common, Hants., 13.vi.87; a very melanic female *Tenthredo ferruginea* Schrank with just traces of red colour on the sides of the abdomen, RHS Garden, Wisley, 3.vi.87; *Croesus varus* (Vill.), King's Sedge Moor, Somerset, 5.viii.87; *Pristiphora subbifida* (Thomson), bred from larvae on field maple at The Slade, Cold Ash, Berks, emerged 29.iv.87; *Nematus crassus* (Fallen) and *N. capreae* (L.) both RHS Garden, Wisley, 1.vi.87; *Pachynematus vagus* (F.), RHS Garden, Wisley, 16.v.87.

MCLEAN, I.F.G. — A female solitary bee *Andrena hattorfiana* (F.) taken on a Field Scabious flower growing by the roadside at Foxhole Heath, Suffolk, 15.viii.87.

MILES, S.R. — Some local solitary bees taken in recent years. These were a female *Andrena hattorfiana* (F.) taken 9.viii.86 on a Field Scabious flower at Croxton Heath, Norfolk; a female *A. fulvago* (Christ) taken 3.vii.85 at Dolebury Warren, Avon; a male *A. bucephala* Steph. on hawthorn blossom, 7.vi.86, at Windsor Forest, and a female on sycamore blossom, 16.v.87, at Windsor Great Park, Berks.; a male *Melitta dimidiata* Morawitz from Tilshead, Salisbury Plain, Wilts., 5.vii.86. The last species was first taken in Britain in 1949 and is only found in the Salisbury Plain area. The exhibitor noted that on a dull afternoon five males were seen at rest on a field scabious flower and three males on a flower of greater knapweed. Such congregations had not previously been observed in this species. The females are associated with sainfoin.

NATURE CONSERVANCY COUNCIL — a display of notable insects found at Risby

Warren, South Humberside. This included *Hedychridium cupreum* (Dahlbom) (Chrysididae) taken on dune areas with bare sand.

NEUROPTERA, MEGALOPTERA AND MECOPTERA

Neuroptera were well represented this year, with several examples of the hook winged lacewing being exhibited. This scarce species does seem to have become more frequent in recent years. A species new to Britain was exhibited by Colin Plant.

ALBERTINI, M. and HALL, P. — A specimen of *Drepanopteryx phalaenoides* (L.) taken 21.viii.87 at mercury vapour light amongst mature scrub on the Chiltern escarpment at Bacombe Hill, near Wendover, Bucks.

COLLINS, G.A. — A specimen of *Drepanopteryx phalaenoides* (L.) beaten from oak at Croham Hurst, Surrey, on 20.ix.87. This is the fourth recent record from the Croydon area.

O'KEEFE, D. — A male *Drepanopteryx phalaenoides* (L.) taken at a mercury vapour trap at Petts Wood, Kent, on 1.x.87.

PLANT, C. — *Hemerobius fenestratus* (Tjeder) (Neuroptera: Hemerobiidae), a species new to Britain. The specimen was collected during the BENHS field meeting at Etchden Wood, Kent, on 9.ix.86. It is similar to *H. contumax* (Tjeder) and *H. pini* (Steph.), both of which occur in Britain. A paper is in preparation which will add this lacewing to the British list and provide a key for separating these three species. Also exhibited on behalf of the Passmore Edwards Museum (Essex Biological Records Centre) was a case of the 38 species of Megaloptera, Neuroptera and Mecoptera recorded in Essex since 1980, with distribution maps based on 10-km squares. These are Megaloptera: *Raphidia cognata* Rambur, *R. notata* F.; *R. xanthostigma* Schummel, *Sialis lutaria* (L.); Neuroptera: *Sisyra fuscata* (F.), *Conwentzia pineticola* Endelein, *C. psociformis* (Curt.), *Semidalis aleyrodiformis* (Steph.), *Parasemidalis fuscipennis* (Reuter), *Coniopteryx borealis* (Tjeder), *C. tineiformis* Curt., *Psectra diptera* (Burmeister), *Micromus variegatus* (F.), *M. paganus* (L.), *Hemerobius humulinus* L., *H. lutescens* F., *H. micans* Oliv., *H. nitidulus* F., *H. stigma* Steph., *Symphorobius elegans* (Steph.), *S. pellucidus* (Walk.), *S. pygmaeus* (Rambur), *Wesmaelius betulinus* (Ström), *W. subnebulosus* (Steph.), *Chrysopa albolineata* Killington, *C. carnea* Steph., *C. ciliata* (Wesm.), *C. commata* Kisdujhelyi, *C. flava* (Scop.), *C. flavifrons* Brauer, *C. perla* (L.), *C. septempunctata* Wesm., *C. ventralis* Curt., *C. prasina* Burmeister, *C. vittata* Wesm., *Nothochrysa capitata* F.; Mecoptera: *Panorpa communis* L., *P. germanica* L. The county has an active recording scheme for these groups and further Essex records or specimens with data for identification are invited by the exhibitor.

ORTHOPTERA

CLEMENTS, D.K. and ALEXANDER, K.N.A. — Two examples of the rare macropterous form *burri* Ebner of *Conocephalus dorsalis* (Latr.) (Tettigoniidae). One specimen was an extreme form taken at Newtown, Isle of Wight, 18.viii.82; the other was intermediate with the normal short-winged form and came from Winchelsea, East Sussex, 11.vi.87.

ARACHNIDA

BARRINGTON, R.D.G. — A case of insects collected on Corfu in June, 1987, which included the poisonous scorpion, *Buthus occitanus*.

ILLUSTRATIONS

BARRINGTON, R.D.G. — Two water colour paintings of (1) the Little Owl and (2) the Large Tortoiseshell butterfly.

BENHS — A light box showing colour transparencies taken by nine members of the Society. The slides depicted a wide range of natural history subjects taken abroad and in the British Isles. A list of the slides shown by members is lodged in the Society's rooms.

GREATOREX-DAVIS, N. and WESTWOOD, N. — A display incorporating maps and photographs of the habitats of butterflies from France and the Pyrenees. Accompanying the display were several drawers of specimens collected in those areas with information about the habitats.

MANNING, D.V. — Photographs of some microlepidoptera taken in Bedfordshire.

NATURE CONSERVANCY COUNCIL — A stand exhibiting maps and illustrations covering the work of those concerned with the Invertebrate Site Register of the British Isles in all its aspects.

OWENS, D.J.M. and J.W. — Photographs of Red Data Book beetles from various localities in the British Isles.

PORTER, J. and CHURCH, S.H. — Photographs of the larvae of British Macrolepidoptera. This comprehensive collection, built up over the years requires approximately 56 species to complete the series. Also shown were photographs of the greater proportion of the imagines of the British Macrolepidoptera.

REVELS, R. — An exhibit of colour photographs of a wide variety of the fauna and flora of the British Isles.

ROBINSON, G.S. — A display entitled 'Keratin moths and fungi in Asian rain forests', including a map and four paintings in colour of Tineidae moths associated with raptor pellets, carnivore faeces, feathers and small rodent and bird corpses. The keratin and fungi appear to be an association conducive to larval feeding.

RUSSELL, M. — Several large scale and finely detailed drawings in colour of various weevils, plus others of a variety of natural history subjects.

STUBBS, A. — Photographs of stratiomyid larvae and some of their various food sources—Grass cuttings, flooded areas, old grapefruit skins etc.

TWEEDIE, M.W.F. — A very interesting series of photographs showing the tracks made by various arthropods running or moving over a smooth prepared surface of fine dry sand. Also shown were 24 colour transparencies of British geometrid moths.

INDOOR MEETINGS

23 July 1987

The Editor, Mr R.A. JONES in the Chair.

EXHIBITS

Mr R.A. JONES showed three specimens of *Aepopsis (Aepus) robini* (Laboulbene) (Coleoptera: Carabidae) taken from thin silt-filled cracks in the chalk rocks below the high water mark between Eastbourne and Beachy Head, 12.x.75. This is one of the truly sublittoral insects. It occurs in association with *Anurida maritima* (Guérin) (Collembola: Hypogasturidae) upon which it may prey. This locality marks the eastern-most point of the beetle's British range.

Mr M.J. SIMMONS exhibited a specimen of the aberration ab. *radiata* of the butterfly *Lycaena phlaeas* (L.). In this aberration the copper band on the hindwing is reduced to copper streaks running along the veins. The adult butterfly emerged on 4/5.vi.87; it had been bred from a larva purchased from a dealer in autumn 1986. An attempt had been made to breed from the specimen and eggs were laid on *Rumex* sp. 3 to 4 weeks earlier. To date, however, no eggs had hatched and so it is probable that the eggs are infertile.

COMMUNICATIONS

The Secretary, Dr J. MUGGLETON, on behalf of Mr A.J. Halstead, read out details of the Sawfly Study Group drawing attention to the existence of this embryonic group and asking for new members.

Mr R.A. JONES reported that he had recently seen *Melanargia galathea* L. in great profusion on the South Downs between Newhaven and Seaford.

Mr G. PRIOR reported that there had been an apparent upsurge in numbers of both *Aphantopus hyperantus* L. and *M. galathea* this year and unusually they outnumbered *Maniola jurtina* L.

LECTURE

Dr R. KEY spoke about the terrestrial invertebrates that inhabit the littoral fringes of coast and estuary. Such habitats appear to be among conservation's neglected areas. Strandlines of rotting seaweed, crumbling boulder clay cliffs, accumulations of driftwood, flaking shale beaches and freshwater seepages down cliffs and across the shore support no notable plant or bird communities, and it remains to the entomologist to identify the value of such areas and press for their conservation. The diverse communities of beetles, flies, woodlice, spiders, false scorpions etc. include many species with very restricted geographical range and the ecology of most species is very poorly understood: many appear to depend on the continuity of very unstable substrates. Some of their habitats are threatened by activities ranging from major coastal engineering projects to the clearing of 'unsightly' strandline material on popular beaches and the burning of driftwood at beach parties! Through the mechanism of the Invertebrate Site Register, the Nature Conservancy Council is aiming to identify the best representative examples of these habitats and use the SSSI mechanism to ensure their conservation.

10 September 1987

Joint meeting with the London Natural History Society

EXHIBITS

Col. A.M. EMMET exhibited some set specimens of *Coleophora caespitiella* Zell. reared 7-14.iv.87 from larval cases collected on jointed rush (*Juncus articulatus* L.) and compact rush (*J. subuliflorus* L.) in September 1986 at High Wood, Duddenhoe End and Chalkney Wood, Earl's Colne, both north Essex. Although this species is generally regarded as a rarity, it is in fact common, at any rate in north Essex, but may be missed by collectors because the larvae occur earlier than most other seed-feeding coleophorids. Ten living larvae collected at High Wood on 8.ix.87 were also shown.

Mr C. PLANT showed two dead longhorn beetles found with imported resin at Hainault, Essex. They had not been identified but were possibly a *Monochamus* sp.

Mr P.R. HARVEY showed an unidentified hoverfly taken at Val di Farma, Tuscany, Italy, on 17.viii.87, in a meadow surrounded by mixed woodland. It appeared to be a hornet mimic.

Mr. R.A. JONES showed a specimen of *Grammoptera ruficornis* (F.) (Coleoptera: Cerambycidae) from Nunhead Cemetery, 13.vi.87, together with representative specimens of *G. ruficornis* and *G. variegata* (Germ.) from the Society's collections. Separation of these species by British authors has generally rested on insect size and the colour of the legs and antennae. The specimen from Nunhead conformed in all of these with descriptions of *G. variegata*. However, microscopic examination of microsculpture and pubescence revealed little if any difference from 'typical' examples of *G. ruficornis*. Reference to Freude, Harde and Lohse (*Die Käfer Mitteleuropas*, 1966; 9, 28) reveals a character which is visible to the naked eye, but which does not rely on extremely variable coloration. *G. ruficornis* has the second antennal segment clearly longer than broad, whereas *G. variegata* has the second segment about as long as broad. This simple character appears to have been overlooked by British authors.

Mr Jones also showed an abandoned embryo wasp nest found in the attic of his Nunhead house. It contained about 40 cells, of which six or seven showed signs of one-time occupancy. The small nest was fixed to a rafter near the eaves and was initially hidden from view by another large empty nest some 20 inches in diameter. A dermestid beetle larva found in the embryo nest was displayed.

Mr I.D. FERGUSON exhibited some pupae of the vestal moth, *Rhodometra sacraria* L., bred from one of three females taken at light on 22.viii.87, near Bough Beach in Kent. The parent may have arrived in the UK on about 16.vii.87 (when the species was taken at light in the exhibitor's garden in Orpington) and be associated with the weather pattern that resulted in rain containing sand said to be from the Sahara.

Mr C.C. PENNEY showed an interesting form of the Mottled Beauty moth, *Alcis repandata* L. taken on 3.vii.87 at Wyndcliff, Tintern, Glos. The wings had a whitish ground colour with strongly contrasting dark bands.

Mr B.K. WEST showed a specimen of the Pebble Hook-tip moth *Drepana falcataria* L. from Dartford, Kent, which showed a slight melanistic trend. Some specimens of *D. falcataria* f. *scotica* Byt.-Salz from Newtonmore, Invernesshire and Pontoon, Co. Mayo, were shown for comparison. Mr. West also showed some larvae of the little thorn moth, *Cepphis advenaria* Hübn. found on bilberry at Pontoon, Co. Mayo, on 1.ix.87. The finding of *advenaria* larvae in Ireland, and the adult moth in Co. Mayo, does not seem to have been recorded before. [See amendment at meeting of 24 September.]

Prof. J.A. OWEN showed examples of two beetles, *Nebria nivalis* (Payk.) and *Eudectus whitei* Sharp, taken by pitfall traps set at the summit of Ben Macdui (1300 m) in connection with the BENHS field meetings held on Speyside in July 1987. In Britain *N. nivalis* is known only from the tops of a few mountains. *E. whitei* is found in similar situations in Scotland but occurs also at two or three sites in the Pennines. The two species are considered to be post-glacial relict species. Both occur in Scandinavia but neither occurs in the mountains of central Europe.

MEMBERSHIP

The names of R.J. Kemp, Ruth C. Day, Martin J.J. Vesely, John Edmund Maskrey, John Patrick Flynn, Simon J. Grove and Jonathan Henry Cole were read for the second time and duly elected as members.

ANNOUNCEMENTS

The Secretary, Dr J. MUGGLETON, reminded members that the venue for the Annual Exhibition had changed this year to the Imperial College. A request for assistance in running the Exhibition and manning the BENHS stand at the AES exhibition was made.

Mr C.B. ASHBY drew the meeting's attention to some London Natural History Society's publications. These were issues 2 and 5 of *The London Atalanta* — the newsletter of the entomology and ecology section of the LNHS. These issues contain articles on dragonflies in the London area. Details of the forthcoming book *Butterflies of the London area* by Colin Plant were also given. Mr Ashby said he was willing to provide a display cabinet for colour transparencies at the Annual Exhibition as had been done last year. He asked members to let him know how many slides they wanted to display or if they preferred to have them projected.

COMMUNICATIONS

Mr J.M. CHALMERS-HUNT reported that he had seen his first two Painted Lady butterflies of the year on 9.ix.87 at the Isle of Sheppey. Other members reported seeing this species in South Devon in late August and in the Scilly Isles in June.

Mr B.K. WEST described how he had set up a mercury vapour light by a lake and wood at Pontoon, Co. Mayo, on 28.viii.87. Within a very short time he had to pack up when the light became inundated with caddis flies. Mr West also noted a trend in recent years towards fictional entomology. He quoted examples from some recently published local lists of moths where statements regarding food plants and flight periods did not tally with the data recorded in the lists.

Mr E. BRADFORD said that light traps can sometimes be overwhelmed by the pyralid moth, *Acentria nivea* Ol. Mr Chalmers-Hunt noted that this species has winged and wingless females, so only some females plus the males come to light.

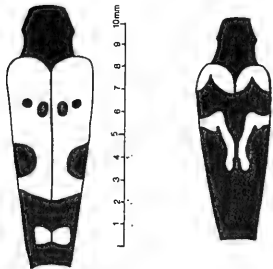
LECTURE

Mr STEPHEN BROOKS gave a talk on dragonflies in the London area, i.e. within a 20 mile radius of St Paul's Cathedral. He is the Odonata recorder for the LNHS and has been compiling records since 1980, with the intention of producing a provisional report in late 1988. Mapping is done on the basis of 2-km squares and recording cards which allow the recorder to note details of dragonfly behaviour will soon be available. Mr Brooks described the species found in the London area, their habitat requirements and distribution. A comparison was made with the survey carried out by Cynthia Longfield in 1949. Most of the 26 species found by Longfield still occur, although some have become more scarce while others have increased in abundance. Details are given in Mr Brooks' article in *The London Atalanta* No. 2 March 1987. In addition to the British Odonata, 14 exotic species have been recorded in the glasshouses of an aquarium plant nursery at Enfield, Middx.

24 September 1987

EXHIBITS

Mr R.A. JONES showed two specimens of *Strangalia maculata* (Coleoptera: Cerambycidae). One was of the normal form, the other was a very dark variety taken in Abbot's Wood, Sussex 10.vii.71. The forms of this very variable beetle have been figured and named by Kaufman (*Ent. Mon. Mag.* 82: 115-117) but the exhibited specimen was darker than any of these. The yellow markings were reduced to a narrow undulating bar at the base of each elytron, and a lunate spot at the median point. The specimen was also rather small.



'Typical' and dark variety of *Strangalia maculata* shown by R.A. Jones

Mr A.J. HALSTEAD showed a female *Metoeocus paradoxus* L. (Coleoptera: Rhipiphoridae) found dying in his office at RHS Garden, Wisley, Surrey. This rare beetle has larvae which develop as parasitoids in wasp nests, usually in those of *Paravespula vulgaris* (L.), although *P. germanica* (F.) and *Vespula rufa* (L.) nests also sometimes produce the beetle. The literature states that the beetle breeds in nests in the ground, implying that nests in roof spaces are not suitable. There is a nest of *P. vulgaris* somewhere under the floorboards of the first floor office where the beetle was found and while there is no certainty that it came from this nest, it is a reasonable assumption that it did.

Mr M.J. SIMMONS showed two variations of the Large Copper butterfly (*Lycaena dispar* Haw.) bred from stock obtained from a dealer. Out of 11 larvae that successfully overwintered and pupated, only two females emerged. One had the forewing spots in spaces 4 and 5 elongated and reaching the discal cell in the upper variant. The other female had slight elongation of the spot in space 1. Matings were achieved with these females and the resulting larvae are now hibernating.

Prof. J.A. OWEN showed two specimens of the weevil *Apion semivittatum* Gyll. found on 21.ix.87 on the 'weed' *Mercurialis annua* L. growing on his wife's allotment at Epsom. This is apparently the first record for the beetle from Surrey. The plant is widely distributed south of a line between the Wash and the Severn. In the group of allotments, it is almost confined to the one plot which probably reflects its introduction as seed from discarded sievings brought back from collections in the field. The weevil, in contrast, is largely confined to the south-east corner of England. In Canon Fowler's time, towards the end of the last century, the beetle was known from only one locality in Kent. It breeds in the stem of the plant forming galls. The plant dies at the end of the season but what the adult weevils do until the plant appears again next July remains to be determined.

MEMBERSHIP

The names of John Bryan Formstone, Simon Roderick O'Connor, Andrew Fielder, John Howard Payne and Ivan Perry were read for the second time and duly elected as members.

ANNOUNCEMENTS

Mr M.J. SIMMONS displayed a letter sent by the Avon and Somerset Constabulary concerning the theft of a large number of British moths and butterflies taken from the Bristol City Museum between 1983 and 1986. These were mainly from the collections of Bartlett, Coney, Lodge, Blatchford and Norgrove. A photocopy of sample labels similar to those on the missing specimens was also sent. Mr G. Prior said he thought as many as 4000 specimens had been taken and that they had probably gone overseas.

The Secretary, Dr J. MUGGLETON, asked for members to help at the Annual Exhibition at Imperial College and at the AES exhibition.

Mr C.B. ASHBY asked members to sign a list if they had slides for display at the Annual Exhibition. An illuminated cabinet capable of holding up to 120 slides would be provided.

COMMUNICATIONS

Col. A.M. EMMET reported that Mr J.M. Chalmers-Hunt had found plenty of the coleophorid exhibited at the previous meeting when he visited High Wood, Duddenhoe End, Essex. Larvae of *Eupithecia trisignaria* H.-S. were also found.

Col. Emmet also said that he had taken a specimen of *Mythimna vitellina* Hübn. in his garden on 16.ix.87, a first record for north Essex.

Mr B.K. WEST stated that the *Cepphis advenaria* larvae from Pontoon, Co. Mayo, exhibited at the previous meeting had now grown too large to be that species. It is believed that they are an unusual colour form of the Scalloped Hazel, *Odontoptera bidentata* Clerck.

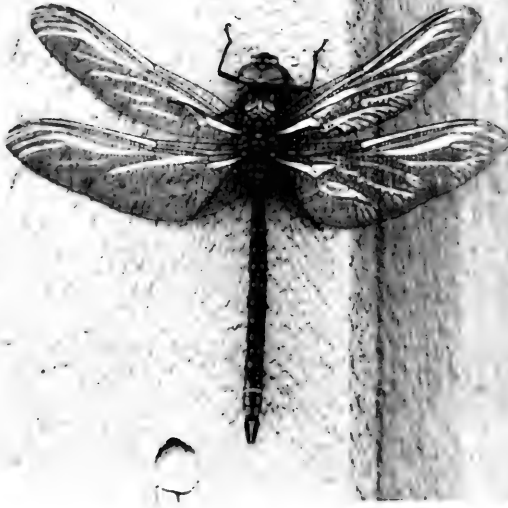
Mr C. PLANT reported by letter that the longhorn beetles he had shown at the previous meeting had now been identified as *Monochamus galloprovincialis* Ol. Two dead females and a live male were found at Hainault, Essex, in pine wood packaging used to import paint pigment from Germany. They had been found by the local Environmental Health Inspector.

Mr R.A. JONES described seeing a harvestman apparently drinking from a saucer of milk provided for a cat in his Nunhead garden.

Mr E. BRADFORD said that while on a walk near Faversham he had found an open fronted farm building. It was about 100 feet long and contained loose straw and litter where sheep or cattle had been kept. When the litter was disturbed, large numbers of the gelechid moth *Oegoconia caradjai* Pop. G. and Cap. flew up. Eighteen of the twenty specimens taken turned out to be males. Also present were the pyralid moths *Aglossa pinguinalis* L. and *Pyralis farinalis* L.

LECTURE

Mr C.B. ASHBY gave members an opportunity to share with him a viewing of some of the excellent colour transparencies he has taken over the years. Under the title 'From *Eulophus* to Lapland' he covered many topics including moths and caterpillars, the development of the parasitoid *Eulophus*, birds in flight, butterfly houses and the Stig Torstenius collection of Scandinavian butterflies and moths. He closed his talk with slides of the plants, birds and scenery of Sweden and Lapland where he and Mr Torstenius have collected.



Aeshna caerulea, the Azure Hawker, on the wall of a stuga in Northern Lapland (this species is also known from north west Scotland, northern Europe and Russia). From a slide shown by Mr C.B. Ashby.



The ectoparasite *Eulophus larvarum* on the larva of the vapourer moth. From a slide shown by Mr C.B. Ashby.

8 October 1987

The President Prof. J.A. OWEN announced the death of special life member, Mr D.G. Sevastopulo, who had been a member since 1923.

The President welcomed to the meeting two visitors from the Museum of Bonn, Dr D. Stüning and Dr W. Speidel.

EXHIBITS

Mr R. SOFTLY exhibited a live specimen of Blair's Shoulder Knot moth, *Lithophane leautieri* Boursin. This species was first found in Britain on the Isle of Wight in 1951. It is now common in Surrey, West Kent and South Essex, but otherwise does not seem to have been recorded in the London area. The specimen shown came from Hampstead and is the first record for that part of London.

Mr R.A. JONES showed a specimen of the pseudoscorpion *Pselaphochernes scropioides* (Hermann) from a nest of the ant *Formica rufa* L. in Pippingford Park, Sussex, on 3.xii.77. This pseudoscorpion was at one time thought to be a mere straggler in ant nests, but can on occasions occur in large numbers within a nest. December is a good time to look for myrmecophiles, as the ants are relatively inactive and nests more easily examined.

Mr M.J. SIMMONS showed a female Brown Hairstreak butterfly, *Thecla betulae* L., with a small dark spot near the apex of the white transverse band on the underside of the left forewing. The spot consisted of red-brown scales surrounded by yellow-brown scales, with an outer zone of white scales on the left hand side. The specimen was from an F₁ generation from stock bought from a dealer, and was the only one out of 120 adults to show this aberration.

Mr A.J. HALSTEAD showed an alder leaf (*Alnus incana* L.) which was being mined by the sawfly *Heterarthrus vagans* Fall. This widespread species was collected at the RHS Garden, Wisley, Surrey. Like other members of its genus, this species spins a flat, circular cocoon attached to the upper or lower inner surface of its mine. Before completing its cocoon, the larva nibbles round the edge so that the leaf disc, with the cocoon attached, drops out of the leaf.

Prof. J.A. OWEN showed two beetles closely associated with the ant *Lasius brunneus* Lat. — *Batrissodes bugueti* Aube (= *adnexus* (Aube)) taken 19.viii.86 in Windsor Great Park and *Euconnus pragensis* (Machulka) taken at the same locality on 27.ix.87. The former was from a nest of the ant exposed by sawing into sections a fallen oak tree. The latter occurred in frass from the base of a beech stump which harboured another nest. The beetles are considered very rare but this may reflect the difficulty of getting access to nests of the ant, which are normally deep inside the trunks of living trees.

MATTERS ARISING

Col. A.M. EMMET said that David Agassiz had also found the coleophorid *Coleophora caespititiella* Zell. in good numbers at Duddenhoe End, Essex, confirming that it is common in that locality.

Mr K. HALSTEAD said that earlier in the year he had found six dead female *Metoecus paradoxus* L. in an attic with a wasp nest near Brockenhurst, Hants. This is confirmation that the beetle does occur in roof space nests.

COMMUNICATIONS

Mr M.R. BROWN reported that while looking for moths on ivy flowers at Bean, near Dartford, Kent, on 1.x.87 he saw a newt curled round the base of an inflorescence. It was about 3 feet above ground level. Prof. Owen said that he had

seen frogs in Australia gathered around the base of a lamp post waiting for moths to flutter down.

Dr I. McLEAN displayed the newly published *Red data book for insects*, copies of which will be on sale at the Annual Exhibition for £10.

Mr A.J. HALSTEAD reported that a female convolvulus hawkmoth, *Agrius convolvuli* L., had been found at rest on the wooden door of a glasshouse at RHS Garden, Wisley, Surrey, on 5.x.87. Dr McNulty said that three *A. convolvuli* had been seen on the Gower Peninsular.

Mr R. SOFTLY said that the warden of the Adelaide Road Nature Reserve, near Primrose Hill, London, had told him that three Clouded Yellow butterflies had been seen at the reserve. These were on 26.vi.87 and on 14 and 15.ix.87. Mr J.M. Chalmers-Hunt said that it had been an average year for this butterfly with most sightings coming from Western England. No other sightings had been reported from the London area.

LECTURE

Dr J. PONTIN spoke on 'Ants in south-east England' and gave a fascinating insight into the lives of these highly organized social insects. He illustrated various aspects of their behaviour and described their habitat requirements. An account was given of how competition between different species occupying the same area is limited by their ability to exploit different food sources and strata in the soil and vegetation.

22 October 1987

The President Prof J.A. OWEN announced the death of Mr F.E. Ranson of Bury St Edmunds.

EXHIBITS

Mr R.A. JONES showed two examples of the very local staphylinid beetle *Quedius ventralis* (Aragona) from Nunhead Green, London, SE15, taken on 16.x.87. They were found in rotten wood and nesting material taken from the centre of a large poplar branch felled by the hurricane-force winds of the night before. The beetle's usually inaccessible pabulum may mean that this species is more widespread than is at present believed.

Prof. J.A. OWEN showed two weevils, *Dryophthorus corticalis* (Payk.) and *Euophryum confine* Broun., found in an old beech stump in Windsor Great Park on 19.x.87. The first of these is a native weevil which has never been taken alive in Britain outside the Windsor area, where it occurs mainly in old oak trees. The second is an immigrant from New Zealand which first appeared in Britain about 40 years ago. Since then, it has spread throughout the land, occurring in softwoods and hard woods, indoors and out-of-doors from Cornwall to the Shetland Isles. It is present in every old tree in Windsor.

Mr R.D. HAWKINS showed a live specimen of *Orsillus depressus* Dallas (Hemiptera: Lygaeidae). This bug is new to Britain and was found on Lawson's cypress (*Chamaecyparis lawsoniana*) at Woking, Surrey. The specimen shown had been reared from a nymph. This species occurs in southern Europe where it also feeds on juniper.

ANNOUNCEMENTS

Dr B. McNULTY said that 72 people had booked places for the Annual Dinner.

Mr R.A. JONES stated on behalf of Mr C.B. Ashby that the cabinet for displaying

slides at the Exhibition would be placed in an anteroom to the main hall. There was still space for another 12 slides.

The Secretary Dr J. MUGGLETON reminded members that the next meeting would provide an opportunity to review and discuss the Annual Exhibition. Comments on the arrangements for the exhibition and dinner would be welcomed. He also drew attention to a letter from the Lancashire and Cheshire Entomological Society giving details of their annual exhibition on 24 October.

Mr A.J. HALSTEAD invited volunteers to lead field meetings in 1988.

COMMUNICATIONS

Several members commented on the effects of the hurricane winds which had swept through south-east England in the early hours of the morning on 16 October.

Dr I. McLEAN observed that most of the fallen trees were young to middle aged specimens, while ancient moribund trees had often survived, presumably because they offered less wind resistance. It was possible that evidence provided by the storm could strengthen the case for retaining ancient, insect-rich trees, against those who wish to remove such trees on 'safety' grounds.

Prof. OWEN said that in a tour of Richmond Park and Windsor Forest he had seen lots of fallen branches but had been disappointed not to have found any large pieces of old oak trunk to take home.

Mr. HAWKINS said that he had seen oaks of all ages affected by the storm.

Mr R. SOFTLY wondered if a search of the tree tops brought down by the wind would reveal the eggs or insects of species normally considered rare.

Prof. OWEN reported seeing a Red Admiral butterfly on the wing in the calmer weather in the morning after the storm. There were no reports of migrants associated with the weather system that brought the storm but Mr Hawkins reported a Clouded Yellow on Epsom Common, Surrey, on 27 August, and Mr Jones said that a convolvulus hawk moth had been seen at Ramsgate in August.

LECTURE

Dr P. KIRBY spoke on 'The art of bugging', in which he reviewed the Heteroptera. He showed slides of the major groups of bugs and gave details of their biology.

COMMENTS ON THE EXHIBITS

Mr JONES asked how many specimens of the bug *Orsillus depressus* had been found. Mr Hawkins said he had found seven adults and four nymphs on one tree.

12 November 1987

The Vice President, Dr I. McLEAN in the Chair. The deaths were announced of Mr G. Mulford of South Ockendon, Essex, and Mr P.N. Crow of Blaenau Ffestiniog, Gwynedd. Mr Crow joined the Society in 1932 and was a Special Life Member.

EXHIBITS

Dr I. McLEAN showed a female *Chymomyza fuscimana* Zett. (Diptera: Drosophilidae) taken at Chippenham Fen, Cambs. This local fly is often associated with freshly cut logs and the specimen was taken on a wind-broken ash branch a few days before the Great Storm of 16th October. The fly has dark markings on its wings and these are waved, possibly as a means of communicating with other members of the species, in a similar manner to that adopted by some Hawaiian drosophilid flies.

COMMUNICATIONS

Mr R. A. JONES reported that he had taken another specimen of the staphylinid beetle *Quedius ventralis* (Aragona). This came from a storm damaged tree in Nunhead Cemetery, London.

Mr K. HALSTEAD reported by letter that the wasp nest parasitoid beetle, *Metoecus paradoxus* L., that he mentioned at the 8.x.87 meeting was associated with a roof space nest of the common wasp, *Paravespula vulgaris* L.

Mr J. M. CHALMERS-HUNT said that Dr F. H. N. Smith had found a specimen of the Bloxworth Snout moth, *Hypena obsitalis* Hübn. at his home in Perranport, Cornwall, on 8.xi.87.

DISCUSSION ON THE ANNUAL EXHIBITION AND DINNER

Several members spoke in favour of the new venue at the Imperial College. The size of the rooms, the catering and the lighting in the exhibition room were considered to be an improvement on the Old Town Hall, Chelsea. The photographer had found his job easier to perform due to the provision of a separate room away from the main hall. Seventy-two people attended the dinner in the evening. This was about a third more than the previous year, when the dinner was held on the night before the Exhibition. It was suggested that in future the Exhibition should open at 11 a.m. instead of the traditional time of 10 a.m., as it was a long day for those attending the Exhibition and Dinner.

The number of exhibits shown was about the same as last year, although fewer people had signed the attendance book. It was felt that next year an advertisement should be placed in the AES 'Bulletin' to draw attention of the venue and date to a wider audience. Due to the AES changing the date of its exhibition for 1988, our own Exhibition will be held later than usual and it has been provisionally booked for 19th November 1988. Because of the lateness of this date, it was felt that the traditional post exhibition field meeting would not be feasible.

Reports on the exhibits were given by the exhibition recorders and other members. The microlepidoptera displays were particularly good this year and most of the more collectable orders were well represented, although there were fewer butterflies, Coleoptera and Hemiptera on show than in previous years.

SLIDE EVENING

Five members showed a selection of their slides. Mr R. J. LOWE showed slides of some of the moths found in his north London garden, and also of some exotic insects found on imported fruits and vegetables.

Mr R. JONES showed a selection of beetles and aculeate Hymenoptera photographed through a microscope attachment. The specimens were chosen to illustrate the variety of sculpturing, grooves and punctuation of their elytra and bodies. Of particular interest was a photograph of an aberrant carabid beetle with anastomosing striae on its elytra. The function of punctures and sculpturing, which are often specific characters used in taxonomy, appears to be unknown.

Mr A. CALLOW showed a number of transparencies of insects and wild flowers taken on recent visits to southern Spain, Austria and Kashmir, as well as on trips to sites nearer to home.

Mrs F. MURPHY showed slides of some of the animals seen on a recent holiday on Cephalonia, an island off the coast of Greece.

Dr I. McLEAN showed slides of the scenery, plants and insects seen in the Trudos mountains in Cyprus.

FIELD MEETINGS

Hoad and Etchenden Woods, Bethersden near Ashford, Kent, 9 August 1986

Leader: M. Brown. As no entomologists turned up for the day meeting, a general walk through Hoad Wood and Newlands Wood was arranged for the two members of the North Kent Wildlife Preservation Society who attended. The day was sunny and a reasonable number of butterflies were seen; most commonly the Meadow Brown and Large, Small and Green-veined Whites. The tail-end of the Ringlet and White Admiral emergence produced only a few of each of these species, both of which are generally common at this locality. Peacock and both Small and Essex Skippers were also present in reasonable numbers, and a male Brimstone was seen feeding on Marsh Thistle flowers. A nearly full-grown larva of *D. elpenor* was found on willowherb. Four species of dragonfly were seen: *Aeshna juncae* (L.), *A. cyanea* (Müll.), *A. grandis* (L.) and *Sympetrum striolatum* (Charp.) along the woodland rides. Notable among the plant species seen were *Centauria pulchellum* (Sw.) *Stachys palustris* (L.), *Epipactis helleborine* (L.) and *Scutellaria minor* (Hudson), which occur very locally along certain of the rides.

Four members turned up for the night meeting which unfortunately turned cold the light attracting only a sprinkling of species. Especially the micro count was well down on normal. A total of 80 species were taken at five lights. Many of the more local species refused to appear. Only one *Parastichis suspecta* (Hübner) was taken.

As the family were on holiday at the nearby Snoad Hill Farm, the leader was able to run a light the following evening joined by Jim Platts. A storm which drowned Ashford, fortunately skirted Hoad Wood except for 10 minutes of heavy rain. Two specimens of *Ipimorpha retusa* (L.) and a single *Apoda limacodes* (Hufn.) were taken at one light and a male *Odeya atrata* (L.) at the other. *I. retusa* is reliably taken during mid August along the ride in Etcheden Wood which is heavily lined with sallow.

Crockford, New Forest, 23 May 1987

Leader: K.H. Halstead. For the second year running, the May meeting was marred by adverse weather and only two stalwarts attended. However the cloud and rain lifted at times to reveal some sunshine which brought out a number of interesting Diptera from the families Empididae, Dolichopodidae, Syrphidae including *Anasimyia lunulata* Meigen, Sciomyzidae with the uncommon *Tetanocera freyi* Stackelberg, Scathophagidae including *Scathophaga scybalaria* (L.), and a species each from Tachinidae and Lonchaeidae with *Dasiops trichosternalis* Morge.

Ants were not particularly active but one *Formica rufa* L. was captured apparently a long way from its habitat to ensure it wasn't *F. sanguinea* Latr. or the rare *F. exsecta* Nylander.

A few spiders were taken, mainly common species, the most worthy of note being *Mangora acalypha* Walckenaer. A *Philodromus* species was collected from a Lodgepole Pine and appeared to be close to the rare *P. collinus* C.L. Koch but Furzebrook was unable to confirm this as the spider was not completely mature although probably close to its final moult.

Amongst some interesting plant life there were extensive stretches of the Bogbean *Menyanthes trifoliata* (L.) conspicuous with their white flowers.

Speyside, 11–17 July 1987

Leader: J.A. Owen. Five entomologists joined the leader at these meetings which were held at various sites on Speyside, including RSPB reserves at Loch Garten and Insh Marshes, Glen Feshie, Loch Vaa, Coylumbidge and River Nethy. Time did not allow retrieval of pitfall traps set out earlier on the summits of Creag Meagaidh and Ben Macdui but these were collected by the leader a few weeks later.

A comprehensive list of captures is still to be completed but among the noteworthy species already recorded are: *Nebria nivalis* (Payk.), *Colon viennense* Hbst, *Eudectus whitei* Sharp, *Lathrobium dilutum* Er., *Negastrius pulchellus* (L.), *Judolia sexmaculata* (L.), *Donacia obscura* Gyll., *Magdalis duplicata* Germ., *M.phlematica* (Hbst) and *Notaris aethiops* (Fab.). Larvae of the Kentish Glory moth were observed on birch at one site.

Dungeness, Kent, 5 September 1987

Leader: B.F. Skinner. A wet day followed by a clear and cool evening constituted most of the ingredients needed for a mediocre night's moth-trapping and the leader was grateful both to the 18 members and friends who turned a blind eye to the unfavourable weather forecast and to the 41 species of Macrolepidoptera which braved the elements. Of passing interest amongst the latter were *Peridroma saucia* Hb., *Earias clorana* L., *Nonagria typhae* Thunb., *Archanara sparganii* Esp., *Tholera cespitis* D. & S., *Aspitates ochrearia* Rossi and a very late-in-the-year *Meganola albula* D. & S.

However as a social event the meeting was most successful, the paucity of insects having little effect on the conviviality of those present.

Thorndon Park, Essex, 27 September 1987

Leader: P.R. Harvey. Seven members and friends attended the meeting and we were fortunate to have reasonably fine and sunny weather.

Two main areas were visited, an area of marsh and a small area of relic heather. Frances Murphy found one part of the marsh much wetter than anticipated and spent an uncomfortable afternoon drying off. I hope she will return to Essex in future without too many misgivings!

Few spiders of particular interest were recorded except for *Saaristoa firma* (O.P. Cambridge), a second Essex record, collected by John Murphy, and a female *Enoplognatha latimana* (Hippa and Oksala), collected at the edge of the car park. This spider, although only described in 1982 and thought to be much rarer than *E.ovata*, is turning out to be fairly widespread in Essex.

Lt Col. A.M. Emmet found three vacated feedings, in folded hornbeam leaves, of the moth *Parornix carpinella* (Frey), a species that he added to the British list only last year.

Ladycross Inclosure, New Forest, Hampshire, 3 October 1987

Leader: A.J. Pickles. A total of five members and friends attended for evening work in warm sultry conditions. The usual autumnal moths started arriving early with *Xanthia aurago* D. & S. and *Chloroclysta siterata* Hufn. being prominent. However, before the evening could develop, torrential rain intervened and when it became unlikely that there would be little or no further action at the lights the meeting was curtailed.

SHORT COMMUNICATIONS

***Philedone gerningana* (D. & S.) (Lepidoptera; Tortricidae) in East Anglia** — On the 28.vii.86, a single example of an unfamiliar tortricoid moth appeared at a 125-W mercury vapour lamp on Roydon Common, West Norfolk (VC 28). This was later identified as *Philedone gerningana* (D. & S.). From Bradley, Tremewan and Smith (1973) the distribution of this moth can be summarized as follows; widely distributed in Scotland, recorded over much of Wales and northern and western England as well as being noted from Kent. Therefore, the occurrence of this species in Norfolk would appear to mark an interesting extension in range. However, the bogs and commons around Kings Lynn are known to contain a northern and western element in their invertebrate fauna and hence the presence of this moth on Roydon Common is not without precedent.

The site was revisited on the 6.vii.87, by myself and Mr A.P. Foster with the aim of looking for larvae of *Choristoneura lafauryana* (Ragonot). We collected a number of spun shoots of Bog Myrtle (*Myrica gale* L.), but few of these proved to contain tortricoid larvae. On returning to the car I put up a second example of *P. gerningana* from amongst heather. This species was later confirmed as a resident of this common when a third example was bred from the spinings that we collected. It is apparent that this is also the first occasion Bog Myrtle has been recorded as a foodplant for this moth.

I would like to take this opportunity to thank the Norfolk Naturalists Trust for granting permission to visit this reserve. — M. Parsons, Nature Conservancy Council, Northminster House, Peterborough PE1 1UA.

REFERENCE

Bradley, J.D., Tremewan, W.G. & Smith, A. 1973. *British Tortricoid Moths; Cochylidae and Tortricidae: Tortricinae*. London: Ray Society.

Monarchs resident in Spain — Four years ago (*Proc. Trans. Br. ent. nat. Hist. Soc.* 1984; 17:84) I wrote a short note about *D. plexippus*. I had found a small colony in Southern Spain and I expressed the hope that these fine insects were now resident in Europe. The situation was reviewed by A. Bretherton in the same issue.

I returned to the same area near Malaga at the same time of year, that is April 1987 and found *plexippus* flying in about the same numbers as in 1984. I was accompanied by Claude Rivers and Karl Bailey and we searched the area for *Asclepias curassavica*, the normal foodplant of the Monarch. The plant is widely distributed in the bottoms of the valleys running down to the sea in the area around Nerja, but is nowhere common.

F.A. Naclo in his article in SHILAP (43:131) mentions the road between the coast and the town of Torrox as the area for the butterfly and *curassavica*. This is an area of commercial cultivation with large plastic sheet greenhouses and we found only a few plants. These are scattered in the valleys to the East and West of Nerja. Virtually every plant had ova and larvae on them, the larvae ranging from fully grown to first instar on the same plant. The adults themselves varied from very fresh to very worn. Some plants were almost defoliated by the larvae. There was no sign either now or in 1984 of *chrysippus*, mentioned by Naclo as found by him in 1983.

To summarise, it seems that *plexippus* is still resident in the area of southern Spain around Nerja and possibly further afield and has been resident for at least 5 years. A.

curassavica is not abundant and the large number of ova and larvae found on virtually every plant during a week of searching, must be the limiting factor of this insect. — P.J. Edwards, Stars Cottage, Stars Lane, Dinton, Nr Aylesbury, Bucks.

***Clusiodes (Clusaria) ruficollis* (Meig.): a postscript.** — In my recent paper (Withers, 1985) on certain British Clusiidae, I proposed the synonymy of *Clusiodes (Clusaria) facialis* (Collin) with *C. (C.) ruficollis* (Meig.). In my haste to communicate this finding, I subsequently found that I had not completely proven this synonym, as I had merely demonstrated that my material was identical to *ruficollis*. I am now happy to report that, through the kindness of the Hope Department of Entomology at Oxford, I have examined Collin's type series of *facialis* and find it in every respect, particularly in the form of the male genitalia, to conform to *ruficollis*. My thanks to Dr Martin Speight who first drew my attention to this shortcoming. — P. Withers, 27 Beech Way, Dickleburgh, Diss, Norfolk.

REFERENCE

Withers, P., 1985. Notes on some British Clusiidae and reduction of *Clusiodes facialis* (Coll.) to synonymy. *Proc. Trans. Br. ent. nat. Hist. Soc.* **18**: 63–64.

Phoretic and parasitic Nematoda of Collembola and Chelonechi. — During the course of examining species obtained from an investigation of terrestrial arthropoda obtained from the sand dunes at Manorbier, Pembrokeshire (SM 061974) south Wales, the results of which are recorded in another article (Miles, 1988), two species of nematode were found in association with five specimens representing four species of arthropods.

Phoresy previously recorded for Collembola (Miles, 1971, 1974, 1976, 1986) was confirmed involving several larval *Rhabditophanes (Cheilobus)* sp. with two specimens of *Neanura muscorum* (Templ.) (Figs 1 and 2) and one specimen of *Isotomurus palustris* (Müll.) (Fig. 3) and a pseudoscorpion *Roncus lubricus* (L.Koch). Parasitism recorded by Miles (1974, 1986) in Collembola was found to have occurred when a larval mermithid was observed completely occupying the abdomen of a *Entomobrya nivalis* (L.) (Fig. 4) this example would prove lethal to its host. — Philip M. Miles, Werndêg, Cnwch Coch, Nr Aberystwyth, Dyfed.

REFERENCES

- Miles, P.M. 1971. Nematodes associated with *Orchesella villosa* (Geoff.) (Collembola, Entomobryidae). *Entomologist's mon. Mag.* **107**: 193–194.
 Miles, P.M. 1974. A nematode parasite of *Onychiurus armatus* (Tullb.) (Collembola, Onychiuridae). *Entomologist's Gaz.* **25**: 31–34.
 Miles, P.M. 1976. A phoretic larval *Cheilobus* sp. (Nematoda) and *Dreschlera* sp. on Isotomidae (Collembola) also *Howardula* sp. (Nematoda) parasitic on *Parasitus* sp. (Acari). *Entomologist's mon. Mag.* **112**: 169–172.
 Miles P.M. 1986. Some parasitic and phoretic nematoda associated with Collembola. *Entomologist's mon. Mag.* **122**: 239–242.

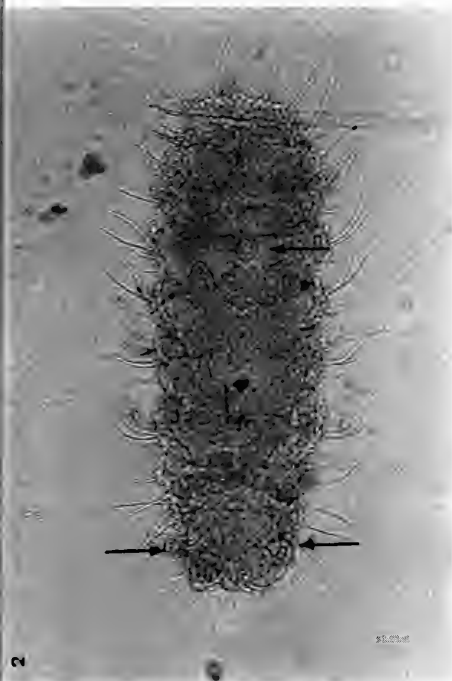
Figs 1–4, opposite.

Fig. 1. Larval *Rhabditophanes* sp. in association with *Neanura muscorum* (Templ.), ×280.

Fig. 2. *N. muscorum* with three *Rhabditophanes* sp. *in situ*, ×70.

Fig. 3. *Rhabditophanes* sp. attached to *Isotomurus palustris* (Müll.), ×280.

Fig. 4. *Entomobrya nivalis* (L.) parasitized by a larval mermithid, ×70.



Drypta dentata (Rossi) (Coleoptera: Carabidae) rediscovered on the Isle of Wight. — Whilst sieving handfuls of grass and associated 'thatch' on an area of lower cliff, some 30 feet above the beach, at Whitecliff Bay, Isle of Wight, on 4.v.87, I was surprised to find a specimen of *Drypta dentata*. The beetle was badly damaged by the sieving operation but a thorough search of the immediate area produced a further two examples.

All specimens were found under the 'thatch' and short dense growth of fine turf on deeply fissured, damp clay. This is precisely the habitat described by Fowler (1887) i.e. 'on clay banks at roots of grass'. Removing handfuls of the grass revealed the beetles running amongst the remaining stubble. A return to the same area the following day with Dr P.S. Hyman and Mr P.J. Hodge produced a further two examples.

Messrs P.J. Hodge and A.B. Drane revisited the site on the 31.v.87 and found four more specimens; one under dead grass left on the previous visit, the others deep in grass tussocks.

Luff (1987) regards *D. dentata* as a relict and gives 'Brownsea Island, Poole Harbour, 1977' as the last known British locality. Mr A.J. Wise, the source of this record, recommends that it be treated with caution as the identity of the beetle on which it is based is in question, and the specimen has been destroyed. There are no other recent British records, but in the past the species has been found at various localities along the south coast between Lyme Regis, Dorset and Chattenden on the River Medway in Kent. The majority of specimens that I have seen in museum collections are from the Isle of Wight.

Although *D. dentata* is a conspicuous species it may easily be overlooked. There are many apparently suitable areas along the south coast which may hold populations of this attractive beetle.

I thank Mr A.J. Wise for his candid remarks about the Brownsea Island record, and Messrs P.J. Hodge and A.B. Drane for allowing me to include their observations. — H. Mendel, The Museum, High Street, Ipswich IP1 3QH.

REFERENCES

- Fowler, W.W. 1887. *The Coleoptera of the British Islands*. Vol. 1. London: Reeve.
 Luff, M.L. 1987. *Drypta dentata*. In *British red data books: 2. Insects*, ed D.B. Shirt, p. 121. Peterborough: Nature Conservancy Council.

BOOK REVIEWS

The spiders of Great Britain and Ireland, (3 Volumes). Michael J. Roberts, Harley Books, Vol. 1, 229 pages, £45, 1985, Vol. 3, 256 pages, £55, 1985, Vol. 2, 204 pages, £45, 1987. Complete set of 3 volumes, £135.

With the publication of volume 2, this major work on British spiders is now complete.

Volume 1 contains the introduction, key to families, descriptions and genitalia illustrations of all the species in the families Atypidae to Theridiosomatidae.

Volume 2 describes and illustrates the genitalia and characteristic male carapaces of the Linyphiidae, a family containing almost half the British spider fauna, together with six new British species that would otherwise have been included in volume 1.

A key to the genera and species of the Linyphiidae, a check list of British spiders showing modern synonyms, a glossary and four colour plates of new species are included in the volume.

The key, using tibial spines, metatarsal trichobothria and spider size characteristics, is an expanded version of the key used successfully for many years by the British Arachnological Society. It is an essential aid required to narrow identification of a specimen down to a small number of species that can then be referred to directly in the text.

The genitalia illustrations of the Linyphiidae are excellent and are a very valuable part of the whole work. Indeed all the drawings in volumes 1 and 2 are of high quality, clear and accurate. The author has also been able to illustrate the range of appearance to be expected in the genitalia of particularly variable or critical species. This is a very helpful feature.

Volume 3 contains 237 colour plates, all painted by the author, illustrating 307 representative species. The plates are large format and of excellent quality. The work will be bought by collectors for these alone.

Although it is difficult to expect more from these volumes, they would have been improved by the inclusion of more detailed generic and species descriptions and more illustration of male palps from both ventral and ectal views. Because of this *British spiders* by G.H. Lockett and A.F. Millidge, although now over 30 years old, is still an essential work of remarkable scope.

However, these volumes by Michael Roberts are unlikely to be replaced or surpassed for many years to come, and are indispensable for the serious arachnologist. The price, although expensive for the individual, is justified by the quality of the publication.

The budding arachnologist now has a wealth of literature available for the identification of British spiders, and the traditionally 'difficult' Linyphiidae should no longer deter beginners. The introduction this year of the National Spider Recording Scheme by the British Arachnological Society and Biological Records Centre is well timed and it is to be hoped that everybody with an arachnological interest will participate in the scheme.

P.R. HARVEY

The hymenopterists handbook. Clive Betts and David Laffoley. The Amateur Entomologists' Society, 2nd edn, 1987, 208 pages, £6.70.

To do justice to a group as large and diverse as the Hymenoptera in one book is virtually an impossible task. To cover every aspect of the order and its study would run to several volumes, and the final product of course could not be considered a handbook. However, the stated aim of this publication, in common with others in the series, is to introduce the amateur to the order, giving practical advice on studying and collecting, and in this the book is very successful.

For convenience it is divided into three main sections the first of these gives some general background information on the Hymenoptera, including systematics and gross morphology of the adult insects. A brief mention is made concerning the immature stages, which I feel could have been expanded both in terms of identification and biological information.

Section two is devoted to the natural history of the order, and is sub-divided to give accounts of the Symphyta, Parasitica and Aculeata in turn, with additional information on such diverse subjects as warning coloration, genetics and pollination by Hymenoptera. The article on sawflies is very brief, and I would like to have seen more on the Parasitica too, although what is written is extremely interesting with the latest findings on such topics as parasitoid and host adaptations, and the location and

selection of suitable hosts by the wasps. The articles on both the solitary and social bees and wasps, and on the ants, are detailed and comprehensive.

The third major part of the handbook deals with studying and collecting. Once again, the piece on sawflies is disappointingly short, but this is compensated for by an excellent article on gall wasps with an updated set of tables detailing host plants, emergence times, and gall locations. The methods of collecting and preserving the Parasitica and Aculeata are dealt with clearly and fully, the one disappointment being a lack of information on rearing and breeding, which is probably the most rewarding aspect of Hymenoptera study, and one in which the amateur can make real contributions to the advancement of our knowledge. A summary of those parasitic groups with known hosts would have been helpful as a stimulus for further study.

Finally, mention must be made of the appendices. The first of these consists of keys to all the major groups in the order down to families, and in the case of the Aculeata, genera. There are over 120 key figures. The second appendix is an updated version of the aculeate flight table which appeared in the first edition of the handbook, and the last one is a useful bibliography of works not already referred to in the main text.

This handbook is a valuable aid to the amateur hymenopterist, and at a price that is very reasonable. As such it fits in well with the other excellent titles in this AES series.

I. HUDSON

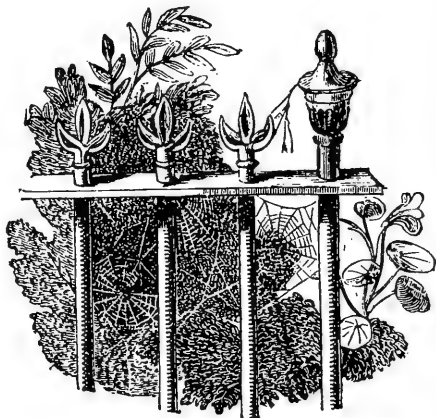
EDITORIAL

This short note now completes the first issue of the *British Journal of Entomology and Natural History*.

A major portion of this issue is the report of last year's Annual Exhibition at Imperial College. This is an important event in the Society's calendar and the published report is an invaluable source of records and information. Unfortunately, the two colour photographs taken of some of the more interesting and photogenic insects have had to be held over until a later date, when they can be printed along with other colour plates not yet available. This will be in the near future.

In answer to some members' queries, the 1986 index is also despatched here, the 1987 index will appear later in the year.

Lastly, the introduction of a 'Short communications' section will, I hope, encourage members to send further short notes of topical interest for rapid publication.



RICHARD A. JONES

SOCIETY ANNOUNCEMENTS

A FIELD GUIDE TO THE SMALLER BRITISH LEPIDOPTERA

Edited by A. M. Emmet, 1979

This book is packed with information, much of it previously unpublished. It contains life histories of almost all of the 1500 species recorded from the British Isles. There is also an index of foodplants which refers the reader to all species known to feed on each plant; this makes it possible quickly to identify larvae found or to narrow the choice to a small number of species. Essential to the fieldworker interested in microlepidoptera.

272 pages, bound in a stiff paper cover. £9 (£6 to members) (+ p.&p. 75p)

A limited number of copies with very slightly 'scuffed' covers are available at reduced price: Members £3 (plus p.&p. 75p)
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These and all other BENHS publications are available from the Sales Secretary: Mr N.A. Callow, 25 Cranes Park Avenue, Surbiton, Surrey KT5 8BS.

'BRITISH BIRDS' FOR SALE

The Society has for sale a bound run of the journal '*British Birds*' in good condition. It is a run of 52 volumes from volume 19 (1925-6) to volume 71 (1978), but is missing the issues for 1942-3.

Collection from the Society's rooms at the Alpine Club to be arranged with the purchaser.

Offers should be sent to the Librarian, Mr S. Miles, at the Society's rooms.

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 £350 in 1988/89.

Applicants should send a statement, if possible in sextuplicate, 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, British Museum (Natural History), Cromwell Road, London SW7 5BD, as soon as possible and not later than 30 September, 1988.

BRITISH JOURNAL OF ENTOMOLOGY AND NATURAL HISTORY

Volume 1, Part 1, April 1988

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INSTRUCTIONS TO AUTHORS

Contributions must be double-spaced with 3cm margins either side to facilitate marking up. They should be typed if possible, on one side only of A4 paper. Layout should follow that of the journal, but apart from underlining scientific names, no marks should be made to define typeface.

Line and continuous tone figures are accepted. Writing on figures is best listed separately for setting and its placing indicated on a duplicate figure. Seek advice before drawing. Reduction may otherwise necessitate redrawing.

Authors of original papers of more than one page qualify for 25 free reprints. Extra copies (prices on application) must be ordered when proofs are returned.

MEETINGS OF THE SOCIETY

are held regularly at the Society's Rooms, but the well-known ANNUAL EXHIBITION and ANNUAL DINNER are planned for the 19th November 1988 at Imperial College, London SW7.

Frequent Field Meetings are held at weekends in the Summer. Visitors are welcome at all meetings.

The current Programme Card can be had on application to the Secretary at 32 Penton Road, Staines, Midd. TW18 2LD.

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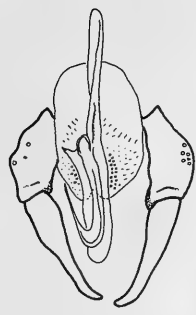
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THE INSECT MAN: J.H. FABRE'S GOOD INFLUENCE

MARTIN HENDERSON
13 Kimble Road, London SW19.



The French entomologist J.H. Fabre will be known by reputation to most of the members of the Society. His work is available in the English translations of Alexander Teixeira de Mattos, and in compilations by several other hands. They are based on the 'Souvenirs entomologiques', which began to appear in 1879 when Fabre was fifty-three years old.

THE SETTING

Ecology as a science was hardly born in the late nineteenth century, let alone ethology. Many popular writers produced second-hand accounts of natural history. They stressed the natural theology of Paley: the study of nature was the study of God's work and everything in nature testified to the glory of God.

By contrast, in his entomological work Fabre gave unstinting attention to accurate observation of the living animal. In broad terms he was interested in instinct, which he believed to be relatively fixed in insects but capable of a certain flexibility sometimes which he called discernment.

FABRE AND THE THEORY OF EVOLUTION

In 1859 Darwin's 'Origin of Species' was published. It caused tremendous controversy, and it immediately gave studies in taxonomy more general interest and depth. Fabre, like several other eminent naturalists and scientists of his generation, never accepted the theory of evolution. He was well removed in his thinking from this idea: probably he was too set in his ways.

But he made a unique contribution in the minuteness and detail of his observations, his simple, telling experiments, and not least in his fluent literary style. His work is popular, and gives readers an understanding of the complexity of the insect lives he chronicled.

THE LIFE OF J.H. FABRE

There are some fascinating chapters of autobiography, and the life of Fabre is given in its essentials by W.K. Ford and E.W. Teale (see bibliography). There are also full-length biographies available in English, though I don't find any of them completely satisfactory.

Fabre's parents and grandparents were of farming stock, barely literate. His father moved to the market town of Saint Léons in the province of Aveyron and became a café proprietor. Jean Henri's school-days suffered a reversal due to his father not prospering, but he was a hard worker and able, and at 19 became a primary teacher at Carpentras, 20 miles to the north-east of Avignon. Here he took up the study of mathematics, obtained a degree and later worked in physics and chemistry. He moved to Corsica to teach these subjects: there was no scope for teaching natural history. But here he met the naturalist Moquin-Tandon, who influenced him in deciding that natural history would in future be his main interest. His observations of insects began at this time.

In 1853 Fabre returned to teach in the lycée at Avignon. In the succeeding years he married, there were to be five children of this marriage, and three by a second after the death of his first wife.

Fabre suffered two major disappointments in these years of teaching. To obtain money (which he would certainly need for a university post, his ambition at this time), he took up the study of industrial chemistry. Using facilities available at his school, he eventually succeeded in extracting the colouring-matter alizarin from madder-root. However he discovered that two German chemists had obtained the dye synthetically much cheaper, and the industrial process he had founded was still-born, though it became operative in a few factories.

Then in 1870, he participated in the teaching of secular subjects to girls. This was then considered the province of the Church: he was denounced from the pulpit, and given notice to quit his job.

However Fabre began to write a series of school-books and popular works in science. These became very successful (they have been translated into English). This enabled Fabre, in 1878, to buy a house in the outskirts of Serignan. Here he could continue his entomological work much more intensively, and it was here, using a wild garden which he called the 'Harmas' for his studies, that he finally wrote the classics of insect behaviour. My impression from my reading is of a solitary man, more immersed in the world of insects than of people, leading a very simple material life and completely dedicated to the largely unknown field of behavioural entomology.

FABRE AND THE HUNTING WASPS

In 1854 Fabre read an article which, he tells us, decided him on concentrating on entomology. It was written by Léon Dufour, an army surgeon who on retiring, worked in entomology. Dufour worked on the sphecid *Cerceris*, which like all these 'hunting wasps' makes a cell (in holes in the ground or in woodwork or masonry) and stocks it with insect food for its larvae.

The *Cerceris* species Dufour studied hunts beetles of the family Buprestidae. Dufour found that the beetles were still fresh after having been stored for some time by the wasp as food for its larvae. From this he concluded that the wasp must inject some sort of preserving agent when it stings the beetle.

Fabre was not satisfied with this explanation, and carefully studied *Cerceris* and many other hunting wasps. He found that a related species, *Cerceris major*, stung its weevil prey once, in the ventral surface of the thorax. By referring to a contemporary work on insect anatomy, he concluded that this was the position where, in these weevils, the three thoracic nerve centres are to be found very close together. By this means the wasp paralysed the weevil. By stabbing a weevil with a thin nib dipped in ammonia Fabre himself could induce paralysis.

Fabre turned his attention to *Sphex flavipennis*, a hunter of crickets. *Sphex* stung its prey three times, in the neck, between the pro- and meta-thorax, and at the base of the abdomen. This, he concluded, coincided with the position of the three nerve centres in the cricket.

The idea that the wasp stings the nerve centres is an inference rather than an established fact. Later workers have emphasized that it can be very difficult to see clearly how a wasp attacks its prey. I think the idea of the hunting wasp as 'clairvoyant surgeon' is somewhat exaggerated. But this is said to be the work in which Fabre took greatest pride.

FABRE AND THE DUNG BEETLES

Fabre was the first to study the behaviour of European dung beetles systematically and thereby reveal their diversity and interest. He appreciated, for example, that the

behaviour of *Copris lunaris* and others could be seen as a simplified version of the complex brood care and nest defence found in social insects.

Nowadays dung beetles (Aphodiinae, Geotrupinae and Scarabaeinae) are broadly classified as rummagers, buriers or rollers. Rummagers (typically Aphodiinae) lay their eggs in dung on the soil surface and so show the minimum parental behaviour of ovipositing on the food source. Buriers (typically Geotrupinae, but also many Scarabaeinae) excavate burrows and fill them with rounded or sausage-shaped dung masses in each of which an egg is laid. Parental care is limited to the provision of food for the larvae in a sheltered position, and defending the nest whilst it is being constructed. Of this group, Fabre worked on *Geotrupes*, *Onthophagus* and *Onitocellus*.

Beetles of the tribe Coprini (Scarabaeinae) convert buried dung into freestanding brood balls in each of which an egg is laid. Fabre observed that the female *Copris lunaris* stays in the underground chamber and protects the brood balls from kleptoparasites and predators. And that in the first stages of nest building she gets assistance from the male beetle.

The tribe Scarabaenini are rollers: a ball of dung is rolled away some distance before being buried in a chamber where it is either eaten or converted to a brood ball. Of this group, Fabre worked on the so-called 'sacred scarab' (he doesn't give its latin name). His studies of this species extended over forty years: his initial observations at Avignon failed to reveal the nesting habits of the beetle. For this he 'required prolonged residence in the country, the proximity of herds and flocks in the bright sunshine'. When he moved to Serignan he was able to study first this species then many others.

This is the beetle which fascinated the ancient Egyptians, who carved its image in the crypts of their dead. The beetle moulds dung into a sphere, and rolling it backwards, takes it to a suitable place for digging a burrow. Here it stays until its provisions are consumed.

During the nesting period, in the hot days of May or June, it is more careful in sorting the dung, and when it has taken a ball of it underground, moulds it into a pear shape. In the elongated neck of the 'pear' the egg is laid in a porous chamber.

Paradoxically, for all his scorn of evolutionists and their explanations, the diversity of habits Fabre documents testify strongly to the adaptive influence of the environment in moulding behaviour. In a recent paper Klemperer considers some of the homologies, preadaptations and intermediary behaviour shown by the dung beetles.

Fabre briefly gives the rationale for his mode of approach to entomology: 'Nomenclator's entomology is making enormous strides: it overwhelms us, swamps us. The other, biologist's entomology, the only interesting branch of the science, the only one really worthy of our attention, is neglected to such an extent that the commonest species has no history, or calls for serious revision of the little that is known.' His studies led Fabre to insist on the taxonomic value of behaviour.

FABRE — THE VERDICT OF POSTERITY

It has been suggested that Fabre, influenced by his studies of mathematics, physics and chemistry, was interested in establishing clear-cut laws when he came to study insects. Thus he failed to give as much importance to exceptions to the rule as modern research workers have found they have to.

Without defining instinct, he attempted to point out its characteristics. He viewed it as a sequence of invariable acts inevitably linked together in a necessary order. The

question is a profound intellectual, almost philosophical one, and he was surer than present day scientists of the machine-like character of instinct. Even he, however, allowed some discrimination in privileged species (e.g. *Copris*).

He was isolated, narrow in his knowledge of entomological literature, frequently repeating experiments that had been reported by others without apparently knowing they had been done before. Sometimes Fabre's facts have been found to reveal only a segment of the full picture. Occasionally it is not possible to tell from his description of an insect which of several species he was describing.

But Fabre was a pioneer, working in poverty with crude equipment. The discrepancies others found in his writing led to much fruitful work. Darwin's appellation of Fabre as 'incomparable observer' hits the nail on the head.

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BOOK REVIEW

Bumblebees. Oliver Prys-Jones and Sarah Corbet. Cambridge: Cambridge University Press, 1987, 96 pages, £5.95 (paperback), £15 (hardback).

The Cambridge Naturalists Handbook series is aimed at students and professional entomologists as well as amateur naturalists. This sixth volume is, like the others, intended to provide an essential basis for field work and indeed fulfils this task well.

There are excellent sections on the natural history and biology of bumblebees, together with the necessary keys and text illustrations for identifying all the British species. Identification of the commoner species is further helped by four colour plates.

In common with the other volumes in the series, this one contains many interesting ideas for future research into different aspects of bumblebee biology. Unfortunately, many of the experiments and techniques detailed would be better suited to those entomologists with access to laboratory facilities than to the average amateur hymenopterist operating from home.

However, there is a wealth of information packed into the 96 pages, and anyone who is at all interested in these attractive and familiar insects will benefit from reading this book. The cost of the hard cover version may be prohibitive to some, but the paperback edition is more reasonable.

I. HUDSON

REVISIONARY NOTES ON BRITISH SPECIES OF *PSYCHODA* LATREILLE (DIPTERA, PSYCHODIDAE) INCLUDING NEW SYNONYMS AND A SPECIES NEW TO SCIENCE

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The small pallid mothflies of the genus *Psychoda* are probably among the most neglected members of a family which has otherwise received considerable taxonomic attention. Because of their diminutive size and secretive behaviour, they are largely overlooked by most students of Diptera, but they are in the main both widespread and numerous.

Despite current unpopularity, the study of psychodids has a long history in Great Britain. The Reverend A.E. Eaton studied the family at the turn of the century and was, for his day (and now!) revolutionary in slide mounting many specimens. Additions to the fauna were described by A.L. Tonnoir in 1940, but since that time, no *Psychoda* have been added or critically examined. Satchell (1947*a*) figured and keyed the larvae of *Psychoda* species as he understood them, but he omitted *P. erminea* and treats *parthenogenetica* and *albipennis* as separate species. (These two species are discussed in depth below under *albipennis*). In 1948 he figured and discussed the pupal respiratory horns.

Whilst working on a Handbook to the entire family, hopefully to be published soon by the Royal Entomological Society, it became clear that the genus was overdue for revision, and better figures of critical parts were required. A revised key to the genus will appear in that publication, along with the genitalia and antennal figures so critical in the recognition of the species. The purpose of this paper is to identify certain anomalies in nomenclature, clarify them and describe as new a species which has lain unnoticed in the collections of the British Museum (Natural History).

It is important to define clearly the limits of *Psychoda* treated in this paper, as a number of species have previously been placed in the genus in error. Fortunately, one character allows easy recognition of the genus: the labium of all *Psychoda* species is armed with short, stout teeth, and tends to be quadrate (Fig. 1). Other similar species, such as *lucifugus* (now in *Threticus*), *humeralis* (in *Philosepedon*) and *obscura* (in *Feuerborniella*) have a pad-like labium with setae. The arrangement of the teeth in *Psychoda* may show specific differences, but has not been systematically studied.

Good characters are provided by the apical antennal segments, but these are all too frequently lost, so more reliance is placed on features of the male genitalia, and the form of the female subgenital plate. It is not possible to separate any *Psychoda* with certainty unless the specimen is slide mounted and examined microscopically.

Psychoda alternata Say

Synonyms: *Psychoda tripunctata* Macquart, 1838
Psychoda sexpunctata Phillipi, 1865
Psychoda conspicillata Hutton, 1881
Psychoda schizura Kincaid, 1899
Psychoda floridica Haseman, 1907
Psychoda nocturnala Haseman, 1907
Psychoda bengalensis Brunetti, 1908
Psychoda albimaculata Welch, 1912

Psychoda dakotensis Dyar, 1926

Psychoda alternata var. *marmorata* Abreau, 1930

Psychoda alternata var. *floridica* Johannsen, 1934

Psychoda septempunctata Rapp, 1945

A large and unmistakable species, wherein the tips of the denuded radial veins are darker than elsewhere. The characteristic V-shaped female subgenital plate is quite unlike any other British psychodid, and the male genital parts are also distinct. In his description of the close relative, *lativentris*, (not recorded from Great Britain), Berdén (1952) states that the type specimen of *alternata* is lost, and this view is endorsed by Quate (1955), who fixes Say's name to the species figured by Tonnoir in 1922 on the basis of the 'first reviser' ruling.

Jezeq (1977) resurrected *Tinearia* for *alternata*, *lativentris* and three non-palaeartic species. Whilst recognizing that these species possess some peculiar features, such as the dark wing markings referred to above, reduced antennal ascoids and the absence of a median digit on the female subgenital plate, it is considered premature to remove any species from *Psychoda* sensu stricto in our present state of limited knowledge of the affinities of the species in question.

This species has come to the attention as a pest in trickle-distributor sewage operations, where the larvae can build to enormous numbers, grazing bacteria from the stones and may significantly reduce the efficiency of the water treatment. Satchell (1947b) records larvae also from septic tanks, urinals, drains and beds of seaweed. I have seen material bred from a grey squirrel drey, bred it myself from a coot's nest and taken specimens around domestic light.

Psychoda brevicornis Tonnoir

This species is part of the small group of *Psychoda* with basally incomplete wing forks. The male aedeagus has a most distinctive process which basally encircles the main shaft, whilst the female subgenital plate has no appreciable 'shoulder' area.

The larvae of most known *Psychoda* are particularly homogenous in appearance, with a variable number of dorsal sclerotized plates and a respiratory siphon posteriorly which is at least as long as the terminal dorsal segment. The exception to this is the larva of *brevicornis*, which shows adaptations in response to its lifestyle. Unlike other dung-inhabiting species, *brevicornis* lives on the surface of very fresh, semi-liquid dung, and the prominent palmate lateral hairs may assist in buoyancy, whilst the abnormally short siphon reflects the surface dwelling habit.

Psychoda brevicornis appears to be an uncommon species, despite the ready availability of larval habitat. It has been recorded as one of the visitors to spathes of *Arum maculatum*, and I have taken males around domestic lights.

Psychoda cinerea Banks

Synonyms: *Threticus compar* Eaton, 1904

Psychoda compar Tonnoir, 1919

Psychoda prudens Curran, 1924

Psychoda domestica Haseman, 1908

Males of this species belong to a small grouping where the cercopod is short and squat, not resembling the pincers of an earwig, which is the more normal condition. The aedeagus is apically expanded with a sharply pointed asymmetric side-arm. The wide female subgenital plate has a prominently darkened basal line and the median digit has a few fine setae.

P. cinerea is common worldwide, and is an infrequent contaminator of sewage beds. It is much more regularly encountered domestically, as it frequently breeds in

drains and sink overflows. It is thus commonly collected at indoor lights. Somewhat surprisingly, perhaps, it has also been recorded from decaying agarics.

Psychoda crassipenis Tonnoir

Only two *Psychoda* possess symmetrical aedeagi, and are thus readily identifiable, *P. crassipenis*, as the name suggests, has a medially dilated aedeagus, and this serves to distinguish it from males of *P. phalaenoides* (L.). No author other than Quate (1955) appears to record that *phalaenoides* has barbs on the aedeagus, and this also serves to distinguish from *crassipenis* which is unadorned. Females are distinct by virtue of the relative dimensions of the median digit.

In my experience, this species is distinctly rare. I have seen only one male more recent than the type series, and the additional material preserved in spirit mentioned by Tonnoir (1940) cannot now be found. There is also a series of females in the British museum (Natural History) from the Cambridge Botanical Gardens, found in *Arum italicum*.

Psychoda erminea Eaton

Females of this species are unique in possessing two additional lobes on the subgenital plate. Other features of note are the reticulated spermathecae and the prolongation of the median digit into a sharp point. The asymmetric process of the male genitalia is closely applied to, and curves around, the aedeagal shaft.

In his discussion of this species, Jezek (1983) designates a lectotype male from Westrow, Holwell (which he pardonably renders as Westron, Holmall!). The genitalia on this mount have migrated to the extreme edge of a very large coverslip, and cannot now be critically examined. I am at this stage loath to remount, in view of the extreme scarcity of material of this species.

Until recently, nothing was known of the larval habits of this species. It is one of only two species not dealt with by Satchell in his comprehensive monograph of *Psychoda* larvae (1947a). I was therefore delighted to be given a male of this species by Mr R.M. Payne which he bred from wild otter spraint.

The limited material in BM(NH) and the few specimens I have collected myself over a 6-year period suggest this is a rare species. This may be an artefact, however, since, with only one exception, all specimens were collected in late autumn or winter, when collecting effort tends to be minimal.

Psychoda grisescens Eaton

Synonyms: *P. horizontala* Haseman

P. pusilla Tonnoir **syn nov.**

P. marylandana del Rosario

P. grisescens is one of the commonest and most widespread of all *Psychoda*. The male has a remarkable squarish subgenital plate with small teeth at the corners, while the female has a curious darkened area basal to the median digit.

I was surprised by my failure to catch *P. pusilla*, as the type series came from the windows of F.W. Edwards' house. The species was distinguished by having three anterior branches to the antennal ascoids, rather than the normal two. Examination of the types in the British Museum (Natural History) revealed that this species is merely *grisescens* with the above antennal aberration. Specimens of *Psychoda* with such odd ascoids are clearly unusual, but at least one other species from North America is recorded with this feature. (Quate, 1955).

P. grisescens has been bred from dung and the fungus *Coprinus atramentarius*.

Psychoda setigera Tonnoir

This species also belongs to the grouping with incomplete wing forks, although it is worth mentioning that I have seen one specimen with only one of the forks thus. Males are quite distinct by virtue of the abruptly tapering dististylus. This organ, as clearly figured by Tonnoir in his 1922 paper, has a dense tuft of hairs basally and two very long flattened spines just basal to the narrowed area. Tonnoir (1940) described what he believed to be the female of the species, and depicted the subgenital plate. Subsequent authors have followed this interpretation, but it is incorrect. I have taken this species *in copula* in a water trap in my garden, and the female so obtained closely resembles *P. surcoufi* Tonnoir. It shares with that species a heart-shaped subgenital plate and a pair of tufted organs basal to this. It differs in having no obvious median keel or apical denticles, and the median digit is very short.

I believe I have now located the female specimen which Tonnoir figured in 1940. It has precisely the data quoted for the allotype of *setigera* (in F.W. Edwards' hand?) and two labels, which must have once corresponded to individual specimens, reading 'type' and 'paratype'. Only the paratype female remains on the slide, which has a partially torn data label stuck over the original determination. Strangely, both determinations are the same! The remaining specimen is labelled '*P. sparsa* n. sp.' in what I believe is Tonnoir's handwriting. This name has never to my knowledge been published, but I hesitate to employ it for Tonnoir's strange female, as the missing type (which could be a male?) may yet be found.

Quate (1955) gives *P. uniformis* del Rosario as a synonym of *P. setigera*, but as the series from which he selected a lectotype comprises females only, and these are quite unlike those described above, this synonymy cannot be valid.

I have taken *setigera* at lights and it has been reared from cow dung, but it is evidently not a common species.

Psychoda surcoufi Tonnoir

Synonyms: *P. subimmaculata* Tonnoir

P. spatulata Satchell

P. sigma Kincaid **syn. nov.**

As described above, this species appears to be a close relative of *setigera*, but the male is clearly distinct. *Surcoufi* males have a remarkably short basistylus, almost as wide as long. The dististylus has a truncate end, and at the mid point of the outer face is a long bristle. The female subgenital plate is heart-shaped and has a prominent median keel. As depicted by Duckhouse (1966) in his redescription of the species, there is a pair of short apical denticles. I find that there is also a denticle on either side of the mid area of the keel. The median digit is elongate.

Freeman (1950) indicated that this was a rare species, known only from one Lancashire male. It is now known to be common, and as Le Gros (1966) observes, is quite common in gardens.

Duckhouse (1966) suggested *sigma* Kincaid might be a synonym. However, Satchell informed Quate that he considered the species quite distinct. Reference to the figures of *sigma* in Quate (1955) render this contention untenable as these clearly depict *surcoufi*. *P. sigma* is herewith formally synonymized with *P. surcoufi*. *P. surcoufi* has been recorded as a pest in bulk potato stores (Shaw, 1968) and reared from cow dung. I have examples bred *ex Polyporus squamosus* and *Pluteus cervinus*.

Psychoda phalaenoides L.

Synonyms: *Psychoda pacifica* Kincaid 1897

Psychoda horizontala Haseman 1907

Psychoda tonnoiri Dyar 1926
Psychoda angustafona Rapp 1944
Pericoma pacifica Enderlein 1937

A quite unmistakable and very common species. As noted above, the aedeagus is bilaterally symmetrical, has tiny barbs at the apex, and is almost as long as the dististylus. Tonnoir (1940) separates females into two subspecies, *P. p. phalaenoides* and *P. p. elongata* on the basis of the relative length of the internal digit, but more work is required to establish the validity of these forms. (I have on one occasion taken both forms in the same locality on a juniper bush.)

The species breeds almost exclusively in cow dung, but there is one record from decaying agarics. Females are also recorded as abundant in spathes of *Arum maculatum*, where they are common pollinating agents. They are not, however, trapped in or by the spathes as generally believed.

Psychoda gemina Eaton

A species with a robust aedeagus with a wide spatula, quite unusual for the genus. I am unable to confirm, with the limited material at my disposal, whether the female subgenital plate has a prominent median rib, as quoted by Tonnoir (1940), but the 'shoulders' of this organ fall away quite markedly, similar to *grisescens*. The species appears to be rare, and I have only seen four specimens in 6 years. It has been reared from leaves and mud in a ditch bottom.

Psychoda minuta Banks

Synonyms: *Psychoda marylandana* del Rosario 1936
Psychoda spreta Tonnoir 1940

The female of this species has a unique crescent-shaped subgenital plate, with a setose median digit. The male is also distinctive because of the two prominent lobes on the subgenital plate and the twisted side-arm of the aedeagus. Quate (1955) examined the syntypes of this species and established the synonymy with *spreta*.

This species is widespread without being common. It has been bred from pigeon guano and captured in a slate mine. Satchell (1947*b*) believed it to breed in rotting vegetation, as it emerged from grass cuttings and scalded *Phormidium* alga. I have bred it from *Polyporous squamosus* and *Grifola frondosa*.

Psychoda lobata Tonnoir

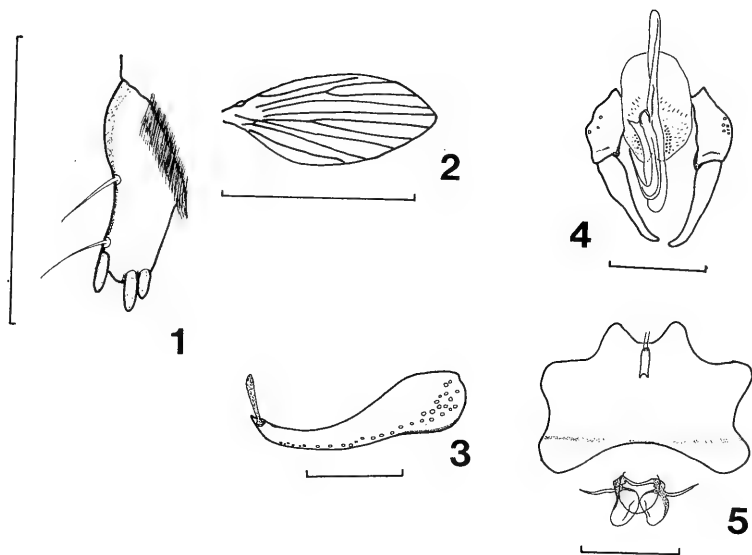
The subgenital plate of this species bears a superficial resemblance to *P. surcoufi*, in that it is heart shaped. However, the keel in that species is missing, as are the basal tufted organs. The base of the plate in *lobata* is deeply cleft, and the whole plate more sparsely haired. The male aedeagus has a darker side-arm at right angles to the shaft.

This species appears to breed exclusively in higher fungi, and I have seen examples from *Coprinus atramentarius*, *Armillaria mellea*, *Amanita* sp. and *Lyophyllum fumatofoetens*. This has been presumed a unique association and has led to 'overrecording' of this species; many ostensible specimens reared from fungi which I have examined have been other species.

***Psychoda buxtoni* sp. nov**

The presumption that all *Psychoda* breeding in fungi are *lobata* has led to a species having been overlooked. This species is described below.

The seminal papers by Buxton & Barnes (1953) and Buxton (1954, 1960) on Diptera associated with fungi mention no Psychodidae, which Buxton considered remarkable. In fact, Professor Buxton *did* rear several specimens which he submitted



Psychoda buxtoni. 1: labium (scale = 0.1mm), 2: wing of male (scale = 1mm), 3: cercopod of male (scale = 0.1mm), 4: genitalia of male (scale = 0.1mm), 5: subgenital plate of female (scale = 0.1mm).

to the British Museum (Natural History) for identification. These were remounted on slides, but have remained unrecognized in the collections for over 35 years, wrongly identified as *lobata*. It is only fitting that I name this species after Professor Buxton.

Male: head, antennae 16 segmented, terminal 3 segments smaller than preceding, all of similar size. Eye bridge 4 facets wide, interocular space 1-2 facet widths. Labium with three teeth (Fig. 1). Wings; wing forks basally complete, upper clearly nearer wing tip than lower (Fig. 2). Genitalia; Cercopod slightly curved, basally forficulate; retinaculum inserted approximately its own diameter from tip, which is pointed (Fig. 3). Retinaculum approximately one-quarter length of cercopod. Basistylus two-thirds length of dististylus with slight apical curvature. Subgenital plate large, flat, with smoothly curved foremargin. Aedeagal base spatulate, tapering medially and widening to rounded apex. Aedeagal side-arm basally cleft, and strongly recurved for almost half its length (Fig. 4).

Female: differing from male only in genitalic features. Subgenital plate as Fig. 5, median digit elongate with two apical setae. Base of plate darkened.

Holotype: male, Tonbridge, Kent, England, September 1951, bred from *Boletus* sp. Mounted on slide, with genitalia under one coverslip and remainder under another, labelled: *Psychoda lobata* (?). Paratypes: one male, two females with identical data. All specimens in collection British Museum (Natural History).

Psychoda trinodulosa Tonnoir

This species is another of the small group with incomplete basal wing forks. It has male genitalia similar to *brevicornis*, but without the encircling collar of the aedeagal process, and the distylus does not taper abruptly, as in *setigera*. All females of this group are abundantly distinct in the form of the subgenital plate and relative length of the median digit.

P. trinodulosa is believed only to breed in cow dung, and is thus quite widespread. I have taken specimens around domestic light.

Psychoda albipennis Zetterstedt

Synonyms: *Psychoda severini* Tonnoir 1940

Psychoda parthenogenetica Duckhouse 1962

Psychoda satchelli sensu Salamanna (nec Quate 1955) 1975

Psychoda zetterstedti Jezek 1983 **syn. nov.**

This taxon represents the most confused and misinterpreted in the genus. The controversy surrounds essentially three species, *albipennis* Zett., *severini* Tonn. and *parthenogenetica* Duckhouse. Firstly, *parthenogenetica* was raised to full specific rank, from being a subspecies of *severini* Tonnoir, 1940. As the name suggests, it was a taxon known only as females. Duckhouse (1962) also added *severini* to the British list, unfortunately without figuring any critical features.

Jezek (1983) then discussed the status of members of the debatable genus *Logima*, in which he included *albipennis*. He synonymized both *severini* and *parthenogenetica*, since the females appeared identical. However, when seeking a male, he selected a specimen (from over 7000 examined) and, it seems, arbitrarily assigned it to *albipennis*. Having examined the *albipennis* type series he reported that 'the male is unavailable for lectotype designation', and so he designated a female lectotype and paralectotype. The generally common and normally accepted *albipennis* males he then proceeded to describe as '*P. zetterstedti*'.

This, however, only added to the confusion. Frequency of association suggests that the common male is the correct male of *albipennis*. Jezek's male assigned to this taxon is not only a unique specimen, but was evidently undescribed. It is therefore in need of a new name, which is given below.

Psychoda jezeki **nom. nov.**

Synonym: *Psychoda albipennis* Jezek, 1983 (pp. 214, 216) partim (male only) nec Zetterstedt, 1850.

P. albipennis males as now defined are very common. The species is a catholic breeder, and has been reared from sewage beds, rotten vegetation and manure of chickens, horse and cow. I have seen material from pigeon guano, horsehoe bat droppings, *Angelica sylvestris* and the fungi *Piptopterus betulinus* and *Polyporus squamosus*. It is a frequent visitor to lights.

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A new RES Handbook for the Tachinidae (Diptera). — Work has just started on a new RES Handbook for the Tachinidae. The BM(NH) collection, upon which the work will primarily be based, has an inadequate series of the following species. Any specimens of these which could be borrowed will be invaluable in constructing a usable key. *Actia exoleta* (Meig.), *Gymnosoma nitens* (Meig.), *Belida angelicae* (Meig.), *Carcelia intermedia* (Herting), *Ceranthia lichtwardtiana* (Villeneuve), *Eurysthaea scutellaris* (R.-D.), *Germaria ruficeps* (Fall.), *Gonia foersteri* (Meig.), *Hemiacquartaria paradoxa* Braur & Bergenstamm, *Litophasia hyalipennis* (Fall.), *Phebellia nigripalpis* (R.-D.), *Phebellia stulta* (Zett.), *Siphona mesnili* Andersen.

Any catalogues of tachinid collections held by other individuals or institutions would be useful. These would enable loans, examination and/or exchanges of material to be arranged at a future date.

The assistance of collectors is also requested to help expand the host records of the group. Specimens reared from known hosts would be greatly appreciated. All parts of the puparium and the remains of the host should be included along with the locality, date, host plant/habitat and authority for host identification, if available. The adult fly should ideally be kept alive for a day or two to allow its cuticle to harden. Specimens reared from hosts whose identity is uncertain would also be of value, especially if accompanied by the puparium. Identifications will be provided if requested and the specimens returned by any date required. Any fly which has developed as an internal parasite of another insect, excepting the leaf-hoppers and the aculeate Hymenoptera, will almost certainly be a tachinid.

The RES Handbooks are intended to provide a service for amateur and professional entomologists, and so any comments or suggestions from possible future users of this particular volume are welcomed. — Robert Belshaw, Diptera Section, Department of Entomology British Museum (Natural History), Cromwell Road, London SW7 5BD.

SOME FURTHER NOTES ON SPECIES OF ICHNEUMONIDAE REARED AS ECTOPARASITES OF SPIDERS

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In 1985 I reported on some species of polysphinctine ichneumons that I had reared from spiders collected in Hampshire and West Sussex (*Proc. Trans. Br. Ent. Nat. Hist. Soc.* 18:32-34 1985). Since then I have encountered many more species throughout these two counties and this paper records my observations on them as well as on some additional specimens of those species already mentioned in that first account.

Schizopyga circulator (Panz.) reared from *Clubiona terrestris* West. (Family Clubionidae)

The sub-adult male and female hosts were found inside dead, hollow umbelliferous stems in woodland at Hilsea, Portsmouth. It is curious that this spider is host to two closely related species of parasitoid at this site. I have recorded *Schizopyga frigida* Cresson extensively over the years from exactly the same situation. In 1986 11 out of 48 spiders that I examined here carried larvae on them. Of those that reached maturity all except one proved to be *S. frigida*.

Sex	Collection Date	Size (mm)	Pupation Date	Final Size (mm)	Emergence Date
♂	9.iii.84	1.0	12.iv.84	6.0	29.iv.84
♀	30.iv.86	7.0	2.v.86	7.0	18.v.86

Polysphincta rufipes Grav. reared from *Larinioides cornutus* (Clerck) (Family Araneidae).

This is a fairly large species of polysphinctine which appears to favour this spider as a host, possibly because of the damp habitat with which it is often associated. The specimen listed was collected on an immature host at Horsea Island, an M.O.D. site at the northern end of Portsmouth harbour. I have a further specimen, reared from the same host species, which was collected by a friend of mine in South Wales in 1984.

Sex	Collection Date	Size (mm)	Pupation Date	Final Size (mm)	Emergence Date
♀	20.vi.87	3.0	27.vi.87	7.5	7.vii.87

Polysphincta boops Tschek reared from *Araniella opistographa* (Kulczynski) (Family Araneidae).

This is apparently a rare species and Hampshire is well out of its known distribution range in this country with the few specimens recorded prior to this all being found in Scotland or the Lake District. This single male was collected by a friend of mine from oak woodland near Basingstoke but unfortunately much of the data on larval size, pupation and emergence dates is unknown. All that can be said with certainty is that the host was beaten from oak foliage at the beginning of June 1986 and the parasitoid emerged towards the end of that month.

Zatypota albicoxa (Walk.) possibly from *Achaeranea lunata* (Clerck) (Family Theridiidae).

Another rare species, this particular specimen was collected as a pupa on 27.vi.86 on a Hampshire and Isle of Wight Trust reserve at Emer Bog near Romsey, and

emerged about a week later. The cocoon, some 6.5 mm long was in a theridiid web on a pine tree trunk and immediately below this was a web belonging to an immature *Achaeranea lunata* (Clerck), a spider from which this parasitoid has previously been reared. The discovery of this female at a site only 11 miles away from that mentioned in my previous paper indicates that perhaps the species is now established in this area of Hampshire.

Acrodactyla degener (Hal.) reared from *Lepthyphantes zimmermanni* Bertkau (Family Linyphiidae).

The adult female host was collected early in the year from amongst leaf litter in deciduous woodland at Hilsea near Portsmouth. This is the same site from where I reared the specimens of *Schizopyga circulator* mentioned above and to date I have recorded five species of polysphinctines from there.

Sex	Collection Date	Size (mm)	Pupation Date	Final Size (mm)	Emergence Date
♀	10.ii.87	0.5	5.iii.87	4.0	3.iv.87

Acrodactyla madida (Hal.) reared from *Meta* sp. (Family Metidae).

The host spider was immature and identification could not be made with certainty although the most likely species is *Meta segmentata* (Clerck), a very common and widespread spider. It was collected from low tree foliage in deciduous woodland near Denny Lodge in the New Forest. This parasitoid differs from other related species in that it overwinters as a prepupa in a cocoon instead of remaining on the host as a small larva. The fact that this one emerged before winter is due to it being kept indoors.

Sex	Collection Date	Size (mm)	Pupation Date	Final Size (mm)	Emergence Date
♀	20.ix.86	5.0	24.ix.86	6.0	17.x.86

Sinarachna pallipes (Holmgren) reared from *Araniella* sp. (Family Araneidae).

Again the host was immature and specific identification was not possible. It was collected from low tree foliage near Burton Park Lake, West Sussex. The parasitoid larva was already well developed and killed its host a few days after collection.

Sex	Collection Date	Size (mm)	Pupation Date	Final Size (mm)	Emergence Date
♂	14.vi.87	3.0	20.vi.87	5.0	3.vii.87

I would like to extend my thanks once more to Dr Mark Shaw of the Royal Scottish Museum for confirming the identity of my specimens and for his continued support and advice. Also to Mr Dick Jones for his assistance in host identification and for providing some of the specimens.

Spiders with polysphinctine larvae on them are often easy to spot in the field and most observant naturalists will probably encounter them in the course of their travels. Hopefully, if more interest can be aroused and people can be persuaded to devote a little time and effort into keeping and rearing them, a lot more will be learnt about both their biology and distribution.

THE BEES AND WASPS OF SCOLT HEAD ISLAND NATIONAL NATURE RESERVE, NORFOLK

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Scolt Head Island NNR, a 4-mile-long island lying just off the Norfolk coast, is part of the magnificent stretch of coastal habitats that extends as an almost uninterrupted series of nature reserves from Hunstanton to Sheringham. The island is a reserve of international importance (Ratcliffe, 1977), and its physiography and natural history have been intensively studied (see Steers, 1960). Detailed lists of the plant and bird species on the island are available (Steers, 1960), but there have been few thorough faunistic studies of the insects. Ellis (1960) gives a list of insects from the island, but the only two orders that have been studied in detail are the Lepidoptera (Ellis, 1960) and the Coleoptera (Welch, 1982; 1986). The present paper is an account of the aculeate bees and wasps of the island and is based almost entirely on collections made by the authors. The only previous published list of bees and wasps on Scolt Head appears to be that compiled by Ellis (1960): a list of 8 solitary and 10 social species (see also Ellis, 1976).

Scolt Head Island consists of a shingle ridge, running east-west parallel to the coast, from which a number of lateral ridges extend southwards enclosing areas of saltmarsh. These shingle ridges are covered by sand-dune, which occurs on the island in all stages of development. Perhaps the best area on the island for bees and wasps is the stretch of dunes from Beach Point through Long Hills and Wire Hills to the Hut, and from there west along Smuggler's Gap to opposite House Hills, roughly in the centre of the island. The south-facing Hut Bank below the Hut and the eroded mature dunes, known as Wire Hills, just south-west of the Hut are particularly rich collecting areas. The mature dunes at the eastern end of the island — Norton Hills — are also interesting, but have been less thoroughly studied.

Bramble (*Rubus fruticosus* agg.) provides abundant nest sites for stem-nesting aculeates. It occurs on mature dunes throughout the island and is particularly abundant around the Hut. The island is relatively rich in plants that provide nectar and pollen (see Chapman, 1960; Jane & White, 1976). The saltmarshes provide a small number of suitable species which can be extremely abundant at certain times of the year: these include *Armeria maritima* (Mill.) Willd., *Limonium vulgare* Mill., *Limonium humile* Mill., and *Aster tripolium* L., which is visited by the rare bee *Colletes halophilus* Verhoeff. The sand-dunes provide a wider range of suitable species. Of particular importance are *Euphorbia paralias* L., *Senecio jacobaea* L., *Rubus fruticosus* agg., *Eryngium maritimum* L., and *Taraxacum* spp. Eisikowitch and Woodell (1975) list 5 species of bee visiting *Armeria maritima*. Notes on associations with particular flowers are given in the detailed list of species.

METHODS

The present paper is based on collections and observations made between 3.vii.81 and 5.viii.81, 30.vi.82 and 3.vii.82, and more sporadically over many years, mainly on field courses during the last week of July and the first 2 weeks of August. We have also visited the island twice in May, specifically to look for spring bees (22.v.83,

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10.v.84). Finally, stem-nesting species were found by collecting bramble stems containing immatures in the 1982/3 and 1983/4 winters. Nineteen such nests produced three species mentioned below and from an additional 11 nests, 35 specimens of the ichneumonid wasp *Perithous divinator* (Rossi) were the only wasps to emerge.

SPHECIDAE

Tachysphex pompiliformis (Panz.). Extremely common. We have also seen one male, collected 1.vi.36 (E.A. Ellis). Female caught carrying large nymph of *Chorthippus albomarginatus* (De Geer) (Orthoptera) to nest, 30.vii.81.

Tachysphex unicolor (Panz.). Not common. Hut Bank.

Crossocerus wesmaeli (Vander Linden). Not common. Hut Bank and House Hills.

Ectemnius continuus (F.). Rare. Male on Wire Hills, 24.vi.84.

Rhopalum clavipes (L.). Rare. Male reared from bramble stem collected 26.i.83. House Hills.

Oxybelus uniglumis (L.). Extremely common. Prey records: three muscids and one syrphid.

Pemphredon lethifer (Shuck.). Adults common on bramble leaves. From 15 bramble stem nests collected in 1983 and 1984 from Long Hills, Wire Hills, Hut Bank, House Hills and Norton Hills, 22 males and 12 females and one unsexed *P. lethifer* emerged. Nine larvae failed to develop, and 12 *Perithous divinator* (Rossi) (Ichneumonidae) also emerged.

Ammophila sabulosa (L.) Very common. A caterpillar of *Orgyia antiqua* (L.) (Lepidoptera) was excavated from one nest, 3.viii.81. It is unusual for such a hairy prey to be caught by *A. sabulosa*.

Podalonia affinis (Kirby). Very common on Hut Bank.

Podalonia hirsuta (Scop.). Very common on Hut Bank.

Gorytes tumidus (Panz.). Rare. Male on top of Hut Bank, 30.vi.82.

POMPILIDAE

Auplopus carbonarius (Scop.). Recorded by Ellis (1960), but not seen by us.

Priocnemis parvula Dahlb. Rare. Male collected 4.viii.75 (S.A. Corbet).

Pompilus cinereus (F.). Extremely common. Prey records: Two females on Hut Bank carrying immature *Arctosa* sp. (probably *perita* Latr.), 31.vii.81, 2.viii.81.

Arachnospila anceps (Wesm.). Rare. The only specimen we have seen was a male, collected 1.vi.36 (E.A. Ellis).

Evagetes crassicornis (Shuck.). Rare. One female, 3.vii.82.

Anoplus infuscatus (Vander Linden). Quite common.

Anoplus viaticus (L.). Extremely common. Females seen as early as 10.v.84.

Episyron rufipes (L.). Extremely common. Both sexes often feeding at *Euphorbia paralias* on Hut Bank. Three individuals caught with females of *Araneus diadematus* Clerck (31.vii.81–3.viii.81), a spider that builds webs on *Suaeda fruticosa* Forsk around the upper margins of Hut Marsh, close to the nest sites of *E. rufipes*. On 4.viii.81, a female *E. rufipes* was caught carrying a lycosid (immature *Arctosa* sp., probably *perita*), and on 14.viii.83, another specimen was caught with a larger *Arctosa* sp. Only three other records of *E. rufipes* capturing non-orb-weaving spiders exist: *Alopecosa* sp. (immature) (Richards and Hamm, 1939), *Arctosa* sp. (Eichler, 1953), and *Xysticus cristatus* (L.) (Thomisidae) (personal observation).

VESPIDAE

Vespa germanica (F.). Listed by Ellis (1960).

EUMENIDAE

Ancistrocerus scoticus (Curtis). Rare. Male and female on bramble, 6.ix.75. Ellis's (1960) record of '*A. trimarginatus*' presumably refers to this species, rather than to *A. trifasciatus* (Müller). A male specimen collected by Ellis (1.vi.36) and seen by us is of *A. scoticus*.

CHRYSIDIDAE

Hedychridium ardens (Latr. in Coq.). Extremely common.
H. cupreum (Dahlb.). Rare. Wire Hills, 3.vii.82.

HALICTIDAE

Lasioglossum minutissimum (Kirby). Uncommon. Wire Hills, Hut Bank.
L. punctatissimum (Schenk). Uncommon. Female on *Limonium binervosum* (G.E. Sm.) C.E. Salmon, 31.vii.82. Several females collecting pollen on *Erodium cicutarium* (L.) L'Hérit and *Cochlearia* sp. flowers, Wire Hills, 10.v.84.
Sphecodes fasciatus von Hag. Uncommon. Wire Hills.

ANDRENIDAE

Andrena scotica Perkins. Rare. At *Eryngium* near Hut, male (7.viii.75) and female (9.viii.75) (S.A. Corbet).

COLLETIDAE

Colletes fodiens (Geoff. in Fourcr.). Common on *Senecio* flowers.
Colletes halophilus Verhoeff. A large colony existed for many years on Butcher's Beach (between Missel and Hut Marsh), on shingle in an area of eroded dunes colonized by scattered plants of *Suaeda fruticosa*, *Halimione portulacoides* (L.) Aell., *Limonium bellidifolium* (Gouan) Dum., and *L. binervosum* (G.E. Sm.). Males were observed feeding on *Erodium* and *L. binervosum*, and females were observed on *Aster tripolium* (7-11.viii.75, 17-19.ix.78). The nesting area was reached by the highest spring tides: for example on 10.viii.75 and on 18 and 19.ix.78. On the morning of 19.ix.78, the tide was exceptionally high (7.7 m above Chart Datum (Immingham: Admiralty Tide Tables)) and the bees were observed trying unsuccessfully to get to their burrows that were submerged by two or three inches of seawater. Many bees were digging new burrows, higher up the bank in dry sandy areas. These bees were females, heavily loaded with *Aster* pollen. The bees have not been observed by us on Scolt since 1978. A large colony was found by P.W. Banham on a shingle area on Wells East Hills (TF 923455): two specimens seen by us (collected 25.ix.83). This colony is almost certainly still in existence. In September 1935, G.M. Spooner discovered large colonies of *C. halophilus* at Blakeney Point and Scolt Head Island, nesting in firm maritime sand (Richards, 1937). Both sexes visited *Aster tripolium* in large numbers, fewer being observed on *Limonium* and *Senecio*. On the continent, *C. halophilus* is also restricted to maritime sands and visits a range of dune flowers, although females primarily visit *A. tripolium* (Manning, 1955).
Hylaeus brevicornis Nyl. Adults never seen. From three bramble-stem nests collected from Long Hills, Wire Hills and Hut Bank in 1983 and 1984, seven female *H. brevicornis* and two *Perithous divinator* emerged.

ANTHOPHORIDAE

Osmia leaiana (Kirby). Rare. One female flying around the Hut.

Megachile centuncularis (L.). Rare. One female, 31.vii.81.

M.leachella Curtis. Extremely common. Collecting pollen, especially from bramble blossom. June to August. Nesting in Hut Bank, Wire Hills, Norton Hills.

M.maritima (Kirby). Common.

M.circumcincta (Lep.). Recorded by Eisikowitch and Woodell (1975) visiting *Armeria*.

M.versicolor Smith. Rare. One female on dunes north of Cockle Bight on *Cirsium vulgare* (Savi) (S.A. Corbet).

Coelioxys vectis Curtis. Uncommon. Wire Hills, female, 3.vii.82; Hut dunes, male, 11.viii.78.

APIDAE

Bombus lapidarius (L.). *B.terrestris* (L.). *B.audax* (Harris). All three species common. All three recorded visiting *Armeria* by Eisikowitch and Woodell (1975).

B.pascuorum (Scop.). Common.

B.pratorum (L.). One male, 1.vii.82.

B.muscorum (L.). Two workers, 3.viii.79 (P.H. Williams).

B.distinguendus Morawitz. Listed by Ellis (1960).

Psithyrus rupestris (F.). Listed by Ellis (1960).

P.vestalis (Geoff. in Fourcr.). Listed by Ellis (1960).

Apis mellifera L. Very common.

DISCUSSION

Like most small exposed coastal sand dune systems in the UK, Scolt Head Island contains few species of bees and wasps in comparison with other types of sandy areas. The total list includes 47 species, of which 36 are solitary and 11 social. Three-quarters of the solitary species are ground-nesters and only four rare species nest in dead wood. Three species nest in bramble stems, an abundant resource on Scolt. These bramble nesters chose mainly fairly thick, old, dead stems, but ones which still bore a protective 'bark' and prickles, preventing rotting. Older bramble is present on Long Hills, Wire Hills and Hut Hills. The House Hills area has been burnt recently and bears mainly young sprawling brambles, unsuitable for aculeates.

It is unlikely that any abundant species has been overlooked. A few more species, for example *Astata pinguis* (Dahlb.) (Sphecidae), are probably present, and others might perhaps be found by spring collecting or by visiting Norton Hills. Particularly noticeable was the lack of spring bees on our two May visits, both of which were unusually hot days. Only *Lasioglossum punctatissimum*, *Bombus* spp. and a few male sphecsids were visible. Although there were no suitable shrubs with many flowers per plant (e.g. *Salix*, *Prunus*), huge numbers of *Taraxacum* spp., *Armeria maritima*, violets and several small dune species (e.g. *Erodium*, *Cochlearia*) were present.

The dunes are obviously not as stable as inland heaths, but the main reason for the low number of species is probably exposure. There is relatively little shelter from the ever-present winds, except at the base of the larger dunes, so that conditions are poor for flying insects. Eisikowitch and Galil (1971) noted the adverse effect of exposure to sea winds on the pollination of a coastal plant in Israel *Pancratium maritimum* L. (Amaryllidaceae): the hawkmoth pollinator could fly only at the rare times when the

wind speeds were less than 2–2.5 m/s. It is possible that many of the plants on the island are wind- or self-pollinated, or reproduce asexually, as Moldenke (1976) found in Californian coastal plant communities. Any significant pollination by bees on Scolt will be by generalist thermoregulatory bumblebees and later also by the abundant *Megachile leachella* and perhaps *Apis*, *Colletes* and other *Megachile* species.

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BOOK REVIEW

The Carabidae (Coleoptera) of Fennoscandia and Denmark. By the late Carl H. Lindroth. Leiden, E.J. Brill/Scandinavian Science Press, *Fauna Entomologica Scandinavica* Volume 15 Part 1, 266 pages, 1985, Gld 80 (approx £24.50) and Part 2, 272 pages, 1986, Gld 80 (approx £24.50).

Fauna Entomologica Scandinavica has established itself as one of the most important series of entomological books being published in Europe. This volume

follows the usual format: an introduction to characters, nomenclature, natural history, collecting and identification is followed by lucid dichotomous keys and species descriptions; the text is copiously illustrated with line drawings. But the line drawings look too familiar. Déjà vu? Yes, I *have* seen them all before — in Lindroth's Royal Entomological Society Handbook on the Carabidae published in 1981. The keys also seem terribly familiar, and sure enough they are almost identical character for character if not word for word to those in the Handbook. Examination of the preface discloses the author's admission that the book is really nothing more than an extension of an earlier work (in the *Svensk Insektfauna* series, 1942, second edition), and it appears that the Royal Entomological Society Handbook was based on the same material. Thus there is little difference between the Handbook and the present volume. It is a shame that in expanding on his earlier work, the author did not incorporate the additional material from the Handbook, because now we are left with a book which unlike the other volumes in the series does not cover the entire British fauna. Thus the 400 species in the book include only a supposed 289 of the 355 British species: a shortfall of 66. This is confounded by the fact that some British species which are included, are not recorded as British in the distribution tables. Given that the book is written in English, and a large market must exist in the UK, it is surprising that the publishers have let this pass. Despite the obvious failings of a book only partly useful to British entomologists, the book does have features to recommend it. The obvious contribution is the expansion of descriptions and details of biology and natural history lacking in the Handbook. Each species is given between 6 and 10 lines of description followed by about 6 lines on its distribution throughout northern Europe and about 6 lines on its biology. This is particularly interesting for some of the species which do not occur in the UK. Most of the figures are those from the Handbook, but there are extra, notably drawings of whole insects and figures of genitalia. Then there are the eight colour plates figuring 130 species. The Coleoptera are not generally very photogenic, but here the detail and colour of the insects reproduce well, even if large and small beetles together on the same plate do look a little odd. There is introduced, by way of an aside, a proposed new classification of the Carabidae (based on Erwin and Sims, 1984, *Quaest. Ent.* 20: 357–466), but the nomenclature and arrangement of the family in the book agrees closely (as would be expected) with the Handbook. One change worth mentioning is *Badister bipustulatus* (F.) which now becomes *B. bullatus* (Schrank). Finally, the distribution tables (including the UK) give a good idea of the ranges of the species; although as mentioned above there are a few errors. The book is not obviously written by someone to whom English was a second language, but there are some 'Fennoscandisms' in the grammar: almost every species is variously described as being 'very' or 'quite' 'distributed'! The book does contain some useful information, and Coleopterists ought to buy it if only to augment Lindroth's Handbook. It is rather irritating not to be able to tell from the spine which part is which when the books are on the shelf together, and a final assessment leaves me rather disappointed with (from the British point of view) perhaps the least practical volume in the *Fauna Entomologica Scandinavica* series. I cannot but contemplate the book it could have been.

R.A. JONES

COMPARISON OF TWO WELSH SAND DUNE FAUNAS WITH SPECIAL REFERENCE TO THE COLLEMBOLA

PHILIP M. MILES

Werndeg, Cnwch Coch, nr Aberystwyth, Dyfed, Wales

An investigation of terrestrial sand dune fauna at Ynyslas, Cardiganshire (Miles 1984) a site managed for its scientific interest by the Nature Conservancy Council, prompted investigations of two sand dunes that have not been previously studied: one at Gwbert-on-Sea in south Cardiganshire, the other at Manorbier in Pembrokeshire.

The dunes at Gwbert-on-Sea (SN162489) are situated at the mouth of the Afon Teivi flowing into Cardigan Bay. On the north side of the estuary at Gwbert-on-Sea the stable dune used for a permanent caravan site restricted the area available for investigation. This dune is not subject to extensive wind erosion or excessive public pressure but at spring tides, especially when gale force south westerly winds drive heavy seas ashore, there is some cutting back of the dune escarpment, but within 16 m from this high water mark fixed dune commences.

Manorbier dune (SM061974) in south Pembrokeshire, dominated by Manorbier Castle, is largely a mature dune system that almost fills the small bay. A small stream trickles onto the beach. There is little erosion or disturbance as much of the area is dune scrub.

A similar pattern of arthropod distribution was found to occur in the component ecological zones at Gwbert-on-Sea and Manorbier, as well as at Ynyslas previously studied.

The arthropod fauna at Gwbert-on-Sea in terms of number of specimens is smaller by about half compared with Ynyslas, but with 15 species, is similar in this respect, Manorbier having most with some 22 species.

The botanical associations at Gwbert-on-Sea and Manorbier are similar in that early scrub commences about 48 m beyond high water.

Excluding plantless areas of blown sand, from evidence so far obtained the number of species of Collembola present in zones colonized by plants appears to be unrelated to the number of botanical species present and rather surprisingly, little if any difference could be detected in the number of species present in wet dune areas, and drier dune scrub in winter months. However, the density of ground cover such as provided by the presence of grasses, mosses, etc, resulted in a small increase in the number of Collembola species present.

In south Wales, dunes facing Atlantic waves have only small numbers of Collembola, the dominant order. Collembola were found to occur to within 16 m of high water. Sand dunes are deficient in organic matter and lack most horizons usually found in inland soil structure, resulting in small populations of only a few species however, a litter layer develops in the dune scrub zone.

The Collembola of these dunes represent a broad cross-section of this order, embracing representatives of soil-dwelling, surface-inhabiting and arboreal species, these last being usually furthest from the shore. The soil-dwelling 'pioneer' species of a primary zone of almost pure sand are *Mesaphorura krausbaueri* (Börner) and *Protaphorura armatus* (Tullberg). The most abundant of the surface dwelling species to be found in the dunes and of general distribution are *Isotoma notabilis* (Schäffer) and *Pogonognathellus longicornis* (Müll.).

Species	Gwbert				Manorbier				
	Zone:	A	B	C	D	A	B	C	D
HEMIPTERA									
<i>Aploneura lentisci</i> Pass.				2					
COLEOPTERA									
<i>Trechus obtusus</i> Er.				2					
<i>Amara aenea</i> (DeG.)								6	
<i>A. lucida</i> (Duft.)								1	
<i>Dromius linearis</i> (Ol.)				1					
<i>Sphaeridium bipustulatum</i> F.								1	1
<i>Megasternum obscurum</i> (Marsh.)								1	
<i>Bledius longulus</i> Er.				4					
<i>Stenus clavicornis</i> (Scop.)				3					
<i>S. flavipes</i> Steph.				1					
<i>Xantholinus linearis</i> (Ol.)								1	1
<i>X. longirostris</i> Heer								1	
<i>Philonthus cognatus</i> Steph.									21
<i>P. varius</i> (Gyll.)									1
Staphylinid (larva)								1	
<i>Tachyporus atriceps</i> Steph.								1	
<i>T. chrysomelinus</i> (L.)								1	1
<i>T. hypnorum</i> (F.)								9	4
<i>T. nitidulus</i> (F.)								2	
<i>T. solutus</i> Er.								1	
<i>Atheta S. Philhygra ?volans</i> . (Scrib.)									1
<i>Chaetocnema hortensis</i> (F.)								1	
<i>Hypera nigrirostris</i> (F.)				1				2	

Mollusca, while present at Gwbert-on-Sea are 'small' species and few in numbers compared with Manorbier which provided a surprising number mostly represented by empty shells, suggesting an accumulation of several years. These species were not found at Ynyslas. Mollusca were recorded for the Biological Records Centre, but are not included in this account.

Coleoptera, only found occurring in zones of mature dune and dune scrub, were all below the soil surface, inactive in a state of hibernation at the time of sampling. Of 17 species obtained, only six were recorded at Gwbert-on-Sea, one species *Bledius longulus* Er. is local, this species is known elsewhere associated with inland sand-pits and cliffs, and *Trechus obtusus* Er. in damp places, stream sides and river banks. At Manorbier *Amara lucida* Duft. was found. This is a chiefly coastal species and the rarely seen *Xantholinus longiventris* Heer was obtained, the remaining species recorded from the dunes are commonly met with and are not particularly associated with coastal dunes.

No rare or unusual plant species were observed at Gwbert-on-Sea or at Manorbier and a few mites, symphyla and woodlice were not of special interest or specific to coastal sand dunes except *Metonoponotus cingendus* (Kinahan).

These studies were achieved by means of 25-cm quadrats spaced at 8-m intervals along a line transect through the major divisions of dune formation from west to east. At Gwbert-on-Sea the transect extended from high water mark to the frontage of the nearest block of caravans. Organisms were extracted by floatation. Samples were taken at the end of January at a time when many Collembola are more numerous than during hot dry summer months.

There having been no previous analysis of terrestrial arthropoda of these dunes a species list is appended with relevant details of zones and dominant plant species.

Gwbert-on-Sea. Zone A, blown sand, nil; zone B, embryo dune, *Festuca ovina* L. and *Poa pratensis* L.; zone C, mature dune, *Festuca ovina* L. *Agropyron* sp. and *Dactylis glomerata* L.; zone D, dune scrub, *Rosa pimpinellifolia* L. (dense root mat), *Rubus fruticosus* L., *Festuca ovina* L., *Ammophila arenaria* (L.).

Manorbier. Zone A, blown sand, nil; zone B, embryo dune, *Ammophila arenaria* (L.), and *Festuca ovina* L.; zone C, mature dune, *Hedera helix* L., *Festuca* sp. and *Pteridium aquilinum* (L.); zone D, dune scrub, *Rubus fruticosus* L., *Hedera helix* L., *Pteridium aquilinum* (L.).

REFERENCE

Miles, P.M. 1984. Terrestrial sand-dune fauna at Ynslas, Cardiganshire. *Nature in Wales* New Series 2. Parts 1 and 2 (for 1983): 75–79.

BOOK REVIEW

Tiger beetles/ground beetles: illustrated key to the Cicindelidae and Carabidae of Europe. Jürgen Trautner and Katrin Geigenmüller. Gaimersheim, Josef Margraf, 1987, 488 pages, DM 98 (cased) and DM69 (paperback).

This is a most unusual book. Written in German and English (with a German accent), it is completely bilingual. After a short introduction (left-hand columns German, right-hand columns English) and some superb colour photographs from life, begin the illustrated keys (left-hand pages German, right-hand pages English). And illustrated they are; profusely and clearly, 1200 excellent line drawings of whole insects or important characters. Liberally sprinkled amongst these is a number of distribution maps (usually about one per genus). The area covered by the book is all Europe excluding Turkey, the Soviet Union and the eastern parts of Bulgaria and Rumania. An illustrated key to *all* the tiger and ground beetles of *all* Europe would be rather a grand claim — and sure enough this is not entirely the claim made. Although many genera are keyed down to species many parts of the key extend only to genus (mainly the smaller beetles such as *Dyschirius*, *Trechus*, *Tachys* etc) or subgenus (*Bembidion* etc), and the vast conglomerate of the blind Trechini are merely listed and are not keyed out separately. Some genera although keyed to species, cover only those from certain parts of Europe. For some of the larger genera like *Carabus*, *Nebria*, *Pterostichus* and *Harpalus*, the key is only valid for various permutations of Central Europe (as in Freude, Harde and Lohse), Scandinavia, Northern France and the UK. It is usually the more species-rich Mediterranean which is left out. Despite these shortcomings, the book is interesting and useful and so far I have found it thoroughly engrossing and entertaining. The English is understandable and the bilinguality will certainly help coleopterists (myself included) to come to terms with some entomological German, however the grammar is often peculiar and highly amusing. The book will certainly 'easen' the identification of the carabids of the whole of Europe, and it well repays the close collaboration of the authors (and their rat!) with the publisher Josef Margraf in his publishing house. I certainly recommend the book, my only misgiving being the rather unaesthetic plasticized cover — perhaps though, this makes it the ideal book to dip into in the bath!

R.A. JONES

INDOOR MEETINGS

26 November 1987

EXHIBITS

Mr A. J. HALSTEAD exhibited a live specimen of a female *Opilo mollis* L. (Coleoptera: Cleridae) from the RHS Garden, Wisley, Surrey. It was found curled up in a pupal cavity in a piece of rotten Lombardy poplar brought down by the 16th October hurricane. This uncommon beetle has larvae that feed on wood boring insects and it is more usually seen in the late summer. Another specimen was taken at light at Wisley on 27.vii.86.

Mr R. A. JONES showed a male and female of *Atherix ibis* (F.), (Diptera: Rhagionidae), swept from vegetation overhanging the upper reaches of the River Ouse, Scaynes Hill, Sussex, 24.v.87. This local fly shows sexual dimorphism; the female has a grey abdomen whereas that of the male is orange. It was noted that a similar colour scheme occurs in a number of other diptera families, including the Muscidae, Tachinidae, Tabanidae, Stratiomyidae, Tipulidae and Scatophagidae.

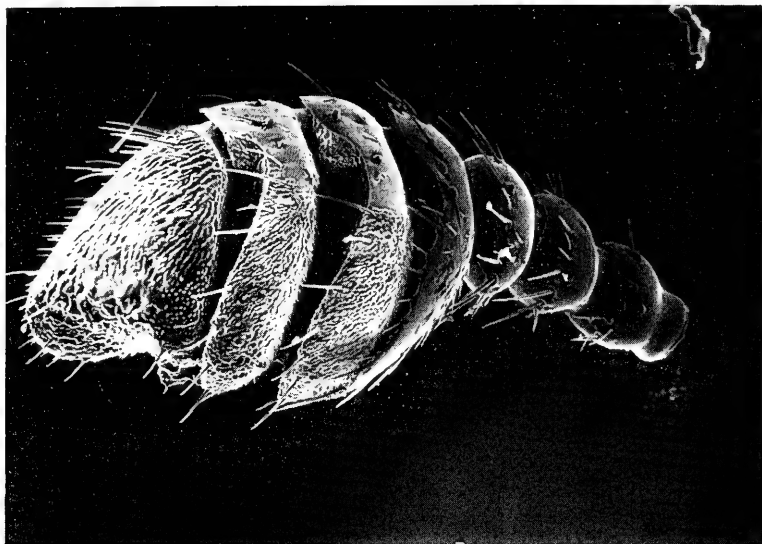
Mr M. SIMMONS showed a variety of the Glanville fritillary, *Melitaea cinxia* L. bred from larvae purchased from a dealer in 1986. The adult emerged on 4.vii.87 and died a few days later without mating. The variety had forewings with the two transverse black bands which cross the upper side of the wing greatly reduced in width. The spot in space slb was enlarged. The transverse band on the hindwing was also reduced and the segments in the submarginal band enlarged. Similar enlargement occurred in these segments on the undersides of the hindwings, and the black spots in the yellow postdiscal band were also enlarged.

Mr M. HENDERSON showed some photographs of the antennae of carrion and burying beetles produced by a scanning electron microscope. These showed the variation between species in the arrangement of sensillae on the three terminal antennal segments.

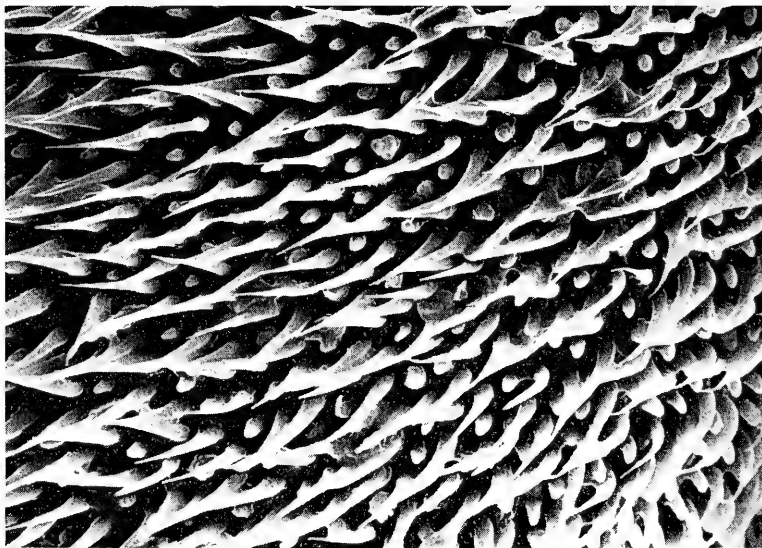
Professor J. A. OWEN exhibited a specimen of the rare elaterid beetle *Lacon querceus* (Herbst) bred from a larva found in a fallen oak bough in Windsor Great Park on 27.v.87. Five larvae of varying sizes were collected from the bough and placed in a glass jar with dryish rotten oak wood. Cheese, pieces of apple and raw mince were also provided as possible food. When the container was examined in September, two adults were present but there was no trace of the smaller larvae which had either died or been eaten by the larger ones. An attempt to further observations in the field was defeated, for when he returned to look at the bough some weeks later, all that remained of it was a heap of sawdust and ashes. Professor Owen said that this was an all too frequent occurrence. Thirty Red Data species of beetle have been recorded in Windsor Great Park but most of the area has no status as a nature reserve or SSSI. The staff and management of the Park did not appear to be sympathetic to conservation and it was time the Nature Conservancy Council acted to protect this valuable site.

COMMUNICATIONS

Mr E. BRADFORD noted that in the Whitstable area a number of butterflies had been seen on the wing shortly after the hurricane abated. Other members also reported seeing small tortoiseshells and red admirals which had presumably been blown out of hibernation sites.



Scanning electron micrograph of the antenna of *Nicrophorus vespilloides* Herbst. Note the olfactory sensillae on the terminal three segments.



Close-up scanning electron micrograph ($\times 2000$) of the sensillae on the terminal segment of *Thanatophilus sinuatus* (F.). Two sorts seem to be apparent. Both photographs shown by M. Henderson, taken by S. Gschmeissner, of the Royal College of Surgeons.

Dr K. SATTLER said that after the storm had damaged the butterfly house at Syon Park, members of the public had returned 'escaped' butterflies, most of which had turned out to be small tortoiseshells and red admirals.

LECTURE

Dr G. S. ROBINSON gave an account of the tineoid moths which consist of several families of moths with certain primitive features. The relationships between the tineoid families and with other groups of Lepidoptera are uncertain and the group has been described as a taxonomic dustbin. Dr Robinson illustrated the group with slides of British and foreign species. He also showed transparencies of microscope slide preparations of various structural features that can be used to recognize the families and establish their relationships. Research is continuing into the phylogeny of tineoid moths but a computer analysis of 31 derived characters has enabled Dr Robinson to present a provisional arrangement of the families. They seem to form two distinct groups. One of these contains the leaf mining families, the Gracilariidae, the Bucculatricidae and the Roeslerstammiidae. The other group is made up of the Tineidae, Eriocottidae and Acrolophidae families, together with the Psychidae, the Arrhothanidae and the Pseudarbelidae.

COMMENTS ON THE EXHIBITS

Mr B. PARKER thought that Professor Owen's remarks concerning the management of Windsor Great Park might be a little unfair to the staff. He suggested that a letter to the Duke of Edinburgh, who is in charge of the Park's management, might be beneficial. It was possible that the Duke was requiring dead trees and fallen timber to be tidied up without realising their importance to dead wood insects. Professor Owen replied that he had written to the Duke, and others involved in managing the Park, in the past without any effect. His studies had continued to be disrupted by the destruction of study sites, even when these had been drawn to the attention of park staff. In the absence of voluntary cooperation in retaining dead wood in the Park the NCC should use its powers to give the site some formal protection.

10 December 1987

The death was announced of Bob Weal who had been a former assistant curator of the Society's collections.

EXHIBITS

Mr R.A. JONES showed five species of Hemiptera (Homoptera) with their wings set to show various features. These were: *Aphrophora alni* (Fallén), a 'typical' froghopper; *Centrotus cornutus* (L.) with the pronotal horn displayed to full advantage; *Cercopis vulnerata* Ill. in Rossi, including a specimen lacking red pigmentation and thus giving a black and white insect, from Capite Wood, Wiston, Sussex, 29.v.77; *Graphocephala fennahi* (Forster) showing the bright and vivid colours of this now common introduced species, and a *Cixius* sp., a genus with no coloration of the forewings beyond a few small dark spots along the veins.

Mr M. PARSONS showed an unusually marked specimen of the November moth, *Epirrita dilutata* D. & S. taken at light on 20.x.87 at Bedford Purlieus, Northants. The forewings had a dark terminal band which contrasted strongly with the pale grey ground colour.

Prof. J.A. OWEN showed two beetles of the family Endomychidae found in the fruiting bodies of the giant puff ball fungus. These were *Lycoperdina bovistae* (F.), a

widespread but local species in the south of England, and *L. succincta* (L.) which is confined to the Breckland area. *Lycoperdina bovistae* was taken at Oxenbourne Down, Hants., on 21.ix.86 and *L. succincta* came from Barton Mills, Suffolk, on 27.x.87.

Mr B.K. WEST exhibited three aberrations of the male Scarce Umber moth, *Agriopis aurantiaria* Hübn., not previously recorded in Kent. These were ab. *fasciata* Linstow taken on 6.xi.71, ab. *maculata* Nordstrom taken on 14.xi.73 and ab. *ellipsaria* Scholz taken on 12.xi.74. All the specimens came from Dartford Heath.

MATTERS ARISING

Dr I. McLEAN spoke on the continuing problems that have occurred in the management of Windsor Great Park. He announced that the NCC was now in the process of designating as an SSSI those parts of the Park that were not already covered. Negotiations with the Park's managers were taking place with the aim of producing an acceptable management plan. He said that difficulties had also occurred at other Crown sites, although this was generally at a lower rather than senior level of management. He pointed out that it would be difficult to bring a prosecution against the Crown Estates as they have immunity in such matters.

COMMUNICATIONS

Mr S. MEREDITH said that at Plaistow Woods, Sussex, uniform stands of conifers had been badly damaged by the 16th October storm whereas deciduous parts of the wood were largely unaffected. He wondered what influence the newly acquired dead wood would have on insect populations and what the replanting policy should be. Prof. Owen said that conifers support relatively few rare insects; out of 490 Red Data book beetles only 18 are associated with conifers. Dr McLean said that landowners were being encouraged, where feasible, to replant with native trees typical of the area but in some cases natural regeneration was the best answer. Mr E. Bradford said that in his wood at Blean, Kent, oaks had suffered from a domino effect with one falling oak toppling another.

LECTURE

Dr W.J. KNIGHT spoke on 'Project Wallace', the entomological expedition to North Sulawesi that he organized for the Royal Entomological Society. The area chosen was the recently established East Dumoga-Bone National Park, which is an area of tropical rain forest around the Dumoga Valley in the northern arm of the Indonesian island of Sulawesi. The year-long expedition, involving many entomologists from Britain and overseas, investigated insect diversity and conservation, forest regeneration, agricultural entomology, public health and geophysical aspects of the park. Over one million specimens were collected and 55 papers have been published to date. A symposium on the findings of Project Wallace is planned for 15-16th October 1988.

COMMENTS ON THE EXHIBITS

Mr R. SOFTLY asked what was known about the abundance and feeding habits of *Centrotus cornutus*. Mr Jones said it was fairly widespread in the south east and was possibly associated with oak. Mr A.J. Halstead said he found this insect quite frequently on various deciduous shrubs and saplings in Surrey.

FIELD MEETINGS

Odiham Common, Hampshire 13 June 1987

Leader: Stephen Miles. This was a combined afternoon and night meeting and was the Society's third visit to this site in recent years. The leader and four members were present in the afternoon when the weather was dry with sunny periods. In the evening five members and friends attended.

In the afternoon the neutral meadows were visited first and it was delightful again to see good numbers of male Forester moths (*Adscita statices* (L.)) in flight and at rest on *Ranunculus* stems. Some members admired the large patches of Yellow Rattle (*Rhianthus minor* Ehrh.) in flower here. Peter Baker took a specimen of the Grass Rivulet (*Perizoma albulata* D. & S.), the larvae of which feeds on this plant.

Other less common moths taken during the afternoon and evening were: the Small Yellow Underwing (*Panemeria tenebrata* (Scop.)), Barred Umber (*Plagiodis pulveraria* (L.)) Beautiful Brocade (*Lacanobia Contigua* D. & S.).

Of the Diptera the most interesting records were one female specimen of the wood-breeding cranefly *Ctenophora atrata* L. taken by Ken Bond. The first record for this site of *Xylophagous ater* Meig. was taken by the leader. It was swept from around the split trunk of a Birch tree. Galls on aspen leaf stalks containing the cecidomyiid fly *Contarinia petioli* Kieffer were also found.

One interesting sawfly was taken; this was *Tenthredo distinguenda* R. V. Stein which is mainly associated with chalk downland.

Mr K. Bond provided a long list of the Lepidoptera amongst which he recorded the following five species *Ectoedemia subbimaculella* (Haw.), *Nemapogon wolffiella* Kars. & Niels, *Argyresthia spinosella* Staint., *Hedya pruniana* (Hüb.) and *Cydia rusticella* Cl. These are additions to the list for vice-county 12 published in *The butterflies and moths of Hampshire and the Isle of Wight* by B. Goater 1974 and in the supplement in the *Entomologists Gazette* 1983.

Farlington Marshes, 11 July 1987

Leader: I. Hudson. Despite the warm, sunny weather and the request for recording information from the warden of this Hampshire and IOW Trust nature reserve, only three members and a friend of the leader turned up for the meeting. However, good lists of Diptera, Coleoptera and Heteroptera were produced and a number of interesting spiders were also recorded. It was amongst the Diptera that the most notable finds were made, with the Stratiomyidae featuring prominently. Twelve species of 'soldier flies' were recorded including *Stratiomys potamida* (Meig.), *S. furcata* (F.) and *Vanoyia tenuicornis* (Macq.). Fourteen species of hoverflies were noted including *Epistrophe diaphana* (Zett.) which was present in some numbers.

Orlestone Forest, Kent, 18/19 July 1987

Leader: D. E. Wilson. Torrential rain for the hours leading up to the meeting time, dampened down the woods very effectively and was probably responsible for a low turnout of members and friends. However, at the appointed hour the rain stopped, and three entomologists set out to reconnoitre the area. The improvement in the

weather allowed a strong flight of the White Admiral butterfly which is obviously enjoying a period of reasonable abundance in the area.

In the evening a stronger contingent of lepidopterists arrived and a number of MV lights and sugar patches were run in various parts of the woods. Although most of the more interesting local moth species were noted, such as *Heterogenea asella* D. & S. and *Moma alpium* Osb., none were represented by more than odd specimens, rather than good counts seen in previous years. A total of 131 species were recorded, including eleven micros (which may reflect the recorders' interests rather than actual micro numbers), of which the following are of most interest: *Apoda limacodes* Hufn., *Dioryctria schuetzeella* Fuchs, *Peribatodes secundaria* Esp., *Deileptenia ribeata* Cl., *Euchoeca nebulata* Scop., *Parastichtis suspecta* Hübn., *Apamea scolopacina* Esp. and *Paracolax derivalis* Hübn.

At about 1.15 a.m., two claps of thunder heralded the return of more normal weather conditions. Those wise enough to read the signs, beat a very hasty and orderly retreat, packing up their equipment before the deluge. The rest of us got very wet.

Cranes Moor, New Forest, 15 August 1987

Leader: I. Hudson. Five members and friends turned out for this meeting on what turned out to be one of the hottest days of the year. Two of the group, interested in freshwater invertebrates came down from Northampton and recorded such diverse fauna as flatworms, water beetles and simuliid larvae from the bogs and streams on the moor. A number of interesting Hymenoptera and Diptera were recorded as well as Heteroptera and Arachnida. A female velvet ant *Muilla europea* L. was seen in the car park and the bog ant *Formica transcaucasia* Nasanov was noted on the moor. Most notable amongst the Diptera were the horsefly *Chrysops sepulchralis* (F.) and the hoverfly *Pelecocera tricincta* Meig. The impressive spider *Dolomedes fimbriatus* Cl. was present in considerable numbers throughout the bog.

Therfield Heath, Herts, 29 August 1987

Leader: A. J. Halstead. Three members joined the leader and, after an early near miss by a badly struck golf ball, an enjoyable day was spent in fine weather. Thirty-one hoverflies were identified, mostly of common species, but a male and female *Triglyphys primus* Loew were taken on hogweed flowers. This appears to be a new county record. A local aphid, *Cryptosiphum artemisiae* Buckton was found causing severe galling on the foliage of common mugwort. Some cecid galls were also noted, including *Rhopalomyia millefolii* Loew on the stems of yarrow. Forty-two Microlepidoptera were recorded as adults or mines and other larval forms. The most notable was *Stigmella poterii* Staint. which was mining the leaves of salad burnet, *Poterium sanguisorba* L. Light traps were run but low temperatures limited the list of macros to 40 species, of which the best was *Xestia rhomboidea* Esp.

SHORT COMMUNICATIONS

The Annual Dipterist's Meeting and Supper, 3rd October 1987. — This occasion was this year a month earlier than the usual early November date due to internal problems at the usual venue, the British Museum (Natural History). As a result it evidently clashed with other priorities and attendance was down on recent years despite the usual welcome batch of new recruits.

The morning programme was, however, even more varied and interesting than is usual at this event. It began with John Ismay's talk on his experiences in Papua New Guinea; he was able to show how much there is to attract both the enterprising entomologist and the more casual visitor to this little known area, where he worked for 6 years. His slides of habitats and of some of the characteristic and also some of the more unusual flies to be found there had great appeal. A rather different approach to a better known but somewhat more developed area was given by Eric Philp in his account of biological recording in Kent. His archives at the Maidstone Museum contain records of all groups of organisms but Diptera records are sparse and more recorders are needed. He showed that many interesting fly habitats still exist in Kent but provided a doleful picture of the rate of environmental destruction affecting the county.

Hoverfly enthusiasts, who fill out the ranks of dipterists, were treated to two talks on different aspects of their study. Jon Heal has been closely studying the behaviour of some common species on city centre wasteland sites in Liverpool, and showed how much there is still to learn about the differences in habits and behaviour of even the commonest species. His work on the different types of mimicry in *Eristalis* species was particularly stimulating. Derek Whiteley's talk both provided publicity for his newly published work *Hoverflies of the Sheffield Area and North Derbyshire* (Sorby Record Special Series No. 6, 1987) and also publicized the wealth of delightful fly habitats to be found both within and not far outside the city limits of Sheffield, contrary to popular belief. His attractively presented Sorby Record lists 169 species or 65 per cent of the British fauna of hoverflies and includes good descriptions of the more productive sites in the district.

Another group of flies was included in the programme when Margaret Redfern gave a synthesis of her research into the biology of the Tephritidae associated with the flower-heads of thistles, which have an intricate range of life styles and interrelationships with their parasites.

Much of the afternoon was given to informal discussion and viewing of exhibits but a meeting was held to review the current situation with regard to the present and future Diptera Recording Schemes. Brian Eversham summarized the latest progress on processing data for the Hoverfly and Larger Brachycera Recording Schemes, for which maps should soon become available. The launch of BRC recording cards for empids and dolichopodids was promoted by their instigator, Roy Crossley; these will become the basis of recording schemes when volunteers can be found to act as recorders.

Alan Stubbs ended the afternoon session in a most interesting way by demonstrating his novel techniques for finding and rearing fly larvae from various habitats. His results in discovering previously unknown larvae or life histories in recent years have been quite outstanding.

The day was well rounded off by the twelfth Annual Dipterist's Supper. As usual the members of the BMNH Diptera Section and their wives provided an abundance of food and drink. The traditional celebratory cake, exquisitely designed as always

by Diane Henshaw was this year decorated with a range of New Zealand insects in honour of a visitor from the University of Canterbury, New Zealand, Professor P.M. Johns, who studies the rich New Zealand fauna of crane flies, as well as being a specialist on 'Wetas', the large Orthoptera found in the Southern Hemisphere. Recognizable depictions of members of his two groups were included in the cake design and Prof. Johns made some pertinent remarks on them when he was called upon to cut the cake.

It is to be hoped that this popular event will in future years be restored to its November date. — P.J. Chandler.

Some additional British records of *Metopomyza ornata* (Meig.) (Diptera: Agromyzidae) a leaf-miner of the flowering rush (*Butomus umbellatus* L.). — The attractive agromyzid *Metopomyza ornata* (Meig.) was introduced to the British list (as *Cerodontha ornata*) on the basis of material from Runnymede, Surrey (Chandler, 1973). Subsequently, the species was transferred to the genus *Metopomyza* (Spencer, 1976). As far as I am aware, no additional localities have been reported in Britain since Chandler's 1973 paper, so it may be of interest that in 1983 I found it by sweeping *Butomus* at three widely separated sites, two in East Anglia and one in South-East England. On 18.vii.83, *M.ornata* was frequent along a dyke with rich aquatic and emergent vegetation (including a considerable amount of *Butomus*) at Oulton Marsh, East Suffolk (TM 506937), in company with some other local Diptera typical of grazing levels marshes, including the hoverfly *Neoscia interrupta* Meig. and the dolichopodids *Syntormon pumilus* Meig., *Chrysotus collini* Parent and *C.microcerus* Kowarz. On 24.vii.83 I found four males and two females of *M.ornata* along the River Ouse near Brampton, Hunts. (TL 220697), in this instance associated with a relatively sparse stand of *Butomus* emerging from the water close to the west bank of the river. Finally, on 25.vii.83, on the Lewes Levels, East Sussex, a single male and two females were discovered beside a large dyke, with varied emergent vegetation including *Butomus* (TQ 426057). At the same time I swept two males and two females of the rare hoverfly *Lejops vittata* Meig. which is a species characteristic of slightly saline levels marshes. The following day, 26.vii.83, a single male and female *M.ornata* were found nearby (TQ 425085) together with *Chalcis sispes* L. (Hymenoptera: Chalcididae) which is a very scarce parasitoid of soldier flies, Stratiomyidae. It seems probable that *M.ornata* is more widely established in England than hitherto realized, and it will be interesting to see whether further records will be forthcoming from elsewhere within the geographical range of *Butomus* in Britain. — I.F.G. McLean, Nature Conservancy Council, Northminster House, Peterborough PE1 1UA.

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SOCIETY ANNOUNCEMENTS

THE BRITISH ENTOMOLOGICAL & NATURAL HISTORY SOCIETY PUBLICATIONS

A field guide to the smaller British Lepidoptera edited by *A.M. Emmet, 1979.*

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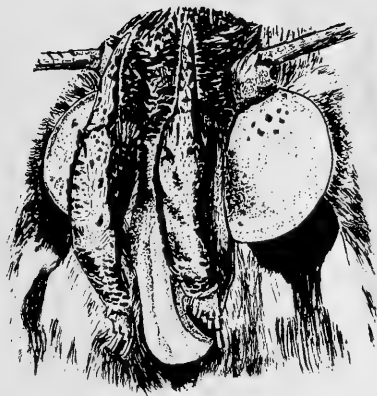
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**AN ADDITIONAL AID TO THE IDENTIFICATION OF *AMPHIPYRA
PYRAMIDEA* (L.) AND *A. BERBERA SVENSSONI* (FLETCHER)
(LEPIDOPTERA: NOCTUIDAE)**

P. Q. WINTER

West End Farm, Muston, Filey, North Yorkshire, YO14 0ES.

It is now just over 20 years since *Amphipyra pyramidea* (L.) and *A. berbera svenssoni* (Fletcher) were distinguished as separate species (Fletcher, 1968) and although the differences are relatively obvious once both have been compared, much confusion remains. In Yorkshire, for example, *A. pyramidea* appears to be virtually absent and there is often doubt over the true identity of *A. berbera*.

The criteria used by most people seem to be underside characters as described by Goater and Christie (1969) and later summarized by Heath (1971) and Skinner (1984). Even these are only subtle differences, requiring specimens of both species for initially identifying with confidence. Undersides of the wings are also rather awkward to examine on live specimens and some people resort to using the distribution of black on the abdomen alone, which is far from reliable. As regards upperside markings, Goater (in Heath and Emmet, 1983) gives a good comparative description of both species, saying that the postmedian line is parallel to the termen in *A. berbera*, whereas in *A. pyramidea* it converges towards the termen at the tornus. Yet there is no mention of the consequent fact that the ante- and post-median lines in *A. pyramidea* are almost parallel to each other, while in *A. berbera* they are noticeably convergent at the inner margin.

When there is uncertainty, all literature points to the genitalia and distinct differences between the palps appear to have been overlooked. To the naked-eye they look longer, narrower and evenly tapered throughout the second and third segments in *A. pyramidea*, compared with the more robust shape and clear junction of the second and third segments in *A. berbera*. Structurally, in fact, they are almost identical and examination with a hand-lens reveals that coloration is responsible for the disparity.

The palps of both species have long hairs projecting anteriorly from the first segment, giving a bearded appearance to the second. Together, the second and third segments measure approximately 3.00 mm. The tip of segment three is whitish in both species, but in *A. pyramidea* it is confluent with a predominance of pale cream or ochreous scales down the front of this and the second segment. A variable number of dark scales are intermingled among these to produce a greyish colour, blending with the 'beard' and adding to the impression of length. There is also a distinct division between the pale front and dark-brown or blackish sides, which are virtually devoid of light-coloured scales and account for the tapered effect and accentuated lateral flattening. In *A. berbera*, on the other hand, chocolate-brown scales uniformly clothe all except the tip, which stands out as a bright point. Some have white scales sprinkled across the front and onto the sides of segments two and three without affecting the overall dark appearance. When in sufficient quantity, however, there is a silvery sheen and the sides look darker, but with no clear line of contrast and a white tip remaining the prominent feature. Others lack white scales altogether and evidence suggests these are mainly from northern localities (Beaumont, pers. comm.). The 'beard' in *A. berbera* tends to be overlooked against a background of light-fuscous hair and the proximal end of the second segment, being considerably darker, is clearly outlined. An impression of the principal difference is given in Fig. 1, where (a) shows the pale front to the palps of *A. pyramidea* contrasting sharply against much darker sides and (b) shows the conspicuous, whitish tips to those of *A. berbera*.

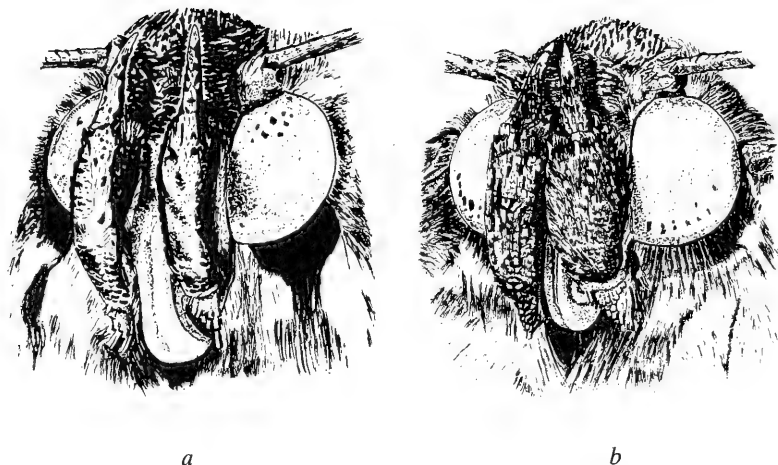


Fig. 1. Partial anterior view to show difference between palps of (a) *Amphipyra pyramidea* (L.) and (b) *A. berbera svenssoni* (Fletcher).

It should be noted that two out of the twenty-five or thirty *A. pyramidea* inspected had palps with tips indicative of *A. berbera*. In one of these, pale scales were missing from segment three, but segment two was typical. In the other, though still having the longer, tapered appearance, both segments were smoky-brown with just one or two pale scales and only marginally darker sides. Nevertheless, wing markings of each individual was highly characteristic.

Comparisons were made between specimens of *A. pyramidea* from Wales, the Bristol area, Wiltshire, Hampshire, Buckinghamshire, north-west London, Essex and Norfolk. Most of the *A. berbera* came from Yorkshire: others originating from north-west London, Buckinghamshire, Berkshire and Hampshire. Museum material, with only one *A. berbera* present, was dated from 1893 up to 1929, but a few labels were missing. All other specimens were caught after 1970.

A glance at the palps of either *A. pyramidea* or *A. berbera*, therefore, should be reasonably reassuring for anyone trying to identify these species, particularly where a microscope is not available. It is also a useful means of checking live specimens when wings are worn. In this situation boxed moths are often shy, but can usually be coaxed onto a piece of cotton wool moistened with dilute honey or sugar solution. Feeding usually begins at once and then manipulation is easy.

ACKNOWLEDGEMENTS

Thanks are due to Mr C. I. Massey for doubling the number of available *A. pyramidea* by allowing access to the Lepidoptera collection in Woodend Museum, Scarborough. I am especially indebted to Mr H. E. Beaumont for checking specimens of both species in his collection and passing constructive comments. Finally, several friends have sought an opinion on the identity of *A. berbera* and this has also helped to raise numbers.

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 BOOK REVIEW

The moths and butterflies of Northumberland and Durham. Part I. Macro-lepidoptera. T. C. Dunn and J. D. Parrack. The Northern Naturalists' Union, 284 pages. 1986 £7. Available from T. C. Dunn, The Poplars, Durham Road, Chester-le-Street, Co. Durham.

This book meets a long felt want for collected information about the three vice-counties since J. E. Robson's *Catalogue of the Lepidoptera* in 1899.

After a short foreword, explanatory introduction and preface, the text deals in detail with the species, some 450 in number, of which about 60 are additional to those in the *Catalogue*, but of about 45 there are no records since 1950, and others since only earlier in this century. Much attention is paid to the very large changes in abundance and distribution in the area, but there is also much interesting information about local habitats, voltinism, and larval food plants. The species are arranged and numbered according to Bradley and Fletcher's *Log book of British butterflies and moths*, with English and scientific names, and their numbers in the 'Catalogue' in brackets.

Maps are on a tetrad square basis with different symbols for those dated before 1900, from 1900 to 1949, and from 1950 to the present. They are set out four to a page, as far as possible opposite to the text in which the same species are discussed. Readers who are not familiar with the area may, however, have some difficulty in correlating them in detail with the text because place names only are used in the text and because many of the earlier records referred to in it are hidden by the later symbols. A whole page map to show place names would reduce these difficulties.

There are many points of special interest. In the butterflies a page is devoted to the history and problems concerned with *Aricia artaxerxes* ssp. *salmacis* Steph., the Castle Eden or Durham Argus, which is now found only in that county, though in past it occurred also on limestone in Northumberland. The author follows J. W. Heslop-Harrison in believing that on the coast the true *salmacis* hybridizes with some other sub-species of *A. artaxerxes*, not of *A. agestis* as was once believed. He also says that *Strymonidia w-album*, recently found in two places in Durham, here reaches a new northern limit in Britain. The same was also true of *Celastrina argiolus* which was found in several places in 1948 and 1950 but has not been seen since. Among the noctuid moths 28 species have been added since Robson's 'Catalogue', mainly

through the use of light in the field or in several static traps. Several of these, as of the butterflies, are of scarce immigrant species, most of which are believed to arrive across the North Sea. There is also a detailed analysis of the distinctive characters for separation of the four geometrid *Epirrita* species (November Moths) and of the feeding habits of their larvae, all of which occur in the area.

This is a very thorough and well researched local list, for which the authors and their team of recent recorders can be warmly congratulated. It makes an important contribution to our knowledge of an area which has been largely neglected in the standard books on British Lepidoptera.

R. F. BRETHERTON

ANNOUNCEMENT

Reared parasitic Hymenoptera: a plea. — In comparison with other holometabolous insects most groups of parasitic Hymenoptera are very poorly known, both taxonomically and biologically. The basis for understanding the biology and ecology of individual species is often held up because the species-level taxonomy has remained unresolved, stranding the group as a whole in a category of such low general interest that accidentally reared specimens are more likely to be discarded, if not angrily squashed, than properly preserved with their rearing data for scientific study.

But equally, part of the reason for such patchy taxonomic progress and vague biological characterisation has been the paucity of illuminating reared material in accessible museum collections: it is very difficult, as well as being rather shallow, to define and interpret biological entities from a consideration of mere structure and form, and accurate concepts of host range for particular parasite species can come only from quantitative and repetitive data.

Worthwhile knowledge of the quarter of British insects that are parasitic Hymenoptera depends on advancement on both fronts simultaneously, and this necessarily involves building large collections of reared specimens with clear and reliable biological data. I have been trying to do this for the past 15 years, both through my own rearing efforts and by scrounging the unwanted parasites that are reared (or otherwise noticed) by so many entomologists and arachnologists. The resulting collection now in the National Museums of Scotland is already an important research source freely available to, and used by, many taxonomists; as well as trying to rear parasites and to pursue research myself, my chief concern is to ensure that the incoming specimens are both useful and used as this collection resource grows in size and scientific potential. Mounting and labelling these accessions; corresponding with donors, both to resolve any uncertainties in the data and — when practicable — to tell them what they have sent; sorting the specimens to the level at which they can be mobilized to participate in taxonomic research; and loaning them to fellow taxonomists; these are the essential tasks that justify my asking you to take the trouble to give reared parasites to the National Museums of Scotland collection. Ichneumonid and braconid parasites of Lepidoptera are best represented so far, though the relatively smaller numbers of parasites from other insect groups, and spiders, are often of even greater interest and novelty.

So, whoever you are, whatever you are trying to rear, do please remember that if you get a parasite instead and send it to me (unmounted is probably best, but carefully packed please) then something worthwhile can be salvaged from your disappointment. And thank you again to all those who already do! — M.R. Shaw, National Museums of Scotland, Chambers Street, Edinburgh EH1 1JF.

HOW THE BUTTERFLY LOST ITS SPOTS — A CLADISTIC EXCURSION

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We in England have a comfortably fixed idea of what a white butterfly should look like, and the green-veined white (Figs 1 and 4) conforms closely with this. Impoverished though the pattern is, in relation to pierid possibilities, its wings still provide a distinctive combination of radial and transverse melanic elements. How firmly established the genetic determination of its basic design is we can appreciate if we look at its close relatives in other lands — across Eurasia to Japan and on to California and Newfoundland. Minor variation certainly occurs: at high latitudes and altitudes the dark markings of the females may be extended, as if to compensate for low temperature by increased absorption of radiation. It does seem certain that here selection has acted, though its exact mode of operation remains controversial.

In North America there are many white subspecies which were formerly taken to belong to the same species, *Pieris napi* L. One of these, ssp. *oleracea* Harris, extends over much of the northern part of the United States and adjacent regions of Canada. But in its most characteristic form (Figs 2, 5 and 6) neither sex has any melanic marking on the upperside, beyond a few black scales on the veins at the forewing apex!

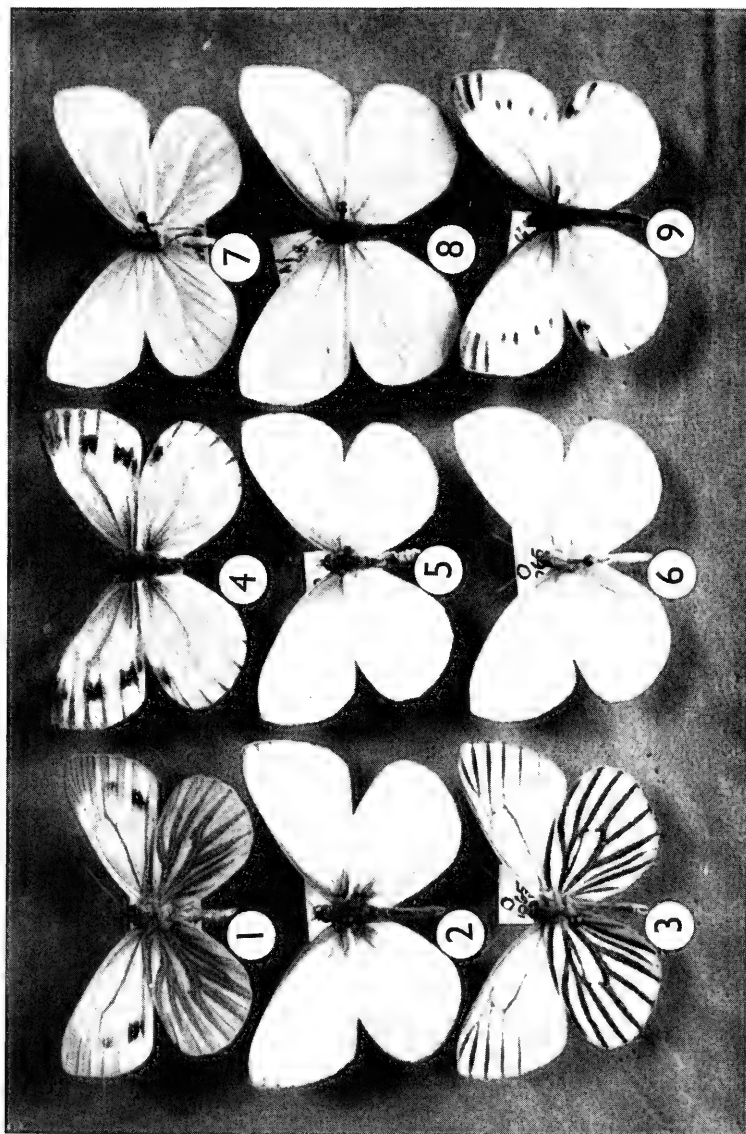
This insect has been much bred in captivity, and its F₁ and F₂ crosses with European *napi* are fertile. It is found that the reduction or loss of black markings is due to a recessive gene, 'restricta': thus the F₁ hybrid has markings of the European pattern, while in the F₂ about a quarter of the butterflies have reduced markings or none, the remaining individuals following *napi*.

If a hybrid female homozygous for *restricta* is examined, it is often found that some reduced marks do appear exactly in the place of the typical discal spots, but 'empty': that is, the dark scaling is confined to a border on the side of the vein as it passes a discal spot, and the spot's centre remains white (Fig. 9). Some specimens of pure *oleracea* offer exactly the same appearance, though in most of them the discal spots are mere traces or have disappeared completely.

One concludes that in some sense the typical *napi* pattern is still present in *oleracea*: that whatever singularities normally switch on production of melanin in certain cells have been unchanged in location.

The very similar (though specifically distinct) ssp. *virginiensis* Edwards, of rather more southerly distribution, also has severely reduced black marking. The results of crossing this with English *napi* suggest that here too the restriction is recessive, though the F₂ could not be obtained from this cross. *Virginiensis* can be hybridized with *oleracea*, but even the F₁ is far from vigorous: in this a few females even show slight radial markings, but in general black scaling is minimal, though again sufficient to show the survival of the under-pattern. The result is that expected from homozygous *restricta*, so it appears that these sometimes syntopic species carry similar *restricta* genes (this was confirmed experimentally in 1975).

In *oleracea* and *virginiensis* a typical development of *napi* markings is very unusual, and we think of *restricta* as fixed rather than polymorphic. Eitschberger (1983) figures an *oleracea* female from British Columbia with full marking, but this may be thought to be a translocated ssp. *pseudobryoniae* auct. Also, one supposes that where *oleracea* adjoins the well-marked *pseudobryoniae* or *venosa* Scudder, there must be some mutual introgression.



1 *napi* '86 ♀ v^{ii} 10 (underside). 2 *oleracea* '65 ♂ o^{iii} 21 ('spring'). 3 *oleracea* '65 ♂ o^{iii} 12 ('spring' underside). 4 *napi* '86 ♀ m 5. 5 *oleracea* '65 ♀ o 30 ('summer'). 6 *oleracea* '65 ♀ o 32 ('summer' underside). 7 *virginensis* '66 ♀ y^{ii} 11 (underside). 8 *marginalis* '68 ♀ o^{iii} 8 ('summer'). 9 *napi* '86 ♀ h^{iv} 8.

In some other Nearctic subspecies, such as *Oregon marginalis* Scudder (Fig. 8), *restricta* seems to occur, but has not become fixed or is differently expressed. *Ssp. marginalis* has been crossed with *oleracea* and with several European stocks, but the genetics of its markings are insufficiently studied.

DISCUSSION

I think it is characteristic of the cladistic approach to classification to consider in the first place the alternative states of one character at a time, and on this basis to set up alternative dichotomous cladograms. Choice between these relies in the end upon the principle of parsimony, minimizing *ad hoc* assumptions, which seems to imply that the least unlikely thing does not fail to happen. If the cladistic technique can be applied at the specific-subspecific level, the green-veined white butterflies may be early victims. Let us see what might happen.

Restricta as wild type seems to be confined to North American whites: it never appears in Europe, nor in related Asiatic taxa such as *melete* Ménétrière and *dulcinea* Butler. Such a very limited geographic pattern of occurrence already suggests that *restricta* is the derived state. This is surely confirmed by the primitive *napi* marking's still having a ghostly existence in *restricta*.

How are we to regard the appearance of the same derived character in two nearly sympatric biological species? We should be unwilling to postulate identical genetic changes independently in two species adjacent to one another, by sheer coincidence.

Did *restricta* arise in one, then pass to the other while interbreeding was still not impossible? This would be really likely only if the character in question presented ecological advantages promoting positive selection. Such advantages would have to transcend difficulties of accommodating any trans-specific genetic reaction; if there were such major advantages, why has the character not spread more widely, in other adjacent populations?

The alternative possibility is that the genetic change took place before *oleracea* and *virginiensis* became separate. In that case *ssp. venosa* Scudder might represent the more primitive ('plesiomorphic') sister-group.

But another gene, the dominant 'acuta', producing (at least in the 'spring' generation) a rather narrow intensely melanic underside vein-marking, is shared by *oleracea* (Fig. 3) and *venosa* but not *virginiensis*. On the other hand, the diffuse underside marking of *virginiensis*, as well as that of the Alaskan *hulda* Edwards, is reminiscent of some European *napi*. *Oleracea*'s *acuta* form seems very bizarre to an English collector, but looks more commonplace among many east Asiatic species; it may therefore belong to the plesiomorphic alternative. *Virginiensis* may be the innovator also in another respect, if the bivoltine life-pattern is the primitive one in this group. Here again, the ghost of the bivoltinism remains in the ability of *virginiensis* to produce a summer generation in the laboratory.

But it would be rash to pursue this line of enquiry further without taking into consideration other genetically controlled characters which differ among the subspecies of the group, and without extending the scrutiny to the Palaearctic. Pupal and larval characters (if not hopelessly polygenic) can be employed too: this will probably involve maintenance of living stocks, but these will be desirable in any event, to explore the genetics and permit rejection of spurious identities. For example, how nearly is the 'subtalba' character of Nearctic *virginiensis* identical with that polymorphic in Palaearctic *bryoniae* Hübner? It would be well to find out. Nor should enzyme polymorphisms be neglected (Geiger & Scholl, 1985).

A character change must often take place through a temporary polymorphism. An apparently complete change concealing residual rare alternative morphs might

present some theoretical difficulties for phylogenetic practice. Wide sampling is a first essential, to reveal any polymorphism.

What sort of phylogeny may we expect to obtain? A nicely branching evolutionary family tree may reward our studies, but I suspect that it will not. We may find a character general in one species, but fixed in only part of another one. We can expect some parallelism, and if there has been hybridization of stocks there will be reticulation among the branches, or even unlikely-looking grafts. Nevertheless it will be surprising if we are able to confirm the real hybridity of many of Warren's supposed (1967) hybrid species, though it would be nice to think we might.

We may, of course, obtain a web of relationships incompletely compatible with present theoretical expectations. That would be even more interesting.

SUMMARY

Two Nearctic *Pieris* (*Artogeia*) subspecies have almost completely lost their characteristic upperside marking: one subspecies seems to have speciated since the loss. An exploration of relationships of the whole *napi/bryoniae/melete* group on the basis of (say) six to ten 'genetic' two-state characters is advocated: results may reveal the evolutionary route of the group's zoogeography.

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ANNOUNCEMENT

Nature Conservancy Council Invertebrate Survey of the New Forest. Society members who are not members of the New Forest Invertebrate Survey Team but who have post-1976 records of, or who make future visits to, the New Forest would assist the survey if they would send such records to the appropriate record-keeper as shown below.

Coleoptera & Heteroptera: Mr D. M. Appleton, 86 Southampton Rd, Park Gate, Southampton, Hants., SO3 7AF.

Diptera: Mr I. Perry, 27 Mill Rd, Lode, Cambridge CB5 9EN.

Hymenoptera: Mr G. R. Else, 'Northcroft', St Peter's Rd, Hayling Island, Hants., PO11 0RX.

Butterflies: Mr M. Oates, The Lodge, Wyck Place, Wyck, Alton, Hants., GU34 3AH.

Macrolepidoptera: Mr E. H. Wild, 7 Abbots Close, Highcliffe, Christchurch, Dorset, BH23 5LF.

Microlepidoptera: Col. D.H. Sterling, 'Tangmere', 2 Hampton Lane, Winchester, Hants., SO22 5LF.

Odonata: Mr & Mrs A. R. Welstead, 3 Kelvin Close, Hythe, Southampton, Hants., SO4 5LW.

Orthoptera: Dr A. J. Pontin, Department of Zoology, Alderhurst, Bakeham Lane, Englefield Green, Surrey, TW20 9TY.

Ants: Mr K. H. Halstead, 'Mistletoe Cottage', Masseys Lane, East Boldre, Brockenhurst, Hants.

Arachnida: Mr I. R. Hudson, 12 North Close, Alverstoke, Gosport, Hants., PO12 2PH.

Other orders: Mr S. R. Davey, HCMS Chilcombe House, Chilcombe Lane, Bar End, Winchester, Hants.

**NEST SITE CHARACTERISTICS OF THE SOCIAL WASP,
PARAVESPULA VULGARIS(L.) (HYMENOPTERA: VESPIDAE)
 DO NOT INFLUENCE MATURE COLONY SIZE**

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Spradbery (1971) suggested that variation in nest site characteristics of British social wasps could affect the growth rates and eventual mature size of a colony. Matsuura (1984) recorded that queens and workers of nests of *Vespa crabro* L. and *V. simillima* Smith, F., where there was not sufficient room for the enlargement and successful development of colonies, often relocated themselves and started a secondary nest in a new location where there was more room. In this paper is reported an attempt to correlate mature nest size with nest site characteristics for *Paravespula vulgaris* (L).

METHODS

Data were collected from 1969 until 1972 from 42 nest sites of *P. vulgaris* from a rural site called Sand Hutton in Yorkshire (SE 6958). The soil throughout this study area was of a similar sandy texture without obstacles so enlargement of the nest cavity by worker wasps was not prevented. The water table was well below the nest cavity level and flooding of nest cavities after heavy rain was not observed. Archer (1981) gave a further description of the Sand Hutton locality. From each nest site the following data were collected: (1) depth of the nest below the ground as measured from the top of the nest, (2) presence or absence of shading by vegetation and (3) whether the aspect was mainly a northerly or southerly one. In addition at the end of the season when all wasp activity had ceased the nests were dug up and the number of cells in each nest counted.

RESULTS AND DISCUSSION

There was no correlation between the number of cells in the mature nests and the depths of the nests in the soil ($r = 0.21$, n.s., $n = 42$). The degree of shading and aspects of the nest sites also showed no relationship with the number of cells in the mature nests. In fact deep nests (10–30 cm depth) which were shaded and faced north had a similar mean number of cells (7594 cells, $n = 12$) as shallow nests (2–9 cm) which were not shaded and faced south (7569 cells, $n = 12$).

This lack of correlation between mature nest size and the nest site characteristics of degree of shading, aspect and depth of nest indicates that the development of the colony proceeds largely independently of the surrounding weather. This is perhaps not too surprising because a colony maintains a remarkably constant temperature just below 30°C, independent of background temperature, when a worker population is present in a colony (Edwards, 1980). Of course variation in nest site characteristics could still influence failure or success of the queen and early worker nests but no data are available to investigate this part of the problem.

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REVIEW

Butterfly houses in Britain. The conservation implications. By N. M. Collins. International Union for Conservation of Nature and Natural Resources.

The butterfly house is a recent addition to the list of facilities available for public entertainment. Though some are 'stand alone' others are found as adjuncts to the country house, the zoological garden or the garden centre.

Following an analysis of the replies to a questionnaire sent to most butterfly houses listed for the UK, Dr Collins concludes that, in 1986, some 68 of these establishments exhibited an estimated half million specimens of around 120 species of butterfly.

A good proportion of these insects were showy tropical species, produced on butterfly farms in Malaysia, Indonesia and the Indian sub-continent. Others originated in the southern USA, Britain and some 17 other countries.

The display of butterflies is often enlivened by the addition of other invertebrates — such as snails, millipedes, arachnids and mantids. Vertebrates may also be included, such as free ranging Chinese quail — used to control ants and slugs — and small alligators (to intimidate errant juveniles of *Homo sapiens*?). Fish, birds, other reptiles and amphibians may also be seen.

Lepidopterous material is supplied in all stages though pupae are now by far the commonest method of importation. A proportion are transported as adults and we must deplore the practice, now happily much reduced, of shipping live imagines sleeved in paper envelopes, this resulting in a mortality rate as high as 40%.

The Report continues with the suggestion that the proprietors of butterfly farms must be aware of and observe, the national and international regulations governing the import and export of various insects, in particular, butterflies. These include the controls imposed by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which have been somewhat complicated by their EEC interpretation. Other relevant regulations have been formulated by, or are part of, the Wildlife and Countryside Act, MAFF/DAFS and the Post Office.

A major recommendation is that owners of collections of living invertebrates, which are on display to the public in the UK, should join the National Federation of Zoological Gardens of Great Britain and Northern Ireland. This body should review its constitution and establish guidelines in order that it may act in an advisory and regulatory capacity in pursuance of the Zoo Licensing Act, 1981. It is further suggested that butterfly houses should work together to develop and fund work concerned with the conservation of butterflies and their habitats in the UK and overseas.

Dr Collins discusses many aspects of the subjects outlined above, as well as a number of other related matters, in a meticulous though readable style. He then ends by listing several useful appendices which list the UK butterfly houses, the insects displayed in them, the MAFF/DAFS free list and the constitution of the National Federation of Zoological Gardens of Great Britain and Northern Ireland.

The subject under review is somewhat emotive and should stimulate much discussion. Our Editor or the reviewer will be pleased to receive Members' observations and comments for publication in this Journal and onward transmission to Dr Collins.

A copy of this publication is held in the Society's library and is also available from 219 (c) Huntingdon Road, Cambridge CB3 0DL.

P. J. BAKER

NOTES ON PREY TAKEN BY SOME NORTH AMERICAN SPIDERS

DONALD L. J. QUICKE

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During a visit to south-central Texas in September 1987 my attention was drawn by a number of spiders whose conspicuousness was markedly increased as a result of the large prey items they were holding. Some of these predator-prey pairs were photographed and other observations were made which are of potential interest in terms of both the types of prey taken and the manner in which these were handled.

The green lynx spider, *Peucetia viridans* (Hentz) (Oxyopidae) was observed on numerous occasions holding moderate to large, aculeate hymenopteran prey. In addition to honey bees, *Apis mellifera* L. (Fig. 1a), which comprised the vast majority of food items (15 out of 18 observations), two spiders, at different localities were observed with large tiphiid wasps, *Myzinum* sp. (Figs 1b-d and 2a). The honey bees and the female tiphiid were held in the spiders' chelicerae just behind the head (Figs 1a-b and 2a) though the male tiphiid was being held by its metasoma (Fig. 1c, d). One other lynx spider was observed with an adult nymphalid butterfly. All of the *Peucetia* prey displayed flaccid paralysis.

The daring jumping spider, *Phidippus audax* (Hentz) (Salticidae), was again observed feeding predominantly on honey bees (six instances) (Fig. 2c) but was also observed once eating a green lynx spider (Fig. 2b). Prey were held by the chelicerae and fore legs and although no preferred orientation was noted none were held immediately behind the head as in *Peucetia*.

Finally on one occasion, a crablike spiny orb spider, *Gasteracantha elipsoides* (L.) (= *G. cancriformis* (L.)) (Araneidae) was observed in its web feeding on another adult of the same species (Fig. 2d). How and why the second individual arrived in the same web is unknown.

The present observations agree fairly well with previous published reports of the feeding phenologies of *Peucetia* (Turner, 1979) and of *Phidippus* (Jackson, 1978). Turner's data show *Apis mellifera* and Hymenoptera in general to be important prey types, but in her sample, they only constituted about 40% of the total prey whereas they constituted more than 90% in the present set of observations. However, since my attention to the spiders was often drawn by their conspicuousness while holding their prey, I may have overlooked spiders with smaller or more cryptic prey. Jackson's work on the diet of *Phidippus johnsoni* (Peckham and Peckham) showed the major prey groups taken to be Diptera (30.3%) and other arachnids (33.3%) with Hymenoptera accounting for only 9% (two *Apis* and one ant). The present observations again suggest that when honey bees are abundant, as they were at the present study site, they can constitute a considerable proportion of the diet of *Phidippus* jumping spiders. Jackson observed *P. johnsoni* feeding on members of three spider families, notably Lycosidae and Salticidae but his data was assembled from observations made in several habitat types. In contrast, the present observations on *Peucetia* and *Phidippus* were all made on spiders among the branches and flower heads of woody herbs such as the composite *Baccharis*, in sunny situations. Here *Peucetia viridans* and *Phidippus audax* were by far the most numerous large spiders; lycosids were not observed. *P. audax* and other large salticids have been observed feeding on several web weaving spiders (*Argiope*, *Allepeira*) (Lamore, 1958; Robinson and Valerio, 1977; Horton, 1983), and as in the present observation of *P. audax*, the salticid attacks by jumping onto the back of its prey (Fig. 2b, c).

The observation that *P. viridans* envenomation causes flaccid paralysis is of



Fig. 1. *Peuceitia viridans* with prey. a, With worker *Apis mellifera*; b, with female *Myzinus* sp.; c, with male *Myzinus* sp.

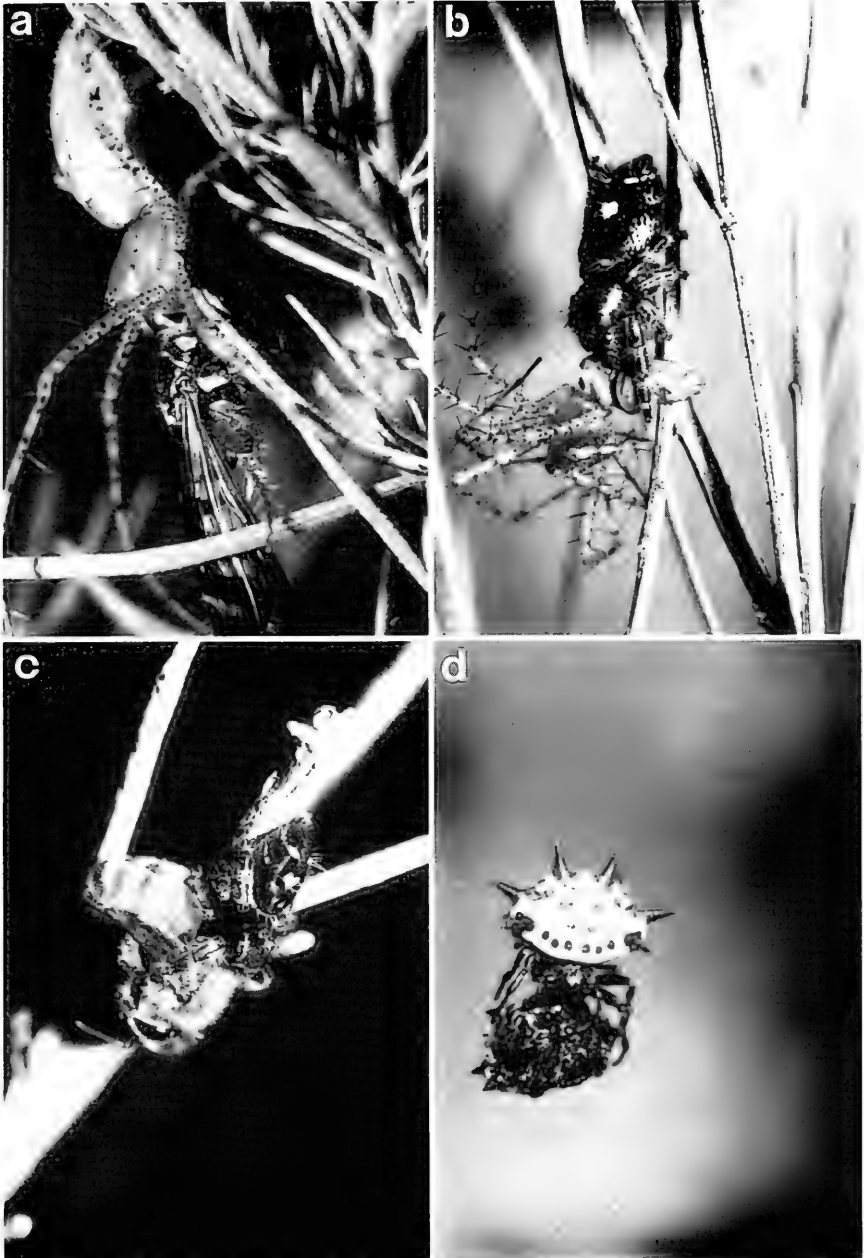


Fig. 2. a, *Peuceletia viridans* with female *Myzinus* sp.; b, *Phidippus audax* with *Peuceletia viridans*; c, *Phidippus audax* with worker *Apis mellifera*; d, *Gasteracantha elipsoidea* cannibalizing another *G. elipsoidea*.

potential interest to the growing number of toxicologists who have been investigating spider venoms. Different spider venoms contain different neurotoxins some of which block neuromuscular transmission (e.g. those of the Araneidae) whereas others cause massive release of neurotransmitter resulting at least initially in rigid paralysis (e.g. theridiid venoms). Since *Peucetia* appears to show a preference for biting its prey behind the head (as also do members of the crab spider family Thomisidae) it seems likely that its venom may act on the insect's central nervous system causing a blockade of nerve activity. It is hoped that in the future, more observations will be made on the effects of spider venoms on their arthropod prey, as such information will help to tie together the findings of the physiologists and toxinologists with the practical functions of the spiders' venom and ultimately, it may enable us to understand why different groups of spiders use widely different sorts of toxins.

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BOOK REVIEW

British red data books: 2 insects. Edited by D. B. Shirt. Nature Conservancy Council, 1987, 448 pages, £10.

This is a book about insects whose survival in Britain is considered to be threatened for one reason or another. It is the outcome of a major undertaking wherein the current status in Britain of members of the major insect orders has been scrutinised and those insects thought to be in danger listed. About 1800 species have been selected, which amounts to about 15% of the relevant insect orders. The book lists criteria used in assigning insects to the main 'at risk' categories — 'endangered', 'vulnerable', 'rare', and identifies those few species and subspecies (about 10) which are endemic to Britain. There follows lists of species in each category and, except for a number of Diptera, an account is provided for each species labelled 'endangered' (category 1) or 'vulnerable' (category 2) under the headings; identification, distribution, habitat and ecology, status, threats, author of account.

In view of the fragmentary knowledge of many insects occurring in Britain, there is bound to have been uncertainty in deciding which names to include in a list of threatened species and which to leave out. Some of the omissions, nevertheless, are surprising, at least among the Coleoptera. A number of beetle species have far fewer records than do many of the species which have been selected, for example: *Anaspis bohémica* Schilsky (recorded for certain only in 1951 and 1986, two 10-km squares),

Atomaria ornata Heer (= *contaminata* Er.) (only two 10-km squares), *Cis dentatus* Mellie (two 10-km squares) and *Trimium brevicorne* (Reich.) (only one or two records since 1913). In contrast, there are species which really ought not to have been included. *Boletothphagus reticulatus* (L.) (category 2), for example, can only be considered common in much of North-West Scotland and *Enicmus rugosus* (Herbst) occurs at more sites throughout Britain than is allowed for a category 3 species.

One aspect of the book which I found particularly unsatisfactory is the use of the terms 'endangered', 'vulnerable' and 'rare' as labels for the main categories of threatened insects. So often the category label does not properly reflect the status of the insect concerned. For example, the species account for the bupestrid *Agrilus sinuatus* (Ol.) states that '... there does not appear to be any major threat to the species' — a perfectly reasonable comment about an insect which breeds in old hawthorn bushes in hedgerows, commons, parks and at least one golf course, yet this beetle is labelled 'vulnerable'. The weevil *Otiorrhyncus auropunctatus* Gyll. is labelled 'endangered', presumably because it has been recorded in Britain from only one site in North-West Scotland yet the definition of 'endangered' given on page 1 requires that '... causal factors continue operating' and no causal factors are identified in the species account, as is the case with quite a number of other insects given 'endangered' or 'vulnerable' labels. As it is, there are hundreds of square miles of entomologically unexplored countryside in North-West Scotland and lack of records for this species is much more likely to be due to under-exploration than to absolute rarity. Entomologists interested in conservation may well understand the special meaning of these labels but they are bound to confuse, for example, an inspector conducting a public inquiry. Labelling 'vulnerable' an insect which is not vulnerable in the ordinary sense is the sort of thing that could well lead to the whole system being discredited. Arguing that it is all the fault of ICUN is not an acceptable excuse.

Turning to the accounts of individual species, most are properly informative but some show lack of adequate home-work. For example, the threat to the anobiid *Dorcatoma dredensis* Herbst is stated to be 'the removal of dead oaks' but the fungi in which the beetle breeds occur on living trees as well as dead ones and on various trees, including beech and *Salix* spp., as well as oak. The reader is referred to Joy (*A practical handbook of British beetles*, 1932) for identification of this beetle but his key contains a critical error which will totally defeat anyone who does not know about it. In contrast, the key given by Donisthorpe (1928, *Entomologist's mon. Mag.* 64:196) is easy to use and reliable. The larvae of the chafer *Gnorimus variabilis* (L.) are stated to 'feed in black wood mould' of old oaks and beeches. Certainly the larvae can sometimes be found in black wood mould but they have very well developed mandibles and actually feed on hard wood. They can mature perfectly well in hard oak trunks without any black wood mould and this could be important in a conservation context. The recommended conservation measures stated for *Cryptophagus falcozi* Roubal is 'the preservation of ancient beech and oak' but there is no evidence from Britain or elsewhere in Europe that the species has anything to do with oak.

The long gestation period of the book is another factor which has made some species accounts now less than authoritative. For example, the account of the elaterid *Lacon quercus* (Herbst) does not quote any record after 1972 whereas the beetle has been found at Windsor as larvae or adults on at least six occasions in the past three years and many trees identified as suitable breeding sites. The book states that information on status '... has been updated to the end of 1984 whenever possible and to October 1986 in selected cases', but this is too vague when it comes to

individual species accounts which, in the face of lack of uniformity, should state specific completion dates.

There are other things which could also be done to make future editions of the book more useful. Many of the persons engaged in conservation who will wish to consult this book will be more or less unfamiliar with taxonomic arrangements. The non-expert, for example, wishing to know what species of *Callicera* or of *Ampedus* have RDB status will be referred by the index to lists of species arranged in a 'user-unfriendly' (taxonomic) manner. What would be a lot more helpful, in this situation, would be an alphabetically arranged list of species covering all orders. A better way of explaining symbols is required. The reader unfamiliar with the book, looking up, for example, about the 'Feathered Ear' will be referred by the index to p.101 where the species account labels the moth endangered +. To find out what the + indicates, the reader will have to search through the book until the table of symbols on p.xii is discovered. Why not have a general index as well as a species index and why not also use arabic page numbers throughout? A simpler way of dealing with 'extinct' species would also be an advantage. As far as I have been able to work out, species (except for certain lepidoptera) which are thought to have become extinct since 1900 are labelled 'endangered +' while those thought to have become extinct before 1900 have been put in an appendix. One beetle, however, *Oulimnius rivularis* (Rosenhauer), which was long recorded only from Surrey in 1870 and thought to be extinct, turned up again in East Anglia in 1986. This seems to have defeated the system for the species is not mentioned. It would be better to have all those species deemed extinct put into one category which, ideally, would have the highest RDB rating since anything returning from 'extinction' requires the maximum of protection.

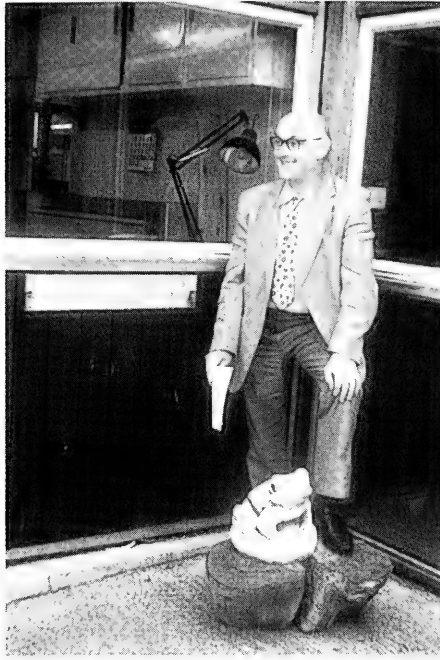
On the matter of insect collectors, the authors (whoever they may be!) state (p.ix) that '. . . extinctions have been due almost entirely to other causes'. One cannot help getting the impression, however, that authors' conviction on this point is not really firm for a few pages later there is reproduced 'A code for insect collecting'. Nonentomologists reading this section of the book may well conclude that many collectors are potentially ecological vandals. This may be true but it would be better if this message was not provided in a book which, hopefully, will be widely consulted. Incidentally, the Code could certainly do with the revision promised. For example, it is frequently impractical to return unwanted, but rare, bred insects, or the pabulum in which they may still be breeding, to the original locality (para 6.3) but the code does not state what is to be done if this problem arises.

Overall, the book somehow lacks the smoothness of its companion volume — *British red data books: 1 vascular plants*. Perhaps this is due to the disconnected subjects dealt with in the introduction. I have already dismissed the 'Code for insect collecting'. Another section which could well have been omitted is the collection of site photographs. They are fine, artistic photographs but the subjects are so obvious that the photographs are unlikely to be of any value to persons engaged in insect conservation. The list of 'Useful addresses' could also go. Addresses (and telephone numbers which are even more useful but not given) change. At the most, a loose sheet with these inserted in the book would have sufficed. Finally, the list of biological recording schemes dealing with insects is not really relevant. At the very least, all these intrusive sections could be placed at the back of the book, allowing the introduction to lead smoothly into the substance of the book.

J. A. OWEN

OBITUARY

John Heath (1922–1987)



On July 6th 1987, entomology suffered a sudden and tragic loss with the death of John Heath. John was well known and respected throughout Britain and Europe, as a leading entomologist and conservationist. He had within him elements of researcher, developer and teacher and in all three fields he left his mark. Professionally, he made a major contribution to conservation by establishing the idea of data banks as the corner-stone for both local and national conservation policy. This involved not only the organization of recording schemes but also the development of a data storage system geared to the production of local lists or national distribution maps. Subsequently, John travelled widely to describe these systems and to assist others in similar developments. He achieved much through the friendships that he so easily forged with fellow entomologists in both professional and recreational contacts. In Britain, he will be widely remembered for his launch and editorship of *The moths and butterflies of Great Britain and Ireland* and for the development of the portable moth trap that bears his name — the Heath trap. Those who knew him as a friend, however, will remember his generosity, helpfulness and humour and his frequent role as a source of inspiration. He will be sadly missed.

John was born in Worcester, on January 18th 1922. His father, who had been an officer in the Indian army, subsequently took up teaching and this brought about a move to the Southampton area, where John was educated at King Edward VI School. His interest in entomology developed during a youth spent amongst the beautiful country of the Hamble estuary and he recently renewed contact with some of his old haunts, to compare the modern fauna with that of his youth.

Entomology remained a hobby during his school days and his career objectives were directed more towards electronics, with the intention of leaving school for a University course at Cambridge. However, the Second World War had started and John joined the army. His interest in electronics was noted and when radar became an important element in Britain's air defences, John was amongst the first to be involved in installation and maintenance of the equipment. His postings took him to many parts of southern England and in his spare time he was able to continue his entomological hobby in such choice locations as the Falmouth and Lizard regions of Cornwall. He was, at this time, a member of the Society for British Entomology and some of his earliest papers, written whilst still in the army, were published in the proceedings of that society.

Returning to civilian life after the war, John was unable to take up his intended course through University, nor could he find employment in the electrical industry. Thus, in 1947, he turned to his hobby of entomology as a source of employment. Taking up a post with Pest Control of Bourne, Cambs, he became involved with agrochemical research, working on laboratory and field evaluation of new insecticides. Field trials took him to Rhodesia for a year, whilst laboratory screening gave him his first experience of data storage. Large volumes of screening results needed storing in a way that would facilitate future recall and comparison. Computerization was still far into the future at this time.

John's interest in entomology centred more on insect study than on insect control and in 1953 he joined the Nature Conservancy as an experimental officer at the Merlewood Research Station, Cumbria. His period in industry, however, left him with a broad and realistic view of the management of the countryside for economic use or conservation.

The move to Merlewood was a turning point in John's life in many ways. Not only did it mark the start of his professional involvement with Lepidoptera, but it also introduced him to his future wife, Joan, whom he married in 1955. A year later their son, Nigel, was born, completing a family circle that was always important to him. As the volume of travelling increased in his later career, John rarely travelled far without Joan and her quiet support from the background was of far greater value than the casual observer might have realised.

Working at Merlewood enabled John to produce his first important paper on Lepidoptera. His account of the insects associated with Yellow Balsam (*Impatiens noli-tangere*), published in 1959, contained a valuable section on the abundance, distribution and ecology of the Netted Carpet moth, *Eustroma reticulatum* D & S. John re-evaluated this species in 1980/81 and the details presented in his presidential address to the BENHS in 1983 showed that the conservation measures recommended by his first report had indeed been successful. His work at Merlewood was not restricted to Lepidoptera, however, and he also published an important paper on the feeding habits of a small soil-living millipede, *Glomeris marginata* (Villers).

The need to record Lepidoptera in remote sites was evident during his studies on the Netted Carpet and this gave John the stimulus to put his electronics to work to develop the small, portable moth trap now generally known as the Heath trap. He published details in the *Entomologist's Record* in 1965 but within the last few years had been testing improvements to the original design and had incorporated modern advances in lighting technology to reduce the power consumption of the trap to about $\frac{1}{3}$ of its original level.

In 1967 John transferred to the Monks Wood Experimental Station to set up a scheme for producing national distribution maps for the British insects. Not surprisingly, the Lepidoptera scheme was the first and the biggest of these. The

concept spread to Europe as a result of John's collaboration with Professor Leclercq in setting up the European Invertebrate Survey. This marked the start of a period of fairly regular European travel for John, as he helped other countries set up their own data banks. His international reputation grew rapidly but it was not until late in his career that John achieved the rank of principal scientific officer and in 1979 he became Head of the Biological Records Centre.

The mapping schemes produced data that went into many important works. The butterfly maps formed the basis for the *Atlas of butterflies in Britain and Ireland*, produced in collaboration with E. Pollard and J. A. Thomas. The IUCN Red Data books also took data from these schemes and have been paralleled by such works as *Threatened Rhopalocera (Butterflies) in Europe* produced by the Council of Europe. Moth maps have been produced for *The moths and butterflies of Great Britain and Ireland*.

The mapping schemes run by the Nature Conservancy rely upon data generated by amateurs but processed at Monks Wood. John soon realised that whilst there were many prepared to provide this data, the numbers with the expertise to reliably identify difficult species were relatively low. To tackle this, he organized a field course under the auspices of the Field Studies Council to train enthusiasts in field recording, identification and record-keeping techniques. This started in 1968 with a course at Preston Montford, Shrewsbury but demand was such that it became an annual event and by 1985 had reached a total of 28 courses, including three in Ireland and two in the Alps. In the UK, the Field Studies Council centres at Nettlecombe Court and Preston Montford featured strongly and John's advance preparation resulted in some fine locations being visited. Twenty-seven species of butterfly were recorded on one day trip in Somerset and over 100 Macrolepidoptera on more than one evening session with lights. Examination of problem material brought by course students resulted in the identification of the first British specimen of *Eriopygodes imbecilla*.

A major function of the courses was training in identification techniques for difficult species and it soon became evident that the literature in most common use at that time was of little help in this. With various colleagues, John set out to supplement the textbooks with a series of short papers in the *Entomologists Gazette* under the serial title of 'Guide to the critical species'. In all, seven of these were produced but even this satisfied only part of the need and John quickly realised that a totally new standard reference work was the only real answer. Thus he set about the task of launching a major new series, *The moths and butterflies of Great Britain and Ireland* (M.B.G.B.I.). Early volumes were beset with many problems and it is doubtful whether the series could have survived these early traumas without John's total commitment to the project. Endless hours and even personal capital were sunk into it, before Harley Books set the series on a more secure footing.

John was a fairly prolific author of entomological papers and despite the time taken by M.B.G.B.I. and increasing demands of his career, he produced or contributed to 55 titles listed in the Zoological Record since 1976 and many more prior to that.

John's particular sphere of specialization was in that curious group of mandibulate Lepidoptera, the Micropterigidae. In this he was an authority of international acclaim, which enabled him to work on collections from many parts of the world. Nine of the 55 papers mentioned above relate to this topic and in these, a total of no fewer than 14 new species were described, with clarification of the taxonomic status of some others. The most recent, published in the *Entomologists Gazette* in 1986, described seven new species from North Africa. Earlier papers covered species from



Spain, Italy and Yugoslavia and during his entire career, over 20 papers were produced on the Micropterigidae, going back as far as 1958.

Despite heavy commitments, John still found time to take an active role in many entomological societies. From his early membership of the Society for British Entomology, he became a fellow of the Royal Entomological Society in 1945 and a member of BENHS in 1954. His membership of the Amateur Entomologist's Society dated from the mid 1960s and he was also an active member of his local county trust, serving as its chairman for three years from 1977 to 1979. During his presidency of the BENHS in 1982, his detailed knowledge of entomological literature and personal acquaintance with many authors proved of great value to the committee when deciding on library acquisitions or exchanges. As with insect surveys, so also was John's interest in societies European rather than just British. He acted as the British membership secretary to the Societas Europaea Lepidopterologica and played an integral role in the organization of the third biennial European Congress of Entomology at Cambridge in 1982.

John was such an active and gregarious entomologist that his loss will be severely felt by many and the gap that he leaves in British entomology is unlikely to be filled by any one person.

ANNOUNCEMENT

London area Lepidoptera records wanted — macro and micro. — I am currently preparing a list of the Microlepidoptera and updating Baron de Worms' list of the Macrolepidoptera (published in the 1950s) of the London Natural History Society's recording area (a circle radius 20 miles centred upon St Paul's Cathedral). I am also producing tetrad distribution maps of records made from 1 January 1980 onwards. All data will eventually be published. I would welcome records from anyone who has collected or who intends to collect in this area, which includes all of Middlesex and portions of the vice-counties of Hertfordshire, North Essex, South Essex, West Kent, Surrey and Buckinghamshire. I should be pleased to provide further details, maps and recording sheets if needed, to any entomologists who may care to contact me. C. W. Plant, London Natural History Society, Passmore Edwards Museum, 29 Romford Road, Stratford, London E15 4LZ.

INDOOR MEETINGS

14 January 1988

EXHIBITS

Mr R. A. JONES showed a small piece of bark removed from a large elm log in Nunhead Cemetery, London, SE15. This showed a female elm bark beetle, *Scolytus scolytus* (Fabricius) (Coleoptera: Scolytidae), dead in the tunnel she had excavated and oviposited in. After burrowing in through the bark, the beetle makes a tunnel parallel to the axis of the trunk and lays eggs at intervals of 1–2mm along each side of the tunnel. The larvae that hatch burrow out at right angles to this, forming a characteristic pattern. This beetle spreads Dutch elm disease, and was very common in the mid-1970s but with the decline of the elm is now quite local. In Nunhead Cemetery there are no living elms; the 20–30 old trees which were there, died and were felled before 1980.

Professor J. A. OWEN exhibited five specimens of the weevil *Miarus graminis* Gyll., two of which were referable to *M. degorsi* Abeille. The latter was described by Abeille in 1906 from specimens collected at Orival, France, by Mons. Degors. It was recognized as British by B. S. Williams in 1928 from specimens taken at Box Hill, Surrey, and Sharpenhoe, Beds, and has since been regarded as a distinct species from the closely related *M. graminis*. It has been recorded sparingly from these and other downland sites in Britain and is listed as a Red Data Book Category 3 beetle. Professor Owen is inclined to the view that British specimens designated *degorsi* are simply small forms of *graminis*, based on the following points. 1. It is very similar to *M. graminis*, with features reduced proportionately in size, e.g. a smaller tooth on the hind femora, and mostly a single row of scales on each elytral interstice instead of a regular double row. 2. Specimens occur which are intermediate in size, with partial double rows of scales. 3. The aedeagi are similar, at least externally. 4. *M. degorsi* is nearly always found in Britain together with *M. graminis*. 5. Lohse states that small examples of *graminis* have single rows of elytral setae and gives the varietal name *uniseriatus* Reitt. 6. Roudier (1966) did not feature *degorsi* in notes on the genus *Miarus* occurring in France, commenting briefly that Hoffman (1953) considered it to be only a subspecies.

COMMUNICATIONS

Several members reported butterflies, presumably the result of a very unseasonable migration that occurred in the abnormally mild late December.

Mr P. PASTON reported seeing a red admiral butterfly in Hay's Mews, Mayfair, on 31.xii.87.

Mr C. PLANT said that Russell Bretherton had told him that several red admirals were seen on the south coast over the Christmas period.

Mr J. M. CHALMERS-HUNT reported two painted ladies in Devon on 31.xii.87, plus a large unidentified butterfly.

Mr K. MERRIFIELD noted a crane fly, either *Tipula oleracea* L. or *T. paludosa* Meig. at Mylor, Cornwall, on 31.xii.87.

Professor OWEN said that an interception trap run in Richmond Park, Surrey, during the second half of December had caught 85 specimens of beetles and four noctuid moths.

LECTURE

The scheduled lecture on French Lepidoptera was postponed due to the speaker's ill health. In his stead Mr N. A. CALLOW treated members to a selection of his slides which covered a wide range of topics and subjects. He gave details of the techniques used to achieve the very high standard of his photography.

28 January 1988

The President, Professor J. A. OWEN, announced the death of Mr H. M. Biley.

EXHIBITS

Mr R. A. SOFTLY showed the larvae of two noctuid moths collected after dark on 26.i.88 at the base of an overgrown hedge on Hampstead Heath. These were one larva of *Noctua comes* Hübn. found on a grass blade and two larvae of *N. fimbriata* Schreb. on foxglove leaves.

Mr M. SIMMONS showed a variant and a typical specimen of the purple edged copper butterfly (*Palaeochrysophanus hippothoe leonhardi* Fruh). Both were taken by Mr A. Bucior at Rilski Monastir in the Rila mountains, Bulgaria, at 1700 m on 20.vii.87. The variant lacked both post discal spots on the inside of the orange submarginal band, and most of the discal spots on the underside of the left hind wing. The underside of the right hind wing was of the typical form.

Mr K. MERRIFIELD read extracts from a book review by Joseph Palca that appeared in the magazine *Nature* in October 1987. The review concerned a book by an American author, Roger M. Knutson, entitled *Flattened fauna: a field guide to common animals of roads, streets and highways*. Mr Merrifield also showed some methods of preparing data labels where the numbers required are excessive for the traditional hand written method but not sufficient to justify having printed labels. The alternative methods illustrated were reduction of typed labels by means of a photocopier, contact printing from a 35 mm negative, or use of the negative itself. He suggested that a convenient way of producing the text to be photographed was to use a home computer to display the label four times on the screen and photograph it using an exposure of over $\frac{1}{30}$ second.

Dr R. S. KEY showed a specimen of the staphylinid beetle, *Teropalpus unicolor* (Sharp) taken at Crook Peak, Somerset, on 23.iv.87. This is a naturalized species from New Zealand and most British records are from under seaweed on sandy beaches. This specimen, which is perhaps the 20th British record, was found under a stone in dry calcareous grassland.

Dr J. R. LANGMAID exhibited leaves of coltsfoot (*Tussilago farfara* L.) which had been mined by the gelechid moth, *Scrobipalpula tussilaginis* (Frey). The leaves were found near the cliff edge at Milford on Sea, Hampshire, on 7.xi.87, and is a new record for the county. Dr Langmaid also showed another gelechid moth taken at Portland, Dorset, on 15.viii.87. This was a *Bryotropha* sp. which agreed with the description of *B. portlandicella* made by Richardson in 1890. This species was synonymized with *B. mundella* (Dougl.), but the genitalia are clearly different and more akin to *B. affinis* (Haw.).

Mr A. J. HALSTEAD showed an old fashioned pair of wooden tongs used to kill flies in houses.

COMMUNICATIONS

Despite the mild weather little insect activity was reported. Mr Softly had run a light trap and took the Satellite, *Eupsilia transversa* Hufn. Professor Owen said that this moth had been taken in his interception trap in Richmond Park in December, with more in the last fortnight.

LECTURE

Mr S. BALL of the Nature Conservancy Council spoke on the subject of 'Hi-tech entomology'. He described several types of trap, some of which were automated, allowing the catch to be sorted into hourly or daily catches. The many uses of computers for insect identification, record keeping, site classification and updating of information were described.

COMMENTS ON THE EXHIBITS

Mr E. BRADFORD warned that some modern papers were unsuitable for data labels as their acid content would, in time, cause them to crumble. Good quality paper made from esparto grass or rag should be used. Professor Owen wondered whether some modern inks, such as used in felt tip pens, would stand the test of time.

11 February 1988

EXHIBITS

Professor J. A. OWEN showed a specimen of *Panspoeus guttatus* Sharp (Coleoptera : Elateridae). This small click beetle is a native of New Zealand and it was first found by the exhibitor and A. A. Allen in Windsor Great Park on 19.vii.81. It has subsequently been found on Ockham Common, near Wisley, Surrey. It appears to be a parthenogenetic species, since of about 100 specimens examined, all were female.

COMMUNICATIONS

Mr R. D. HAWKINS reported taking a March moth at light on 6.ii.88. Professor Owen said that a brimstone butterfly had been seen at Windsor Great Park on 7.ii.88.

LECTURE

Mr M. MATTHEWS spoke on 'Moths in Mali' and illustrated his talk with slides taken during visits to this north west African country in 1984-86. His studies in Mali were particularly concerned with a *Heliothis* species, the head miner moth, which in recent years has become a serious pest of millet. Mr Matthews also described other problems encountered by farmers attempting to grow crops in semi desert areas on the edge of the Sahara.

FIELD MEETING

Lady Cross Enclosure, New Forest, 14 May 1988

Leader: E. H. WILD. Eight members, two wives and a daughter attended what proved to be a most productive and enjoyable evening. For once the weather was kind to us, and though the co-leader was unable to be present, eight lights were set up, mainly in the area of the railway bridge.

In all, 81 species of macro were recorded, an excellent count for the time of year.

Among the more interesting species taken, the following should be mentioned: a fine variety of *Lomaspilis marginata* L. with all white hind wings (Bernard Skinner); a female *Lithophane socia* (Peter Baker); *Lampropteryx otregiata* Metc. (B.S.); a number of specimens of *Eupithecia irriguata* Hübn were still about to the gratification of those members who had made the journey for this local insect, and several female *Chloroclysta siterata* Hufn.

Of the commoner species, the *Hyloicus pinastri* L. must qualify for one of the earliest dates ever recorded for this species, and the two *Mimas tiliae* gave rise to speculation on their foodplant, which must be birch in this locality.

Although not a good micro night Mr Chalmers-Hunt was able to record 30 species.

Mr A. Halstead took two rotten-wood-feeding species of Diptera which were new to the assembled company and about which he will publish a note when they have been identified.

The leader, who had anticipated running lights on his own, was delighted to meet so many old friends.

OFFICERS' REPORTS FOR 1987

COUNCIL'S REPORT

The Council met seven times during 1987 with, on average, 14 members attending each meeting.

The Society's membership stood at 706 at the end of the year; 43 new members were elected during the year, but nine members were struck-off for non-payment, and eight resigned. Seven deaths were reported to the Society during the year. Mr R. M. Craske completed 50 years continuous membership of the Society at the end of the year, and has been elected a Special Life Member.

Four issues of the *Proceedings* appeared in 1987, something which has not been achieved for many years. Mr Jones is to be congratulated on having brought about an excellent turn-round in the fortunes of the Society's journal in his first year as Editor. The health of our journal is, of course, dependent on a continuing supply of copy from both members and non-members. After much discussion during the year it was decided that a change in title to the *British Journal of Entomology and Natural History* would place the Society's journal in a less parochial setting and thereby attract more readers and contributors.

In his last year as Indoor Meetings Secretary, Richard Jones arranged a varied programme of 21 meetings. Andrew Halstead arranged 18 field meetings in localities as far apart as Dorset, Essex, Cumbria and Speyside. Both field and indoor meetings are enjoyed by a regular group of devotees; the Council would hope to see more new faces at both these types of meeting during 1988.

The change of venue for the Annual Exhibition from Chelsea Old Town Hall to Imperial College in South Kensington, and the change in day of the Annual Dinner from Friday to Saturday, proved a great success. In spite of a price increase the numbers attending the dinner rose by over 30, and once more the Council's thanks go to Dr MacNulty for managing a very enjoyable evening. The new venue for the Annual Exhibition was judged a great improvement by all those who attended. Access and car parking were much more convenient, while the catering facilities were a considerable improvement. The only disappointment of the day was that the number of people attending the exhibition was down, but this may in some part have been due to the continuing disruptive effect of the hurricane force winds the previous week. The same venue has been booked for 1988 when your Council hopes that many more members will come and appreciate the facilities for themselves. Colin Hart, who took over the task of organizing the exhibition at what could have been a traumatic time, is to be congratulated for ensuring that everything went smoothly; the Council regrets that he has since had to resign as Exhibition Secretary.

A Zenith ZW148 computer has been purchased and the Society's membership records are now stored on it. Each member's entry contains the information given on his/her nomination form, together with a record of subscription payments. It is hoped that the task of membership administration will be considerably eased, as will the production of address labels and membership lists. As a result it is intended that a new membership list will be published in 1988. The Society's thanks are due to Geoff and Mark Burton, and Ken Merrifield for the effort they have put into this venture. The storing of this membership information on a computer has meant that the Society has had to register under the Data Protection Act. Members may request to see their own records on payment of a fee.

The second edition of *British Hoverflies* was published in February 1988 and has been selling steadily. David Agassiz's paper on the British *Argyresthiinae* and

Yponmeutinae is available as a separate as the second in a series of illustrated papers on the British Microlepidoptera. The Society's next major publication is progressing on schedule. During the year a decision was made to publish an expanded second edition of the *Field guide to the smaller British Lepidoptera*. Col. Emmet will be editing this edition which it is hoped will be available during 1988.

TREASURER'S REPORT

The greatest alteration this year is in the cost of producing four separate issues of the *Proceedings* as shown in the Publications Account. The printing costs increased from £2376 to £6373 and the distribution costs from £348 to £906, a total increase of £4555. The cost of the coloured plates in these was met by a grant of £1420 from the Hammond Bequest Fund, and the balance of the increase from the higher yield from increased subscriptions and from investment income.

The Society's stocks and shares have not suffered any decline in value taken over the year as a whole, in spite of the stock market problems. In fact, at the date of preparation of the accounts, their market value was over £4500 in excess of their market value at the corresponding time last year.

After valuable advice from Ken Merrifield and a great deal of hard work from Geoff Burton and his son Mark, the Society's membership and subscription records are now on a computer system, purchased from another grant from the Hammond Bequest Fund.

Special publication sales have increased the value of the Special Publications Fund by £2505, and, in spite of expending £4677 on producing a second edition of the hoverflies book, the cash available for producing future publications is in fact nearly £200 up on last year, so no problems are envisaged in funding the current plans of the Publications Committee.

British Entomological and Natural History Society Balance Sheet as at 31 December 1987

1986 £	<i>FUNDS</i>	1987 £
16668	<i>GENERAL FUND</i> – Opening balance	22828
3864	Gain on investment disposal	153
<u>2296</u> 22828	Excess of income over expenditure	<u>1593</u> 24574
2308	<i>HOUSING FUND</i>	2308
15187	<i>SPECIAL</i> –Opening balance	16180
<u>993</u> 16180	<i>PUBLICATIONS</i> Surplus from sales	<u>2505</u> 18685
27740	<i>HAMMOND</i> – Opening balance	30806
<u>3121</u>	<i>BEQUEST FUND</i> Income	<u>3177</u>
30861		33983
55 30806	Expenditure	<u>2754</u> 31229
3144	<i>HERING</i> – Opening balance	3215
	<i>MEMORIAL</i> Gain on investment disposal	154
<u>371</u>	<i>FUND</i> Income	<u>645</u>
3515		4014
<u>300</u> 3215	Expenditure	<u>520</u> 3494
<u>75337</u>	<i>TOTAL FUNDS</i>	<u>80290</u>

THESE FUNDS ARE REPRESENTED BY:

<i>INVESTMENTS AT COST (details appended)</i>			
24586		General Investments	24711
<u>2936</u>	27522	Hering Memorial Fund Investments	<u>3060</u> 27771
<i>STOCK</i>			
1074		Special Publications at cost	3970
<u>127</u>	1201	Christmas cards	<u>98</u> 4068
(The value of the library, collections, ties, back numbers of Proceedings and computer system is not included in the accounts)			
<i>LIQUID ASSETS</i>			
40313		N. S. Investment Account	38256
922		Debtors and advance payments	356
7200		Cash on Deposit/Business Reserve account	9181
<u>3495</u>		Cash on Current Account	<u>3048</u>
51930			50841
<u>5316</u>	46614	Less Subs. in advance, amounts owed and provisions	<u>2390</u> 48451
<u>75337</u>		TOTAL ASSETS	<u>80290</u>

Schedule of Investments as at 31 December 1987

	<i>Book value at cost</i>			<i>Assessed current</i>
	<i>General</i>	<i>Hering Memorial</i>		<i>market value</i>
	£	£		£
410 Shell T & T 25p Ord.	477.79	771.83	@ 1025	4202
750 Unilever 5p Ord.	248.45		@ 490	3675
£1975.79 Treas. 9½% 1999	771.22	1171.21	@ 98¾/32	1938
£4098.06 Treas. 13¾% 1993	4041.44		@ 117⅞	4831
£6836.92 Treas. 8¼% 1990	5910.00	300.00	@ 99¾/32	6775
£2138.90 Funding 5¾% 1991	1670.00		@ 93	1989
4776 M&G Charifund Units	<u>11592.00</u>	<u>817.24</u>	@ 481.1	<u>22977</u>
	<u>24710.90</u>	<u>3060.28</u>		<u>46387</u>

INCOME AND EXPENDITURE ACCOUNT FOR 1987

1986		1987	1986				1987
£		£	£				£
2387 Publications Account		5207	4526	Subscriptions			5332
1762 Rent and Insurance		1778	4022	Interest and Dividends			3916
704 Stationery and General Expenses		568	106	Donations			58
630 Indoor meetings and Exhibition		718	7	Net surplus on sales (misc.)			208
197 Cabinets and Collections				Over-provisions in 1986 accounts			442
99 Subs/Donations Other Societies		92					
580 Library							
6 Shortfall on 1985 dinner							
<u>2296</u> Excess Income over Expenditure		<u>1593</u>	<u>8661</u>				<u>9956</u>
<u>8661</u>		<u>9956</u>	<u>8661</u>				<u>9956</u>

PUBLICATIONS ACCOUNT FOR 1987

(Publications free to members)

2376 Production of Proceedings							
		6373	337	Sales			652
348 Distribution Costs		906		Hammond Bequest grant for plates			1420
				Net Cost to Income & Expenditure			<u>5207</u>
			<u>2387</u>				<u>5207</u>
<u>2724</u>		<u>7279</u>	<u>2724</u>				<u>7279</u>

SPECIAL PUBLICATIONS ACCOUNT FOR 1987

	(Publications for sale)		
1681 Opening Stock	1074	1730	Sales 4720
Hoverflies 2nd. Edition	4677	1074	Closing Stock 3970
130 Distribution & General Costs	434		
993 Surplus to Spl. Publications Fund	2505		
<u>2804</u>	<u>8690</u>	<u>2804</u>	<u>8690</u>

AUDITORS' REPORT

In our opinion the annexed Balance Sheet gives a true and fair view of the Society's affairs as at 31st December 1987 and the Income and Expenditure accounts give a true and fair view of the Society's results for the year.

A. J. PICKLES F.C.A.

R. A. BELL

I should like to thank our Subscriptions Treasurer, Geoff Burton for all his hard work in a particularly busy year. It is certainly no mean task to deal with the usual work plus all the problems resulting from a subscription increase and also to set up and load the data for a computer system in a single year, and the Society is greatly indebted to him for his most successful efforts. Please lighten his work as much as possible by paying your subscriptions promptly and at the correct rate.

Finally, I should like to offer the Society's thanks to our Honorary Auditors, Tony Pickles and Reg Bell for once again carrying out the audit of the accounts.

PROFESSOR HERING MEMORIAL RESEARCH FUND

Six applications worthy of consideration were received. This represents a pleasing increase in interest in the Fund, and is probably due in part to the greater number of journals in which an advertisement was placed. May I express the Committee's gratitude to the editors of the journals concerned for their readiness to provide space gratis.

Three awards were made for 1987/88. The sum of £250 was granted to Monsieur Jean-Luc Gumez, from Amiens, France, for his study of the biology of the cambium mining agromyzid genus *Phytobia*. The money will cover travel expenses and the cost of basic collecting equipment. As a forester, Monsieur Gumez is in an ideal position to undertake such a project, and he has already made a number of contributions to the topic. The Committee agreed to support Dr Margaret Redfern-Cameron, from Stourbridge, to the tune of £170, a sum that will cover her travel expenses to an international congress on the biological control of weeds in Rome in March 1988, where she has been invited to deliver a paper on the density and survival of introduced populations of the tephritid fly *Urophora stylata* on *Cirsium vulgare* in British Columbia. The third award, of £50 was made to Dr Goldie-Smith for a study of the eggs and breeding habits of British Dixidae. Although not a priority of the Fund the project was supported not only because of its intrinsic interest, but also because the finances this year permitted the support of one study requiring a relatively small sum.

Reports have been received from the two recipients of awards in 1986/87. Mr Philip Sterling, Balliol College, Oxford, provided preliminary conclusions on his studies of the use of leaf-mining guilds to understand how to restore and manage land set aside for wildlife. In one project, he found that continuous sheep-grazing,

designed to create a floristically rich limestone grassland from an arable field, reduced species richness of leaf mining guilds. Even a short burst of grazing in spring or autumn may have long-lasting effects on some species. In his other project, it was found that leaf-miners are severely and detrimentally affected by coppicing, with no species benefiting from the practice in the early years of regrowth. The Committee gave Mr Kevin Tuck, British Museum (Natural History), partial support towards the cost of his expedition to Sabah (North Borneo) under the aegis of Operation Raleigh. His principle aim was to collect microlepidopterans from montane rainforest. The expedition was clearly a success, and a number of rarely collected species were brought back.

This report ends on a sad note. Frau Hering, Professor Hering's widow, died last year. Up to the end of her life she took an interest in the activities supported by the Fund, and was a key figure in achieving its origin.

CURATOR'S REPORT

During the year consideration was given to the composition and layout of the collections. The arrangement of cabinets in the Society's room has been changed accordingly in an endeavour to facilitate access and provide more working space, although this is still very limited. Ultimately it will be possible to reduce the congestion by making some cabinets available for sale but this is not practicable in the near future. The first to become available in this way will probably be the existing 20 drawer British butterfly cabinet and the 16 drawer Hymenoptera cabinet, but this is unlikely within the coming year.

The reorganization of the layout has permitted the return to the original sequence of cabinets of both the main British Lepidoptera collection and the separate Messenger collection of British Lepidoptera. It is intended to provide labels using the existing system of colour coding to those cabinets, like the Messenger collection, which are presently unlabelled. This should encourage access to collections which have been less used by members. Labelling of individual drawers with a summary of their contents will also be extended.

Work has begun on cataloguing the Society's collections, concentrating initially on the British Lepidoptera and the Coleoptera, this having been done with the Diptera some years ago. I am grateful to Professor Owen for providing me with an updated check list of the British Coleoptera, to use as a basis for this process. On completion of the cataloguing, lists will be prepared of species absent or represented by one or two specimens only, so that donations can then be sought from members.

As indicated last year, a microscope has been purchased for use in the Society's room. A Zeiss binocular microscope with a stereoscopic zoom lens and an associated lamp unit were selected. This equipment is now available for any member requiring this facility while examining the collections.

A start has been made on restoring the Joy collection of Coleoptera to its original order, ten drawers comprising seven of Staphylinidae and three of weevils having been completed. The remainder will be arranged as soon as further relined drawers in the correct sequence become available.

It is also expected in the coming year that the Hymenoptera collection, principally aculeates and sawflies, will be transferred from the present cabinet and will be arranged according to the Kloet & Hincks check list allowing space for additions. It is not expected that the Parasitica collection will be expanded but the nomenclature will be updated where practicable.

David Moore has continued his meticulous work on rehousing the British Butterflies as outlined last year. He has completed the Hesperiidæ, Papilionidæ and Pieridæ and begun the Lycaenidæ. I am most grateful to him for his efforts.

Loans have been made to some members of material requiring identification. Also a visit was recently made by a non-member, Colin Johnson, to determine material of the genus *Atomaria* (Cryptophagidae) resulting in the correction of many errors and providing useful records to augment the known distribution of these minute beetles.

Donations of specimens have been made by Messrs D. O'Keefe and P. Baker, to whom I wish to express my gratitude. Finally, I wish once again to thank Bill Parker for his invaluable assistance in many ways.

LIBRARIAN'S REPORT

Considerable time has been taken up this year in stocktaking of the books held in the Library, so that we are now almost two-thirds complete. A number of anomalies have unfortunately been found and the appropriate corrections to the author/index file and to the books themselves carried out.

The listing of details regarding the journal exchanges that the Society has with other entomological organizations and our holdings of such journals continues to take up some time. I hope to produce a proper list for distribution to each member in the future, subject to Council's approval.

One Library Committee meeting was held during the year. The major decision made at this meeting was to further rationalize the Society's journal exchange arrangements. The prime reasons for this decision are lack of space and because I consider that the Society is mainly interested in the Palaearctic fauna.

The last six years' supply of the main British entomological journals, *Entomologist's Gazette*, *Entomologist's Monthly Magazine*, *Entomologist's Record* and the Society's own *Proceedings and Transactions* have been bound during the year.

One further batch of separates has been collated this year under the title 'Irish Lepidoptera' and is now on the Library shelves for bulk or individual loan.

On behalf of the Society I would like to thank those organizations and individuals who have donated books to the Library in the past year, particularly Basil and Annette Harley, Mr H. Biley, Mr I. Ferguson and Mr M. Henderson. I would also like to thank Messrs D. Moore, C. Ashby, M. Henderson, Mrs F. Murphy and the Library committee for their help in running the Library during the past year.

EDITOR'S REPORT

I would like to think that 1987 marked a change for the better as far as the Society's journal is concerned. For a long period, the Society has published two 64-page issues each year. When I took over as Editor, I was pleased to find a nice pile of manuscripts waiting for me. Thus in 1987 we have been able to publish four separate parts totalling 192 pages (and six colour plates) — an achievement which I hope we can repeat in 1988 and beyond.

1987 should have seen the publication of the index for 1986, but this will now appear with the first part in 1988. The 1987 index will appear later in the year.

A major event for the journal in 1987 was a decision which would not take effect until this year — a decision to change its name. In 1988 the Society will publish the *British Journal of Entomology and Natural History*. This was felt to be a more modern and succinct description of the content than the rather long and cumbersome title of *Proceedings and Transactions of the British Entomological and Natural History Society*.

The first part of the new journal is now in production and should be sent to members with the new meetings details in late April.

Thanks are due to the members of the editorial committee, in particular Raymond Uffen the retiring editor, and to everyone who has made the Editor's job so pleasurable — especially the authors who have contributed in such sterling fashion.

SHORT COMMUNICATIONS

The life history of *Mompha lacteella* (Steph.) (Lepidoptera: Momphidae). — The first mention of the life history of *Mompha lacteella* (Steph.) in British literature is in Meyrick (1927) which states that the larvae live in blotches in leaves of *Epilobium hirsutum* L. in August, but Wakely (1944) states that repeated search of this plant by himself and his friends in August failed to find any trace of the larvae. Emmet (1979) repeated Meyrick. Heckford (1986) reported that he found a larva in *Epilobium montanum* (L.) on 13th April 1985 which emerged on 18th May and proved to be this species, but the larva was not seen outside the mine.

On 4th April 1988 Dr J. R. Langmaid, Col. D. H. Sterling and Messrs M. J. and P. H. Sterling visited Savernake Forest, Wiltshire VC 7 in an area where PHS had taken this species in July 1987 at MV. A number of mines were found in the leaves of young *Epilobium montanum* plants, but none were seen in other *Epilobium* species. The larvae had a black head, trisected by a V-shaped fissure with the apex posteriorly, and bisected by a median pale line. Thoracic legs were dark grey and the bodies varied from purplish brown to yellowish pink, paler and slightly yellow tinged at the segments and laterally. The anal plate was dark grey irregularly mottled black. The larvae appeared mature and all made dull cream coloured cocoons and pupated within 2 weeks of capture. Those kept outside emerged between 8 and 15 May, but they were kept in a plastic-covered seed tray, so would probably have emerged slightly later in the open. All were *Mompha lacteella*.

The normal cycle therefore appears to be

O 8 On *Epilobium montanum* and possibly other *Epilobium* species.

L 9-4 In a mine.

P 4-5 In a dull cream cocoon

I 5-7

—Col. D. H. Sterling, 'Tangmere', 2 Hampton Lane, Winchester, Hants. SO22 5LF.

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- EMMET, A. M. 1979. *A field guide to the smaller British lepidoptera*, London: BENHS.
 Heckford, R. J. 1986. Larvae of *Mompha lacteella* on *Epilobium montanum* in April. *Entomologist's Rec. J. Var.* **98**: 121-122.
 Meyrick, E. 1927. *A revised handbook of British Lepidoptera*.
 Wakely, S. 1944. Notes on the genus *Mompha*. Paper read to SLENHS 11 Nov. 1944 and printed in *Illustrated Papers on British Microlepidoptera*, BENHS 1978.

Butterfly resting positions: *Pieris* up, *Vanessa* down. — While the interesting article by M. W. F. Tweedie in the April issue of this journal draws attention to the various attitudes adopted by the wings of Lepidoptera when at rest, it does not mention the *positions* they take up and the differences between some pierids and nymphalids was very strikingly brought to my attention recently when I had occasion to have several hundred butterflies of more than one species in the same cage for mating and oviposition purposes.

The species in question were *Pieris brassicae* L., *Vanessa atalanta* L. and *Cynthia cardui* L. The *brassicae* were always present in the cage, but the two nymphalids were in with them at different times and not together. When the butterflies roosted for the night it was very striking that when on a vertical surface all the *brassicae* were sitting head up and all the *atalanta*, or all the *cardui*, were resting head down. At least 60% would be vertical and the remaining 40% rarely more than 10° off the vertical. During the day, while the butterflies were active and particularly when the two

nymphalid species were sunning themselves (an activity not indulged in by the *brassicae*), then they retained a head-up posture. On a horizontal surface, as the roof, positioning in all three species tended to be random, although small groups would form all facing in the same direction. It would be interesting to learn of the resting position of other Nymphalidae as well as other families and one does wonder if the two different postures adopted by such different species has some selective advantage, or even if it is due to the nymphalids only having four usable legs to the pierid's six — Brian O. C. Gardiner, 18 Chesterton Hall Crescent, Cambridge CB4 1AP.

REFERENCE

TWEEDIE, M. W. F. 1988. RESTING POSTURE IN THE LEPIDOPTERA. *Br. J. Ent. nat. Hist.* **1**: 1–8.

Blair's Shoulder Knot *Lithophane leautieri* Bours. in West Wales. — On the 9.x.87 a single *L. leautieri* was trapped in a u.v. tube moth trap at Salem, Penrhynoch, Dyfed (SN669843), about 8 km from the coast at Aberystwyth. As far as I can ascertain, this is the first record from West Wales of this recently arrived species, with the nearest records from Monmouthshire (Howlett & Majerus, 1987).

Since only a single individual was trapped, one may only speculate whether it was a migrant or of local origin. Other migrants trapped at the same site in 1987 included single *Rhodometra sacraria* L. on 8.ix and *Mythimna vitellina* Hübn. on 17.ix, the latter only the second record for Ceredigion (Cardiganshire). However there is also plenty of cypress present at Salem. — P. R. Holmes, Nature Conservancy Council, Plas Gogerddan, Penrhynoch, Aberystwyth, Dyfed SY23 3EE.

REFERENCE

HOWLETT, R. & MAJERUS, M. 1987. THE SPREAD OF BLAIR'S SHOULDER KNOT (*Lithophane leautieri hesperica* Bour.) (Lep: Noctuidae). *Entomologist's Rec. J. Var.* **99**: 258–260.

***Dorcatoma chrysomelina* Sturm (Coleoptera: Anobiidae) and *Xylophagus ater* Meig. (Diptera: Xylophagidae) new to Pembrokeshire.** — A brief visit to Lawrenny Wood (SN 013075) in Pembrokeshire on 2.vii.1988 produced some interesting deadwood associated insects, two of which — *Dorcatoma chrysomelina* and *Xylophagus ater* — appear to be new to the county. Lawrenny Wood is an area of sessile oak woodland lying along the eastern side of the Daugleddau Estuary, mostly of abandoned coppice form, but with mature standards where it swings into the creek of Garron Pill. This latter section produced all the records of interest.

A single dead *D. chrysomelina* was found amongst exposed red rot in a living oak. Larvae of *X. ater* were found beneath loose bark on a dead oak bough, together with larvae of *Pediacus dermestoides* (F.) (Coleoptera: Cucujidae). No records for *X. ater* in Pembrokeshire were found when reviewing its British distribution (see Clements and Alexander, 1987). Lawrenny remains the only county locality for *P. dermestoides* to my knowledge, having been discovered here in 1964 (Angus, 1965). — K.N.A. Alexander, 22 Cecily Hill, Cirencester, Glos. GL7 2EF.

REFERENCES

- Angus, R.B. 1965. Some new records of Coleoptera from Pembrokeshire. *Entomologist's mon. Mag.* **101**: 12–13.
- Clements, D.K. & Alexander, K.N.A. 1987. The distribution of the fly *Xylophagus ater* Meigen (Diptera: Xylophagidae) in the British Isles with some notes on its biology. *Proc. Trans. Br. ent. nat. Hist. Soc.* **20**: 141–146.

A relict old forest beetle fauna from Nettlecombe Park in Somerset. — An afternoon spent in Nettlecombe Park, near Williton in S. Somerset (ST 0537), on 6.vi.1988 produced an excellent variety of deadwood associated beetles. The list included 11 of the species listed in Harding and Rose (1986) as associated with sites where there has been long ecological continuity of deadwood habitats: *Stenichnus bicolor* (Denny), *Sinodendron cylindricum* (L.), *Ctesias serra* (F.) *Xestobium rufovillosum* (F.), *Thymalus limbatus* (F.), *Pediacus dermestoides* (F.), *Biphyllus lunatus* (F.), *Mycetophagus atomarius* (F.), *Bitoma crenata* (F.), *Eledona agricola* (Herbst), and *Pseudocistela ceramboides* (L.). The last named is the rarest of these and was reared from a pupa taken from the exposed heartrot of a large split oak. It has been found in Somerset once before, from Wellington (Wilson, 1958). This source also includes the only Somerset records for two further old forest beetles: *Quedius microps* Grav. and *Trichonyx sulcicollis* (Reich.), taken at Nettlecombe during last century. One further rarity was found during my visit: *Soronia punctatissima* (Ill.), which I believe to be new to the county. A dead specimen was taken from spider webs beneath loose bark on an old oak.

Nettlecombe lies on the northern edge of the Brendon Hills, and includes many large old oaks, as well as ash, beech, hawthorn and other species. Its history and old forest lichen communities are described in Rose and Wolseley (1984). It is clearly an important old forest timber site in the context of South-West England, where only Shute Park in S. Devon has produced more than Nettlecombe's 13 species, and it is highly likely that further recording will raise the site to national significance.

I thank Pat Wolseley for encouraging me to visit Nettlecombe and for showing me around. — K.N.A. Alexander, 22 Cecily Hill, Cirencester, Glos. GL7 2EF.

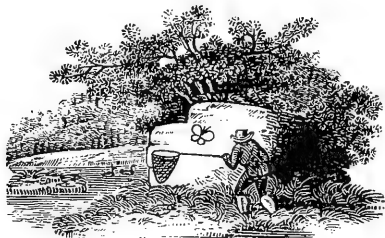
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- Rose, F. & Wolseley, P. 1984. Nettlecombe Park — its history and its epiphytic lichens: an attempt at correlation. *Field Studies* 6: 117–148.
- Wilson, W.A. 1958. *Coleoptera of Somerset*. Somersetshire Archaeological and Natural History Society.

EDITORIAL APPEAL

For several years, the Society's journal has been excellently indexed by Mr Norman Hall. However, after his long stint, he must now step down and the Editor would like to hear from anyone feeling that they could continue this important task. Access to a computer is rather a necessity, however, over the last few years, Mr Hall has amassed a large data base of the indexed insect names which generally remains similar from year to year. This data base could be transferred to another computer.

R.A. JONES



BRITISH JOURNAL OF ENTOMOLOGY AND NATURAL HISTORY

INSTRUCTIONS TO AUTHORS

Contributions must be double-spaced with 3cm margins either side to facilitate marking up. They should be typed if possible, on one side only of A4 paper. Layout should follow that of the journal, but apart from underlining scientific names, no marks should be made to define typeface.

Line and continuous tone figures are accepted. Writing on figures is best listed separately for setting and its placing indicated on a duplicate figure. Seek advice before drawing. Reduction may otherwise necessitate redrawing.

Authors of original papers of more than one page qualify for 25 free reprints. Extra copies (prices on application) must be ordered when proofs are returned.

MEETINGS OF THE SOCIETY

are held regularly at the Society's Rooms, but the well-known ANNUAL EXHIBITION and ANNUAL DINNER are planned for the 19th November 1988 at Imperial College, London SW7.

Frequent Field Meetings are held at weekends in the Summer. Visitors are welcome at all meetings.

The current Programme Card can be had on application to the Secretary at 32 Penton Road, Staines, Mdx. TW18 2LD.

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The Society, founded in 1935, promotes the study and practice of entomology, particularly for the amateur and the young. The present membership is c.2000 and members receive a quarterly printed Bulletin and Wants & Exchanges lists. An Advisory Panel provides advice and identification on most insect orders. Publications of the Society are also available on the practical aspects of entomology, written with the amateur in mind.

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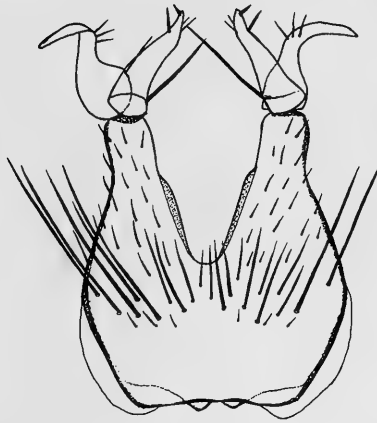
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THE MOTHS OF WISTMAN'S WOOD, DARTMOOR

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Wistman's Wood lies within the Dartmoor National Park at a height of between 380 and 435 metres on a west facing slope in the valley of the West Dart. The climatic environment has been described as oceanic (Simmons, 1965), with an annual rainfall of about 215 cm (falling on about 200 raindays a year) and cool summers. The wood is small, about 7.5 acres, divided into two main sections, (with outlying fragments) and isolated from other woods. Along with Black Tor Copse and Piles Copse, it is high altitude relict oak forest, a remnant of the woodland that covered Dartmoor until about 2500 BC. The area is granite, covered with boulder scree or litter occasionally covered in humus; the leached soils and high wind velocities are inimical to tree growth. Whereas most of the oak woodland (including those woods on the fringes of Dartmoor) in south west Britain is of sessile oak (*Quercus petraea*), here pedunculate oak (*Quercus robur*) is the dominant tree, stunted and twisted, and covered in epiphytes. This distribution of *Quercus robur* may be a relict distribution from the period when soils were more base-rich than now, and possibly an Atlantic type of woodland extending from Britain to Portugal. Also occurring are rowan (*Sorbus aucuparia*), eared willow (*Salix aurita*) and holly (*Ilex aquifolium*), whilst the ground flora includes bilberry (*Vaccinium myrtillus*), greater woodrush (*Luzula sylvatica*) and bramble (*Rubus fruticosus*). The woodland is changing; the trees are growing taller with less epiphytic growth, the wood is becoming easier to penetrate, and there

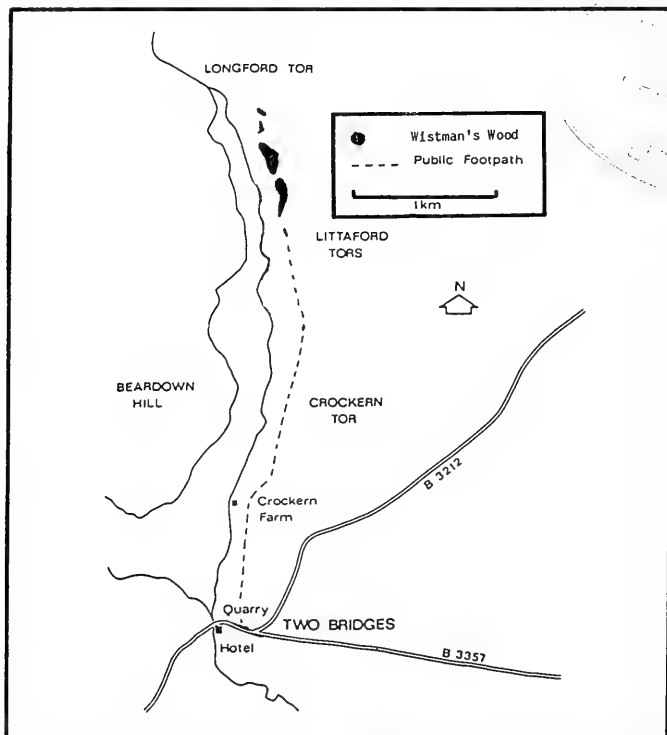


Fig. 1. Wistman's Wood.

is more grazing by sheep which stray in from the surrounding unimproved acidic grassland. Here, as on much of Dartmoor, grow *Calluna vulgaris*, *Vaccinium myrtillus*, and *Molinia caerulea*.

I first visited Wistman's Wood at night on 12 May 1984 with Steven Church and Mark Hadley. We found a way to drive a Land Rover close to the wood, but still had to carry the mothing gear several hundreds of metres. We were looking especially for *Jodia croceago*, which I had found previously in Cornwall (and probably, considering the site where it was found, feeding upon *Quercus petraea*). Unknowingly, we had picked the night of the Ten Tors expedition, when every year hundreds of young people camp overnight on the moor, supported by the armed forces. Not only was the night clear and cold, with a full moon, but far from being alone in the middle of the moor we were surrounded by campers and at one stage a helicopter flew low overhead with a searchlight.

On various trips to the Wood, several capture techniques were used. The chief method of collection was an m.v. light placed on a white sheet at an altitude of about 400 metres where there was a natural gap between the two main sections of woodland. Finding shelter from the wind was a continual problem. Heath traps were set up out of sight of the m.v. light, one at the southern end of the wood at the same altitude, and the other at the lower and northern end of the wood. Beating was also tried, a valuable technique as one species (*Phyllonorycter quercifoliella*, beaten from the epiphytic bilberry) was only found by this method. Sugaring on the lee side of trees and boulders did not work well, presumably because the weather was cold.

I visited Wistman's Wood on six occasions. On 12.v.84, nine species were caught, including a larva of *Dichonia aprilina* as well as two specimens of *Drymonia ruficornis*, one of which (a male) was of the light grey coloration typical of Cornish specimens, the other (a female) being a much darker brown colour, similar to *Drymonia dodonaea*. My next visit was not until 23.v.1986, when no new species were found. On the night of 27.vi.86, however, when the temperature was 9°C after a hot sunny day, 49 species came to light. Two tiny golden-winged moths were probably *Micropterix aruncella*, but unfortunately one lost its abdomen and the other was a female and thus difficult to separate from *M. calthella*; with both, only the base of the costa seemed to be purple. If they had been males, then they would have been *M. calthella*. I would imagine that *M. aruncella* is perhaps more likely here as it occurs in dry open woodland, whereas I HAVE found *M. calthella*, especially on *Ranunculus* spp., in damper woods and meadows. The most interesting record was a single *Microthrix similella*, which I believe has not been recorded from Devon before (and apparently has not been recorded nearer than Hampshire (Goater, 1986). It is a moth of mature oak woodlands, with a central European distribution (Meyrick, 1968). However, a single specimen was found at Westcliff-on-Sea on 25.vii.1956 (Emmet, 1981), which suggests that its distribution is wider than realized; being a canopy feeder, it is seldom seen.

A visit on 20.vii.86 yielded 32 species, including *Choristoneura hebenstreitella*, which probably feeds on oak here, but could feed on bilberry. *Scoparia ambigualis* (which usually flies in May and June) was represented by the small dark form *atomalis* which is characteristic of the moorland of the hills of northern and western Britain and flies later in the year. This may be a moth of the wood or the moor, the larvae presumably feeding on moss. It is a problem with moth-trapping that it is impossible to know whence the moths have flown, especially in such a small wood as Wistman's Wood. The next visit, on 16.ix.86, with a full moon and a cold northerly wind, yielded just three individuals of *Paradiarsia glareosa* and one *Carabus violaceus* (Coleoptera). A visit on 10.x.86 yielded three species, including over 30

Epirrita dilutata. I took 12 of these, covering a wide range of forms, as I was fairly sure that on the external characteristics both *E. christyi* and *E. autumnata* were present. In some, the post-median fascia was clearly angled around the conspicuous discal spot (as I have found to be often the case with *E. autumnata*), in others the band curved round close to the discal spot (as is often the case with *E. christyi*), but in fact all proved, on genitalia examination, to be male *E. dilutata* (Heslop-Harrison, 1932). My last trip was on 23.v.87, when no new species came to light, though the single *Noctua pronuba* was probably a migrant at this time of year.

As far as I am aware, these are the first nighttime moth-hunting visits to Wistman's Wood, but I would not be surprised if people had trapped there before, despite the difficult access. I know of only one other moth record from the wood, a record of *Stilbia anomala* Haw., dating from 1960, although there are a few butterfly records and one beetle record. I have recorded 76 species for the wood (see the Appendix for a complete list), out of which 23 are primarily or solely feeders on oak, and presumably confined to this small woodland. Two of the species caught would feed on heather (*Eupithecia nanata angusta* and *Lycophotia porphyrea*), seven on bedstraw (presumably *Galium saxatile*) including *Deilephila porcellus*, eight on *Salix aurita*, nine on various grasses and three on bracken. Although the larvae of *Eulithis populata* may well feed on the epiphytic bilberry, and *Scoparia ambigualis* on epiphytic moss, there were no specialist epiphytic feeders, and no lichen feeders. The only two Arctiidae present were the ubiquitous *Spilosoma lubricipeda* and *S. luteum*. I expected flight periods to be later here than in the warmer parts of Cornwall, but with so few visits spaced so far apart, I did not find any noticeable differences except the single *Noctua janthina* that came to light on 10.x.86, some 3 weeks later than I've seen it in Cornwall.

Such an isolated wood would provide an excellent site for a population study on a species such as *Microthrix similella*, as emigration and immigration of this species would be unlikely, given that the nearest ancient woodland is several miles distant. The population may well have survived here for centuries, isolated from any other communities by the clearance of trees for agriculture and tin-smelting, surviving several fluctuations in the size of the wood. (It is interesting to note that in 1797 the wood covered merely half an acre and has expanded since then.) This site is probably its highest recorded station in Britain which may well be due to the fact that Dartmoor is the only high altitude region of Britain that has never been glaciated. Relict populations of *M. similella* may occur in Black Tor Copse and Piles Copse, and perhaps even in relict oak woods on Bodmin Moor (itself never glaciated). The species would be expected to occur in the woods that can be found on the edges of Dartmoor, such as Yarnar Wood, as it may well have been from woods such as these that the Wistman's Wood population originated (although *Quercus robur* does not occur in these woods). A similar example of relict populations are the populations of *Luperina nickerlii gueneei* found in Lancashire and Point of Air in North Wales; this species may well have existed during the fourth glaciation of the ice ages on the low-lying land of Liverpool Bay (Beirne, 1947), before the present-day populations became isolated by the flooding of the Bay when the ice melted (the last ice age ending some 11 000 years ago). With *M. similella*, isolation in an apparently inhospitable environment was probably man-made, occurring because of the felling of the surrounding woodland. However, there is an hypothesis that Wistman's Wood was a plantation, with *Quercus robur* being deliberately planted to provide wood for coppicing and tin smelting (Simmons, 1965), in which case *M. similella* may have been introduced into the wood with the trees. The other oak-feeding moths found here all occur widely in Britain in several different habitats, so finding them here was

not surprising. However, it is possible that future moth collecting may well yield further interesting and unexpected species.

ACKNOWLEDGEMENTS

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APPENDIX

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|--|---------------------------------------|
| Gracillariidae | <i>Opisthograptis luteolata</i> L. |
| <i>Phyllonorycter quercifoliella</i> Zell. | <i>Selenia lunularia</i> Hübn. |
| Tortricidae | <i>Odontopera bidentata</i> Cl. |
| <i>Pandemis cerasana</i> Hübn. | <i>Biston betularia</i> L. |
| <i>Choristoneura hebenstreitella</i> Müll. | <i>Alcis repandata</i> L. |
| <i>Aleimma loeflingiana</i> L. | <i>Ectropis crepuscularia</i> D. & S. |
| <i>Tortrix viridana</i> L. | <i>Campaea margaritata</i> L. |
| <i>Olethreutes lacunana</i> D. & S. | Sphingidae |
| Pyralidae | <i>Smerinthus ocellata</i> L. |
| <i>Chrysoteuchia culmella</i> L. | <i>Laothoe populi</i> L. |
| <i>Crambus lathoniellus</i> Zinck. | <i>Deilephila porcellus</i> L. |
| <i>Agriphila inquinatella</i> D. & S. | Notodontidae |
| <i>Scoparia subfusca</i> Haw. | <i>Ptilodon capucina</i> L. |
| <i>Scoparia ambigualis</i> Treit. f. <i>atomalis</i> . | <i>Drymonia ruficornis</i> Hufn. |
| <i>Microthrix similella</i> Zinck. | Lymantriidae |
| Lasiocampidae | <i>Dasychira pudibunda</i> L. |
| <i>Philudoria potatoria</i> L. | Arctiidae |
| Thyatiridae | <i>Spilosoma lubricipeda</i> L. |
| <i>Thyatira batis</i> L. | <i>Spilosoma luteum</i> Hufn. |
| Geometridae | Noctuidae |
| <i>Xanthorhoe montanata</i> D. & S. | <i>Agrotis exclamationis</i> L. |
| <i>Scotopteryx mucronata umbrifera</i> Heyd. | <i>Ochropleura plecta</i> L. |
| <i>Scotopteryx luridata</i> Hufn. | <i>Noctua pronuba</i> L. |
| <i>Epirrhoe alternata</i> Müll. | <i>Noctua janthina</i> D. & S. |
| <i>Epirrhoe galiata</i> D. & S. | <i>Paradiarsia glareosa</i> Esp. |
| <i>Cosmorhoe ocellata</i> L. | <i>Lycophotia porphyrea</i> D. & S. |
| <i>Eulithis populata</i> L. | <i>Diarsia mendica</i> F. |
| <i>Chloroclysta truncata</i> Hufn. | <i>Diarsia brunnea</i> D. & S. |
| <i>Electrophaes corylata</i> Thunb. | <i>Xestia baja</i> D. & S. |
| <i>Colostygia multistrigaria</i> Haw. | <i>Anaplectoides prasina</i> D. & S. |
| <i>Colostygia pectinataria</i> Knoch | <i>Cerastis rubricosa</i> D. & S. |
| <i>Epirrita dilutata</i> D. & S. | <i>Lacanobia thalassina</i> Hufn. |
| <i>Eupithecia pulchellata</i> Steph. | <i>Lacanobia oleracea</i> L. |
| <i>Eupithecia nanata angusta</i> Prout | <i>Ceramica pisi</i> L. |
| <i>Eupithecia abbreviata</i> Steph. | <i>Orthosia stabilis</i> D. & S. |
| <i>Petrophora chlorosata</i> Scop. | <i>Orthosia gothica</i> L. |
| <i>Plagodis dolabraria</i> L. | <i>Dichonia aprilina</i> L. |

ON THE BUTTERFLIES (LEPIDOPTERA: RHOPALOCERA) OF SOME TYRRHENIAN ISLANDS (SOUTHERN ITALY)

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The aim of the present paper is to summarize the results of the research carried out by the authors in some Tyrrhenian islands on and off since 1976; also included are some records made by some of our colleagues and brought to our attention. The paper is not intended to provide a comprehensive survey of the butterflies of these islands: much more work would be needed to satisfy such an aim.

The following islands and island groups were the subject of our investigation:

Eolie Islands (Aeolian Islands, Lipari Islands, Isole Eolie) were visited by G. Leighb in July 1976, 1977, 1980 and in September 1987 as well as by O. Kudrna in June 1987.

Ischia and Vivara were visited by O. Kudrna in early June 1985.

Ponza Islands were visited by O. Kudrna in late June 1986.

The location of the islands and areas we have investigated is shown in Fig. 1.

In addition to this we have received some information on and/or specimens from Isola Panarea (Eolie Islands) from C. Prola, Isola Ischia, from D. Mütting and P. Provera, and from Ponza Islands from V. Sbordoni.

The Eolie Islands are situated in the south-east of the Tyrrhenian Sea just north of north-eastern Sicily. They are of volcanic origin and some of their volcanoes are still active. The group consists of seven major islands. The chief island is Lipari; Vulcano and Salina are separated from Lipari only by some 10 km of sea; Panarea, Stromboli, Filicudi and Alicudi lie further away and are not so easy to reach on a one-day trip. All the islands are inhabited, Lipari is almost overpopulated. The most characteristic species of this archipelago is without any doubt the endemic *Hipparchia leighebi*; the apparent absence of *Gonepteryx cleopatra* is most unexpected.

The Island of Ischia is situated in the Bay of Naples; it is a well known resort, popular with tourists and holidaymakers, rather overpopulated in coastal districts. It is dominated by the highest mountain, Monte Epomeo (787 m) which is of volcanic origin and now mostly wooded. Suitable butterfly habitats can be found on the eastern, southern and western slopes of M. Epomeo and its surroundings; the northern slopes are covered by thick woods mixed with degraded garrigue, by and large inaccessible and unsuitable to butterflies. The most interesting Ischian butterfly is certainly *Hipparchia ballettoi*; *Maniola jurtina* and *Glaucoopsyche alexis* were the most common species at the time of recording, apart from apparently migrating *Vanessa cardui*.

The Island of Vivara is really just a part of Procida Island, to which it is connected by a narrow isthmus carrying a bridge. Whereas Procida is heavily populated, practically just a single town, unsuitable for butterflies, Vivara is by and large covered by thick garrigue and original maquis; it is an important nature reserve. It is inhabited only by the relatively few butterfly species which can live in this specialized habitat. *Lampides boeticus* was perhaps the most common species at the time of recording.

Ponza Islands are also largely of volcanic origin; the chief island is Ponza, dominated by Monte Guardia (280 m) and flanked by the smaller islands of Zannone and Palmarola situated some 10 km north-east and west respectively. The islands of Ventotene and the tiny S. Stefano are situated nearly 50 km south-east of Ponza, about in the middle of the line from Ponza to Ischia. Only the main island Ponza was visited by us; the dominating butterfly habitat is degraded garrigue. The character-

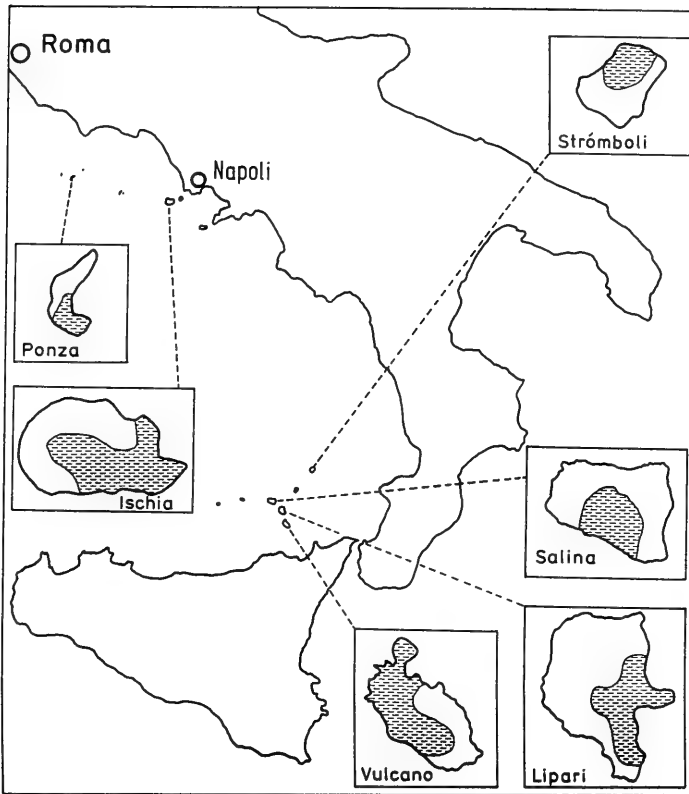


Fig. 1. Tyrrhenian islands surveyed by the authors, with areas investigated marked.

istic species of the island are the endemic *Hipparchia sbordonii* and a distinct local form of *Lasiommata megera*; very surprising was the absence of *Maniola jurtina*, which must have been on the wing at the time of the visit in other parts of Italy.

The species recorded and their distribution are shown in the Table 1.

Pieris daplidice was only observed in flight in the islands of Ischia and Ponza, *Polygonia egea* and *Argynnis pandora* have never been captured in Ischia; although their identification is to be regarded as positive, all these records require confirmation.

Hipparchia ballettoi is known from Monte Faito, south of Naples, which is its type locality, and in Isola Ischia only. Only a single male was seen (and captured) near Fontana on south-eastern slopes of M. Epomeo in early June 1985. D. Müting (pers. comm.) found males abundant, but no females, north of San Angelo on the southern coast of Ischia, i.e. further south of M. Epomeo, P. Provera found the species in late July and August on western slopes of M. Epomeo (towards Forio), flying partly together with *Hipparchia stailinus*.

Hipparchia leighebi belongs to the most widespread species in the Eolie Islands, we suspect that it will also be found in Filicudi and Alicudi (we have never been able to visit these islands, nor Panarea, owing to adverse weather encountered in June

Table 1. Species recorded.

Species:	Islands							
	Vul	Lip	Sal	Pan	Str	Pon	Isc	Viv
<i>Papilio machaon</i> Linnaeus, 1758	■	■	■					
<i>Iphiolides podalirius</i> Linnaeus, 1758							■	
<i>Pieris brassicae</i> Linnaeus, 1758	■		■			■	■	
<i>Pieris napi</i> Linnaeus, 1758	■	■	■		■	■	■	■
<i>Pieris manni</i> Mayer, 1851	■	■	■		■	■	■	
<i>Pieris rapae</i> Linnaeus, 1758							■	
<i>Pieris daplidice</i> Linnaeus, 1758	■	■				■	■	
<i>Colias crocea</i> Geoffroy, 1785	■	■				■	■	■
<i>Gonepteryx cleopatra</i> Linnaeus, 1767						■	■	■
<i>Callophrys rubi</i> Linnaeus, 1758							■	
<i>Lycaena phlaeas</i> Linnaeus, 1761	■	■	■				■	
<i>Lampides boeticus</i> Linnaeus, 1767			■			■		■
<i>Syntarucus pirthous</i> Linnaeus, 1767		■			■			
<i>Celastrina argiolus</i> Linnaeus, 1758	■	■	■					
<i>Glaucopsyche alexis</i> Poda, 1761							■	
<i>Aricia agestis</i> Den. & Schiffermüller, 1775	■	■	■					
<i>Polyommatus icarus</i> Rottentburg, 1775	■		■			■		
<i>Charaxes jasius</i> Linnaeus, 1767			■					
<i>Polygonia egea</i> Cramer, 1775		■					■	
<i>Vanessa atalanta</i> Linnaeus, 1758		■					■	
<i>Vanessa cardui</i> Linnaeus, 1758			■			■	■	■
<i>Argynnis pandora</i> Den. & Schiffermüller, 1775							■	
<i>Hipparchia balletoi</i> Kudrna, 1984							■	
<i>Hipparchia leighebi</i> Kudrna, 1976	■	■	■	■				
<i>Hipparchia sbordonii</i> Kudrna, 1984						■		
<i>Hipparchia statilinus</i> Hufbagel, 1766							■	
<i>Maniola jurtina</i> Linnaeus, 1758							■	
<i>Pyronia cecilia</i> Vallantin, 1894	■	■	■					
<i>Lasioommata megera</i> Linnaeus, 1767	■	■	■		■	■	■	
<i>Pararge aegeria</i> Linnaeus, 1758	■	■			■	■	■	■
<i>Gegenes pumilio</i> Hoffmannsegg, 1804		■						

Names of islands are abbreviated as follows: Vul = Vulcano, Lip = Lipari, Sal = Salina, Pa = Panarea, Str = Stromboli, Pon = Ponza, Isc = Ischia, Viv = Vivara. The nomenclature follows Kudrna (1986).

1987). It is the only butterfly known to us from the Island of Panarea (*C. Prola* leg., material deposited in part in coll. R. Verity in Museo Zoologico de la Specola in Florence). *H. leighebi* is particularly abundant on the Islands of Stromboli, Vulcano and Salina. Whereas the males frequent open spaces on the slopes of Gran Cratere of Vulcano (Fig. 2), the females concentrate exclusively in relatively thick woodland consisting predominantly of olive and oleander trees (Fig. 3), practically avoiding the males; they are very rarely seen to visit flowers, settling mostly on tree trunks. Males settle both on open ground and on flowers, with an apparent preference for thistles. Both attempts to breed the species failed as the first instar larvae died shortly after they hatched.

Hipparchia sbordonii is one of the commonest butterfly species on the Island of Ponza; individuals, especially males, are often seen flying through the streets of the port of Ponza, occasionally visiting flowers of potted plants. V. Sbordoni (Kudrna, 1984) found *H. sbordonii* also on the islands of Palmarola, Zannone, Ventotene and S. Stefano. Like *H. leighebi*, *H. sbordonii* also shows the same odd behaviour of



Fig. 2. Vulcano: a typical biotope of *Hipparchia leighebi* males on the slopes of the Gran Cratere.



Fig. 3. Vulcano: a typical biotope of *Hipparchia leighebi* females.

territorial separation between males and females. Like *H. leighebi*, males of *H. sbordonii*, inhabit open country whereas the females concentrate in thick *Rubus* bushes, flying virtually 'inside' them, but the separation of sexes in this species does not appear to be as strict as in *H. leighebi*. It is possible that in both *H. leighebi* and *H. sbordonii* pairing takes place in late summer or in autumn: it may be an advantage in a dry and hot climate. Nevertheless, G. Leigheb obtained eggs from five females of *H. leighebi* in July 1980.

Lasiommata megera from Ponza Islands somewhat resembles *L. tigelius* Bonelli, 1826, a species endemic to Sardinia and Corsica. The examination of the male genitalia revealed that there is no very close connection between *L. megera* from Ponza and *L. tigelius*. The exact status of *L. megera* from Ponza remains an open question.

All three *Hipparchia* species, *H. ballettoi*, *H. leighebi* and *H. sbordonii* are endemic, each confined to a very restricted range. Their long-term survival depends on the conservation of their respective habitats. At present they are (probably all three) abundant and in spite of growing tourism probably not directly threatened because their habitat is of little value to humans. It would not be a bad idea to encourage the Italian government to purchase land on some of the islands and to establish there large reserves as a preventive conservation measure.

Vannessa cardui appeared in masses on the south-eastern slopes of Monte Epomeo above Fontana (Ischia) 5.vi.1985 and disappeared completely on the following morning. It was certainly the beginning of a migration.

We hope that our preliminary treatment of the butterflies of the relatively poorly known Eolie and Ponza Islands as well as of Ischia will encourage further research into their fauna, especially of the biology of all three *Hipparchia* species, the early stages of which remain undescribed.

We have great pleasure in thanking Prof. A. Messina, Prof. D. Müting, C. Prola, P. Provera and Prof. V. Sbordoni for their valuable help. Miss E. J. M. Warren was kind enough to proof read the paper for us. Last not least we thank Dr E. M. Wolfram who drew for us a map of Tyrrhenian Islands (Fig. 1) dealt with in this paper. The research was in part supported by a grant from Ministero Pubblica Istruzione, Fondo Ricerca Scientifica (nr. 65 DPR 382/80) attached to Dipartimento di Biologia Animale of the University of Catania.

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BOOK REVIEW

Field Guide to the Butterflies of Southern Africa by I. Migdol. 256 pp. inc. 111 plates containing 640 coloured photographs. New Holland Press; £9.95.

The book comprises chapters on butterfly structure, general life history, nomenclature, collecting, breeding, survival techniques, conservation, family characteristics and description of species. It deals with 232 of the 800 species occurring in the region—the Republic of South Africa, Lesotho and Swaziland. For each species there is a distribution map, a short description including size, behaviour and habitat, and where known larval description and foodplants. Each species, sometimes including larva and pupa, is illustrated by a colour photograph, unfortunately not to natural size, but otherwise excellent, especially those of the insect in natural pose. However many of the set specimens selected for illustration, even of the commonest species, e.g. *Pontia helice* ♂ (Fig. 206b) and *Hemiolaus caeculus* (Fig. 103b) have a mangled appearance, presumably due to thorax pinching for killing, and papering, two practices advocated by the author. For each species English and Afrikaans names are assigned.

The chapter on collecting is useful, but whilst noting the difficulty of killing Acraeas and Danaids by pinching or cyanide, the author omits to mention the satisfactory method of pricking with oxalic acid; similarly whilst noting the difficulty of setting Hesperids he does not mention cutting the muscle at the base of the hindwing.

The chapter on breeding techniques is excellent; those on insect survival strategies and conservation interesting and informative; there is a 'further reading' list, an index based unfortunately on generic names, and an English name index. The bulk of the work is devoted to descriptions and illustrations of species, and the book as a whole is well balanced; it is not a substitute for D. Swanepoel's *Butterflies of South Africa*, for many common butterflies are omitted, especially Hesperids, but it is an excellent supplement to it containing much extra accurate information; it is a worthy and recommended addition to the many fine books which have been written on the butterflies of southern Africa.

B. K. WEST

THIRTEEN SPECIES OF *MYCETOPHILA* MEIGEN (DIPTERA: MYCETOPHILIDAE) NEW TO THE BRITISH LIST

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Mycetophila is the largest genus of fungus gnats in the British fauna and the additions here increase the list to 70, i.e. 29 species over those dealt with by Edwards (1925) who provided the only published key to the British species. Edwards (1926, 1941) added eight species. Further species were added by Kidd & Ackland (1970), Laštovka & Kidd (1974) and Chandler (1977*a,b*). Species included here have been recognized in collections or discovered anew in the past 10 years; two of them, *abiecta* Laštovka and *sumavica* Laštovka were recorded from Ireland by Chandler (1987).

Reference is made as to where species run in Edwards' (1925) key (which relied largely on colour characters) and Laffoon's (1956) key to the Nearctic species (based more on structural and chaetotactic characters). Most *Mycetophila* have brown wing markings, whose distribution is often characteristic. Also the colour of the thoracic dorsum (mesoscutum) is frequently constant and useful for recognition. Laffoon made considerable use of the chaetotactic characters of the legs, arranging the species in six groups on the distribution of setae and colour of setulae on the tibiae. A combination of these characters permits the identification of most species on external characters and have assisted association of the sexes. However, all external characters may be variable and confirmation from the genital structure is essential.

Males of most *Mycetophila* are readily recognized from their genital structure without dissection owing to the wide range of form within the genus, but more critical examination is necessary in some groups of closely related species such as the *ruficollis* and *vittipes* groups. Females of more than 50 British species have been certainly recognized and their identification is aided by ovipositor characters and in some cases the degree of thickening of the fore tarsi.

The *ruficollis* Meigen group

Laštovka (1972) revised this group, recognizing 11 species in the Holarctic. Laffoon (1956) had previously realized that the *lineola* Meig. of earlier authors was a complex of species, and the composition of the group in Britain was clarified by Laštovka & Kidd (1974), who found four species in the material they examined. Two further species may now be added, both mainly Scottish in distribution; both can be recognized from the genitalia figures given by Laštovka (1972).

Mycetophila evanida Laštovka, 1972

This is evidently widespread in Scotland and has been seen from a good number of localities in Ross, Inverness, Perthshire and Argyll. It has been recorded from Scandinavia, central Europe and Mongolia (Laštovka, 1972; Plassmann, 1976, 1980*a,b*).

Mycetophila uninotata Zetterstedt, 1852

This was raised from synonymy by Laštovka (1972), who recorded it from Norway, Austria and Czechoslovakia; Plassmann (1980*a,b*) added records from Sweden and the German Alps. It is another mainly Scottish species (several localities in Sutherland, Ross, Inverness and Perthshire) and seen from Durham, Sleightholme Beck, 23.vi.1981.

Mycetophila czizeki Landrock, 1911

M. sordida Wulp was recorded under the name *czizeki* by Edwards (1925) and the two species are very close. Laffoon established that the British material was *sordida* and the true *czizeki* has only recently been discovered in Britain. According to Landrock (1940) and Matile (1977) *czizeki* is the commoner species in France and Germany but *sordida* has a wider overall distribution, being Holarctic. *M. sordida* is not common here but has been seen from southern England, the Scottish Highlands and Ireland while *czizeki* has been found only in northern England.

Landrock (1911, 1927, 1940) figured the genitalia of *czizeki*. External characters are very similar but *czizeki* is a little darker; specimens examined have the thoracic stripes more approximated and the hind femur darkened at the tip and vaguely along the dorsal margin; the hind femur is entirely yellow in specimens of *sordida* examined, although said to be sometimes dusky apically by Laffoon.

Material examined. N. Yorks.: Castle Bolton Woods, 3.x.1985, ♂ (M. Pugh); Birkbeck Wood, 27.vi.1981, ♂ (I. F. G. McLean); Rake Beck, 4.x.1985, ♂ (I. F. G. McLean); Durham: Castle Eden Dene, 14.ix.1981, ♂ (J. H. Cole).

The *vittipes* Zetterstedt Group

This is a well defined group within Laffoon's group 6, which was defined and revised in Europe by Laštovka (1963). More species were found in North America although several evidently formed species pairs with European species. Laštovka recognized nine species but only three of these (*vittipes* Zett.; *gibbula* Edwards; *bohemica* (Laštovka)) have hitherto been recorded as British. A further three are added here, which may be recognized from the keys and figures provided by Laštovka. All species of the group run to couplet 19 in Edwards' key and the structural differences are small. *M. vittipes* is the only common species of the group; of the six British species, only *vittipes* and *schnabli* have the median flagellar segments more than twice as long as broad, and in other species the antennae are relatively short, but obviously longer than the head and thorax together.

Mycetophila schnabli (Dziedzicki, 1884)

This is the largest (wing length over 5 mm) and most distinctive member of the group, but is closely related to the Nearctic *propinqua* Walker. It has the thoracic dorsum broadly yellow laterally and on the humeral areas, leaving three fused dull brown stripes on the disc. It is frequent in Scandinavia; Plassmann (1970) recorded it from Austria and Matile (1977) recorded it from France (Drôme).

Material examined. Inverness: Glen Affric, 19.vi.1981, ♂ (A. E. Stubbs).

Mycetophila abiecta (Laštovka, 1963)

This and the next species are very close in all respects but small differences in the genitalia appear to be constant. Both are variable in the extent of the wing markings and the more strongly marked examples, which are more frequent in *abiecta*, usually have the mid and hind coxae entirely dark but specimens with the coxae entirely yellow are also frequent. This type of variation occurs also in *vittipes* and in the two British *Platurocypta* species. *M. abiecta* and *M. sumavica* are usually smaller than *vittipes* (wing length range 2.3–3.2 mm, *vittipes* 2.5–3.9 mm). *M. abiecta* has a long flight period (iii–iv, vii–xi) but is more frequent in the autumn.

Material examined. 29 ♂ and 10 ♀ from 16 localities in England and Wales; only females recorded from Ireland (Chandler, 1987) so confirmation desirable.

Mycetophila sumavica (Laštovka, 1963)

Most examples of *sumavica* seen have the coxae entirely yellow (some from Logie have the mid and hind coxae dark) and the hind femur more narrowly darkened apically than is usual in *abjecta*, but examination of male genitalia is essential. Both *abjecta* and *sumavica* have the thoracic dorsum mainly dark brown and grey dusted with only a narrow yellow humeral mark. *M. sumavica* has a long flight period (vi–x).

Material examined, 17 ♂ and 8 ♀ from 16 localities, mainly in Scotland and Ireland, but also North Wales, Yorks., Northumberland and Hereford.

Mycetophila abbreviata Landrock, 1914

This is a very distinctive species, belonging on genital structure to the *pictula* group (Chandler, 1977a) and the female has single segmented cerci like other members of this group. It, however, differs from other species in lacking an a–d seta on the mid tibia so runs to Laffoon's group B (where it comes to couplet 10) and in the preapical wing marking being entirely beyond the tip of R1. In Edwards' key it runs to *finlandica* Edwards, as does *mohilevensis* Dzedzicki (see below) but differs from both in the thoracic colouration as the dark stripes are practically fused to form a dark grey dusted disc surrounded by broadly yellow sides and humeral areas. Landrock (1914) described *abbreviata* on a male from Czechoslovakia, while Lundström (1916) described it from Hungary as *luteiventris*; both figured the male genitalia. Plassmann (1980b) recorded it from Sweden. In Britain it appears to be confined to the Scottish Highlands. Wing length of ♂ 3.6–3.9 mm, ♀ 3.8–4.2 mm.

Material examined. Sutherland: Migdale Wood, 11.vi.1984, 2 ♂, 1 ♀ (P. J. Chandler); Ross: Rogie Falls, 15.vi.1984, 7 ♂, 3 ♀ (I. F. G. McLean); Alness, 16.vi.1984, ♀ (A. E. Stubbs); Inverness: Belladrum Burn, 16.vi.1984, ♀ (A. E. Stubbs); Feshie Bridge, 29.v.1973, ♀; Inshriach Forest, 17.viii.1986, ♂ (P. J. Chandler); Nairn: Banchor, 19.vi.1982, ♂, 2 ♀ (I. F. G. McLean); Cawdor Wood, 12.vi.1984, ♀ (A. E. Stubbs).

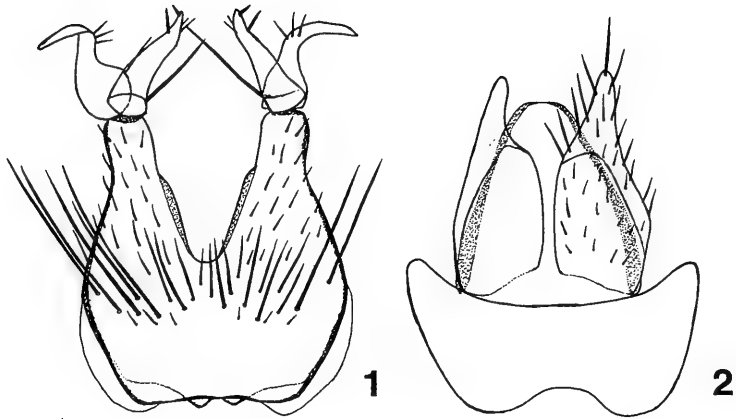
Mycetophila lapponica Lundström, 1906

Another recently discovered 'Scottish' species. Lundström figured the male genitalia and described both sexes from Finnish Lapland. It had been found in association with polypore fungi at two localities, in one case on birch. Plassmann (1976, 1979) recorded it from Sweden. In Edwards' key *lapponica* runs to *occultans* Lundström, from which it differs in a more strongly shining thorax and a distinct preapical wing band as well as only strong dorsal setae on the hind tibia. It belongs to Laffoon's group E and runs like the new species described below to couplet 4; the entirely dark thoracic dorsum distinguishes it from *uliginosa* sp. n and the genital structure is quite different.

Material examined. Ross: Beinn Eighe N.N.R., 10.vi.1984, ♀ (I. F. G. McLean); Perthshire: Rannoch, Camghouran birchwood, 31.viii.1987, ♂ (P. J. Chandler).

Mycetophila uliginosa sp. nov.

Male. Head shining black; antennae brown with basal segments, entire basal flagellar segment and second flagellar segment ventrally yellow; palpi yellow. Thorax brown; mesoscutum (dorsum) shining with large humeral areas, smaller post-humeral patches and small median prescutellar spot yellow; scutellum yellow on apical half; anterior spiracle yellow; most hairs and bristles yellow, only stronger ones brown; three mesepimeral (pteropleural) bristles; four scutellars. Abdomen dark brown; genitalia brownish yellow, rather small with very distinct structure (Figs 1–2). Legs pale yellow, hind femora dark brown on apical third, mid femora



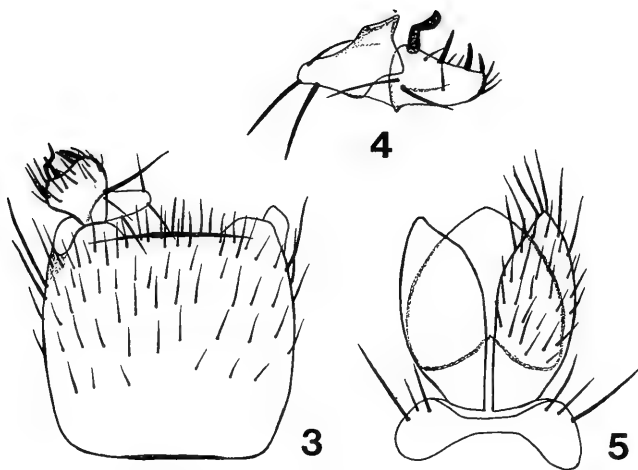
Figs 1–2. *Mycetophila uliginosa* sp. nov. 1. Ventral view of male genitalia, with left dorsal stylomere deflected. 2. Dorsal view of male cerci.

narrowly brown apically; fore tibia with 1–2 short a–d bristles near tip; mid tibia with 3 a, 1 a–d, 4 d, 3 (–4) v, 2 p near tip; anterior setulae all brown; hind tibia with 6 a, 5 d (basal shorter) without shorter bristles between, 2–3 short p near tip; first row of anterior setulae brown on apical three quarters, next three rows entirely yellow, more ventral rows brown apically; hind coxae without long posterior bristles; hind femur with 4–6 a–v bristles on apical third. Wings with yellowish membrane bearing two brown marks; median brown spot from R1 to M2 including Rs and bases of cells R5 and M1; sinuous preapical band well beyond tip of R1, reaching tip of R5, extending across M2 but not reaching CuA1, narrowed in median fork (holotype) or distinctly interrupted for middle third of fork (paratype); wing tip faintly brown around M1 and faint round spot behind basal half of CuA2; vein R before Rs with 15 setulae below; M before r–m with 2 setulae below apically. Wing length 2.8 mm (paratype), 3.0 mm (holotype).

Holotype: ♂ Berks., Cothill, 2.x.1977, wooded fringe of fen (J. W. Ismay). Paratype: ♂, Beds, Flitwick Moor, 13.vii.1978 (J. H. Cole).

Discussion

In Laffoon's key *M. uliginosa* runs with *lapponica* to the *foecunda* Johannsen and *percursa* (Laffoon) couplet in group E; the genitalia are close to *foecunda*, which is evidently a sister species, but there are small differences in the shape and chaetotaxy of the stylomeres, according to the figures given by Laffoon (1956) and it is considered to be a distinct species pending comparison of more material. In Edwards' key it runs to '*obscura* Dziedzicki', (= *dziedzickii* Chandler, figured by Chandler, 1977a) which has vein tb (= M before r–m of Laffoon) setulose beneath and short bristles interspersed with the long d setae on the hind tibia. It also resembles *dentata* Lundström and *blanda* Winnertz, which belong to group E of Laffoon, but again differs in the presence of short d bristles on the hind tibia and obviously in genital characters. Also *dentata* has longer posterior setae on the hind coxae and *blanda* has the second row of anterior setulae on the mid tibia yellow; both species have the hind femur only narrowly dark apically. I understand from Dr P. Laštovka that a similar species to *uliginosa* exists in Czechoslovakia.



Figs 3–5. *Mycetophila gratiosa* Winnertz. 3. Ventral view of male genitalia, with right stylomeres removed. 4. Internal view of right stylomeres. 5. Dorsal view of male cerci.

Mycetophila gratiosa Winnertz, 1863

This species is very similar to *luctuosa* Meig., to which it runs in Laffoon's key (group F). The differently shaped ventral stylomere and overall smaller size of the hypopygium (Figs 3–5) distinguish *gratiosa* from *luctuosa*; the figures of *gratiosa* by Dzierdzicki (1884) are based on Winnertz's type and the apparent differences from those given here are probably not significant. It has been rarely recorded; Kröber (1955) gave a German record and Matile (1969) cited a male from Iran.

In Edwards' key it runs rather to *occultans* as its scutellum is entirely dark and there are three v bristles on the mid tibia (also sometimes in *luctuosa*) but its distinct preapical wing band is an obvious difference. The body is mainly slightly shining black but a small humeral spot and the anterior spiracle are yellow. *M. luctuosa* has a duller mesoscutum and the scutellum broadly yellow on the disc.

The two examples seen differ in size and intensity of wing markings: the larger (wing length 2.9 mm) has darker wing markings with a broader preapical band reaching the hind margin near CuA1; the smaller (wing length 2.5 mm) has the preapical band narrower and interrupted in the median fork.

Material examined. Surrey: Chobham Common, Gracious Pond, 16.x.1984, 2 ♂ (P. J. Chandler).

Mycetophila mohilevensis Dzierdzicki, 1884

M. mohilevensis has very characteristic genital structure and can be readily recognized from the figures of a Bjelo-Russian male by Dzierdzicki (1884), reproduced by Landrock (1927). In Edwards' key it runs to *finlandica* Edwards, which it resembles in having three separate brown stripes on the dull yellow thoracic dorsum. This and *v-nigrum* Lundström (see below) both run to *albertaina* Curran in Laffoon's key (group F) and both differ from *finlandica* in lacking long posterior setae on the hind coxae and in all the anterior setulae on the hind tibia being dark, as well as having a broader more compact preapical wing marking stopping short in the middle of cell R5.

Material examined. Inverness: Dalnapot, 15.vi.1982, wooded flush, ♂ (I. F. G. McLean); Perthshire: Camusurich, 6.vii.1979, ♂ (P. Skidmore).

Mycetophila v-nigrum Lundström, 1913

This species runs to couplet 23 in Edwards' key, differing from the two alternatives, but agreeing with *lamellata* Lundström, added by Edwards (1941), which also runs to here in that its scutellum is mainly dark on the disc. *M. lamellata* is a locally common southern species, which differs most obviously in the broadly yellow sides of the mesoscutum. *M. v-nigrum* differs from both *lamellata* and *mohilevensis* in the dorsum being mainly dull black with broad yellow humeral areas occupying a third of its width and a narrow yellow fore margin. Lundström (1913) figured the genitalia of both sexes.

Material examined. Dunbarton: Bonhill, 23.iv.1907, ♂ (J. R. Malloch, Royal Scottish Museum); Inverness: Belladrum Burn, 16.vi.1984, ♂ (A. E. Stubbs).

Mycetophila lastovkai Caspers, 1984

Caspers described this species from West Germany, comparing it with *marginata* Meig., which it closely resembles. The genitalia, figured by him are, however, quite distinct. In the specimens of *lastovkai* examined the thoracic dorsum is broadly yellow at the sides with more or less fused dark stripes on the disc, as in many examples of *marginata*.

Material examined. Cornwall: Maudlin Valley woods, 6.vii.1983, ♂ (I. F. G. McLean); Hants.: New Forest, Eyeworth Wood, 6.vi.1987, ♂ ♀ (P. J. Chandler).

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THE USE OF INSECT SOUNDS IN TAXONOMY

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INTRODUCTION

The chirps and buzzes made by insects are among the most familiar and evocative sounds of the countryside in summer, but few people who hear them realize the significance of the sounds to the insects making them and listening to them. Take the example of a grasshopper chirping on a grassy bank. It is announcing to the world that it is a male (the females are almost silent) of a particular species and is inviting females of the same species to approach it. The females can recognize the song of their own species and, if they are in the correct physiological state, will approach the male and mating may follow. For the female to be able to recognize the song it must be characteristic of the species and, if it is distinct enough for her to recognize, then we may be able to recognize it too and use it to identify the species. The characters of the song that are species-specific and therefore suitable for such identification normally lie in the temporal patterns and changes in volume.

Not all insect sounds are useful to the taxonomist. The noise a startled insect may make when seized by a predator need not be characteristic of its species in order to be effective; it merely needs to be loud and 'alarming'. Only the sounds used to attract mates are likely to be species-specific.

SOUND PRODUCTION

The methods insects use to produce sounds are very varied. Unlike mammals with their larynx and birds with their syrinx, in insects any part of the body that can be scraped against any other is used in at least one group to produce sound. A full review is given by Dumortier (1964), but among the most interesting are a pigmy mole-cricket that rasps its mandibles against its maxillary palps, a reduviid bug that scratches the tip of its rostrum against a ridged area between its front legs, a beetle that rubs a striated part of its front femur against a row of ribs on the side of the prothorax, several groups of ants that scrape part of the petiole against the gaster, and some noctuid moths that produce sound when in flight, using modified areas of the forewings that are presumed to come into contact with suitably modified legs. These are just some of the *frictional* methods of sound production; other methods involve vibration of a membrane or appendage, expulsion of a gas or liquid from a bodily opening, and banging part of the body on the substrate, as, for example, in the death watch beetle.

The cicadas provide the best-known examples of sound production by vibration. At the base of the abdomen they have a pair of tymbals, which are curved areas of cuticle that are made to click in and out like tin lids by muscles on the inside. It is now known that tymbals are also present on most other Homoptera, and that leafhoppers, treehoppers and froghoppers also use them for communication; these groups do not, however, have the large abdominal air sacs of the cicada which are tuned to resonate at the natural frequency of vibration of the tymbal and amplify the sound to a level not reached by any other insect.

All the examples mentioned from here onwards will be Orthoptera—the grasshoppers, crickets and bush-cricket—because that is the group I work on and because Orthoptera are the group in which sounds are most easily used in taxonomy. Many Orthoptera have loud songs that attract mates, they sing from accessible

places, and they are fairly easy to catch because they do not usually fly for long distances.

The commonest method of sound production in European grasshoppers consists of rubbing a row of pegs on the inside of each hind femur against a prominent vein on the adjacent forewing. In crickets and bush-crickets the forewings are raised for singing and a row of teeth on one wing is scraped with a plectrum on the other. Grasshoppers usually produce louder sounds during the downstroke of the legs than on the upstroke and, similarly, crickets and bush-crickets normally produce louder sounds during the closing stroke of the wings than the opening one.

BASIS FOR THE TAXONOMIC USE OF SONG

Although the songs of many species of insects were described over a hundred years ago, they were virtually ignored in taxonomic circles until recently. When taxonomists did start to study the songs, they soon realized that, in many cases, what had been thought to be single species were in fact groups of species with clearly distinct songs. Despite the fact that they are almost or entirely unrecognizable in superficial appearance, there is no doubt that they are different species, because they do not interbreed and often have different behaviour patterns, seasonal cycles and habitat preferences. Usually, once enough specimens with known songs have been collected, it is possible to find subtle and previously unnoticed differences in structure. For example, during the last 30 years many previously unknown species of cricket have been detected in the USA as a result of studies on their songs. Americans have also used songs to elucidate the taxonomy of the periodical cicadas.

By the mid 1960s my colleague Dr D. R. Ragge had convinced the British Museum (Natural History) that a recording laboratory was needed to make and analyse tape recordings of insect songs. Lack of funds caused a delay but work had begun by 1970 and the laboratory came into use in 1973, which was when I joined the staff. There is an outer laboratory, containing most of the equipment, and a sound-proof inner studio where the insect being recorded is placed in a muslin recording cage with a microphone pointing at it, while the recordist sits in the outer laboratory with the tape recorder.

It was decided to concentrate first on the western European fauna, and particularly on the many groups in which there is still taxonomic confusion. There are several reasons for this. First, both field and studio recordings can be made with relative ease and low cost. Second, several groups of European grasshoppers are of economic importance. Third, grasshoppers have recently been found to be excellent subjects for cytogenetic study, and we have been asked by cytologists for taxonomic information at a more advanced level than has yet been reached in these groups. Fourth, grasshoppers and bush-crickets are large, relatively static insects that often occur in dense, well-defined populations, and so lend themselves well to ecological studies, and there have been many comprehensive studies of this kind in western Europe. Fifth, acoustic communication is a good example of Konrad Lorenz's concept of the 'fixed action pattern' and the 'innate releasing mechanism'—a hereditary, predetermined sequence of movements and a system specialized to recognize it. This behaviour is easily triggered and has made Orthoptera a favourite choice for neurophysiologists and neuroethologists, tracing back the origins of behaviour to the central nervous system, sense organs and muscles. These studies have been held up by problems of identification in the more difficult species groups, which have had to be treated as single species. It is therefore felt that working on the taxonomy of the more difficult groups of western European Orthoptera provides a much-needed service to other biologists.

On his first recording trip, to Austria in 1973, Dr Ragge proved that it was possible to make high quality recordings of most Orthoptera in the field; since then we have each made several trips to France, Spain and Italy and altogether have made about 650 recordings which now form the basis of our western European collection.

EQUIPMENT AND METHODS

The equipment we use for recording in the field is a Uher tape recorder and an AKG D202 microphone. The microphone has separate low and high frequency sections, and ours has been modified so that the on/off switch is linked only to the low frequency section; with this switched off, most of the unwanted background noises are excluded, leaving the insect sounds unaffected because they are mostly above 1 kHz.

In order to get as loud a recording as possible in relation to the background noise, the microphone should be within a few inches of the subject, which must therefore be approached very carefully so as not to disturb it. The most useful recording is of an isolated male producing 'calling song', i.e. not interacting with any others. If the population is too dense to find an isolated male, one can be caught and taken to a quieter spot and released in the hope that it will start singing. After making a recording it is vital to catch the singer so that it can be examined morphologically. For this reason it has to be permanently associated with the recording.

The tape recorder we use for studio recording is a Nagra IV D, which is also portable, so that it can be used in the field if necessary, but it is twice as heavy as the Uher and so less convenient for field use. The Nagra has built-in filters to reduce the low frequency background noise but an additional filter has been added to ours to cut out frequencies above 20 kHz, i.e. above the range of human hearing. Many bush-cricket and other insect songs contain a lot of sound above this frequency and, if it is not filtered out, it is liable to cause distortion at audible frequencies. It appears that nothing of taxonomic significance is lost by such filtering: the ultrasound and audible sound have the same temporal patterns.

After a recording has been made, it needs to be analysed so that it can be compared objectively with other recordings. Our oscillograms are made using an ink-jet recorder which, as the name suggests, squirts a jet of ink at a roll of paper. The machine has two channels, one of which is used for the song, and the other for a timing trace. A typical part of the recording is chosen for analysis, usually at two or three speeds, and then the analyses are filed in a transparent envelope. Back to back with these in the envelope is placed a data sheet, on which all the relevant information about the specimen, recording equipment, conditions etc is typed. These transparent envelopes are kept in a filing cabinet, arranged systematically in major groups, and then alphabetically by genus and species. Because of the full data and analyses that these files contain, they are a very useful data bank in themselves, and can often provide all the information needed on the songs without a tape being taken off the shelf. The museum collection now contains about 3000 recordings on 700 tapes, including some 450 species. About 200 of these are European species with taxonomically useful songs. Throughout the world, it is estimated that, of the 17 000 or so species of Orthoptera, there are about 10 000 with songs that may be useful to the taxonomist.

SPECIFIC SONGS

The classic work on the importance of song in maintaining reproductive isolation was published in 1957 by Perdeck and dealt with three species of common European grasshopper that had presented a taxonomic problem for a century or more. Only

one of the three is found in Britain, the Field Grasshopper, *Chorthippus brunneus* (Thunb.). Although very common here, it is much less so on the Continent, where one of the others, *C. biguttulus* (L.), is the most abundant. The third species is *C. mollis* (Charp.). Morphologically, the three are so similar that some entomologists have considered them to be a single variable species; but the songs are totally different and enable them to be identified at once in the field. Hybrids between these three species are very rarely found in nature, despite the fact that they sometimes occur together, but it is quite easy to produce hybrids in the laboratory. The hybrids are viable and fertile and have intermediate songs and morphology.

Perdeck showed experimentally that the songs of these species were the most important, if not the only, reproductive isolating mechanism. Responsive females make quiet singing movements with their legs when they respond to a male song, and when tape recordings of different songs are played to them they respond only to the song of their own species. This work was carried out in the Netherlands, but the songs had also been described from Germany and it was at that time generally assumed that these three species were found throughout continental Europe. However, Dr Ragge and I have now been able to establish that they are absent from most of the Iberian Peninsula and, apart from *brunneus*, from all but the northernmost part of Italy. They are replaced in these peninsulas by look-alikes with different songs (Ragge, 1987; Ragge & Reynolds, 1988).

Another of the groups in which the songs have helped in clarifying the taxonomy has been the grasshoppers belonging to the European genus *Euchorthippus* Tarbinskii (Ragge & Reynolds, 1984). There were just two species known from the European mainland, *pulvinatus* (Fischer de Waldheim) and *declivus* (Bris.), when Descamps described a third, *chopardi*, from southern France in 1968. He described it purely on morphological grounds, saying that he could find no difference between the songs of the three species. It seemed unlikely that species with the same song could live together as these sometimes do, so we suspected at first that they might be no more than ecological forms of one variable species; the species living in the wettest conditions has short wings and a pointed male abdomen, and the one living in the driest conditions has long wings and a blunt male abdomen. These two are never found together, but both may be found with the third, which lives in intermediate conditions and is intermediate in morphology.

On investigation it was found that there were in fact differences between the songs; careful comparison of the oscillograms showed that the 'dry' and 'wet' species that are never found together have the most similar songs, but the intermediate species that is often found with either of the other two has a song that is noticeably different, both in the rate of repetition of the chirps and in the structure of the chirps themselves. The two species that never come into contact do not need songs to act as species-isolating mechanisms; their choice of habitat serves that purpose. Thus it was apparent that there really are three valid species, and when our recorded specimens were examined it was found that there were reliable morphological differences between them too. It was surprising to find, however, that the Spanish material, which had been thought to be the 'wet' and the 'intermediate' species by all previous authors, actually belonged to the 'intermediate' and the 'dry' species, respectively, and all the taxonomic, ecological and genetic papers of the last 100 years had used the wrong names.

In the next example the study of a song led to the discovery of a new species. The mole-cricket, *Gryllotalpa gryllotalpa* (L.) has a loud song which it produces on warm evenings in late spring and early summer. It is on the verge of extinction in Britain but was causing damage to root vegetables in Southampton gardens a few years ago and

is regularly found when the early potatoes are harvested in Guernsey. There appears to be no published record of its song having been heard in the field in Britain since Gilbert White heard it 200 years ago, though Dr Ragge collected insects from the New Forest and tape-recorded the song in captivity in 1968.

Mole-cricket song was being studied in the Dordogne region of France by the physiologist, Dr Henry Bennet-Clark, now of Oxford University. He discovered to his surprise that he heard two different songs, one low pitched, like the British ones, from the damp soil at the bottom of the valley, and the other higher pitched, from the drier soil of the vineyards on the sides of the valley. Those producing the high-pitched song proved to be a new species which he named *vineae* (Bennet-Clark, 1970a, b). He dug up 20 singing males of each species and found only slight morphological differences between them. He also took plaster casts of their singing burrows and found that these were different too, that of *vineae* being smoother and more regularly shaped. Both have flared openings like the ends of trumpets, which amplify the sound, so that on a quiet night it is claimed that humans can hear the song of *vineae* at a distance of 600 metres.

Among the bush-crickets there are examples of local forms that until now have been regarded as distinct species but that have songs identical to those of species occurring more widely in Europe. In the Decticine genus *Metrioptera* Wesmael the form *buyssoni* (Saulcy) from the Pyrenees has a male calling song identical to that of the widespread species *saussuriana* (Frey-Gessner). These forms are at present regarded as distinct species on the basis of small morphological differences but the identity in song suggests that they would be better treated as conspecific. On the other hand, *caprai* Baccetti from the Apennines has a song that is probably sufficiently different to justify keeping it as a distinct species (Ragge, 1987).

Another example is provided by the genus *Decticus* Serv., in which there is a small short-winged form, *aprutianus* Capra, in the Apennines, which is regarded by Italian authors as specifically distinct from *verrucivorus* (L.), the common Wartbiter. But the songs of the two are identical and it therefore seems likely that only one species is involved (Ragge, 1987).

Although the songs can be used as characters for identification, in the same way as morphological characters, the songs have an added significance. When dealing with closely related species, the best way of discovering how many there are is by using the signals the insects themselves use. It was mentioned earlier that experiments have shown that females often reply to the songs of males of their own species and not to other songs, but some experiments have gone further: they have used artificially generated sounds to test which characteristics of the song are necessary to evoke the female response. Drs Dagmar and Otto von Helversen, working in Erlangen, West Germany, found that in *Chorthippus biguttulus* the legs of a singing male make one big up and down movement followed by two smaller ones, but because the left and right legs are slightly out of phase, the sounds produced by these movements overlap, producing a block of sound separated from the next block by a distinct gap. These experimenters found that females responded best to sounds that did not stray too far from the natural song, and that the important characteristics were that the blocks of sound should be of the right length and separated by silences of the right length. The song changes according to temperature and, as one would expect, so does the response to it (Helversen & Helversen, 1981, 1983).

CONCLUSION

Unfortunately there have been very few experiments like this, but they appear to show the way in which more accurate taxonomic decisions can be made. They

provide the sort of information needed for judging whether populations of the sort recorded in Spain and Italy belong to the same species as those in Northern Europe. The male songs can be analysed and compared to see whether there are clear differences between them that could be recognized by the females. By using the signals that the insects themselves recognize we can be confident that we are dealing with genuine biological species.

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THE VALIDITY AND INTERPRETATION OF INSECT FOODPLANT RECORDS

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SUMMARY

Literature records of insects and mites feeding on plants are examined in the light of experience in compiling information for the Phytophagous Insects Data Bank (PIDB). Data on *Senecio* are used to illustrate difficulties and uncertainties in the records, and the following points are reviewed briefly—species which are not fully phytophagous, introduced and migrant species, identification and nomenclature, unreliable data, geographic differences in food-plants, species in captivity, quantitative aspects of preference, and polyphagous species. It is concluded that food-plant data are still incomplete and that the objectives of studies using faunal lists are important in deciding on the most effective use of available data.

INTRODUCTION

Insect foodplant records are used to make lists of insects associated with particular plants for applied work and for research in ecology. Pests of agriculture, forestry and horticulture have long been considered in relation to their hosts, and nature conservation management is also now using foodplant data. Lists of insects appear in reference works on plant species as in the 'Biological floras of the Ecological Society'. Research into patterns in the interrelationships of insects and plants has increased since Southwood's (1961) classic paper on insects associated with British trees. For these studies also foodplant records provide a valuable and useful method of using accumulated information, often outside the capacity of an individual to collect (Kennedy & Southwood, 1984). However, details of the records used to produce lists of insects on plants are often rather vague, and close examination reveals difficulties in interpretation.

For some years, I have compiled insect foodplant records into the Phytophagous Insects Data Bank (PIDB), and have now reviewed all families of phytophagous insects and mites known to feed on higher plants (ferns to angiosperms) in Britain. During this work discrepancies in data on different insect groups and for different purposes have come to my attention. As many other workers also use or compile insect foodplant lists, it is thought that a summary of problems encountered in the compilation of records would be useful, and would provide a basis for any work with PIDB data.

DATA

The PIDB currently holds records of some 45 000 linkages between insects and plants compiled from the literature, from museum collections and from unpublished sources. This information is drawn upon for writing this paper. As an example, data for the genus *Senecio* have been summarized in Table 1. (The full data are available from the author.)

INSECTS TO BE INCLUDED ON FOODPLANT LISTS

Phytophagy and other feeding habits

Most phytophagous insects are clearly plant-feeding. However, in some species and groups phytophagy grades into other habits such as predation, omnivory, saphrophagy and myrmecophily. Lists of insects may be of plant-feeding species only as in Table 1, or may include all associated species.

Table 1. Summary of records of 137 species of British insects and one mite feeding on the genus *Senecio* (adult feeding excluded; plant nomenclature from Clapham, Tutin & Warburg (1962) or cited with authority).

Plant species	Total insects	Mono-phagous species	Feeding on other plant families	Additional information European data	Unreliable data	In captivity
<i>S. jacobaea</i> †	72	8	30	5	3	1
<i>S. vulgaris</i> †	43	1	28	3	—	5
<i>S. erucifolius</i> †	12	—	2	1	—	—
<i>S. aquaticus</i> †	9	1	2	—	—	1
<i>S. squalidus</i>	8	—	2	1	—	—
<i>S. viscosus</i> †	5	—	1	2	—	—
<i>S. sylvaticus</i> †	4	—	—	2	1	1
<i>S. fluviatilis</i>	2	—	—	3	—	—
<i>S. paludosus</i> †E	3	—	—	2	—	1
<i>S. cruentus</i> (Masson) DC. G	2	—	—	2	—	—
<i>S. doria</i>	2	—	—	2	—	—
<i>S. cordatus</i> Koch	1	—	—	1	—	—
<i>S. vernalis</i> Waldst. & Kit.	1	—	—	1	—	—
<i>S. cacaliaster</i> Lam.	1	—	—	1	—	—
Other <i>Senecio</i> spp. (unnamed)	2	—	—	2	2	1
<i>Senecio</i> records (generic name only)	22	(1)	5	11	2	1

† native species; E extinct?; G greenhouse species.

Some species are partially predatory, feeding on the plants and on prey species on the plants, e.g. *Phytocoris* and *Psallus* (Miridae). This habit may grade into fully predacious when the amount of plant material eaten is insignificant, but such details are not always known. However, some definitely predatory species are very closely attached to phytophagous prey which are specific to plants, and thus predators may be regarded as associated with particular plants although they are not feeding on the plant itself. These species can appear in foodplant lists e.g. Anthocoridae (Southwood & Leston, 1959) or Cucujidae (Walsh, 1954).

Omnivory may be the best definition of the feeding habits of some insects which can survive without feeding on plants but which nevertheless can be pests damaging crops e.g. adult carabid beetles attacking strawberries (Jones & Jones, 1974).

Saprophagy on rotting plants and dead plant materials is common, e.g. many Elateridae feed on dead and rotting wood; some Pyralidae feed on rotting leaves. Generally these species are not very specific to particular foodplants, and again their feeding habits may be poorly understood—they may be partially or entirely predatory. Other species are scavengers e.g. *Limonicus violaceus* (Mull.) (Elateridae) (Leseigneur, 1972), and some may be associated with burrows made by other insects. Species feeding on stored products may not be easily categorized either, although they are clearly phytophagous.

Myrmecophily also occurs; the grade from phytophagy is well known in species of Lycaenidae; however myrmecophily is also found in aphids and Coccoidea, with similar intermediates of dependence on ants.

Another area causing difficulties over species to be included on lists is that of insects not actually feeding on higher plants, but on epiphytes like lichens or on associated fungi. Sometimes these species are listed for the higher plant rather than

their true host, which is more difficult to identify. This often occurs in species living on trees. Indeed in some groups all habits may be found in related species, e.g. in Anobiidae some species feed on wood, others on rotting wood and fungi, while some are definitely specific to fungal bodies (Lohse, 1969). On herbaceous plants, insects may be feeding on associated rusts or smuts e.g. Phalacridae or *Mycodiplosis* (Cecidomyiidae).

Introduced species and migrants

Lists of insects on plants can include doubtfully British species, but there are problems in deciding which species have sustainable populations. Migrant Lepidoptera are recorded frequently, and some must obviously be included, but other records may be based on only 1 or 2 occurrences of adults at light.

Like migrants, only a proportion of introduced species are fully established, and it is especially difficult to know how many of those feeding on plants in greenhouses and botanic gardens should be included. The problem is especially acute for Coccoidea, which are easily introduced on plant material, and where colonies may persist only as long as the foodplant, often in very small areas. Kloet & Hincks (1964) note species in this category with a distinguishing symbol.

LIFE CYCLE OF INSECTS AND RELATIONSHIP WITH FOODPLANTS

There are all degrees of dependence on plants by the different developmental stages in the life cycle of insects, so that the definition of a foodplant is not simple. I regard a true foodplant as a plant able to support the development of the insect from first instar larvae through to adult. This may be qualified to include as foodplants those species essential to a specific stage of development. e.g. early instars of the myrmecophile, *Maculinea arion* (L.) (Lycaenidae). Some records usually of smaller more immobile species may be excluded because although the food-plant supports more than one generation it does not sustain the species indefinitely (Westphal, 1980; Oetting, 1984).

There is confusion about the life-cycle stage listed for the foodplant in different insect groups. In Lepidoptera, it is currently customary to refer to plants for oviposition (Emmet, 1979; Heath & Emmet, 1979). Records of oviposition plant are usually the same as for larvae, so that selection by the adult of oviposition plants is regarded as most important. It is also relatively easy to observe Macrolepidoptera laying eggs, and to record the plants. However, not all species do in fact select the foodplant, but oviposit in nearby plants, leaving larvae to find the true foodplant e.g. *Mellicta athalia* Rott. (Nymphalidae; Warren, Thomas & Thomas, 1984). In groups, similar to Lepidoptera, where adults do not feed extensively, the larval foodplant is always recorded e.g. Tenthredinidae (Benson, 1958). However, larvae may move about, and can be recorded on plants other than those where development began. In extreme cases it becomes difficult to determine true foodplants. Soo Hoo, Coudriet & Vail (1984) showed that *Trichoplusia ni* Hüb. (Noctuidae) was only able to complete its full development on a limited range of plants when reared from the early instar. Later instars survived on a much wider plant range. This could occur in other polyphagous Lepidoptera, and may be a source of doubtful records, as it is common practice for collectors to take later instars, and rear these to adults, recording the plant on which they were found as the foodplant.

Species of many groups feed both in the immature stages and as adults on the same foodplant; this is especially obvious in the more immobile and gregarious species, like mites, aphids and scales. The difficulties of identifying larvae are greater than for adults, and in these groups larval feeding is ordinarily inferred from primarily adult

identification. Many Coleoptera also share the same foodplants for adults and larvae, but often these details are not given in the record, and adult beetles only are identified. It is more informative if both larval and adult foodplants are recorded, because in those species where good records are available, adults are often less specific than larvae, and have a wider foodplant spectrum for feeding than for oviposition, e.g. Curculionidae (Hoffmann, 1955–8) and Thysanoptera (Morison, 1947–9).

Adult foodplants can differ entirely from those of larvae, e.g. adults of nectar-feeding species, particularly Macrolepidoptera. Occasionally, adult feeding can be sufficiently important to confer pest status on species, e.g. *Phyllobius* and *Otiiorhynchus* spp. (Curculionidae) have adults which can seriously damage foliage and flowers of fruit trees, while their larvae feed on the roots of these and other plants (Masse, 1954). For many purposes however, it is best to exclude these less specific adult feeding records as in Table 1. A higher total number of British records on *Senecio jacobaea* is given by Harper & Wood (1957) mainly because they have included species that do not breed on the plant, especially adult flower-visiting thrips.

Some insects have a life cycle in which different generations feed on different foodplant species or on different parts of the same plant. The obvious example is that of holocyclic aphids, which have entirely different summer and winter foodplants. Complications occur in those species which show facultative heteroecy or have regional anholocyclic forms e.g. *Metopolophium* (Aphididae) (Stroyan, 1982). Similar differences in foodplants between generations also occur in other groups, although less rigidly, and possibly related to seasonal availability of foodplants, e.g. *Eupteryx aurata* (Cicadellidae) (Stiling, 1980). Cynipidae have alternation of bisexual and agamic generations which cause galls on different parts of *Quercus*.

IDENTIFICATION AND NOMENCLATURE

Incomplete identification is especially common in foodplant records. Table 1 has 22 records for *Senecio* with no specific identification, and one of these is the only record. Where a generic name is given for a genus with only one native species in Britain, e.g. *Pinus*, it is likely that most records do refer to *P. sylvestris*. *Senecio* is less certain as both *S. jacobaea* and *S. vulgaris* are common species. Even less identity is supplied in some groups e.g. 'Carex and Gramineae'. This is most frequent in plant groups where identification is more difficult for the non-botanist, and where it is harder to determine exactly which plant the insect was feeding on. Thus insect specificity appears to be less in Gramineae than in other groups, but this cannot be considered reliable until our knowledge of grass-feeding insects is more complete.

Sometimes only the English name for a plant is given and has to be interpreted to a standard Latin name. This causes uncertainty where more than one species is covered by the name. Ash is clearly *Fraxinus excelsior* in Britain, but 'thistles' might be interpreted as *Carduus* and *Cirsium* spp.

Taxonomic status and knowledge of various groups differs. Plant species are very well known, but groups like eriophyid mites are taxonomically disordered. All taxonomy is changing to some extent, and data have to be continually revised. Lumping previously separate species is easily dealt with by additions, but splitting of a species causes all previous data to become unreliable. Checking names for synonym and correct spelling reveals numerous minor errors, becoming more serious when species appear under more than one name. Stille (1984) reduced the numbers of *Rosa* species galled by *Diplolepis rosae* (L.) (Cynipidae) from 20 to four due to synonymy. Misinterpretation of older records with synonymic changes has

produced errors which can be difficult to trace. Heath, Pollard & Thomas (1984) decided that, although *Viola canina* is cited as a foodplant for several fritillary butterflies, the dog violet proper is a rare heath species, and the name almost certainly refers now to the common *Viola riviniana*.

Use of signs of insect attack, such as galls or leaf mines, to identify species are specialized cases of possible confusion. Where a gall is clearly a recognizable structure, then insects or mites are quite often identified from this rather than the actual species inducing the gall (Bagnall & Harrison, 1928). Difficulties are especially acute for eriophyid mites, where species have been described entirely on gall morphology, e.g. *Eriophyes callunae* Swanton (Eriophyidae).

Finally, when computers are used for listing names, it is especially important to maintain accuracy in nomenclature. Checklists need to be consistent as errors caused by very small changes, e.g. dropping authority initials in the checklist of Auchenorhyncha (Le Quesne & Payne, 1981) as compared to the earlier edition of Kloet & Hincks (1964).

UNRELIABLE DATA

There are quite a lot of unreliable data in the literature, e.g. for *Senecio* the PIDB holds seven unreliable records (Tables 1). Sometimes the questionable nature of the data is obvious because the author has said 'may be' a foodplant. At other times mistakes of identification have been made. Comparison of records shows up possible errors, for where genera or groups have species with reasonably closely-related foodplants, any entirely different foodplants may be wrong, e.g. a stenocephalid not feeding on Euphorbiaceae is likely to be an incorrect record (Schaefer & Mitchell, 1983). Sometimes the plants recorded as foodplants for an insect are taxonomically very different but grow in the same habitat, and more detailed investigation of the true larval foodplant is needed, e.g. *Altica pusilla* Duft. (Chrysomelidae) is currently recorded for *Helianthemum*, *Poterium* and *Sanguisorba* (B.N.K. Davis pers. comm.). Insects feeding on trees can drop off and be recorded as feeding on the plants below e.g. *Coleophora serratella* (L.) (Coleophoridae) (Coshan, 1974). Other unreliable records are of insects visiting plants, and recorded when probing or nibbling. Aphids in this situation are called 'vagrants' in some papers (Wood-Baker, 1979). Of course, some apparently incorrect records may be of genuine rare feeding, although whether such plants could support the whole life cycle may be unknown. There is an understandable tendency for authors to record foodplants that differ from the usual hosts. This is especially true of the many 'casual' records for Macrolepidoptera. These records have to continue in the literature until additional research shows that they are definitely unreliable or wrong.

GEOGRAPHICAL DIFFERENCES IN FOODPLANTS

The most important way in which British records are augmented is by comparison to continental European data, which may have the best foodplant lists currently available. This is such a common practice, that, at least in the past, it is not clear where these data have been used. Statements like 'male recorded twice in the Cairngorms, foodplant *Betula*' are suspect. For PIDB data in Table 1 there are quite high proportions of European records. Generally, European data reflect the potential foodplants of a species, and the probability that at some future time the same foodplant could be recorded for Britain. The same applies to world data on widespread species. Presumably more foodplants will be recorded with the possible plants in different countries, and this will be compounded in most data sets by the amount of effort made in compiling lists.

Some foodplant data may be primarily part of a taxonomic account of an insect group and no attempt made to specify the geographical location of records.

Local foodplant differences are known within the range of many species, e.g. the swallowtail butterfly, *Papilio machaon* L (Papilionidae) has a wide range of foodplants in the Umbelliferae (Berenbaum, 1981), but ssp. *britannicus* Seitz is confined to *Peucedanum* (Dempster, King & Lakhani, 1976). Lekander *et al.* (1977) found changes in foodplant with latitude for Scolytidae, e.g. the more northerly foodplants differed for *Dendroctonus*. Within the British Isles, Woodroffe (1971) thought that insects on the edge of their range in Scotland might have different foodplants. Regional specialization can occur when the spectrum of possible foodplants is incomplete in an area e.g. *Euura amerinae* (L.) (Tenthredinidae) occurs on *Salix pentandra*, but on *Populus* when *S. pentandra* is not available (Liston, 1982). The availability of foodplants differing locally may result in different choices of preferred foodplant by the more polyphagous species e.g. *Phalera bucephala* (L.) (Notodontidae) (West, 1982).

All grades of genetic adaptation to the foodplants of different geographical areas are found, from closely related insect genera and species to subspecies, races and populations. A few examples are cited here. Species of *Medicago* in different parts of Europe have different species of *Sitona* (Curculionidae), formerly considered as local races of *Sitona humeralis* Steph. (Aeschlimann, 1984). Subspecies of *Eupithecia intricata* Zett. (Geometridae) differ within Britain; ssp. *arceuthata* Frey rarely feeds on native *Juniperus communis* in southern England, preferring ornamental Cupressaceae, while in the north ssp. *millieraria* Wnuk. does feed mainly on native *Juniperus* (Ward, 1977). Races of *Rhinocyllus conicus* Froel. (Curculionidae) feed on different Compositae in various parts of Europe (Zwölfer & Harris, 1984). Populations of the large bud moth, *Zeiraphera diniana* (Guenée) (Tortricidae) have different foodplants at different altitudes correlating with different colour forms in the larvae (Day, 1984).

SPECIES IN CAPTIVITY

Records of species and their foodplants in captivity are not uncommon in the literature. Usually these records are from tests for true foodplants; occasionally for giving advice on rearing when the wild foodplant is not easily obtained, e.g. Macrolepidoptera (Allen, 1949). Table 1 shows that the PIDB holds more captive records for *Senecio vulgaris* (groundsel)—a convenient plant to use for captive stock.

For studies of biological control of weeds using insects it is very important to test the potential foodplant range, and various choice tests or starvation tests with insects confined on possible hosts are used, e.g. *Rhinocyllus conicus* Froel. (Curculionidae) (Zwölfer & Harris, 1984). All degrees of survival may be recorded, and generally adults have wider potential feeding ranges than immature stages; older larvae survive on more foodplants than younger. Usually field records are for fewer foodplants than those found to be possible in captive rearing experiments. Quite often the insects are never found on plants available in the field, although they are successfully reared in the laboratory. Phenology may be important in some cases, e.g. Brewer & Skuhavy (1980) altered the emergence date of *Monarthropalpus buxi* (Laboul.) (Cecidomyiidae) which enabled this species to attack *Buxus sempervirens* var. *bullata* which had never been infested in the field because of lack of synchrony in development.

QUANTITATIVE ASPECTS OF FOODPLANT PREFERENCES

Some insect species are monophagous with all known records unequivocally for

one foodplant, particularly where the foodplant genus is itself monotypic. Data on *Senecio jacobaea* give eight out of 72 species currently recorded only from this plant, while *S. vulgaris* and *S. aquaticus* have one monophagous species each (Table 1). I believe that many monophagous species will eventually be recorded attacking other plants in the same genus.

Most records are samples from populations of insects attacking populations of several possible foodplant species. The resulting quantitative data on preferences cannot be clearly defined except under controlled experimental conditions, although obviously some species are important hosts and others rare. A method which is commonly used for testing foodplant range and preference in the field is the provision of a series of potential foodplants for natural colonization, e.g. cruciferous plants attacked by the swede midge, *Contarinia nasturtii* (Kieff.) (Cecidomyiidae) (Stokes, 1953). Botanic gardens with good plant collections are also useful for preference testing (Davis, 1982). Field methods are often used in conjunction with captive resistance and starvation tests.

Insect abundance

Population sizes of insects are not the same in different years, and this may influence the numbers of foodplant species recorded. *Euproctis chrysorrhoea* L. (Lymantriidae) has a sequence of foodplants; the preferred plant, *Hippophaë rhamnoides* has the highest attack rate, and increasing numbers of additional woody plant species are attacked as the populations rise (Voute & van der Lind, 1963). Similar data have been noted briefly for *Thecodiplosis brachytera* (Schwag.) (Cecidomyiidae) which attacks more *Pinus* species at higher population levels (Brewer, Skuhravy & Skuhrava, 1984).

Plant abundance

Common plants have more insects than rare plants (Strong, Lawton & Southwood, 1984). These commoner species normally cover a wider geographical area and have had greater recording effort. Economically important plants are especially prone to these effects; Schaefer & Mitchell (1983) note that there are many spurious references to monophagous feeding on cocoa and pigeon pea for Coreinae (Heteroptera). Entomologists report more details for economic plants, e.g. 'causes damage to lettuce and other plants'. Conversely the status of insects on rare plants, especially some herbs, is often poorly known because entomologists have traditionally been more concerned with the collection and taxonomy of the insects, than their foodplant spectrum, and have not been likely to search out rare foodplants or plants with identification difficulties. The common *Senecio jacobaea* has records of 72 species and *S. vulgaris* has 43, while the less common species have far fewer records, and nine rare or introduced species of *Senecio* in Britain have no records (Table 1). These data are certainly incomplete, and for example, Smith (1979) has recorded two unidentified species on *Senecio integrifolius*, which otherwise has no records.

POLYPHAGOUS SPECIES

There is no exact definition of a polyphagous species, but, as generally understood, it is an insect feeding on a number of unrelated plants. Schaefer & Mitchell (1983) for example, decided that a polyphagous species fed on more than five plant families; but that out of 219 species of Coreinae only 45 could be reliably assigned to either mono- or poly-phagy because of various uncertainties. Indications of the likely proportions of insects on *Senecio* which are not restricted to Compositae are provided by records of alternative hosts in other plant families (Table 1). These

account for nearly half the records for *S. jacobaea* and more than half on *S. vulgaris*.

For most, if not all, polyphagous species the numbers of foodplants given in the literature are likely to be underestimates. Börner (1952) lists 184 foodplants for the summer morph of *Myzus persicae* (Sulz.) (Aphididae), while the world slide collection in the British Museum (Natural History) produced 196 hosts for *Coccus hesperidum* L. (Coccidae). These lists are definitely incomplete.

A well-known difficulty with polyphagous species is that of very long lists of foodplants. In many cases only a few foodplants are noted, usually common or economic plants, followed by remarks such as 'and on many other plants'. One solution is to at least list plant families or higher groups attacked, as in Eastop (1981) to show the range of plants attacked. Many polyphagous species do have restrictions and do not feed on certain plant families, e.g. Cerambycidae are often more or less restricted to either Gymnosperms or Angiosperms (Duffy, 1953).

DISCUSSION

The study of insect foodplant records is an important way of using accumulated knowledge. However, the various difficulties outlined above mean that lists of insects feeding on particular plant species are subject to some uncertainties with present data. Additionally, objectives for the use of lists must be taken into account in their compilation.

There is definitely some bias in literature records, because of the emphasis on commoner or economic insects and plants and the failure to record all hosts of polyphagous species. In a comparison of field and literature data, Niemela & Neuvonen (1983) were easily able to add to the list for Macrolepidoptera on rarer trees in Finland. They thought that the geographical effect of species richness was overestimated because of incomplete recording of polyphagous species on rarer hosts. Britain is one of the best studied areas in the world, but even here new foodplant records are continuously made and species of phytophagous insects new to the country or to science are added. As this information accumulates lists are extended; better literature searches are made, and total numbers for particular plants increase. For example, Southwood (1961) listed 91 species for *Pinus sylvestris* in Britain, and in Kennedy & Southwood (1984) increased this to 172. PIDB data has a similar number of 173 British records for *Pinus*, but the potential is obviously higher as there are 238 British species when continental European foodplant records are included.

It is important to decide on objectives when using faunal lists for plants. Data on stenophagous or monophagous species are more relevant to many ecological studies, and some 50% of insect species are restricted to one plant family in the PIDB records. The many casual feeding records of polyphagous species may be confusing and could be omitted. However, for taxonomic studies of the insect species all available data on foodplants may be relevant. For biological control of weeds, knowledge of host specificity is important in preventing attacks on related crop plants, and data will include laboratory records of preferences. In evolutionary studies the interplay of field factors may be more important, and records of potential foodplants from captive data might be excluded. Similarly, where total dependence of species on plants is important, larval but not adult foodplants should be used. In work on biogeography, lists compiled using political areas produce bias and are unsuitable for some studies (Kuris, Blaustein & Alio, 1980). The distribution of some introduced species has not reached equilibrium, and Ward & Lakhani (1977) thought that introduced insect species should be excluded from studies of foodplant island sites of native juniper.

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**SOME OBSERVATIONS ON TWO OLD BOOKS:
WOOD'S INDEX ENTOMOLOGICUS AND
BROWN'S BUTTERFLIES, SPHINXES AND MOTHS**

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From time to time I have noticed that antiquarian bookdealers will advertise some book or other as being 'a previously unrecorded edition' or 'not in British Museum catalogue'. This raises the interesting point that many dates of publication, which could effect nomenclature, are still in doubt and it seems that the full publication history of many entomological works remains to be elucidated, although the evidence, as deduced from occasional remarks made in their catalogues, is that at least some antiquarian book-dealers have some knowledge we are not aware of and it is a pity they do not publish more of it. While books before 1800 have been thoroughly researched by Lisney (1960), variants and combinations are still capable of turning up. For nineteenth century books, however, the field remains wide open.

Although the library catalogue in question is sometimes specified, more often it is not and so the term 'not in British Museum catalogue' is an ambiguous one for does this refer to the British Library in the British Museum, Bloomsbury, or, which is perhaps more likely with natural history books, the library of the British Museum (Natural History), South Kensington? I know of at least one butterfly booklet item that is in Bloomsbury but not in South Kensington and there are undoubtedly others and doubtless vice versa. Also to be borne in mind is that the *printed* catalogue dates from 1940 and in the past 50 years both libraries have made many acquisitions for which their updates on the premises must be considered.

The item that has led to this article was the offer for sale of an 'unrecorded and apparently unknown' 1845 edition of William Wood's *Index Entomologicus* which is 'not in Hagen or the British Museum (Natural History) catalogue'. The dealer's catalogue went on to state 'It has the 54 plates as in the first edition and is NOT the 'Second Edition' (Wood & Westwood). This work was originally issued in parts and the 'First Edition' of 1833-1839 bears a title page with the date 1839. The 'Second Edition' is dated 1854.'

Now this statement does not concur with my own knowledge of this book, since I possess a copy dated 1852 (edited by Westwood) and inscribed within as 'new and revised edition', which can hardly, therefore, be followed 2 years later by the 'second edition'. The 'previously unrecorded' 1845 edition was in fact recorded in 1949 by Curle (1949) and there is a copy in the Balfour Library of the Department of Zoology, Cambridge. While Freeman's Handlist (1980) is an excellent starting point, it does not mention this edition for it is by no means comprehensive and is indeed what it subtiles itself, a 'handlist', not a publishing history and detailed collation as in Lisney. Since there is no bibliographical account of so many nineteenth century books I would like to query the words 'previously unrecorded'. Unrecorded by whom? In fact it appears to be errors of accidental omission, since library catalogues are a list of books in their possession not a comprehensive list of every edition of every book ever published. The *Dictionary of National Biography*, a useful source of (not always accurate) information on the more famous, when giving details of the publications of its entries, lists them, sometimes only the better known works, so far as they were known to the compiler, and certainly not all editions, which in some cases can be very numerous indeed. Nor can any one library be expected to possess every edition of every book.

It is worth giving a brief review of book production as it existed in earlier centuries and which goes a long way to explaining, in the absence of any written records, the confusion over printings and editions of early works as they exist today.

Bound books in the form in which they are published today did not come into existence until the mid 1820s. For a very long period indeed, both before and after this date, books were sold either 'in sheets as printed', 'in weekly/monthly/occasional parts', or 'in boards'. This last consisted of the complete work roughly and economically sewn and cased in cardboard with a paper spine. Gentlemen were expected to have them bound up uniformly in leather according to their taste or the fashion of the time. Edges were left untrimmed. It was not until about the 1820s that cloth and/or printed paper covers came into use with the rise of literacy and the sale of books to people who could now afford them but not the expense of having them bound by hand.

Books were often issued first in parts to subscribers and then sold, when completed, as a volume or indeed even as a 'half' volume. Maybe then with a different title-page. Not infrequently they were re-issued some time later again in parts and as completed volumes. Sometimes this was a simple reissue of existing stock and at other times it was a revised and reset printing. There may well have been a mixture of both. This is a practice that still goes on today. Now the major cost in times past (apart from the engraving and handcolouring of plates) was in binding (if this were done well) not in the typesetting or printing the cost of these being minimal so that it took only a small amount of capital to print $x+n$ copies where x was the number already sold to subscribers. The extra n copies were then stored until a demand arose and were of course also a disposable asset and were sometimes sold *en bloc*. At other times the firm itself would be sold or taken over, as indeed is still happening today. The new owner would then re-issue the book under his own imprint by simply printing a new title-page. As there is today there was also a 'remaindered trade'. Pirating of popular works was also all too common.

As perhaps we all know it is very easy to misplace and lose parts of periodicals. Indeed this very thing happened with at least one copy of *Index Entomologicus*, for when Griffin collated the dates of a copy in parts as originally issued, he also notes several plates as 'wanting in this copy' (Griffin 1931). Although not done in this instance (or perhaps they were lost at a later date), in the past it was easier to replace missing pages, plates, or parts than it is today. One only has to study the many advertisements of the period to find that many books remained 'in print' both as parts and as complete volumes over very long periods of time compared with today. Nor would every purchaser of these works in parts have them bound. Often the binding did not take place until a second or later owner, who then might have to replace some missing part. We can see how easy it is for any volume dating prior to at least 1860 to be a mixture of editions and printings and should not be too surprised therefore if odd binding combinations exist. Indeed I recently had such evidence when a copy of Ackerman's *History of the University of Cambridge* turned up in a local auction. It was in a specially made library box and was labelled as being 'original parts'. However, on inspection only about 80% was in original parts, the rest had clearly been torn out of a bound volume in order to complete this 'original parts' set. They were not only without covers, but of a smaller format and had gilded edges, something only to be found in leaves torn from a bound volume.

Another source of error of course is typographical. Even if subsequently corrected, a number of copies may have been released before the mistake was noticed and corrected. For instance I have one book where the title page bears the date 1838, but from style alone, not to mention other evidence, I know the book was printed in 1783. In Wood's *Index Entomologicus* a preface was issued with the first part in 1833, but was replaced with a new one in 1839 when the book was issued as a completed volume. The original preface has the misprint *Gompetyryx* for *Gonepteryx* (see Griffin, 1931).

I would state, therefore, that occasional 'aberrant' and 'previously unknown' editions need not necessarily be taken at their face value. Like a number of Lepidoptera they may be aberrations due to the whim of chance. In addition to the factors stated above I also have a feeling that some pages may even have been specially printed as a one-off job in order to complete a book, by order of the then owner to a local jobbing printer. After all in those days those who could afford to have their purchases often sumptuously bound in full tooled leather were not going to miss the shilling or two it would cost to replace a missing page. It was indeed not unknown for some persons to own their own printing presses, usually for the purpose of issuing scurrilous anonymous political pamphlets, but also because they enjoyed printing as a hobby.

When we consider the complete 'first editions' fraudulently printed by the forger Thomas Wise, it can be seen how difficult it is to be sure of the authenticity of some works. It is also standard practice to see stated in auction catalogues that certain pages have been replaced 'from another copy' or even 'handwritten in matching style'. So such 'made-up' copies are by no means rare.

Another cause of possible doubt over an edition is in its thickness. There is an understandable assumption to think that if two apparently identical copies are of differing thickness then they must be different editions. This is not so, for I know of a number of books, known to be of the same date, but where the thickness varies. This is due to the paper used originally, for unlike paper manufactured today which is of uniform thickness, in times past this was not so and even small batches could vary as between sheets. During the printing the most convenient paper to hand would have been used. This is also the explanation of why we sometimes come across copies of a book where a whole signature is discoloured or even obviously different in texture or thickness from the others. By chance an inferior batch of paper was used when that particular signature was printed.

In 1852 Westood published a supplement to go with his 'new and revised' edition of Wood's *Index Entomologicus*. In this supplement the pagination was carried straight on from the end of the 'Doubtful British Species' section of the 1845 edition and the former index, which it displaced, was then replaced at the end of the Supplement. The running title of these pages are headed 'Additions to the Second Edition'. The 1852 edition has been typeset afresh but great care has been taken to preserve the same text on each page as exists in the 1845 one. It is unfortunate that the wording on the cover of this separately issued supplement is contradictory and therefore ambiguous, for the cover, while clearly headed 'Supplement to Former Editions. 12s. 6d.' then spoils things by stating '... not included in the former edition of the ...' One plural; one singular!

The publishing history of Wood's *Index Entomologicus* would therefore seem to be as follows:—

First edition, first issue, 1833–38. Issued in 22 parts between (April?) 1833 and October 1st 1838, pp xii + 266 + 54 coloured plates. Title page dated 1839 (arabic numerals). Full title: *Index Entomologicus; / or, / a complete / Illustrated Catalogue, / consisting of 1944 figures, / of the / Lepidopterous Insects / of / Great Britain. / By W. Wood, F.R.S. & L.S. / Author of Zoography, General Conchology, Index Testaceologicus, / Linnean Genera of Insects, Etc. / (short wavy rule) / London: / William Wood, 39 Tavistock Street, Covent Garden. / 1839.*

The Publisher is given as Ward (typographic error?) in Freeman. Two alternative prefaces, sometimes both bound in, as may be two identical title pages when found bound as two volumes (Curle, 1949). The last part was issued October 1st 1838 (Griffin, 1931); printed by Richard and John E. Taylor.

First edition, second issue, 1839. The above issued as a completed volume with date 1839 on title page. Printed by Richard and John E. Taylor.

Second edition 1845. New title page bearing this date but title now reads: *Index Entomologicus; / or, / a complete / Illustrated Catalogue / of the / Lepidopterous Insects / of / Great Britain, / containing / 1944 Figures of Moths and Butterflies, / Accurately engraved and carefully coloured after nature.* Rest as first, apart from date which is now in Roman numerals. Pp xii + 266 + [i] + 54 coloured plates. The extra page is of omissions in the index. This edition was still published by William Wood, Covent Garden and printed by Richard and John E. Taylor. Now it has been stated, and could be argued, that this is a re-issue of unsold parts of the first edition with a new title page. Curle states ‘. . . what seem to be the old sheets with the same illustrations coloured as needed were given a new title page—in 1845’, (Curle, 1949). It is my opinion that it is a new printing. This is proved by the copy before me, where six of the plates bear an 1839 watermark and so must have been run off after the completion of the work in October 1838 (Griffin, 1931). Seven of the earlier plates bear watermarks of 1837 or 1838, these dates being several years later than their original publication and therefore must also be of a later printing. The remaining plates are undated, but some bear the watermark ‘Whatman’, which was and is still one of the best makes of paper to be had. I therefore consider that this is a true edition rather than re-issue.

Third edition 1852. Pp vii + [i] + 298 + ii + 59 coloured plates. Published by Willis, Covent Garden. Styled ‘A New & Revised Edition.’ Revised by J. O. Westwood, who added five supplementary plates which were also bound and sold separately. In this edition the title reads: *Index Entomologicus; / or, / a complete / Illustrated Catalogue, / consisting of about / two thousand accurately coloured figures / of the / Lepidopterous Insects / of / Great Britain. / By W. Wood, F.R.S. & L.S. / Author of Zoography, General Conchology, Index Testaceologicus, / Linnean Genera of Insects, Etc. / (short straight rule) / A new and revised edition, / with figures of the newly discovered species, / by J. O. Westwood, F. L. S. / President of the Entomological Society, etc. / (longer rule) / London: / G. Willis, Great Piazza, Covent Garden / 1852.*

Fourth edition 1854. Exactly the same as third except for title page which now reads: *Index Entomologicus; / or, / a complete / Illustrated Catalogue, / consisting of upwards of / two thousand accurately coloured figures / of the / Lepidopterous Insects / of / Great Britain. / By W. Wood, F.R.S. & L.S. / Author of Zoography, General Conchology, Index Testaceologicus, / Linnean Genera of Insects, Etc. / (short straight rule) / A new and revised edition, / with supplement, / containing figures and notices of nearly two hundred newly discovered / species, synoptic lists, etc. / by J. O. Westwood, F. L. S. / Late President of the Entomological Society, etc. / (longer rule) / London: / G. Willis, Great Piazza, Covent Garden / 1854.* Supplementary plates were also issued separately with this date.

It is very curious that the editions of 1852 and 1854 do not bear any printers imprint, for I believe this was still a legal requirement at the time. Nor does the supplement state by whom it was printed.

As stated by Curle (1949) there are actually 1950 coloured figures, (which gives exactly the publicly advertised price of 1 (old) penny each), not the 1944 stated. The five supplementary plates are in the same style of four rows of nine with the exception that there are only eight figures in the last row. This gives a total of 179 extra figures, which at its published price of 12/6 (150 old pence) is actually *less* than the original

price and it must be remembered that both this and the original contained extensive printed text as well!

There appear with some regularity on the market various incomplete bits of this publication where some of the plates are plain or only partly coloured. This argues for copies only being made up as and when required and, as usual in such circumstances, towards the end, due to spoilage and accidents, one or more plates runs out and the remainder are then disposed of, as they are, for what they will fetch.

In 1949 Richard Curle published a short account of this work, but my experiences of it are so contradictory to his that I feel they should be detailed. It could be that our differences are due to the surfacing of a number of copies of Wood's *Index* over the 40 years that have elapsed since his paper was published. In detail we differ as follows.

Curle states that he has never seen an un-coloured copy. I have seen two and also two with only partial colouring of the plates. Unfortunately I did not collate these and they could well have been incomplete copies resulting from remaindering, as mentioned above. I have also heard of other such copies.

Prices of this work have also changed over the years. Curle states that the published price was £8-2s-6d (£8.12½; quite expensive for the 1830s), far more than the then 1949 price. In Cambridge there was a copy for £2-5s (£2.25) about then. Today £150 would be the going rate.

As stated above I consider the 1845 edition to be the second, not the old sheets and same illustrations as stated by Curle.

Very surprising is Curle's assertion that 'Certainly, the work is generally found in two volumes, . . .' Now I have never seen a copy in two volumes, but have seen some 20 copies bound as a single volume. I will admit, however, to not having tried to track down any two-volume set, but their failure to appear in either the bookshops or dealers catalogues when so many single volume copies do, argues for their rarity.

Curle states 'In 1852 Westwood republished the work . . . and in 1854 he added five coloured plates . . .' This date is incorrect for the cover of the individual Westwood supplement before me bears the date 1852 and it is clear from the 1852 title page that the five plates must then have been published.

Curle goes on to say ' . . . the colouring of the plates is in certain respects inferior, though I dare say that all the editions vary slightly from copy to copy, and anyone who wants to possess a copy of Wood's *Index Entomologicus* might well be advised to procure the edition of 1839'. Here again my experience differs very markedly from Curle's. In all four editions before me as I write, 1839, 1845, 1852, 1854, the colouring is superb. In the three Westwood supplements it can only be described as exquisite.

An aspect of this work which I do not believe has been previously commented on, is the attribution of the plates. These are all signed to W. Wood Junior, whom I take it was the author's only son. He would have been responsible for the copper plate outline to be coloured.

When one considers the smallness of the figures and the very accurate, even with the smaller micros, application of the colours (even if not always quite true to life) one has to remember that these were priced at only one (old) penny (= $\frac{1}{2}$ a new p) each. The colourists have to be both admired and pitied. Admired for the excellence of their work: pitied for their having almost certainly been 'sweated labour', poorly paid, (how else could this price have been maintained?) and probably working very long hours in poor conditions. How long did they keep it up and what happened to their eyesight in the long-term?

I now turn to the rather curious and, I believe, not previously commented on,

discrepancies in the publication of Capt. Thomas Brown's *The Book of Butterflies, Sphinxes and Moths*. Now the first two volumes of this work were published in 1832 and it is clearly stated to be 'in two volumes' and 'illustrated by ninety-six engravings'. However, in 1834 a third volume was issued and the series is now stated to be 'in three volumes' and illustrated by 'one hundred and forty-four engravings'. In the first two volumes these are numbered 1-96, but in volume 3 the numbering starts again and runs 1-48.

There is confusion over both title, number of plates, and publisher(s) of these volumes. According to Freeman it is *The Book of Butterflies, Sphinges* [sic] and *Moths* and the two-volume edition contains 93 plates (total not mentioned for the three-volume edition). Now in all seven or eight copies that I have examined, the plates in volume 2 are not quite in sequence and towards the end are bound in the order 90, 91, 94, 95, 96, 92, 93, and in this order they correctly adjoin the accompanying text referring to the species depicted. Since plate 93 appears always to be the last, this accounts for Freeman's statement.

Now sometimes found bound in with the volumes of Constables Miscellany is a 16-page advertising leaflet listing the volumes in the series. Dated 1832, the last entry in one copy I have seen is:— LXXV. LXXVI. *The Book of Butterflies, Moths and Sphinxes* (note reversed change of title) 'contain-ing. . . 120 engravings'. Today of course a purchaser of the 96 actual engravings would have a case under the Trade Descriptions Act! There are 60 plates in volume 1 and 36 in volume 2. It is possible of course that volume 2 was originally intended to have the same number as the first volume. Two years later, when the third volume was issued a different printer was used and this may account for the fact that this volume is entitled *The Book of Butterflies, Sphinges, and Moths*. Note the change from sphinxes to sphinges. But there is a further anomaly in this connection. Although not always present, the foretitle in volume 1 gives sphinges although as already mentioned the title page (and the advert) gives sphinxes. Freeman gives the sphinges version only for the title.

These volumes, as did some others of Constables Miscellany, contain two title pages. The first, on thicker (or 'plate' paper) bears an engraving, an abbreviated title, but no author's name; the second is straightforward typography with title, author and publisher in full.

I have in my possession two copies of this work, one of which is a 'normal' copy, clearly Constables Miscellany, and similar to all other copies I have consulted and another copy (of volumes 1 and 2 only) where the first title page is different and there is no mention of the books being in the Constables Miscellany series. These two volumes are also 'large paper' issues. It is worth giving the titles in full.

First, or normal, version. *Constables Miscellany / of / Original and Selected Publications / in the Various Departments / of / Literature, Science & the Arts. / Vol. LXXV. / The Book of Butterflies. Vol. 1. / Follows an engraving of a cupid asleep on a grassy bank, above which towers a garden urn, full of flowers, a butterfly approaching. Below the engraving a quotation from Shakespeare. / London; / Printed for Whittaker, Treacher and Co. / and Waugh & Innes, Edinburgh. / 1832.*

Second version. *The / Book of Butterflies, / Sphinxes & Moths. / Vol. 1. / Follows the same engraving and quote / Printed for Constable & Co., Edinburgh: / and Hurst, Chance & Co. London. / 1832.*

In both versions the second title page is the same and the imprint is as in the first version. Volume 2 is similar, but the engraving is of two cupids playing with butterflies in a meadow. When we turn to volume 3 we are back to Constables Miscellany, as in the first version above, but we have lost Treacher. The imprint on

both title pages is now:- London. / Printed for Whittaker & Co. / and Waugh & Innes, Edinburgh. / 1834.

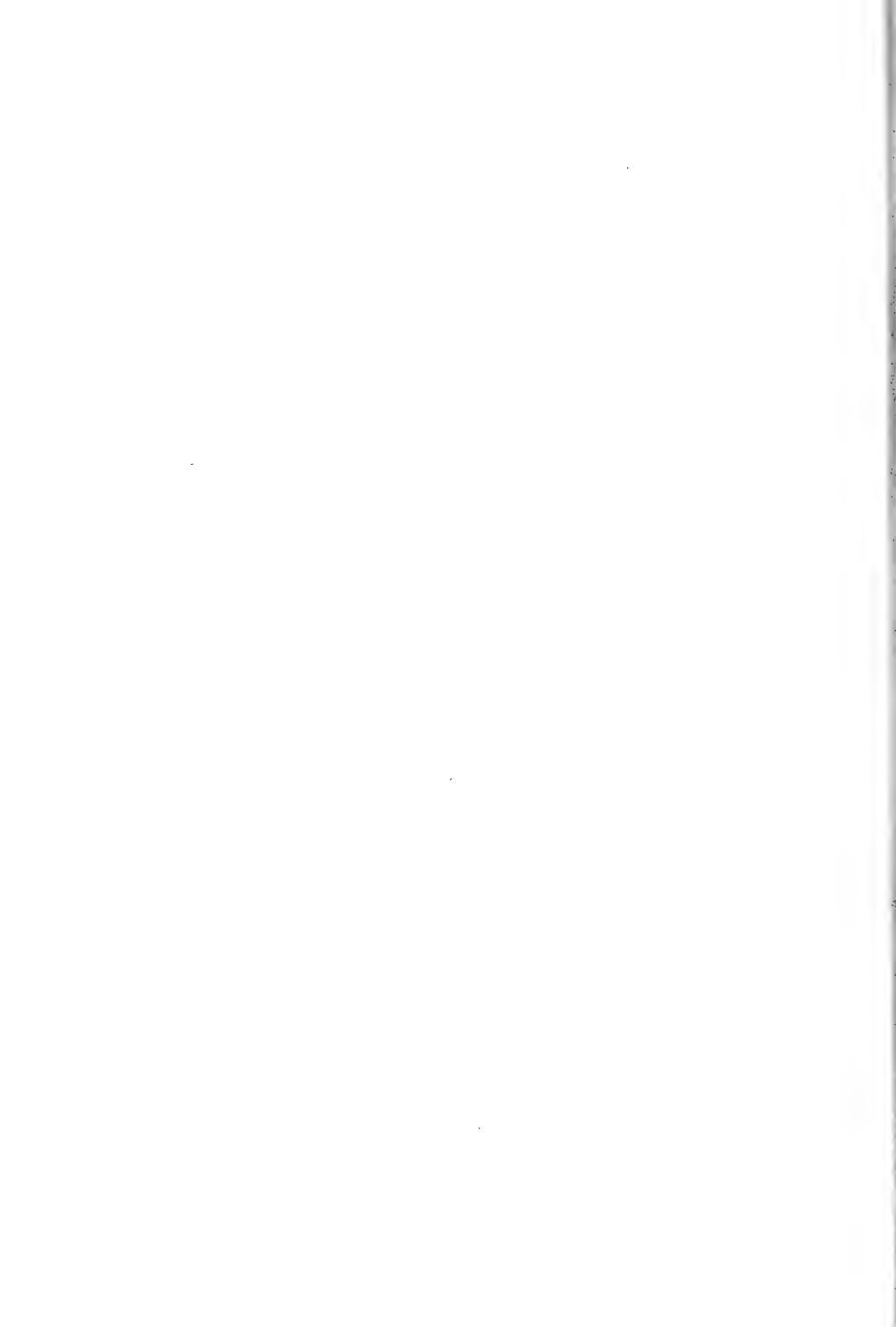
The engraving in this volume is of two winged cupids playing with butterflies in a wood.

I would like to thank Pamela Gilbert and Julie Harvey of the Entomological Library, British Museum (Natural History) for help and comments in the preparation of this paper.

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INDOOR MEETINGS

25 February 1988

Minutes of a Special Meeting of the Society held at the Alpine Club at 6.30 p.m.
Chairman: The President, Professor J. A. OWEN. *Present:* 32 members.

The Secretary Dr. J. MUGGLETON read the motion to delete the words 'Proceedings and Transactions' from Bye-laws 12(b), 15(b), 16(a) and 16(b) and to substitute for them the words 'British Journal of Entomology and Natural History'. The President explained the necessity for this change and then called for a vote. 23 members voted for the motion, 1 against and there were 8 abstentions. The President then announced the result of the postal ballot, which was 30 for the motion and none against. The President declared the motion passed and the meeting closed.

Ordinary Meeting

EXHIBITS

Mr R. A. JONES showed a live female pale blindled beauty moth, *Apocheima pilosaria* D. & S. It was found in sunshine on the base of a large beech trunk in Waste Wood, Hadlow Down, near Uckfield, E. Sussex on 20.ii.88.

Mr C. PLANT circulated a copy of his book *Butterflies of the London area*, published recently by the London Natural History Society at a price of £15.95.

Dr I. F. G. McLEAN exhibited two scarce tephritid flies taken within a few yards of each other on 14.viii.83 in the north meadow at Chippenham Fen NNR in Cambridgeshire. These were *Icterica westermanni* Meig., which is associated with ragwort, and *Acinia corniculata* Zett., which probably has knapweeds (*Centaurea* spp.) as its host plants.

Mr A. J. HALSTEAD showed a hand written letter sent on 12.viii.11 by the Rev. Canon W. W. Fowler to Mr F. J. Chittenden, a former Director of the R.H.S. Garden at Wisley. Fowler was an eminent coleopterist whose six volume book *The Coleoptera of the British Islands* was published in 1887-1913.

ANNOUNCEMENT

The Rev. D. AGASSIZ said that he had a friend who works for the south west electricity board. They are converting some street lights from mercury to sodium lamps and will shortly have about 100 80 and 125 watt chokes surplus to requirements. Anyone interested should contact him.

COMMUNICATIONS

Mr E. BRADFORD said that he had taken three months, *Alsophila aescularia* D. & S., *Tortricodes alternella* D. & S. and *Emmelina monodactyla* L. on 12.ii.88 at East Bleau, Kent. These are early dates for these months in this wood.

Mr M. PARSONS reported taking ten macrolepidoptera, including *Apocheima hispidaria* D. & S., At Ninfield, Sussex on 18.ii.88.

The Ordinary meeting was then followed by the Annual General Meeting.

Annual General Meeting

Minutes of the Annual General Meeting of the Society held at the Alpine Club at 6.45 p.m. *Chairman:* The President Prof. J. A. OWEN. *Present:* 34 members.

Minutes of the last Annual General Meeting were read and signed.

The Secretary read the Council's report, followed by the Treasurer who read his

report. The Editor, Librarian and Curator then read their reports and Dr M. Scoble read the report of the Hering Memorial Research Fund. The President proposed the adoption of the reports, the motion was seconded by the Rev. D. Agassiz and carried unanimously. [These reports were published in the last issue of the Journal, Vol. 1, part 2, pages 120-125.]

The President then read the names of the Officers and Members of Council recommended by the Council for 1988-89 and, as no other names had been submitted, he declared the following duly elected:

President: Dr I. F. G. McLean; Vice-Presidents: Prof. J. A. Owen, Mrs F. M. Murphy; Treasurer: Col. D. H. Sterling; Secretary: Dr J. Muggleton; Editor: R. A. Jones; Curator: P. J. Chandler; Librarian: S. R. Miles; Lanternist: M. J. Simmons; Ordinary Members of the Council: P. J. Baker, N. A. Callow, J. M. Chalmers-Hunt, K. G. W. Evans, I. D. Ferguson, C. Hart, P. J. Johnson, R. K. Merrifield, R. W. J. Uffen and B. K. West.

The Secretary then read Bye-law 22(d) and invited motions or questions. In response to this invitation Mr G. Prior said that he thought that the standard of the *Proceedings* had improved during the last year, in relation both to content and promptness of arrival. He also congratulated those responsible for managing the Hering Memorial Research Fund, pointing out that it had been possible to make awards in the past year that were equivalent to 40% of the sum originally invested. The President thanked Mr Prior for his kind remarks.

The President read his report and gave his address. [These will be published in a subsequent issue of the Journal.]

The President proposed a vote of thanks to the retiring President and asked for permission to publish the Presidential Address. Permission was given.

Col. A. M. EMMET proposed a vote of thanks to the retiring Officers and Council, this was seconded by the Rev. D. Agassiz and passed.

The re-election of Messrs A. J. Pickles F.C.A. and R. A. Bell as auditors for the Society was proposed by the President, seconded by Messrs C. Penney and J. M. Chalmers-Hunt, and passed unopposed.

10 March 1988

EXHIBITS

The President Dr I. F. G. McLEAN showed a specimen of *Leucopis praecox* de Meijere (Diptera: Chamaemyiidae). This is the first member of the genus on the wing, being found from early March onwards. Its larvae feed on a conifer woolly aphid, *Pineus pini*, on Scots pine. There are several closely related species, some of which are on the wing in early spring, and it is possible that there may be some additions to the British list which have similar associations with conifers.

Mr P. M. WARING showed a vacated cocoon of the Black Veined moth (*Siona lineata* Scop.), collected in Kent in 1987. The cocoon resembles that of a burnet moth but differs in being spun out of sight within a grass tussock. Mr Waring displayed some colour photographs of the moth's life cycle and described his progress in attempting to rear the adult in captivity. His larvae are now overwintering in a non-feeding state, resting head down on plant stems. Marjoram has been used as the food plant. Mr Waring also showed colour transparencies of four rarely photographed moth larvae. These were the Reed Leopard (*Phragmataecia castanaea* Hübn.), the Silky Wainscot (*Chilodes maritimus* Tausch.), the Silver Hook (*Eustrotia uncula* Cl.) and the Alder Kitten (*Furcula bicuspis* Borkh.).

ANNOUNCEMENTS

The President announced that at the Council Meeting of 3rd March, 1988, a proposal for the Society to support the RSPB Caledonian Pine Forest Appeal was discussed. They need £800000 by April 1988 to purchase Abernethy Forest Estate, which is to the south of the existing RSPB reserve at Loch Garten. The proposed reserve of 21000 acres contains 4000 acres of old pine forest, and the RSPB plan to allow this to regenerate and increase in area up to 10000 acres. Council decided to support the appeal to the extent of a £1000 donation, to be funded out of the interest from the Hammond Bequest. This was felt to be appropriate for two reasons: firstly, Cyril Hammond was a staunch supporter of the conservation cause and had a considerable fondness for the pinewoods of the Spey Valley. Secondly, use of this bequest means that no money from members' subscriptions will be used for the donation. By joining with the RSPB and supporting the appeal the Society has made a substantial contribution towards saving this area of Caledonian Pine Forest. In his presidential address, Professor Owen told us of the wealth of insect life from the Loch Garten Reserve, and it would be worthwhile if members of the Society could extend such surveys to other groups of insects in both the Loch Garten and Abernethy Forest Estate Reserves.

COMMUNICATIONS

Mr J. M. CHALMERS-HUNT stated that a Silver-Y moth (*Autographa gamma* L.) had been seen at Bromley, Kent on 9.iii.88.

Mr P. M. WARING, who is investigating the status of some scarce moths for the NCC, gave details of some of his forthcoming projects. These include surveys of existing and possible new sites for the Black Veined moth, the Reddish Buff (*Acosmetia caliginosa* Hübn.) and the Viper's Bugloss (*Hadena irregularis* Hübn.). He will also be involved in surveys of Winterton Dunes, Norfolk, the management of fens for wainscot moths, and the management of Breckland areas in Thetford Forest. Volunteer helpers with these surveys are required and should contact Mr Waring at the Peterborough office of the NCC.

The President said that he had been contacted by the BBC at Bristol who were seeking information about excessive collecting by light trappers at Dungeness and Portland. He had informed the BBC of the reasons for using light traps and offered to take in any programme on insect collecting.

B. K. West pointed out that lights run at places like Dungeness were mainly for migrants rather than native moths.

LECTURE

Dr I. WOJWOD of the Rothamsted Insect Survey spoke on 'Moths as indicators of environmental change'. The survey runs light traps in a variety of habitats throughout Britain. Each trap is operated every day of the year and the macro-lepidoptera are identified and counted, with the data being stored on a computer. The scheme began with three traps in 1964, rose to a peak of 120 in 1976 and has now settled at about 80. The data provided by these traps allows the production of density maps which show how the abundance of a species varies across the country, or from year to year. This can be useful in predicting where and when pest species may cause problems.

By plotting the numbers of moths recorded each year, graphs can be produced which can indicate cycles of abundance. The data suggests that most moths have fairly stable populations when considered on a national level, although there may be considerable variation at individual sites. A mathematical formula exists that relates

the diversity of species to the environment around the trap site. This index of diversity, known as the alpha value, is normally fairly constant but alters when major environmental changes occur. The speaker illustrated this by discussing three trap sites at Rothamsted, comparing current results with data collected at identical sites in the 1930s and 40s.

24 March 1988

The Vice President, Prof. J. A. OWEN in the Chair.

EXHIBITS

Mr M. K. HENDERSON exhibited a rearing chamber for investigating the subsocial behaviour of burying beetles and their larvae. The device was shaped like a letter T, with two sides of the upright being made of clear perspex to enable observations to be made of the beetles' activities.

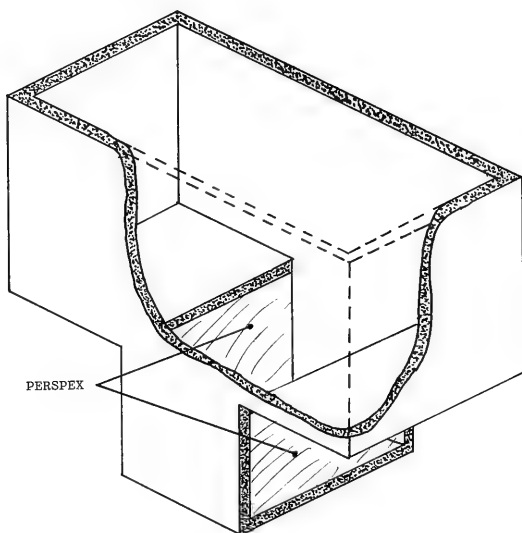


Fig. 'Cut-away' diagram of the rearing chamber exhibited by Mr M. K. Henderson. The box is half-filled with earth, and a dead bird or animal placed on top. The two sides of the upright of the 'T' shape are made of perspex to allow the subterranean activities of the burying beetles and their larvae to be observed.

Mr R. A. JONES showed a single specimen of *Metatropis rufescens* (Herr.-Sch.) (Hemiptera: Berytinidae) swept from its foodplant, Enchanter's Nightshade (*Circaea lutetiana* L.) at the edge of a ride through woodland at Scaynes Hill, near Haywards Heath, Sussex, on 20.v.87. It was first noted from a single specimen collected by Wollaston in the 1840s from Pangbourne, and at the turn of the century was a very rare bug known only from three other localities in Hampshire. Of late it has become much more common and widespread, now being known from most of southern England.

Dr J. MUGGLETON displayed some books on French insects in connection with his lecture.

Prof. J. A. OWEN showed a specimen of *Hydrochus megaphallus* Berge van Henegouwen and of *H. brevis* Herbst (Coleoptera: Hydrophilidae). The former was collected at Catfield Fen, Norfolk, on 30.iii.78; the latter from Loch Vaa, Inverness, in June 1972. The most striking difference between these species is the size of the aedeagus, which is about 60% larger in *megaphallus*. There are also minor differences in the sculpturing of the pronotum. *H. megaphallus* has long been confused with *H. brevis* and was only described as a distinct species in the February 1988 edition of the Balfour-Browne Newsletter. Prof. F. Balfour-Browne took specimens of *H. megaphallus* at Catfield Fen in 1904 and there are a few other records from East Anglia.

COMMUNICATIONS

Mr A. J. HALSTEAD reported taking a flame shoulder moth, *Ochropleura plecta* L. in a Rothamsted light trap at the RHS Garden, Wisley, Surrey, on 14.iii.88. This moth is not usually taken until early May.

LECTURE

Dr J. MUGGLETON spoke on the natural history of the Provence region of France, based on a number of holidays spent in the area in recent years. There are several major habitats in Provence, such as sand dunes, salt marshes, coastal plain and limestone hills, and Dr Muggleton illustrated his talk with slides of plants, insects and other invertebrates found in these situations.

14 April 1988

EXHIBITS

Dr I. F. G. McLEAN showed a male *Heteromyza commixta* Collin (Diptera: Heleomyzidae) taken on 2.iv.88 at Foxhole Heath, Suffolk. It was part of a swarm of flies seen at a height of about 20 ft near a pine tree. The genus *Heteromyza* is unique amongst the Heleomyzidae in that the males have eyes close together, while those of the females are widely separated. This condition of holoptic male eyes is associated with the swarming habit, which is unusual among acalyptrate flies. Other families of British acalyptrate flies with swarming males are apparently limited to the Milichiidae and Lonchaeidae. *Heteromyza commixta* is local but widely distributed in Britain. Its larval biology is unknown but related species have been recorded from bird droppings and an unidentified lignicolous fungus.

Mr S. FALK showed a hoverfly new to Britain and science, and not yet formally described. It is a *Platycheirus* sp. close to *peltatus* and referred to as *Platycheirus* sp. A in the British Hoverfly book supplement. It was discovered by the Canadian worker Vockeroth who segregated a series from material of *P. peltatus* at the British Museum (Natural History), which had been collected from various Scottish localities. During 1984 Mr Falk found the species in abundance at three sites in Moray, Scotland, and noted their small size in relation to typical *P. peltatus*. These matched the specimens separated by Vockeroth at the BM. Alan Stubbs also has specimens collected from widely scattered localities in Scotland, in Merionethshire, North Wales, and possibly in Teesdale.

Mr A. GODFREY showed a female conopid fly, *Leopoldius brevirostris* Germ. taken in Sydenham Hill Wood, Forest Hill, London, on 24.viii.87. There are very few records of this fly in Britain. Also exhibited was a female *Opetia nigra* Meig. (Diptera: Opetiidae) taken in a Malaise trap in Sydenham Hill Wood on 31.iii.87. This species is widespread and common in Britain, although females are seen very infrequently.

Mrs F. MURPHY showed a live specimen of a *Peripatus* sp., probably *P. sumatrensis*. It was found in leaf litter on the Genting Tea Estate, near Kuala Lumpur, Malaysia. *Peripatus* spp. are sometimes referred to as 'missing link' species between segmented worms and the arthropods.

COMMUNICATIONS

The President noted that while the Easter sunshine had brought out the spring butterflies, there were few queen bumble bees to be seen. Steven Falk thought this might be due to the mild winter causing fungal attacks on overwintering females. He said that it had been a good year for spring hoverflies, with Alan Stubbs taking *Melangyna barbifrons* Fallén and *M. quadrimaculata* Verrall, the latter at hazel catkins.

LECTURE

Dr R. H. L. DISNEY gave an account of the remarkable natural histories of some scuttle flies in Sulawesi. He had taken part in the Operation Wallace expedition to the Indonesian island of Sulawesi in 1985. Prior to his visit there were no records of flies of the Phoridae family from Sulawesi, although they comprised approximately 10% of the catch in Malaise traps set up in the forest. He was particularly concerned with scuttle flies associated with ants and termites, and had managed to discover their biology after many hours of patient observation. Dr Disney had also collected flies showing unusual features and speculated how these might throw some light on the evolutionary development of the Phoridae and their relationships with other flies.

COMMENTS ON THE EXHIBITS

Dr Disney noted that *Opetia nigra* had had a chequered taxonomic history. It was once placed with the Empididae, then moved to the Platypezidae and is now on its own in the Opetiidae. Examination of the yet-to-be discovered larvae should enable its true taxonomic position to be ascertained.

24 April 1988

EXHIBITS

Dr I. McLEAN showed a tiny predatory fly, *Chersodromia incana* Walker (Empididae) taken on 9.vii.87 at Sandy Bay, Anglesey. It is a widespread coastal species and can be found running over the sand in the fore dunes, though the prey of the adults remains unknown, in part due to the difficulties of observing the behaviour of such minute insects.

Mr S. BALDWIN showed some replica fossils of a dragonfly and a spider-like animal.

COMMUNICATIONS

Prof. J. OWEN reported the sighting of a humming bird hawkmoth on Bigbury Golf Course, South Devon, on 21.iv.88. He had also noted hawthorn in flower at Windsor Great Park.

B. K. WEST said that early flowering hawthorns could often be found growing on the sides of road embankments and cuttings.

Several members reported seeing orange-tip butterflies in the previous week and there was one report of the holly blue in Putney. This latter butterfly was particularly scarce in 1987. Mr M. J. Simmons said that some of his captive stock of holly blues had failed to produce the usual second brood of adults in 1987. The pupae had

overwintered and produced two females in the spring. Mr G. Prior asked whether members had found any moth larvae normally associated with broad-leaved trees on conifers. He said that at Bladon Heath, Woodstock, Oxon, he had beaten *Campaea margaritata* L. from pine, and *Deileptenia ribeata* Clerck from spruce.

LECTURE

Mr S. BALDWIN gave an account of the life of John Ray (1627–1705). Ray has been described as the father of natural history, a reputation based on his prolific writings in which he described and classified plants and animals. His first book, published in 1660, was a catalogue of Cambridgeshire plants and is the first county flora. His main interest was plants but he also produced books on birds, reptiles, fish, mammals and insects. He collected in Britain and Europe and also received many specimens from correspondents. His books were the first attempt at classifying plants and animals based on their structural morphology. Mr Baldwin displayed a number of books by Ray, together with others written about him.

12 May 1988

The president Dr I. F. G. MCLEAN welcomed an overseas member Dr P. Viette from the Paris Museum.

EXHIBITS

The President showed a live specimen of *Odinia maculata* (Meig.) (Diptera: Odiniidae) found by his colleague Dr S. Ball at Grimsthorpe Park, Lincs., on 11.v.88, resting on an oak trunk. The larvae of this scarce fly are associated with the workings of wood-boring beetle larvae. The distinctive spotted wings, somewhat silvery appearance in sunshine, and restless, quivering walk make this an unusual and attractive fly in life.

Mr M. SIMMONS showed a first and a second brood-type female of the Holly Blue *Celastrina argiolus* (L.). The larvae pupated in July 1987, but instead of emerging later that same year, they overwintered and emerged between 28.iii and 3.iv.88, some 7–8 months later, coinciding with the emergence of the following year's first brood.

Mr R. SOFTLY showed a larva of *Aethmia centrargo*, the Centre-barred Sallow. An adult female of this scarce moth was taken at actinic light at Hampstead on 6.ix.87 and, when confined with ash twigs, laid eggs on terminal buds. A slide of these eggs was shown. On 11.ii.88, tiny entrance holes were seen in various buds. Fresh ash was supplied as catkins became available. The exhibited larva was the sole remaining one.

Mr P. WARING showed larvae of the Scalloped Oak and Common Emerald moths beaten on 11.v.88 from 'amenity planted' trees in Peterborough. He also showed some slides of the larvae of the Black-veined moth. These showed them feeding on Marjoram, and resting in a very characteristic manner along grass stems. Two larvae have now spun cocoons; the remaining five have still to spin, but look quite healthy.

He also showed a slide of the Sloe Pug feeding on blackthorn flowers. This apparently overlooked species has now been found in many southern counties.

ANNOUNCEMENTS

The Secretary Dr J. MUGGLETON reported that due to the acquisition of a computer, the Society's addressograph machine had become redundant and it was therefore offered to any other society or organization that could make use of it. He

also reminded members that because of the necessity of ringing the doorbell to obtain entry to ordinary meetings, members should remember that once let in, they should endeavour to open the door for the next person, and so on.

COMMUNICATIONS

Mr P. BAKER reported that recent weather systems had deposited desert dust in southern England and asked whether any migrants had been seen. He had recently seen Painted Lady butterflies and Diamond Back moths. Various other members also reported seeing Painted Ladies recently, Mr W. PARKER having seen very battered specimens which might have overwintered. Mr Parker also reported that while Mr P. Chandler was working at the Botanical Gardens in Dublin recently, someone had brought in two specimens of the Long-tailed Blue.

In answer to Mr G. Prior's request at the last meeting, Mr P. WARING reported that the Winter Moth and the Mottled Beauty were at present doing great damage to conifers.

LECTURE

Dr N. WEBB of the Institute of Terrestrial Ecology's Furzebrooke Research Station at Wareham spoke on 'The natural history of the southern heathlands'. Beginning with a review of the different types of heathland, their history and geological make up, Dr Webb went on to describe the various uses to which heathland had been put by man and the consequent effects on landscape, flora and fauna. He then discussed specific plants and animals (including insects) associated with heaths. Only about 40 species of insect feed on heathers, the dominant plants. The majority of insects and other animals associated with heaths are simply animals of hot and dry sandy places, requiring the same conditions as heather and other heathland plants. Aquatic communities are important components of heathland faunas, for example about half of the British species of dragonfly are associated with acid water. The lecture closed with a look at various means of managing heathlands, to preserve a character previously imposed by burning, peat cutting, cutting of heather and gorse and grazing by domestic animals and rabbits.

26 May 1988

The President Dr I. F. G. McLEAN announced the death of Mr Les Wrightson, who joined the Society in 1949.

EXHIBITS

Mr A. GODFREY exhibited two uncommon empid flies, both with strongly marked wing patterns. The first, *Oedalea apicalis* Loew is a notable rarity with apparently only three recent published records: from Windsor Forest, and Surrey and Essex. Old records exist for Epping Forest and the New Forest. It is a species of ancient woodland and probably develops in beech wood. It is characterized by its thickened third antennal segment and dark wing tip. The specimen was taken on 17.v.88 in Whippendell Wood, Watford, Herts., on a beech log. The second exhibit was of *Euthyneura gyllenhalii*. This is a local species of old woods in southern England. The larva probably develops in rotten wood. It was one of two swept from around beech logs in Whippendell Wood on 20.v.88.

Dr I. F. G. McLEAN also showed two flies, the first of which was a specimen of *Lonchaea fumosa* Egger (Lonchaeidae) found swarming at a height of about 5 m above a road verge amongst pines at Foxhole Heath on 22.v.88. The second exhibit

was *Euthyneura myrica* Haliday (Empididae), a single female from Castle Hill Wood, Helmsley, on 21.vi.83. This species was previously known only from the holotype female described by Haliday, probably from Ireland. That specimen is now lost, presumed destroyed. The species is distinct by virtue of the fact that it lacks any style on the end of the third antennal segment. This group is currently being reviewed by Mr P. Chandler. [At the meeting of 9 June Dr McLean subsequently reported that the specimen had been examined by Mr Chandler and was found to be a possibly undescribed species of *Anthalia*.

COMMUNICATIONS

Mr R. A. JONES reported seeing a Brown Tail moth caterpillar crawling across the pavement in Vauxhall, London SW8 earlier in the day.

Mr J. DOBSON reported seeing the local hoverfly *Melangyna triangulifera* in Ealing on 7.v.88. Mr A. Godfrey reported that he too had seen this species, at Sydenham Hill Wood, during May.

Numerous members reported seeing the Holly Blue recently, which appeared to be having a good season following last year's poor showing. It was commented that this species fluctuates wildly over the years.

Reports of members operating moth traps indicated that results had been poor recently, with the exception perhaps of the Scalloped Hazel.

LECTURE

The scheduled speaker was unable to appear, but two members showed slides. Mr R. A. JONES showed a few slides of Nunhead Cemetery, to illustrate the types of habitat to be investigated by members at the forthcoming Field Meeting. The major part of the evening however was given over to a fine array of slides by Mr. S. FALK, from his recent trip to New Delhi, Srinigar in Kashmir and Pokhara in Nepal. These were mainly of birds, which provided a diverse and photogenic subject in this fascinating part of the world. They ranged from brightly coloured kingfishers to a motley array of several species of vulture feeding on a dead donkey.

9 June 1988

EXHIBITS

Mr A. J. HALSTEAD exhibited a specimen of the chrysomelid beetle, *Cryptcephalus nitidulus* F. taken 30.vi.87 at White Downs, Surrey. This is listed in the Red Data book as an endangered species with a few scattered records from the Midlands and Southern England, the last being at Colesbourne, Glos. in 1944. It is said to occur on young birches in natural woodland and is threatened by the clearing of woodland. The specimen exhibited was found on a wild rose leaf on a steeply sloping piece of chalk downland with encroaching scrub but little birch, either on the slope or in the surrounding woods. This illustrates the difficulties in devising conservation measures for infrequently recorded insects.

Mr M. J. SIMMONS displayed two black and white photographs showing the upper and lower sides of a bilateral gynandromorph of the common blue, *Polyommatus icarus* Rott. This had the left side male, right side female, and was taken by Mr A. M. Bucior at Równina Bilgrajska, Janón Lubelski, Poland, on 27.vi.87.

Rev. D. AGASSIZ showed some live adults of the yponomeutid moth *Argyresthia thuella* Packard and its larval mines collected by G. Langohr at Limberg, Heerlen, Holland, on 18.v.88. This species originates from North America but is now established in Europe and is common on *Thuja* in parts of Holland.

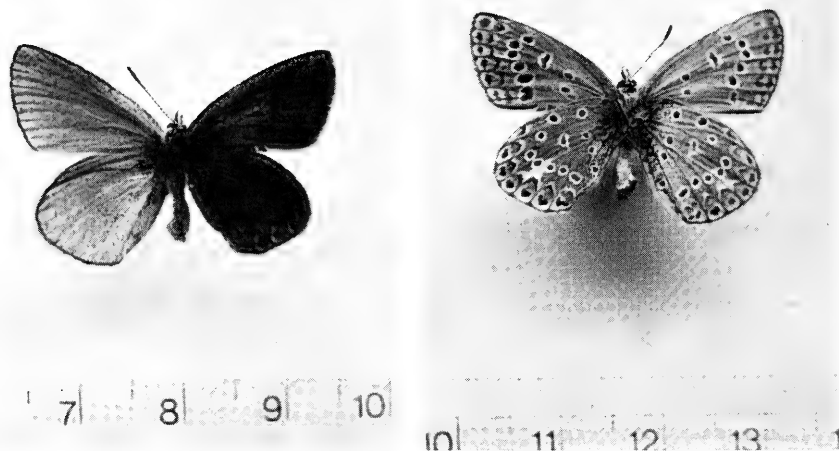


Fig. Bilateral gynandromorph of *Polyommatus icarus* showed by Mr M. J. Simmons. Left: upperside, left side male. Right: underside, right side male.

Mr G. W. BECCALONI showed 70 eggs of the lobster moth laid by a female that had emerged on 14 May. It emerged in a crippled state and was kept in a net cage where it laid the eggs before dying on 21 May. No male was available for mating but some of the eggs began to darken on 6 June as though larvae were developing. None had hatched so far but neither had any of the eggs collapsed and the exhibitor asked if it was known if the lobster moth could reproduce by parthenogenesis. No-one knew of the lobster moth being able to produce viable eggs without mating. A further report on the fate of these eggs is awaited with interest.

Mr R. V. GOULDING showed two pieces of fossilized wood derived from the cretaceous chalk at Herne Bay, Kent. One fossil showed signs of having been bored by what are believed to be insect larvae rather than bivalve molluscs.

Dr I. F. G. MCLEAN showed a specimen of the rhagionid fly *Ptiolina obscura* Fall. and gave details of its probable oviposition behaviour. On 2.vi.88 he had seen a single female at the base of a large dead standing beech trunk at High Standing Hill, Windsor Forest. Photographs were taken as the fly extended the tip of her abdomen and apparently attempted to place eggs into the dense covering of dry moss on the bark. Alan Stubbs had previously bred this species from dry moss at Windsor Forest, so this would appear to be the situation in which the larvae develop.

COMMUNICATIONS

Mr E. BRADFORD said that his pond at Pean Hill, Kent, had received 58 great crested newts which had been rescued by the NCC from a site in Ashford. Apart from these newts, all the plants and animals in the pond had arrived by their own efforts. This has given rise to a well balanced pond and Mr Bradford stressed the importance of letting the environment dictate the fauna and flora, rather than attempting the reverse.

Dr D. A. L. DAVIES recalled that in the mid 1950s he had found 15 great crested newts curled up under a stone on Salisbury Downs during the winter.

LECTURE

Dr D. A. L. DAVIES spoke on continental drift as seen from the present distribution of dragonflies. These insects date back some 400 million years to the Carboniferous era and their evolution can be traced through the fossil record, particularly through developments in the form and venation of the wings. Some modern dragonflies are similar to those in the fossil record and a study of their distribution today gives an indication of how and when the ancient land mass broke up and drifted apart, as well as providing some support for an 'expanding earth' theory.

23 June 1988

EXHIBITS

Dr I. F. G. McLEAN showed a specimen of the longhorn beetle *Molorchus umbellatarum* (von Schr.) taken on 16.vi.1988 during a survey at Chattenden Woods, Kent organized by Mr Eric Philp of the Maidstone Museum. In Britain, this is a scarce species found most often as adults feeding on umbel flower heads. The larvae develop in the wood of deciduous trees. Chattenden Woods is a Ministry of Defence area, access to which is restricted to permit holders.

Dr McLean also showed a specimen of the plume moth *Buckleria paludum* (Zell.) found at Dersingham Bog, Norfolk on 20.vi.1988. The moth was swept in an area of wet heath where the sundew (*Drosera rotundifolia*), the larval foodplant, grows. Other associated plants included cross-leaved heath (*Erica tetralix*), *Sphagnum* spp. and bog asphodel (*Narthecium ossifragum*).

Prof. J. A. Owen showed a live pair of the ichneumon mimic tipulid fly *Ctenophora ornata* Meig. reared from larvae found in April 1988 in damp wood mould in a fallen beech tree in Windsor Forest. The adults had emerged some time between the end of May and the 21 June, while the exhibitor was on holiday.

Prof. Owen also showed a live pair of the chafer *Gnorimus nobilis* (L.), two of eight adults reared from eggs laid by a female taken in Mallard Wood, New Forest in July 1986. The larvae were reared in a mixture of dead plum and cherry wood.

Mr A. J. HALSTEAD showed a live specimen of the mordellid beetle *Tomoxia biguttata* Gyll. found on the bark of a dead standing oak tree at the RHS Garden, Wisley, Surrey on 23.vi.1988. This species is rather local in southern England graded Red Data Book Category 3.

COMMUNICATIONS

Mr R. SOFTLY described his observations on the feeding of the humming-bird hawk moth recently in S.W. France. When feeding at flowers of cultivated *Petunia* it settled and entered each flower like a bumble bee, rather than feeding in flight while hovering in front of the flowers as is usually the case in this species.

Prof. Owen referred to a report given at a recent meeting that the holly blue butterfly had been very scarce in 1987 and reported that he had seen a specimen in his garden at Epsom, Surrey flying around a *Pyracantha* bush on 15.v.1988.

SLIDE EVENING

Mr A. CALLOW showed slides of many different creatures which he had come

across while travelling in N.W. India, Pakistan and Nepal at altitudes of 2000 and 12,000 ft, including some taken in hotel and airport gardens. He had many excellent slides of insects, arachnoids and other creatures, taken in natural surroundings but usually with the aid of electronic flash equipment.

Mrs F. M. MURPHY showed slides taken in Cephalonia, Greece illustrating spiders, geckoes and other fauna of the area. She then went on to show slides of scenery and creatures which she had encountered in travelling in Malaysia, Singapore and Hong Kong.

Mr R. SOFTLY showed a series of slides of a larva of the swallowtail moth constructing its cocoon and pupating.

Dr I. F. G. McLEAN showed slides taken during a visit to the Samaria Gorge in the west highland of Crete in May 1982. This is a Greek National Park situated at an altitude of about 5500 ft comprising a deep gorge with cliffs to 1800 ft. His slides include those of some of the endemic flora of the region, insects and a number of hand-painted road traffic warnings.

Mr M. J. SIMMONS showed slides illustrating various insects including different colour forms of the larvae of the holly blue butterfly and also slides of the damage caused by the gale in October 1987.

COMMENTS

With reference to the slides of various asilid flies with prey shown by Mr Callow, Prof. Owen remarked that he had recently observed in Glen Affric a large asilid fly carrying a specimen of the flightless weevil *Strophosomus melanogrammus* (Forster) and asked if such flies could really eat this type of prey. Dr McLean commented that the insects known to be taken by asilid flies included weevils, suggesting that the fly manages somehow to insert its proboscis between chinks in the weevils' integument.

14 July 1988

Vice-President, Mrs F. M. MURPHY, in the Chair.

EXHIBITS

Mr R. A. SOFTLY exhibited two moths. The first was a specimen of *Dioryctria abietella* (D. & S.) (Lepidoptera: Pyralidae) taken at actinic light at Hampstead on the night of 13.vii.1988. This moth is a pine feeder which is recorded as local and rather rare in the neighbouring county of Essex. It is a migrant and a possible resident. The second moth was a specimen of *Biston betularia* L. (Lepidoptera: Geometridae) taken at actinic light at Hampstead on the night of 10.vii.1988. This was a non-melanic specimen which was remarkable for the reduction in the amount of black stippling on the wings.

Mr M. J. SIMMONS exhibited a female specimen of the melanic form of the Scalloped Hazel moth (*Odontopera bidentata* Clerck). This had been taken by Mr G. Harler at a porch light in St Paul's Cray, Orpington, Kent on 17.v.1988. Six days earlier a 'normal' type male had been taken at the same locality and in the same circumstances. The melanic female had laid 48 ova from which 26 larvae still survive; they are being reared on apple. Bernard Skinner in *The colour identification guide to moths of the British Isles* records that the melanic forms occur regularly in the London area, northern England and in some areas in the Midlands.

Dr J. MUGGLETON reported that the frequency of the melanic form of *O. bidentata* could change quite dramatically over very short distances and thus it appeared to be a better indicator of local air pollution than the better known melanic form of *B. betularia*. It may be a less mobile species than *B. betularia* and hence the melanic

genes tend not to spread into neighbouring populations. He said that little was known of the pattern of melanism in *O. bidentata* in the London area and a detailed survey of the situation would be well worthwhile. Remarking on Mr Softly's specimen of *B. betularia*, Dr Muggleton said that of the hundreds of specimens of this moth he had examined, he had never seen such a pale example.

Mr R. D. HAWKINS exhibited a specimen of the homopteran bug *Issus coleoptratus* (F.) from Surrey together with another specimen, doubtfully conspecific, also from Surrey. The second specimen was slightly larger and had two longitudinal dark marks.

COMMUNICATIONS

Mr E. BRADFORD reported that larvae of the Painted Lady (*Vanessa cardui* L.) had recently been very plentiful at Seasalter in Kent, and that he had found an adult Red Admiral (*Vanessa atalanta* L.) outside his home in Kent.

Mr S. L. MEREDITH reported that he had been searching for Adonis Blue (*Lysandra bellargus* Rott.) in Kent, Sussex, Surrey, Hertfordshire, Wiltshire and Dorset, but had seen only a single adult (at Martin Down NNR, Wiltshire). In contrast he had found the Small Blue (*Cupido minimus* Fuessly) to be plentiful in the Cotswolds. He wondered whether the weather, and in particular the mild winter, might have contributed towards the scarcity of the Adonis Blue.

It was also reported that the week before the meeting an unusually large number of Stag Beetles (*Lucanus cervus* L.) had been present in the West London area, making a very impressive sight as they took to the air in the evening.

LECTURE

Mr P. D. BROCK gave a lecture entitled 'Stick insects, an illustrated talk with particular reference to the stick insects of the British Isles'. He started the talk by reading some amusing newspaper reports describing the alarm caused by the escape into the wild of some of the larger species kept in captivity in Britain. He then discussed the three introduced species which now appear to be resident in Britain; all three originated from New Zealand and are parthenogenetic. They are *Acanthoxyla geisovii* found in the Scilly Isles and Cornwall, *A. inermis* found in Cornwall, and *Clitarchus hookeri* (White), found in the Scilly Isles. Mr Brock concluded his talk by showing some slides illustrating these and other species of stick and leaf insects; some of the slides of tropical species had been provided by Mr A. Harman.

28 July 1988

The President Dr I. F. G. McLEAN welcomed to the meeting M. B. Méry from near Versailles, France.

EXHIBITS

Dr McLean showed three insects associated with river shingle taken at Fauldshope on Etrick Water, Selkirkshire, in July 1988. These were: *Cryptostema alienum* Her.-Sch. (Hemiptera: Dipsocoridae), a small bug of widespread occurrence under pebbles, especially those which are wet, in river shingle in upland districts. *Saldula scotica* Curt. (Hemiptera: Saldidae), a large predatory bug found frequently flying or running over the larger stones, 4-6 inches across, on northern shingle banks. *Tachydromia halidayi* Collin (Diptera: Empididae), a tiny predatory fly once thought to be very local but now known to be more widespread; usually found on larger banks where sand is mixed with the stones.

Mr R. SOFTLY asked what happens to river shingle insects when the river floods. Dr McLean replied that some undoubtedly got washed away. Large shingle banks are often richer in insects and this may be because they offer more protection in times of flood.

COMMUNICATIONS

Mr S. MEREDITH reported seeing an adonis blue butterfly on Ranmore Common, Surrey. It appears to have produced a small first brood in late May.

Mr C. B. ASHBY reported on a visit he made recently to see Stig Torstenius at his home near Stockholm. In drawer 20 of the Society's Torstenius collection there is one specimen of *Orodemnias quenseli* Payk., a small tiger moth of the Arctiidae family. This is similar to but discernibly different from a central European species, *O. cervini* Fallou. In 1967 and 1968 two unfamiliar arctiid moths were taken in northern Lapland and passed to Mr Torstenius for identification. After correspondence with authorities in Finland and Leningrad, and close examination of the larval skin, Mr Torstenius concluded that the Lapland specimens were new to Sweden and, together with one taken on the Kola peninsula in 1931, were an arctic subspecies of *O. cervini*. In a detailed paper published in *Entomologisk Tidskrift* 92: 3-4, 1971, Mr Torstenius proposed the sub-specific name of *frindolini*. At the time of Mr Ashby's visit, Mr Torstenius was leaving for northern Lapland to search for this moth which pupates under stones on the arctic mountains at heights above 700 m. Four pupae found by Mr Torstenius in Lapland in 1982 were overwintered outdoors and one adult duly emerged — the third record of *Orodemnias cervini frindolini* for Sweden.

LECTURE

Mr D. LEES spoke on the butterfly house as a tropical research laboratory in Britain. In 1987 there were 42 butterfly houses in Britain, including the one at Syon Park where Mr Lees works. As well as providing entertainment, Syon Park butterfly house helps to educate and promote a conservation message to its visitors, which include about 400 school parties in the summer. Butterfly houses have considerable potential for research and this includes work on artificial diets, behavioural studies, flight mechanics, butterfly sound and measuring butterfly longevity. A collection of larvae in alcohol is being made for the British Museum (Natural History). Mr Lees illustrated his talk with slides of larvae and butterflies being bred at Syon Park, showing examples of protective or warning colouration, and of some hybrid butterflies which have occurred in the house.

8 September 1988

Joint Meeting with the London Natural History Society held at Burlington House

Mr R. M. BURTON, Vice President of the LNHS, in the chair.

EXHIBITS

Mr A. J. HALSTEAD showed a male *Oxycera dives* Loew (Diptera: Stratiomyidae) taken on 10.vii.88 at Whitlaw Bank, near Hawick, Roxburghshire. This very scarce soldier fly is known from scattered sites in Scotland and northern England. During the 1988 dipterists' week in the Galashield area in the second week in July this fly was recorded from several new sites in the Borders region.

Mr C. PLANT showed a complete sloughed skin of a grass snake (*Natrix natrix* L.)

found in Wanstead Park, Essex (East London) in September 1988. The skin was 73 cm long and probably came from a female. He also displayed four old black and white photographs discovered recently in the Passmore Edwards Museum, London, E15. These were taken by Hugh Main and showed: 1. A larva of the Essex emerald, *Theidea smaragdaria* F. on sea wormwood, *Artemisia maritima*. 2. A larva of the peppered moth, *Biston betularia* L. on birch. 3. An adult small brindled beauty, *Apocheima hispidaria* D. & S. on oak. 4. An adult red underwing, *Catocala nupta* L. on a poplar trunk.

Mr R. McCORMICK showed some larvae of the gold spangle moth, *Autographa bractea* D. & S. being reared on nettle. They hatched from eggs laid by a female taken at light during the field meeting at Cranwich Heath, Norfolk, on 23.vii.88. A male was also taken at the same time. Records of this moth in east and southern England are thought to be migrants.

Mr I. D. FERGUSON showed two shield bugs, *Troilus luridus* F. and *Palomena prasina* L. (Hemiptera: Pentatomidae) reared from nymphs collected on 3.ix.88, near Bough Beech, Kent.

Dr I. F. G. McLEAN showed a specimen of the scarce carabid beetle *Amara alpina* Payk. taken 18.vii.88 in Lurcher's Gully, Cairn Gorm. They were found feeding on the seed heads of deer grass, *Scirpus cespitosus*, and had a tendency to drop to the ground when approached. Lurcher's Gully is under threat from a renewed application for the development of a ski run and associated facilities. This proposal is being opposed by the NCC and other conservation bodies.

Mr P. WARING showed some colour transparencies of his successful attempts at rearing the black-veined moth, *Siona lineata* Scop. Larvae had been kept overwinter and fed on marjoram. The larvae spun long spindle-shaped cocoons low down on plant stems in early May. The cocoons are at first white but 24–48 hours later they become yellow-orange. From 28 eggs, Mr Waring succeeded in raising seven adults, from which two pairings were obtained in June. The moths were caged on *Brachypodium* grass which had the tops bent over horizontally to encourage pairing. Eggs have been laid and the next generation of larvae were about 25 mm long. The black-veined moth is currently known from only two sites in Kent but this could be increased through captive breeding and release in suitable areas.

Mr E. BRADFORD showed a rare harvestman *Dicranopalpus ramosus* Simon which came to an actinic light at his house at Pean Hill, Kent, on 3.ix.88.

LECTURE

Mr P. STERLING spoke on coppicing for conservation: which invertebrates benefit? Coppicing has been the traditional management of many woods for about 1000 years but it has declined during the twentieth century, particularly since the second world war. Currently only about 600 hectares of woodland are being actively coppiced and much former coppice wood has not been cut for at least 40 years. The speaker, with a colleague, has carried out research to determine how coppicing or lack of coppicing affects the invertebrate animals. To facilitate recording, animals which create obvious signs of their presence, such as leaf mines, galls and spiders' webs, were selected. Investigations at Brasenose Wood, Oxford, which has been coppiced again since 1975, suggest that the abundance of the animals sampled increased with the age of the coppice stools and was greatest in neglected parts of the wood. A similar trend was noted at Bradfield Wood, Suffolk, which has been coppiced continuously since the thirteenth century. Coppicing does, however, favour some invertebrates such as butterflies and other insects that are attracted to the flush of flowers that appears in the first few years after cutting. The speaker put forward the view that a return to

coppicing in neglected coppice woods is not necessarily the most appropriate form of management. The wood should be carefully assessed to see which parts might benefit from coppicing, or whether the wood should be left to develop naturally. If coppicing is to be done, there should be a clear aim to benefit particular species or groups of invertebrates known to occur in the wood.

A lively discussion on the merits of coppicing followed the lecture.



FIELD MEETING

Wyre Forest, Worcestershire and Shropshire, 6/7 August 1988

Leader: C. W. Plant. There was a good turnout of around twenty members at this weekend meeting, in spite of at least one member encountering initial confusion between Wyre and Wye! Pleasing too to welcome faces additional to those regulars from the southern counties of Britain! Saturday was spent recording mainly micro- and macro-Lepidoptera, Diptera, Coleoptera and Arachnida, first along the disused railway track which runs the length of the national nature reserve section of the Wyre Forest then later back to the cars along the length of the Dowles Brook, taking in several ancient meadows in the valley bottom. Sadly, the insects were not numerous (perhaps a function of the apparent lack of proper management of both the wooded areas and the meadows), though a number of interesting species were noted. Andrew Godfrey took the Asilid fly *Laphria marginata* (L.) and a gynandromorphic example of the Stratiomyiid *Beris vallata* (Forster), having the holoptic eyes and left clasper of the male together with the ovipositor of the female! Peter Follett and possibly others took *Xylota coeruliventris* Zett. whilst several people took *Xylota florum* (F.). These two hoverflies are thought to have mutually exclusive distributions and this record may be the first for the two species together at a single site. Robert Dyke, having captured the only *Minoa murinata* (Scop.) of the day proceeded to locate a single pupa of the plume moth *Amblyptilia punctidactyla* (Haw.) on *Stachys sylvatica* flowers on the Shropshire side of the border and, with assistance from Barry Goater and the leader several more pupae and larvae were collected. It is of interest that the larval descriptions of this species and *A. acanthadactyla* (Hb.) may be transposed in Beirne's *British pyralid and plume moths* since these examples, undoubtedly the former species, had larvae fitting the description of the latter. Peter Harvey also found the spider *Xerolycosa nemoralis* (Westring) — probably a new record for Worcestershire. During the afternoon the party drove to Rock Coppice, a newly annexed part of the NNR on the Worcestershire side of the brook and, within minutes, several *A. punctidactyla* larvae were located here also.

Several interesting moths were captured at the nine light traps which were set up during the ensuing evening though only one trap produced numbers of *Enargia paleacea* (Esp.). Notable macros included *Deileptenia ribeata* (Cl.), *Phytometra viridaria* (Cl.) and *Parascotia fuliginaria* (L.) — all new records for the NNR; several micros included *Acrobasis consociella* (Hb.).

Suitably refreshed by beer and rested after a good night's sleep, the remainder of the party rejoined the Lepidopterists on Sunday morning for an examination of the Forestry Commission portion of the forest. Diptera were the principal quarry and all the advertised species were recorded; most people managed to catch *Sphaerophoria virgata* Goeldlin de Tiefenau whilst many also took *S. batava* Goeldlin de Tiefenau, *S. menthastri* (L.) and *S. philanthus* (Meig.). Other hoverflies included more *Xylota coeruliventris* Zett. (in areas where the leader has taken *X. florum* in earlier years); a second example of the drab looper moth *Minoa murinata* (Scop.) was taken in flight by Graham Finch; and Peter Harvey collected examples of the two spiders *Araneus alsine* (Walchenaer) and *Cercidia prominens* Westring) — both probably new for Worcestershire. After lunch, Peter Chandler returned to the NNR and in Shelf-held Coppice located the rare crane-fly *Gonomyia alboscuteolata* (Von Roser) — captured here in 1987 by the leader and one of the trip's "target species". Here, Peter also captured the second British record of the fungus fly *Macrocera fastuosa* and *Phronia sudetica* recorded as new to Britain in 1987.

SHORT COMMUNICATIONS

Pelecocera tricincta (Meig.) (Diptera: Syrphidae) in the Isle of Wight.—Whilst examining some hoverflies that I had collected over a number of years, my eye was caught by a specimen of once unfamiliar yet clearly distinct. Its huge antennal joint quickly identified it as *Pelecocera tricincta*. Reference to Verrall (1901), Coe (1953) and Stubbs and Falk (1986) showed it to be a very local little fly confined to Dorset, Hampshire and recently Surrey. My specimen, a female, was swept from a ride edge in Parkhurst Forest, Isle of Wight on 16.viii.74, and although not new to Hampshire *sensu lato*, was apparently new to the island, vice-county 10. On hearing of my identification my father Mr A. W. Jones said that he thought he had a specimen from the same place, and sure enough he has a male swept from a similar ride edge in Parkhurst Forest 4 years previously on 16.vi.70. (Incidentally he also has another specimen, a female, taken from a flowering head of *Hypochaeris radicata* (L.), Sherford Bridge, Wareham, Dorset, 21.vi.66.)

Despite a seemingly unusual locality for what is thought to be a heathland species, Parkhurst Forest still retains much of its previous (pre-Forestry Commission planting) heathland character. This is reflected by remnants in its present flora (A. W. Jones, Flora of the Isle of Wight, unpublished manuscript, 1967–1986) and, as demonstrated by *Pelecocera*, in its fauna.—Richard A. Jones, 10 Nunhead Grove, Nunhead, London SE15 3LY.

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- Coe, R. L. 1953. Syrphidae. *Handbooks for the identification of British Insects*. X(1): 87.
 Stubbs, A. E. & Falk, S. 1986. *British hoverflies, an illustrated identification guide*, pp. 204–205. London, BENHS (2nd edition with supplement).
 Verrall, G. H. 1901. *Platypzeidae, Pipunculidae and Syrphidae of Great Britain*, pp. 461–463. London, Taylor & Francis (reprinted 1969, Faringdon, Clasey).

A second British locality for *Aphis mammulata* Gimingham & Hille Ris Lambers (Homoptera: Aphididae).—On 20 September 1986 I visited Cavenham Heath NNR, West Suffolk, in order to record the distribution and abundance of *Trichoermes walkeri* Förster (Homoptera: Psylloidea), as part of a long-term study of the life history and population dynamics of this gall-forming insect. *T. walkeri* forms simple galls at the margin of leaves of *Rhamnus catharticus* L. (Buckthorn), and since 1981 I have examined *Rhamnus* bushes at localities in Bedfordshire, Buckinghamshire, Huntingdonshire, West Norfolk and West Suffolk and taken samples of galled leaves for measurement and dissection. At Cavenham Heath car park (TL 757727) two bushes of *Rhamnus* were found, one of which was distinctive because of large numbers of the ant *Lasius fuliginosus* (Latreille) walking over the branches, twigs and foliage. Closer examination of the bush revealed that these ants were attending aphids of two colour forms, dark grey and orange, which they defended vigorously when disturbed. Subsequent examination of a sample of these aphids, using the excellent Handbook by Stroyan (1984), enabled them to be identified as *Aphis mammulata* Gimingham & Hille Ris Lambers. This is apparently a rare species in Britain because Stroyan gives the type locality, Eastleach Martin, on the Oxfordshire–Gloucestershire boundary, as the only known site. No other colonies have been found by me elsewhere during my studies of *T. walkeri*, though the Cavenham Heath colony has been re-found on the same bush on 30.vii. and 5.ix.87, and 10.vii. and 13.ix.88. *Aphis mammulata* is unusual because the females are a typical dark *Aphis* colour, while the males are orange during all instars (Stroyan, 1984). The fact that this aphid is attended by *Lasius fuliginosus* should also draw attention to its presence, and perhaps may assist the discovery of further localities. This would be of

interest in revealing the true status of the aphid, and possibly lead to the description of the early summer biology which is currently unknown — I. F. G. McLean, Nature Conservancy Council, Northminster House, Peterborough PE1 1UA.

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- Hodkinson, I. D. & White, I. M. 1979. Homoptera Psylloidea. *Royal Entomological Society: Handbooks for the Identification of British Insects II*, 5(a).
 Stroyan, H. L. G. 1984. Aphids — Pterocommatinae and Aphidinae (Aphidini). *Royal Entomological Society: Handbooks for the Identification of British Insects II*, 6.

The spread of *Phlyctaenia perlucidalis* (Hübner) (Lepidoptera: Pyralidae) to Hampshire.—The first record of this marshland species in Britain was at Woodwalton Fen in 1951. According to Goater (1986), it subsequently spread to the fens of Huntingdonshire and Cambridgeshire and the coasts of Lincolnshire, Suffolk, Essex and Kent and in 1983 as far north as south-east Yorkshire. A specimen from Nottinghamshire was exhibited at the 1987 Annual Exhibition of the British Entomological and Natural History Society (Sterling, 1988). These all indicate that the spread of the species was restricted initially to wet areas in the eastern part of the country. The only record outside this area was a report that one had been taken at Waterlooville, Hants. VC11 in 1973 in Goater (1974). Waterlooville is near to the coast and as no more were reported, this specimen cannot be explained in terms of the extension of the British colony, but as a casual specimen.

On the night of 24/25.vi.88, I took a specimen in an M.V. light trap being run at the edge of the River Test marshes at Leckford, Hants. VC12. I then had a telephone call from Mr A. H. Dobson informing me that he had taken a specimen at the trap run at the Hampshire College of Agriculture, Sparsholt on the night of 20/21.vi.88. Sparsholt spans VC11 and VC12 and although the trap was inside VC11 and not in a marshy area, it is in fact only 4 miles from Leckford. I then received a further specimen from Dr R. J. Hornby for confirmation of identity. This had been taken in his garden M.V. light at East Woodhay, Hampshire VC12 on the night of 5/6.vii.88, the garden being beside a stream and adjacent to a very wet alder wood and an ungrazed marshy meadow.

Traps have been run on a fairly regular basis at these sites over at least the last few years without this species being seen previously and three records over a period of 16 days in the current year would indicate that the moth has very recently established a breeding area or areas in the northern part of Hampshire. The British foodplant has not yet been established.—Col. D. H. Sterling, 'Tangmere', 2 Hampton Lane, Winchester, Hants. SO 22 5LF.

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- Goater, B. 1974. *The butterflies and moths of Hampshire and the Isle of Wight*. Faringdon.
 Goater, B. 1986. *British pyralid moths*. Colchester.
 Sterling, M. J. 1988. *Annual Exhibition. Br. J. Ent. Nat. Hist.* 1: 31.

Mass emergence and apparent 'perching' behaviour of *Notozus panzeri* (F.) (Hymenoptera: Chrysididae).—Rubytail (or 'cuckoo') wasps are parasitoids of solitary aculeates. And although their hosts may nest closely within a small area giving the appearance of a colony, rubytails themselves are not noted for their abundance or mass occurrence. I was therefore more than a little surprised when I recently found *Notozus panzeri* in large numbers.

On 25 June 1988, my father A. W. Jones and I were walking along the bare sandy tracks of Ambersham Common, West Sussex. At about 3.30 in the afternoon, my

eye was suddenly caught by several flashes of bright silvery metallic light just above the short *Calluna*. At the same time, my father announced that he had just swept several rubytails. These proved to be *Notozus panzeri*, and several more sweeps of the net showed that this species was quite common here.

On looking around, it was as though the *Calluna* at the edges of the path was twinkling, as dozens of rubytails flitted about. Over a stretch of about ten metres there were perhaps between five and ten per metre, all keeping to within about one metre from the bare edge of the path where the *Calluna* was short, about eight inches high. We had previously found *Notozus* singly, and other chrysidids only in small numbers. Yet here were several dozen within a very small area.

On hands and knees in an attempt to observe them more closely, and even perhaps photograph them, a more or less repeated behaviour could be discerned. They seemed to be selecting perches at the tips of the *Calluna* leaves. A wasp would hover about, appearing to concentrate on a single 'target' about which it would manoeuvre for a second or two before settling head out at the very apex of the stem. It then adopted an alert almost straining posture, standing out as far as its legs would allow, its antennae outstretched and quivering. Here it would stay for several seconds until disturbed by a passing shape, sometimes another rubytail, sometime a fly, sometimes another insect. When alerted, it would dart out to investigate, but never very closely; then it would return to its previous perch or another close by.

I have been unable to find any published reference to this or similar behaviour (Morgan, 1984; Morice, 1896, 1900), although Smith (1862) does state "some years ago I met with it in some numbers at Sandhurst near the military College; again in 1861 in the month of September I beat three or four into my net at Byfleet near Weybridge".

The hosts of *Notozus* (*Psen* spp.) were not about as far as I could judge, and as all the specimens we collected were males, it is possible that they were selecting sites from which to locate females.

An interesting result of the photography was the camouflage effect of the bright metallic colours which was revealed. The red of the abdomen almost exactly resembles the head of the tips of the *Calluna* leaves, and with the head-out position the abdomen was held close to this leaf tip, the change to green on the thorax enhancing the effect as the red of the *Calluna* leaves gave way to green, down away from the tips.—Richard A. Jones, 10 Nunhead Grove, Nunhead, London SE15 3LY.

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- Morgan, D. 1984. Cuckoo-wasps, Hymenoptera, Chrysididae. *Handbk Ident. Br. Insects* **6.5**: 14–15.
- Morice, F. D. 1896. An annotated revision of the British Chrysididae. *Entomologist's Mon. Mag.* **32**: 116–117.
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- Smith, F. 1862. Monograph of the family Chrysididae. *Entomologist's Annual*. 1862: 103–104.





Extracts from the Society's Journals

75 years ago

At the meeting of 24 April 1913, Edward Step exhibited a specimen of the fly *Ogcodes gibbosus* and read the following note:-

This little hump-backed spider-fly was taken in my garden at Ashtead last summer; and I am indebted to Mr Andrews for its identification, and for references to records of its previous capture. It is a representative of the family *Acroceridae*, whose members are characterized by a weakness for destroying spiers by feeding upon them internally as larvae. *Ogcodes gibbosus* is an exceedingly local species, and apparently rare in its few localities. Curtis (quoted by Verrall) records it from Wimbledon Common and the adjoining Coombe Wood; and a specimen in the Oxford Museum is labelled "Richmond Park, July 4th, 1835." Its principal locality to-day appears to be the New Forest; but it has been recorded also from two localities in Herefordshire, and one in Suffolk; to which must now be added Ashtead, Surrey. The head of the fly is remarkably small, and consists almost entirely of the two compound eyes. The great disproportion between the tiny head and the high rounded body, gives one the impression that the latter would be normally much smaller, but that it has been inflated by some diseased condition. This effect is intensified by the fact that the thorax is covered by a rather matted coating of whitish-grey hairs, which gives it the appearance of a house-fly that has been killed on our windows in autumn by the activity of the fly fungus. It is just possible that it may not be as rare as supposed, but that specimens may be passed with a cursory glance in the belief that they are merely diseased house-flies.

Having regard to the fact that the food of the larva is plentiful, and that feeding under cover it runs few risks, one would expect the fly to be quite common. But it has an enemy who takes effectual steps to keep down its numbers. This enemy is a hymenopteron, *Crabro interruptus*, a little wasp that makes tunnels in decaying wood, bramble-stems, and the like, dividing the tunnels into cells, in each of which an egg is laid, and the cell packed with flies. Each species of *Crabro* appears to have its own special taste in flies, and will provision its cells with only one species. Whether *Ogcodes gibbosus* is regularly exploited for the purpose is not established, but that it is so used an occasion is made clear by a communication to the "Ent. Mo. Mag." (Vol. xxxviii, 1902, pp. 205-6) from the Rev. H. S. Gorham, who came upon a hoard of the flies in a nest of the wasp. The latter, with that regard for economy of labour that is shown by many species, instead of making a tunnel for itself, had found one that had been excavated by the larva of *Gortyna flavago* in the stem of the marsh thistle. This she had divided into cells, and packed each of them with *Ogcodes gibbosus*. There were twenty-five to thirty flies in each cell, and the row of cells measured eight inches. In some of the cells the wasp-egg had hatched and the wasp-grub was already feeding upon the stored up flies. A further peculiar circumstance of this discovery is that Mr Gorham's attention was attracted to the thistle, not by the entry of the wasp with its prey, but by the fact that several spiders appeared to be watching the hole in the stem. The spiders — whose name he did not know — so greatly resembled the fly that he considered it to be a case of mimicry. Mr Gorham

considered these spiders to be of the actual species parasitized by *Ogcodes*, but I fail to see that he had any evidence to that effect. It may be so, and they may have been watching rejoicingly to see how many of their enemies were being safely interred in the stem of the thistle; or they may have been attracted by the odour of the fly emanating from such a store, and were discussing ways and means of breaking into a larder so well stocked with spider food.

[*Crabro interruptus* is currently called *Ectemnius (Metacrobro) cephalotes*.]

50 years ago

26th NOVEMBER 1938.

VISIT TO THE BRITISH MUSEUM (Natural History), South Kensington.

Leader: Mr F. D. COOTE

The Council decided this year as an experiment to arrange during the winter months for some visits to places of interest that would especially appeal to Naturalists, and the first on the programme was fixed for the Natural History Museum, South Kensington. Capt. N. D. Riley and Dr K. G. Blair very kindly undertook to lead the party, consisting of nearly 30 members and their friends.

Starting at 2.30 p.m. they were conducted to the student's section of the galleries and shown some of the treasures not usually exhibited, including some very valuable books, etc., such as Hübner's original works and the originals of the illustrations for Frohawk's "British Butterflies." Petiver's collection was also exhibited and proved most interesting. The cabinets of British Lepidoptera were opened for inspection. Some of the wonderful examples of Mimicry and Seasonal Dimorphism were exhibited and explained by Capt. Riley. Meanwhile Dr Blair had taken those interested in orders "other than Lepidoptera" to another part of the building, where some very interesting Coleoptera were exhibited and described. These included luminous Coleoptera, forms characteristic of desert regions, the dimorphic males of certain *Lucanidae*, etc.

Capt. Riley and Dr Blair were very heartily thanked for their kindness and at 4.15 p.m. members dispersed. Some members remained in the building to view the exhibits in the public galleries while about half of the party adjourned to Lyons depot for tea. Everyone seemed to have had a most enjoyable time and were of the opinion that the experiment had been very successful.

END OF VOLUME ONE



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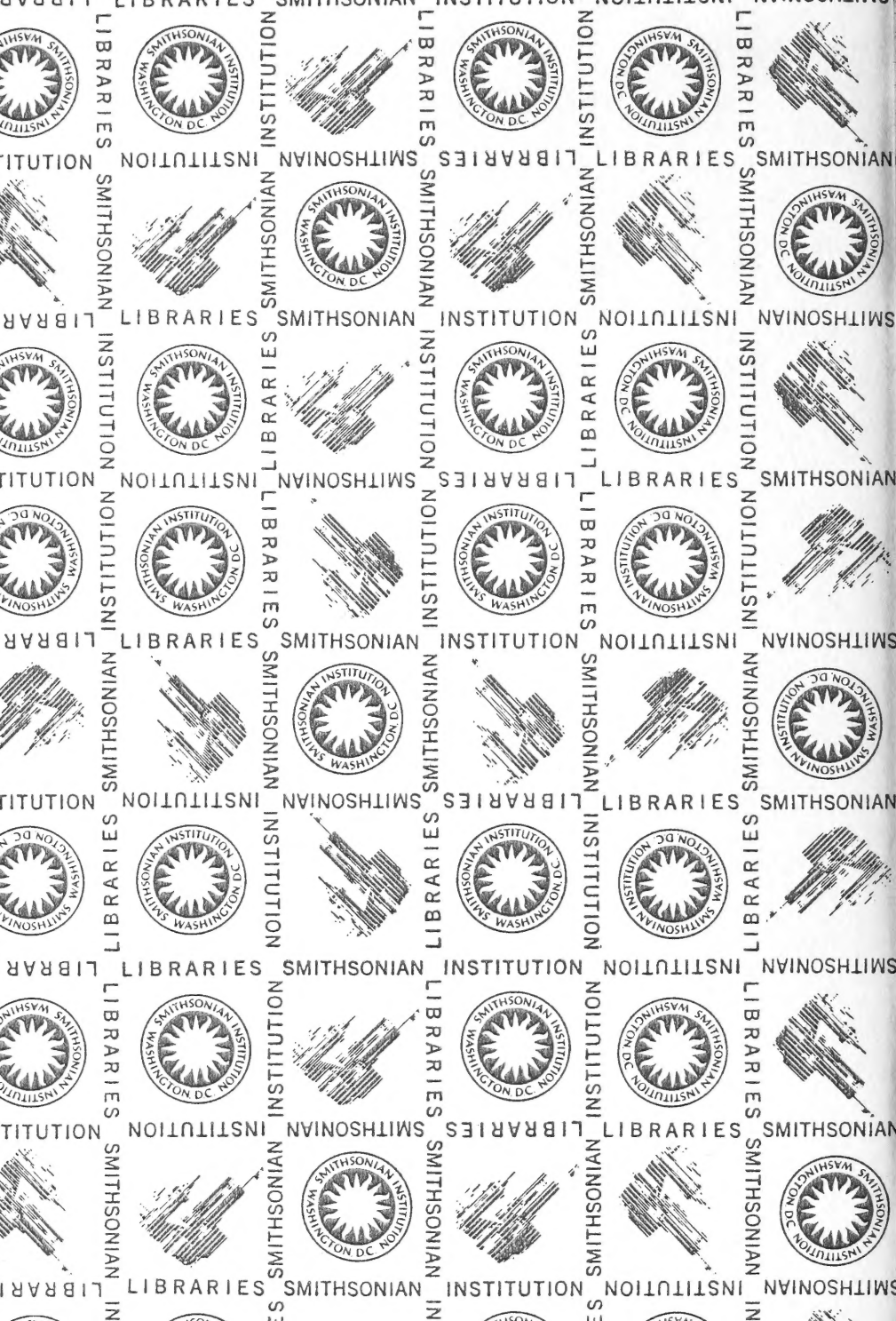
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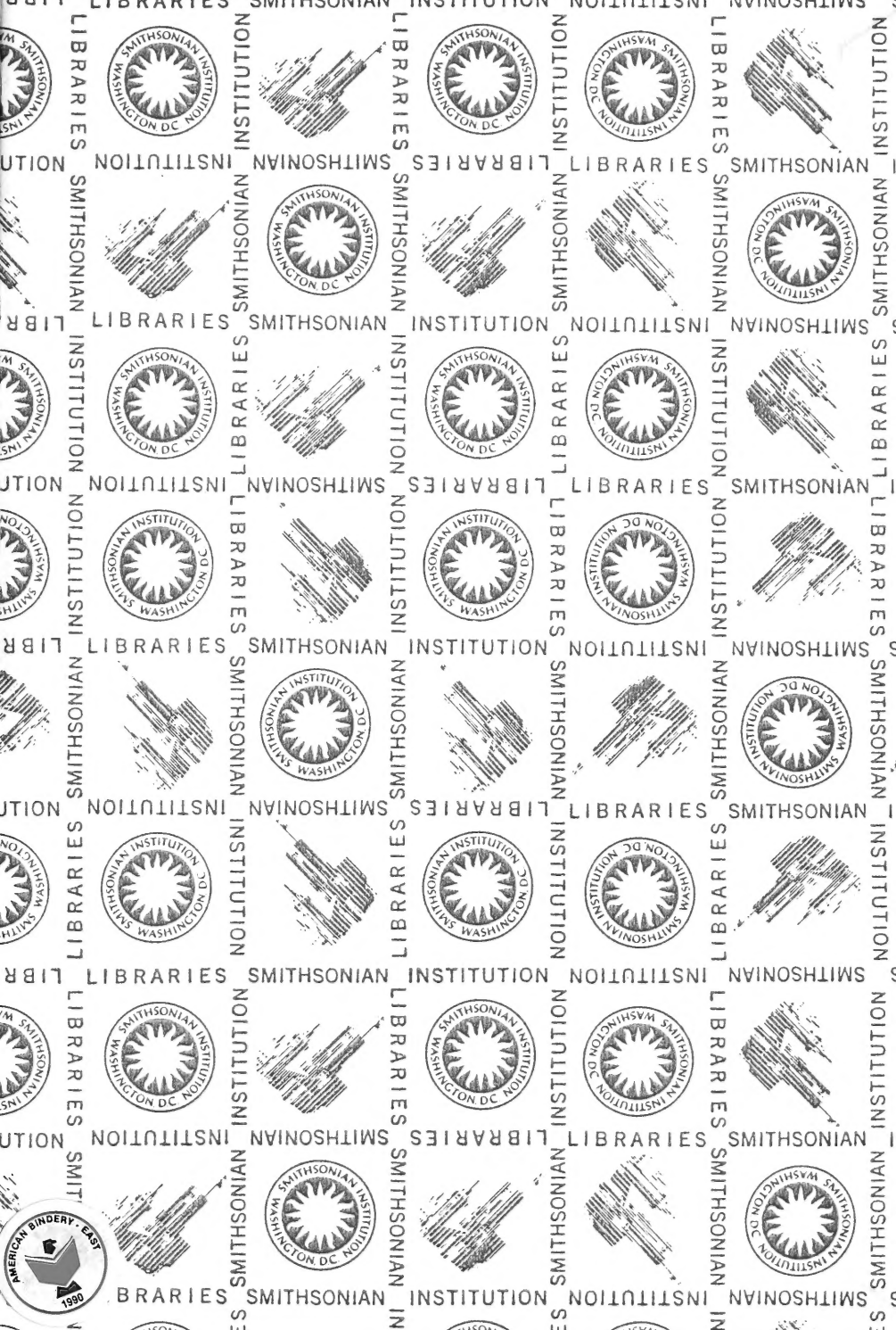
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